



# WHITEFISH BAY SCHOOL DISTRICT

## LONG-RANGE MASTER PLAN FACILITIES ASSESSMENT REPORT

PRA Project No. 230018 | Summer 2023

Whitefish Bay High School

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# DISTRICT OVERVIEW

Whitefish Bay School District is a highly ranked public school district in the village of Whitefish Bay, WI serving grades K4-12th, and providing a variety of community and recreational offerings. The District was originally established in 1892 for the education of students in the growing Milwaukee suburb.

Today, the District serves a population of nearly 15,000 residents with 2,891 students enrolled at the most recent count (at the time of this study). Regarding physical buildings, the District owns and maintains two elementary schools, Richards and Cumberland, one middle school, one high school, and Lydell School and Community Center. Information on their years of construction and specific functions of each building is available in the Facilities Condition Assessment.

More information can be found at the District's website - [www.wfbschools.com](http://www.wfbschools.com)



## An Exceptional Place to...

### Learn:

Every student will continuously grow to meet or exceed academic learning targets and social emotional competencies.

### Work:

Every staff member will experience an environment where they are valued, developed, and supported.

### Engage:

The community will be provided with opportunities to be involved in activities that promote collective growth, learning, and well-being.

*\*Excerpt from District 2024 Vision Plan*

# PROJECT TEAM



## DISTRICT ADMINISTRATION TEAM

Dr. John Thomsen, Superintendent of School  
Shawn Yde, Director of Business Services  
Brian Chase, Director of Buildings and Grounds  
Dr. Jamie Foeckler, Director of Teaching and Learning Services  
Anne Berleman Kearney, Board President



## PLUNKETT RAYSICH ARCHITECTS, LLP

Nicholas Kent, AIA, ALEP, LEED AP - Partner in Charge  
Nicole Dryden, AIA, LEED AP BD +C, WELL AP - Project Manager  
Devin Kack, AIA, LEED AP - Design Lead  
Dr. Melissa Thompson - Educational Strategist  
Grant Heimerdinger - Project Specialist



## MSA PROFESSIONAL SERVICES

Randy All, Principal Engineer  
Jamie Johnson, Mechanical  
John Russell, Electrical  
Ellis Miller, Electrical  
Alex Feudner, Plumbing  
Rebecca Deau, Plumbing

# EXECUTIVE SUMMARY

The following document is a comprehensive study of the physical state of Whitefish Bay School District's buildings, as well as a review of how they function as tools for the education of students and the community. The study is a snapshot in time that does not include any work that has been or will be done since the observations took place.

Large portions of Whitefish Bay School District's building portfolio are over or nearing 100 years old. While the buildings have been consistently maintained, a number of major building systems and components are at the end of their intended lifespans and in need of comprehensive work. Most notable are the mechanical, electrical, and plumbing systems at the Middle School and High School. Any remaining original exterior envelope components should also be considered. All of the District's buildings (excepting recent additions) were built at a time when accessibility was not a major consideration and large portions do not account for physical accessibility barriers. The Middle School and High School buildings were added on to consistently over the past 100 years and interior wayfinding is often circuitous and confusing.

The District buildings (excepting recent renovations such as the libraries and High School business classrooms) do not accommodate more modern modalities of learning. They consist primarily of classrooms that are generally only able to accommodate traditional desks in rows due to their size and configuration. Rooms lack the interconnection and visibility that is prevalent in today's learning environments. Additionally, the Middle School and High School have a number of special curriculum areas that do not have adequate facilities and challenging spaces for large gathering and/or lunch. All school buildings (including the elementaries) do not have adequate spaces for student services and support (as many of these program functions did not exist when the buildings were constructed)

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# FACILITIES CONDITION ASSESSMENT

# INTRODUCTION

This study is intended to survey and document the physical characteristics of all Whitefish Bay School District instructional buildings. The survey reviews the appearance, condition, and current uses of the buildings. The result of this study is a detailed and prioritized maintenance list to address material conditions and bring the buildings to current code/safety standards. Food service, pools, athletics, and other specialty reviews were not undertaken with this study.

The process included a review of available existing floor plans and a walk-through of all District buildings. The review makes comments based on exposed conditions and is non-destructive in nature.

The buildings were toured separately by the Plunkett Raysich Architects, LLC for architectural scope various times in June and July of 2023. Attendees were Nicholas Kent, Devin Kack, Nicole Dryden, and Grant Heimerdinger with District representation from Brian Chase. MSA teams including electrical and plumbing visited over the course of June and July of 2023.

# REFERENCE INFORMATION

## BUILDING SERVICE LIFE

When evaluating buildings, it is important to consider the life expectancy—both of the building as a whole and each individual component. Typically building elements fall into one of several categories when evaluating life cycle expectations, these categories speak to replacement feasibility.

Structural components and Concealed or Inaccessible components are not recommended for replacement. While minor repairs can be undertaken, these should be designed to last the lifespan of the building. This includes column systems, footings, floor, slabs, basement walls, and roof construction. When these components start to fail, it is typically recommended to vacate a building. Additional components are considered “Cost Prohibitive or Impractical” for replacement—replacement is technically feasible but not recommended for cost reasons. This includes exterior walls (re-cladding may be reasonable depending on the material).

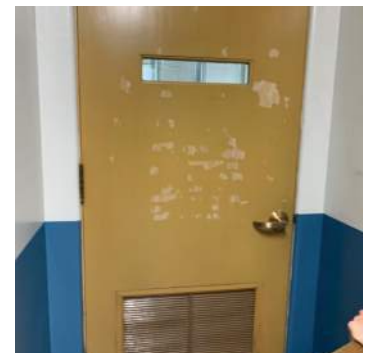
Additional components fall into “replaceable” categories—Major

Building, Mechanical, Electrical, Plumbing, Roofing, and Site. These pieces are designed to be replaced during the life of a building and include items like windows, doors, floor finishes, ceilings, roof coverings, plumbing fixtures, etc. The following report focuses on replaceable elements.

To consider the recommended lifespan for an entire building, it is important to look at the age of the oldest portion of and the anticipated service life for the Structural and Concealed/Inaccessible components. For the Whitefish Bay School District, the oldest portions of buildings date from 1918 - 1928, while the newest portion within the school district was built in 2010. Most of the district's additions range in between the 1950s.

It is important to note that the numbers on the following page are reference numbers only. While not recommended, components can be extended beyond this age (or have been known to fail earlier). Reference Service Lives are provided for maintenance planning purposes.

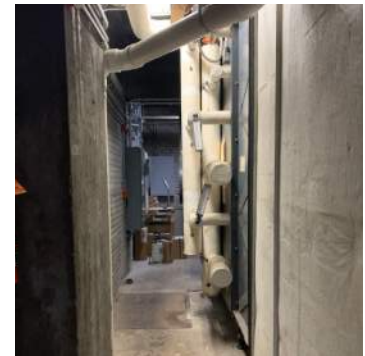
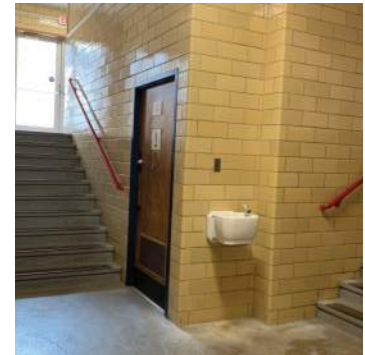
	<b>Component</b>	<b>Reference Service Life* (Years)</b>
<b>Structural</b>	Poured footings + foundations	100
	Concrete block	66-100
	Coated Steel + Steel Framing	100
<b>Cladding</b>	Brick Masonry	100
	Cast Stone Masonry	100
	Natural Stone Masonry	100
	Siding—Wood	10-50
	Siding—Vinyl	50
<b>Other Exterior</b>	Gutters + Downspouts	30
	Window/Storefront—Aluminum	40
<b>Interior Materials</b>	Gypsum Board	50
	Doors—Wood	30
	Tile (Wall + Floor)	50
	Carpet	11-25
	Vinyl Tiles (VCT, SVT, VET, VT)	15-20
	Rubber Flooring	30
	Acoustic Ceiling Tiles	30
<b>Site</b>	Concrete Paving	40
	Asphalt Paving	25



\*All life expectancies are based off proper installation and regular maintenance

\*Reference Service Life data based off ASTM E 2136, ASHRAE, and other available industry standards

	Component	Reference Service Life* (Years)
Roofing	Membrane	12-25 (per warranty)
	Asphalt Shingles	15-30
	Metal	20-50
Mechanical	Boiler	30-35
	Air Handling Unit	30-35
	Unit Ventilators	20-25
	Package Rooftop Unit	17-20
	Chiller	25-30
	Air-Cooled Condensing Unit	20-25
	Hot Water System Pumps	20-25
	Ductwork	25-40
	Exhaust Fans	5-15
Electrical	Service + Distribution	30
	Lighting + Branch Wiring	20
Plumbing	Piping	15-40
	Fixtures	15-25
	Waste Piping	50-100
	Hot Water Heater	11-14



\*All life expectancies are based off proper installation and regular maintenance

\*Reference Service Life data based off ASTM E 2136, ASHRAE, and other available industry standards



# RICHARDS ELEMENTARY SCHOOL

**ADDRESS:** 5812 N. Santa Monica Blvd.

**SITE SIZE:** 5.5 acres

**BUILDING SIZE:** 105,256 SF

**ENROLLMENT:** 658 students

**BUILDING AGE:** 1928  
(additions in 1950s, 1989, and 2010)

**GRADE LEVELS:** 4K - 5th

**SPRINKLERED:** No





SCHOOL TYPE	MIN. ACREAGE	PLUS	RECOMMENDED SIZE	ACTUAL SIZE	ADEQUATE SIZE
ELEMENTARY	10 ACRES	1 ACRE PER 100 STUDENTS	17 ACRES	5.5 ACRES	NO

**CONDITION KEY**

GOOD	No major needs anticipated in next 15 years. Meets or exceeds expectations for a modern educational facility.
GOOD TO FAIR	No major needs anticipated in next 10 years. Meets minimum expectations for a modern educational facility.
FAIR	No major needs anticipated in next 5 years. Components may be at or nearing expected service life.
FAIR TO POOR	No major immediate needs. Components are likely past expected service life.
POOR	Major immediate needs. Components are at or nearing failure.

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## SITE

The following report is the result of a site visit by Nick Kent, Nicole Dryden, and Grant Heimerdinger that occurred in June of 2023. Site observations and interviews with staff were used in preparation of this report.

### OBSERVATIONS

The site is overall in fair condition with good athletic fields. There is limited space to expand and site paving has some heaving/damage concerns.

### RECOMMENDATIONS

See maintenance list for all specific areas of concern.



## EXTERIOR

The following report is the result of a site visit by Nick Kent, Nicole Dryden, and Grant Heimerdinger that occurred in June of 2023. Site observations and interviews with staff were used in preparation of this report.

### OBSERVATIONS

Exterior material conditions are fair although windows are starting to show signs of age and replacement parts are no longer available for the original windows. Foundation, brick cracking, and water damage on bricks causes the district to perform yearly tuckpointing and maintenance.

### RECOMMENDATIONS

See maintenance list for all specific areas of concern.



# INTERIOR

The following report is the result of a site visit by Nick Kent, Nicole Dryden, and Grant Heimerdinger that occurred in June of 2023. Site observations and interviews with staff were used in preparation of this report.

## OBSERVATIONS

Interior materials are in fair condition, some such as casework, and lockers are nearing their usable life span and showing signs of damage. A large portion of doors and frames are also worn and in poor condition.

## RECOMMENDATIONS

See maintenance list for all specific areas of concern.

# ACCESSIBILITY

The following report is the result of a site visit by Nick Kent, Nicole Dryden, and Grant Heimerdinger that occurred in June of 2023. Site observations and interviews with staff were used in preparation of this report.

## OBSERVATIONS

Overall accessibility throughout Richards Elementary School is fair to poor. There is no accessible entry at the front door, nearly all door hardware is non compliant, and some classroom entrances have door approach clearance issues.

## RECOMMENDATIONS

See maintenance list for all specific areas of concern.



## MECHANICAL

The Whitefish School District contracted separately with Nexus Solutions to develop a comprehensive report and maintenance recommendation for the mechanical systems. The results and pricing are included in our compiled maintenance list.

# ELECTRICAL

The following report is the result of a site visit by Mike Pasineau of MSA Professional Services, Inc. that occurred on Wednesday, July 12, 2023. Site observations, existing drawing review and interviews with facility staff were used in preparing this report.

The original building was constructed in 1928 with building additions and/or renovations in 1952, 1957, 1991 and 2010.

## Main Electrical Service Observations

- A. The elementary school building is fed by one main electrical service that was installed as part of the 2010 renovation project. This service is a 120/208 volt, 3-phase, 4-wire, 1600 amp service and is fed from a pad mounted utility transformer and wall mounted C/T and meter cabinet located on the northeast side of the building. The main service switchboard is a Square D QED Series 2 type switchboard that was installed in 2010, appears to be in good working condition and has room for additional breakers.
- B. The existing service has a surge suppression device.
- C. The serving utility is WE Energies.

## Recommendations

- A. The existing electric service and service switchboard are in good working condition, in general has room for additional breakers and can remain. It appears that there is adequate service capacity on the service in the building. Add to the existing service as necessary.
- B. If a large building addition is constructed

or construction is located at the existing service location(s), a new larger service or relocation may be required.

## Panelboards Observations

- A. There are a variety of panelboards located throughout this facility. A majority of the panelboards were replaced during the 2010 addition and renovation project. These panelboards are square D NQ type panelboards and Square D HCN type distribution panelboards. These panels in general have room for additional breakers and appear to be in good working condition.
- B. We also noted a few old Square D NQOB type panelboards located throughout the building that still remain in the facility from previous renovation projects. These panels are nearing the end of their useful life and do not have room for additional breakers.

## Recommendations

- A. The old Square D NQOB type panelboards have exceeded their useful lifespan and should be replaced based on their age and condition.
- B. The Square D NQ and HCN type panelboards installed during the 2010 renovation project are in good working condition, in general have room for additional breakers and can remain. Add to the existing panelboards as necessary.
- C. Complete an Arc Flash Coordination Study of the existing electrical system and add arc

flash labels to all electrical panelboards. This will increase the safety of the personnel maintaining or operating equipment along with occupants in the vicinity of the equipment.

D. We noted numerous locations throughout the building where the area directly in front of panelboards was used as storage space. Ensure that a minimum of 3 feet of clearance is maintained in front of all panelboards throughout the facility.

#### **Generator Observations**

A. This building does not have a generator.

#### **Recommendations**

A. One option is to continue the use of battery backup exit lights and egress fixtures.  
B. Another option would be to consider adding a new generator and remove battery backup exit lights and egress lighting, provide power to data closets, phone, keyless entry, coolers and freezers as well as circulation pumps on boilers. Provide complete, new, code approved egress lighting paths throughout the facility if new generator set is added.

#### **Interior Lighting and Control Observations:**

A. All the lighting was recently replaced with new LED type fixtures throughout the facility and no issues were reported by the owner.

#### **Recommendations**

A. None

#### **Emergency Lighting Observations**

A. Emergency lighting and exit lighting is accomplished through a mixture of battery backup light fixtures and battery backup bug-eyetype fixtures with some of them being old incandescent type light fixtures.  
B. We did not verify full egress compliance during our walk through but assume some areas could use upgraded egress lighting to comply with current codes.

#### **Recommendations**

A. See recommendations from generator section.  
B. Add interior and exterior egress lighting to emergency generator to comply with current codes.  
C. Replace old incandescent egress light fixtures.

#### **Exterior Lighting Observations**

A. The building outdoor light fixtures were recently updated to LED wall pack type fixtures.

#### **Recommendations**

A. None

## ELECTRICAL (CONTINUED)

### Wiring Devices Observations

A. The receptacles and toggle switches are a mixture of commercial grade 15A and 20A with a mix of plastic and stainless steel wall plates. The devices vary in age and condition and for the most part show signs of general wear and tear.

### Recommendations

- A. Replace wiring devices and plates that are damaged.
- B. Add additional receptacles and circuits as necessary.
- C. We did not verify shared neutral loads on any existing circuits; this should be done by a qualified electrician prior to adding any additional devices. We would recommend a separate neutral be installed on any shared neutral loads or add multiple breakers to bring the circuiting up to code compliance.
- D. We did not verify if circuits contained independent grounding conductors. This should be done by a qualified electrical contractor or at a minimum verify if grounding continuity in all circuits. It was common in schools in Wisconsin to use the conduit as a grounding system on some older facilities. Over time, the conduit may have been disconnected causing ungrounded circuit conditions. We always recommend a separate grounding conductor be installed for every circuit.

### Fire Alarm System Observations

- A. The fire alarm is a Simplex 4100U Addressable fire alarm system. The head end and devices were installed during the 2010/2011 addition and renovation project. The fire alarm system appears to be in good working condition and staff indicated it is operating properly.
- B. There are pull stations by exterior doors
- C. There are horn/strobe devices in all public spaces including corridors and classrooms.
- D. There are smoke detectors present throughout the building.
- E. The external devices were code compliant at time of installation.

### Recommendations

- A. The system was installed in 2010 and is in good working condition. Add devices to the existing system as necessary.

### Clock System Observations

- A. The existing clock system consists of a Primex head end GPS transmitter. The existing clocks throughout the building are battery powered Primex and simplex type clocks.

### Recommendations

- A. The existing clock system is in good working condition and can remain. Add new Primex clocks to the existing system as necessary.

### Public Address System

## Observations

- A. The existing public address system was installed more than 10 years ago. The existing public address system is a proprietary system that was built and serviced by a local contractor.
- B. Numerous types of speakers are located throughout the facility of different ages and types. A majority of the speakers throughout the facility are round, ceiling mounted, recessed speakers in areas with lay-in ceiling grid and surface, wall mounted speakers in areas with hard ceiling surfaces or exposed structure.

## Recommendations

- A. The existing public address system is functional and can be expanded; however, due to the age of the equipment and the system being only serviceable by the contractor that built the system, a new public address system should be considered. We

recommend an all new Valcom or Carehawk Hybrid IP public address system with all new speakers and wiring throughout the building.

## Data, Telephone Observations

- A. The MDF data rack is located on the 2nd floor in a server room adjacent to the Library. There are (2) additional IDF data closets located throughout the building. The MDF data closet is fed with fiber and fiber is used to connect all switches throughout the building.
- B. The data system consists of a mixture of CAT 5 and CAT 5E type data cable which is routed to patch panels in the data rack.
- C. The building has wireless access points.
- D. Through random sampling of data cable, we found CAT 5 and CAT 5E plenum and non plenum rated data cabling.



## ELECTRICAL (CONTINUED)

### Recommendations

- A. A possible upgrade to the cabling is to provide all new plenum rated CAT 6 type data cabling to increase the speed of the network. New cabling also makes sense if large areas of ceilings are removed to accommodate other work.
- B. Additional CAT 6 data cabling can be added to rooms as needed.
- C. We believe the number of data drops could be reduced in each room if new cabling was provided; Two for a wireless access point, two for a teacher station and one for a media delivery device per classroom.
- D. Remove all abandoned phone and coaxial cabling throughout the entire facility.

### CCTV System Observations

- A. There is an existing Exacqvision IP based security camera system in the facility that was installed during the 2010 renovation project. The existing system is in good working condition. We noticed a few areas that could use additional coverage.
- B. The security cameras located throughout the building are a mixture of Sony, Samsung and Axis type cameras.

### Recommendations

- A. Add additional or modify cameras as required if remodeling to the building is proposed.
- B. This system is in good operating condition, but the system appears to be dated and new IP technology may be considered as an upgrade. Further discussion

with district is required to determine exact intent of a new system.

### Keyless Entry System Observations

- A. There is an S2 browser based keyless entry system installed in the facility. The system was installed during the 2010 renovation project. The facility was recently upgraded with encrypted card readers, hard wired from control panels to select doors.

### Recommendations

- A. Expand the existing door access control system as required if more doors are desired to have Card readers/Strike control added or if additions to the building are proposed that require card access.
- B. The system is in good operating condition, but new technology may be considered as an upgrade. Further discussion with the district is required to determine exact intent of a new system.

### Security System Observations

- A. There is a Honeywell security system in the facility with security motion detectors located throughout corridor areas and large collaboration spaces. Staff indicated that the system is operational without any issues.

### Recommendations

- A. Expand the existing security system with additional motion detectors or security keypads as necessary.

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# PLUMBING

The following report is the result of a site visit by Alex Feudner of MSA Professional Services, Inc. that occurred on Wednesday, July 12, 2023. Site observations and interviews with staff were all used in the preparation of this report.

The original building was constructed in 1928 with building additions and/or renovations in 1952, 1957, 1991 and 2010.

## DOMESTIC WATER SYSTEM OBSERVATIONS

A. The building is supplied by the municipal water utility. It has a 4" ductile iron water service with a 4" water meter. The system piping material is type L copper. The isolations valves are gate and ball valves. There are backflow preventers that serves the HVAC boilers. The system consist of cold water hard, hot water supply and hot water return. Pipe insulation is in fair condition. The system pressure is 45-55psig. The hot water delivery time to the most remote fixture is 60 seconds. There are minor reports of leaks and of hard to operate isolation valves. The overall system is in fair condition.

## RECOMMENDATIONS

A. Any future renovations and or additions, shall account for the resizing of the domestic water pipe mains in order to provide adequate pressure and flow to any new and existing fixtures. Current plumbing and energy codes required faster hot water delivery time to all fixtures. This will extend

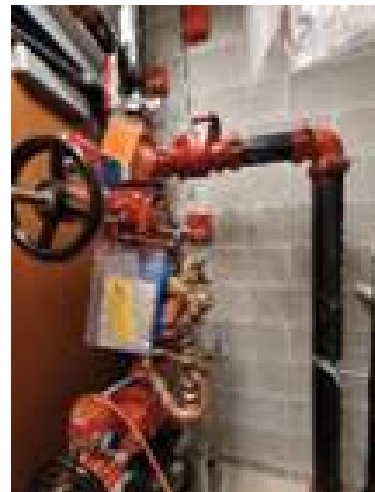
the domestic hot water piping system piping closer to all hand washing type fixtures and increase the size of the pipe main and circulation pump.

## Fire Suppression Piping System Observations

A. The building contains an automatic fire sprinkler system for the 2010 addition. It has a 6" ductile iron separate from the water service. There is 1 flow and 2 tamper switches. The overall system is in fair condition.

## Recommendations

A. The fire sprinkler service appears to be properly sized to support a fire sprinkler system for the entire building for any future renovations and or additions. The existing water service is not capable of providing an automatic fire sprinkler system for the entire building for any future renovations and or additions. A new properly sized water service will be required to support an automatic fire sprinkler system.



### Sanitary Drain, Waste and Vent Piping System

#### Observations

A. The building system discharges to the municipal sewer. Floor areas that are prone to spills have floor drains. The HVAC boilers are served by hub drains. The main system piping material is hub and spigot cast iron with PVC piping material installed for repairs and in renovated areas. The main drain piping are cleaned annually. Sections of existing hub and spigot cast iron piping are routinely replaced as back-up arise and as part of the preventative maintenance schedule. The overall system is in poor condition.

B. The lower level is served by a sanitary ejector basin and pump.

#### Recommendations

A. Replace the entire cast iron piping system with new piping since it is past its life expectancy. This includes underground, above floor and tunnel piping.

### Storm and Clear Water Drain, Waste and Vent Piping System

#### Observations

A. The building system discharges to on-site storm sewer drainage. The roof is served by internal roof drains. The HVAC air handling equipment are served by hub drains. The system piping material is hub and spigot cast iron and PVC. Pipe insulation is in fair to poor condition. There are no reports of back-up or system issues. The overall system is in poor condition.

### Recommendations

A. Replace the entire piping system with new piping since it is past its life expectancy. This includes underground, above floor and tunnel piping.

### Natural Gas Piping System

#### Observations

A. The building is supplied by the local gas utility. The system serves the HVAC, plumbing and kitchen equipment. Main system pressure is 2-5lb with a 7"-14" w.c. pressure regulator serving the equipment. The system piping material is black iron steel. The isolations valves are ball valves. The overall system is in fair condition.

#### Recommendations

A. None at this time

### Compressed Air Piping System

#### Observations

A. The system is served by an air compressor which is piped to equipment. The overall system is in fair condition.

#### Recommendations

A. None at this time.

### Plumbing Equipment

#### Observations

A. Water Heater – Northside of Building – 98 gallon 75,100btu atmospheric vented gas water heater with expansion tank and

## PLUMBING (CONTINUED)

re-circulating. Fair Condition.

B. Water Heater – Westside of Building – 50 gallon, 9kw Electric Water heater with expansion tank and re-circulating pump. Fair Condition.

C. Circulating Pumps – Northside of Building – Fair Condition.

D. Circulating Pumps – Westside of Building – Fair Condition

E. Sanitary Ejector Basin and Pump – Lower Level – Was not able to inspect at time of site visit.

F. Clearwater Sump Basin and Pump – Foundation Drain Tile – Was not able to inspect at time of site visit.

### Recommendations

A. Any future renovations and or additions, shall account for the resizing of the domestic hot water equipment to meet the demands of the any new and existing fixtures. Provide power vent, high efficiency gas water heater(s) with expansion tank and re-circulating pump to and from new hot water storage tank and distribution system circulating pump(s).

B. Increase the water heater water temperature outlet to 140 degree to prevent legionnaire bacteria growth inside of the hot water storage tank. Provide a thermostatic mixing valve to serve the hot water storage tank outlet piping. The thermostatic mixing valve shall be digital type.

### Plumbing Fixtures Observations

A. Water Closets – Vitreous china wall and floor mount with brass chrome

plated sensor hardwired flush valve. Poor Condition.

B. Lavatories – Vitreous china wall mount with brass chrome plated manual lever faucets. Fair Condition.

C. Lavatories – Vitreous china under mount with brass chrome plated sensor hardwired faucets. Fair Condition.

D. Wash Stations – Wall mount with sensor hard wired faucets. Fair Condition.

E. Urinals – Vitreous china wall and floor mount with brass chrome plated sensor hardwired flush valve. Fair Condition.

F. Kitchen Sinks – Stainless steel drop in mount with brass chrome plated manual lever faucets. Fair Condition.

G. General Sinks – Stainless steel drop-in with brass chrome plated manual lever faucets. Fair Condition.

H. Classroom Sinks – Stainless steel and cast iron enamel finish drop-in with brass chrome plated manual lever faucets and drinking fountain. Fair Condition.

I. Art Room Sinks – Stainless steel floor mount and drop-in with brass chrome plated manual lever faucets and point of use solid interceptors. Fair Condition.

J. Science Room Sinks – Epoxy resin under mount with brass chrome plated manual lever faucets and vacuum breaker spouts. Poor Condition.

K. Service Sinks – Mold PVC and Terrazzo wall/floor mount with brass chrome plated manual lever faucets and vacuum breaker spouts. Fair Condition.

L. Showers – Stainless steel single and multiply use brass manual lever showers valves. Poor Condition.

M. Electric Water Cooler – Single use with/without filling station. Fair Condition.

## Recommendations

- A. Replace all plumbing fixtures that are 15 years and older. Provide wall mount fixtures where possible and sensor operated flush valves / faucets in toilet rooms to improve hygiene and sanitary efforts.
- B. Provide floor drains with trap seal protection in all toilet rooms.
- C. Provide monthly testing of emergency fixtures.



# MAINTENANCE LIST

No.	Issue	Proposed Solution	Discipline	Cost	Priority
1	Southeast playground does not have accessible access.	Level entrance to playground	ACCESSIBILITY	\$7,148	2
2	Main entrance has no accessible access.	Provide ramp to main entry	ACCESSIBILITY	\$35,738	2
3	Hooks/shelves extend too far into corridors on all levels and do not provide cane detection per current code.	Remove hooks/shelves and replace with cubbies.	ACCESSIBILITY	\$10,721	2
4	Main office B131 door does not meet accessible clearance requirements	Remove or relocate door location	ACCESSIBILITY	\$30,020	2
5	Toilet B132 in main office B131 does not allow for clear floor space required by current accessibility codes.	Renovate room and allocate more space for toilet room or remove toilet room	ACCESSIBILITY	\$57,180	2
6	Immediate step down at southeast entry stair (ST-C1) door 8 (ST-B4) door 7 (ST-B3) door 6	Repair and/or replace landing to level entry	ACCESSIBILITY	\$32,164	2
7	Drinking fountains on east and west ends of first and second floor corridors do not meet current accessibility requirements and are not up to current code requirements	Replace and/or relocate drinking fountains	ACCESSIBILITY	\$53,606	2
8	Most classroom entrances have pull/push clearance issues	Replace doors	ACCESSIBILITY	\$1,000,650	2
9	Interior door hardware is not accessible or up to current code requirements throughout most of the building (knobs instead of levers)	Replace hardware	ACCESSIBILITY	\$571,800	2
10	Accessibility to the art and music wing is circuitous/difficult.	Provide accessible elevator at this end of the building.	ACCESSIBILITY	\$142,950	3
11	Most 2018 renovated toilet rooms do not provide an ADA accessible sink or vertical grab bars	Provide ADA sink and vertical grab bars	ACCESSIBILITY	\$85,770	3
12	Gymnasium stage is not accessible and both stairwells do not provide code compliant railings	Provide lift or ramp to access stage, widen existing stairs, and extend stair railing to meet code	ACCESSIBILITY	\$71,475	3
13	Stairwell ST-C1 and ST-A1 do not meet current code requirements, mainly due to railing extensions and continuity, as well as lack of visual contrast strips on treads.	Extend/connect railings and provide adhesive contrast strips to meet code requirements.	SAFETY/SECURITY	\$35,738	1
14	Non-compliant railing at exterior entry stair (ST-C1) door 8 (ST-B4) door 7 (ST-B3) door 6	Raise railing height, replace railing type, and extend railing past steps to comply with current code requirements	SAFETY/SECURITY	\$64,328	1

No.	Issue	Proposed Solution	Discipline	Cost	Priority
15	South entry door 11 has step too close to doorway	Repair and/or replace landing to level entry	SAFETY/SECURITY	\$14,295	1
16	Gymnasium C109 is in fair to poor condition. Egress doors do not include panic hardware, wood partition panels, wood doors underneath the stage, and ceiling tiles are dated	Replace doors, remove wood partitions and doors, and replace ceiling	SAFETY/SECURITY	\$71,475	1
17	Main entry railing is not up to current code requirements	Replace railing	SAFETY/SECURITY	\$32,164	1
18	Railing at south entry stairwell (ST-C1) does not meet current code requirements	Replace railing	SAFETY/SECURITY	\$21,443	1
19	No dumpster enclosure present on site (northeast).	Add dumpster enclosure with WFB compliant screening and bollards.	SITE	\$71,475	2
20	Stone path south of main entry is overgrown and inaccessible	Level and clear path	SITE	\$6,433	2
21	Pavement is damaged and heaving	Repair, level, and/or replace pavement	SITE	\$285,900	3
22	Northeast chain fence is in fair condition	Replace fence	SITE	\$35,738	3
23	Windows on entire south face elevation are too close to grade and do not allow for proper drainage.	Excavate earth around ground floor windows to create window wells.	EXT	\$42,885	2
24	Windows are at grade on entire main entry elevation do not allow for proper drainage.	Excavate earth around windows to create window wells.	EXT	\$42,885	2
25	Window sealant missing in 2018 addition around west window elevations	Provide proper sealant	EXT	\$7,148	2
26	Brick and foundation cracking north of entry door 11	Repair brick and foundation	EXT	\$6,433	2
27	Brick and foundation cracking and dated at main entry stairway (north and south of entry)	Replace and repair brick and foundation	EXT	\$53,606	2
28	Lintel damaged at first window north of main entry	Replace lintel	EXT	\$8,577	2

## MAINTENANCE LIST (CONTINUED)

No.	Issue	Proposed Solution	Discipline	Cost	Priority
29	Roofs from 2003 (A, B, B1, B2, B3, C, D, D1, D2) are due for replacement	Replace roofs	EXT	\$624,692	2
30	Exposed water pipe north of main entry appears to be rusting and dated	Replace water pipe	EXT	\$1,430	2
31	Windows are showing signs of age. Some parts are no longer available to repair in original building	Replace windows	EXT	\$743,340	2
32	Exterior door south of entry door 5 at receiving A114 is rusting and worn	Strip, prep, and paint door	EXT	\$1,430	2
33	At northwest and southwest corner of building 2018 renovation, landscaping tarp is exposed and covering brick flashing	Excavate earth around windows to provide proper clearance	EXT	\$6,433	3
34	Window flashing, when it exists, is too close to grade and landscaping	Excavate earth around windows to provide proper clearance. Cut in metal flashing if not present.	EXT	\$35,738	3
35	Flashing missing on ground floor windows north of main entry	Provide flashing	EXT	\$14,295	3
36	Flashing missing on ground floor windows south of main entry	Provide flashing	EXT	\$21,443	3
37	Stonework cracking and worn on main entry elevation	Repair and/or replace stonework	EXT	\$25,731	3
38	Fence around southeast playground is listing but in fair condition	Replace fence	EXT	\$19,298	3
39	Window sills (limited) around entire building are in poor condition.	Replace windows and sills	EXT	\$300,195	3
40	Some classrooms have layers of flooring on top of original wood floor on sleepers. Due to movement the upper layers are failing.	Remove existing flooring and infill floor to level and replace tiles	INT	\$1,429,500	2
41	Lockers and bases are rusting, peeling and dated	Remove lockers and base	INT	\$171,540	2
42	Direct apply or spline ceiling is chipping and dated in first floor corridor	Remove or patch ceiling where applicable	INT	\$85,770	2

No.	Issue	Proposed Solution	Discipline	Cost	Priority
43	Casework and lockers are damaged and dated	Replace casework and lockers	INT	\$450,293	2
44	Door leafs are worn with damage to face	Replace doors	INT	\$1,300,845	2
45	Flooring is in poor condition in majority of classrooms on the second floor	Replace flooring	INT	\$285,900	2
46	Interior door frames are in poor condition and worn	Strip and repaint all hollow metal frames.	INT	\$111,501	2
47	General electrical recommendation.	Complete an Arc Flash Coordination Study of the existing electrical system and add arc flash labels to all panelboards.	ELEC	\$28,590	1
48	Some areas are not well covered by existing camera system.	Add new cameras as required.	ELEC	\$142,950	2
49	Several older style Square D NQOB type panelboards are nearing the end of the useful life.	Replace with new panelboards.	ELEC	\$178,688	2
50	Public address system is dated and proprietary (can only be serviced by single contractor).	Plan for new public address system (IP) with all new speakers and wiring.	ELEC	\$357,375	3
51	Some receptacles and toggle switches show wear and damage.	Replace damaged wiring devices.	ELEC	\$142,950	3
52	Some egress lighting are old incandescent fixtures.	Replace with new LED fixtures.	ELEC	\$53,606	3
53	Through random sampling of data cable, some non plenum rated CAT 5 and 5E was found.	Upgrade all cabling to new plenum rated CAT 6 data cabling.	ELEC	\$1,429,500	3
54	Water closets, science room sinks, and showers were noted to be in poor condition.	Replace all plumbing fixtures that are over 15 years old. Provide wall mounted fixtures where possible. Faucets and flush valves to be sensor operated.	PLUMB	\$285,900	1
55	Most of the storm piping system is past its life expectancy. The system is in poor condition, with fair to poor pipe insulation, but there are no reports of back ups or issues.	Replace entire piping system with new. This includes underground, above floor, and tunnel piping.	PLUMB	\$1,429,500	1
56	Within the sanitary piping system sections of existing hub and spigot cast iron piping are routinely replaced as back-ups arise and as part of the preventative maintenance schedule. The overall system is in poor condition.	Replace the entire cast iron piping system with new piping (past life expectancy). This includes underground, above floor and tunnel piping.	PLUMB	\$1,429,500	1

## MAINTENANCE LIST (CONTINUED)

No.	Issue	Proposed Solution	Discipline	Cost	Priority
57	General plumbing recommendation.	Provide a thermostatic mixing valve to serve the hot water storage tank outlet piping (digital).	PLUMB	\$71,475	2
58	Some toilet rooms do not have floor drains, or floor drains with trap seal protection.	Provide floor drains with trap seal protection in all toilet rooms.	PLUMB	\$85,770	3
59	There are minor reports of leaks and hard to operate isolation valves. However, domestic water piping is overall in fair condition.	Replace and/or repair at areas of concern.	PLUMB	\$71,475	3
60	Classrooms do not have thermal controllability expected from a modern building.	Add slip in style VAV boxes (Qty 54) to existing ductwork for classroom air handling unit. Provide ten (10) additional zones.	MECH	\$608,200	2
61	Gym AHUs are past their useful life expectancy.	Replace 1957 gym air handling units (Qty 2) and add DX cooling.	MECH	\$322,700	2
62	Exhaust fans are past useful life expectancy.	Replace 1991 exhaust fans (Qty 3) and add thermal equalizers (Qty 4) to gym.	MECH	\$38,100	2
63		Add a high efficiency condensing boiler for spring, fall, and summer use.	MECH	\$364,400	3
64	Large 1991 AHU is starting to reach useful life expectancy.	Replace 1991 large built up classroom air handling unit.	MECH	\$85,770	3
65	Office 1991 AHU is starting to reach useful life expectancy.	Replace 1991 office air handling unit and associated DX condensing unit.	MECH	\$171,200	3
66	Building has dated and inefficient pneumatic controls.	Replace remaining pneumatic and proprietary DDC controls components with Niagara Tridium platform compatible DDC controls systems.	MECH	\$663,000	3
<b>RICHARDS ELEMENTARY TOTAL</b>				<b>\$16,489,761</b>	

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# CUMBERLAND ELEMENTARY SCHOOL

**ADDRESS:** 4780 N. Marlborough Dr.

**SITE SIZE:** 9.1 acres

**BUILDING SIZE:** 103,918 SF

**ENROLLMENT:** 629 students

**BUILDING AGE:** 1928  
(additions in 1950s, 1989, and 2010)

**GRADE LEVELS:** 4K - 5th

**SPRINKLERED:** No





SCHOOL TYPE	MIN. ACREAGE	PLUS	RECOMMENDED SIZE	ACTUAL SIZE	ADEQUATE SIZE
ELEMENTARY	10 ACRES	1 ACRE PER 100 STUDENTS	17 ACRES	9.1 ACRES	NO

**CONDITION KEY**

GOOD	No major needs anticipated in next 15 years. Meets or exceeds expectations for a modern educational facility.
GOOD TO FAIR	No major needs anticipated in next 10 years. Meets minimum expectations for a modern educational facility.
FAIR	No major needs anticipated in next 5 years. Components may be at or nearing expected service life.
FAIR TO POOR	No major immediate needs. Components are likely past expected service life.
POOR	Major immediate needs. Components are at or nearing failure.

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## SITE

The following report is the result of a site visit by Nick Kent, Nicole Dryden, and Grant Heimerdinger that occurred in June of 2023. Site observations and interviews with staff were used in preparation of this report.

### OBSERVATIONS

Site is overall in fair condition with good athletic fields and space to play/learn outdoors. Site paving has some heaving/damage concerns, and water was noted as flowing back towards the building and grade level windows.

### RECOMMENDATIONS

See maintenance list for all specific areas of concern.



## EXTERIOR

The following report is the result of a site visit by Nick Kent, Nicole Dryden, and Grant Heimerdinger that occurred in June of 2023. Site observations and interviews with staff were used in preparation of this report.

### OBSERVATIONS

Exterior materials are mostly in fair condition, some windows are beginning to deteriorate and original windows no longer have replacement parts available. Water damage on bricks and stone as well as cracks in foundation and brick causes the district to perform yearly tuckpointing and maintenance.

### RECOMMENDATIONS

See maintenance list for all specific areas of concern.



# INTERIOR

The following report is the result of a site visit by Nick Kent, Nicole Dryden, and Grant Heimerdinger that occurred in June of 2023. Site observations and interviews with staff were used in preparation of this report.

## OBSERVATIONS

Interior materials are for the most part in fair condition with the exception of doors and frames which are largely in poor condition and showing signs of wear. Materials including casework and lockers are nearing end of usable life span and some are damaged.

## RECOMMENDATIONS

See maintenance list for all specific areas of concern.



## ACCESSIBILITY

The following report is the result of a site visit by Nick Kent, Nicole Dryden, and Grant Heimerdinger that occurred in June of 2023. Site observations and interviews with staff were used in preparation of this report.

### OBSERVATIONS

Cumberland Elementary school has fair to poor accessibility. The main entry lacks an accessible route. There is only one elevator in a devided section of the building and the stage is inaccessible. The majority of doors have non compliant door hardware. Many classroom entrances have approach clearance issues.

### RECOMMENDATIONS

See maintenance list for all specific areas of concern.



## MECHANICAL

The Whitefish School District contracted separately with Nexus Solutions to develop a comprehensive report and maintenance recommendation for the mechanical systems. The results and pricing are included in our compiled maintenance list.

# ELECTRICAL

The following report is the result of a site visit by Mike Pasineau of MSA Professional Services, Inc. that occurred on Wednesday, July 12, 2023. Site observations, existing drawing review and interviews with facility staff were used in preparing this report.

The original building was constructed in 1927 with building additions and/or renovations in 1938, 1950 1957, 1991 and 2010.

## Main Electrical Service Observations

A. The elementary school building is fed by one main electrical service that was installed as part of the 2010 renovation project. This service is a 120/208 volt, 3-phase, 4-wire, 1600 amp service and is fed from a pad mounted utility transformer and wall mounted C/T and meter cabinet located on the northeast side of the building. The main service switchboard is a Square D QED Series 2 type switchboard that was installed in 2010, appears to be in good working condition and has room for additional breakers.

B. The existing service has a surge suppression device.

C. The serving utility is WE Energies.

## Recommendations

A. The existing electric service and service switchboard are in good working condition, in general has room for additional breakers and can remain. It appears that there is adequate service capacity on the

service in the building. Add to the existing service as necessary.

B. If a large building addition is constructed or construction is located at the existing service location(s), a new larger service or relocation may be required.

## Panelboards Observations

A. There are a variety of panelboards located throughout this facility. Many panelboards in the building were replaced during the 2010 addition and renovation project. These panelboards are Square D NQ type panelboards and Square D I-Line type distribution panelboards. There are also numerous Square D NQOD panelboards that appear to have been installed during the 1991 renovation project. The panelboards installed during the 2010 and 1991 renovation projects in general have room for additional breakers and appear to be in good working condition.

B. We also noted a few older style Square D NQOB type panelboards as well as one very old Square D Fusible panelboard located in the lower level of the building. These panels have reached the end of their useful life and do not have room for additional breakers.

## Recommendations

A. The old Square D NQOB and Square D fusible type panelboards have exceeded their useful lifespan and should be replaced based on their age and condition.

B. The Square D NQ, NQOD and I-Line type panelboards installed during the 2010

and 1991 renovation projects are in good working condition, in general have room for additional breakers and can remain. Add to the existing panelboards as necessary.

C. Complete an Arc Flash Coordination Study of the existing electrical system and add arc flash labels to all electrical panelboards. This will increase the safety of the personnel maintaining or operating equipment along with occupants in the vicinity of the equipment.

D. We noted numerous locations throughout the building where the area directly in front of panelboards was used as storage space. Ensure that a minimum of 3 feet of clearance is maintained in front of all panelboards throughout the facility.

**Generator Observations**

A. This building does not have a generator.

**Recommendations**

A. One option is to continue the use of battery backup exit lights and egress

fixtures.

B. Another option would be to consider adding a new generator and remove battery backup exit lights and egress lighting, provide power to data closets, phone, keyless entry, coolers and freezers as well as circulation pumps on boilers. Provide complete, new, code approved egress lighting paths throughout the facility if new generator set is added.

**Interior Lighting and Control Observations:**

A. All the lighting was recently replaced with new LED type fixtures throughout the facility and no issues were reported by the owner.

**Recommendations**

A. None

**Emergency Lighting Observations**

A. Emergency lighting and exit lighting is accomplished through a mixture of battery



## ELECTRICAL (CONTINUED)

backup light fixtures and battery backup bug-eye type fixtures with some of them being old incandescent type light fixtures.

B. We did not verify full egress compliance during our walk through but assume some areas could use upgraded egress lighting to comply with current codes.

### Recommendations

A. See recommendations from generator section.

B. Add interior and exterior egress lighting to emergency generator to comply with current codes.

C. Replace old incandescent egress light fixtures.

### Exterior Lighting Observations

A. The building outdoor light fixtures were recently updated to LED wall pack type fixtures.

### Recommendations

A. None

### Wiring Devices Observations

A. The receptacles and toggle switches are a mixture of commercial grade 15A and 20A with a mix of plastic and stainless steel wall plates. The devices vary in age and condition and for the most part show signs of general wear and tear.

### Recommendations

A. Replace wiring devices and plates that are damaged.

B. Add additional receptacles and circuits as necessary.

C. We did not verify shared neutral loads on any existing circuits; this should be done by a qualified electrician prior to adding any additional devices. We would recommend a separate neutral be installed on any shared neutral loads or add multipole breakers to bring the circuiting up to code compliance.

D. We did not verify if circuits contained independent grounding conductors. This should be done by a qualified electrical contractor or at a minimum verify if grounding continuity in all circuits. It was common in schools in Wisconsin to use the conduit as a grounding system on some older facilities. Over time, the conduit may have been disconnected causing ungrounded circuit conditions. We always recommend a separate grounding conductor be installed for every circuit.

### Fire Alarm System Observations

A. The fire alarm is a Simplex 4100U Addressable fire alarm system. The head end and devices were installed during the 2010/2011 addition and renovation project. The fire alarm system appears to be in good working condition and staff indicated it is operating properly.

B. There are pull stations by exterior doors

C. There are horn/strobe devices in all public spaces including corridors and

classrooms.

D. There are smoke detectors present throughout the building.

E. The external devices were code compliant at time of installation.

### Recommendations

A. The system was installed in 2010 and is in good working condition. Add devices to the existing system as necessary.

### Clock System Observations

A. The existing clock system consists of a Primex head end GPS transmitter. The existing clocks throughout the building are battery powered Primex and simplex type clocks.

B. The Primex GPS transmitter was observed to be resting on a ledge of a window in the 2nd floor corridor of the building with the transmitter cords and wiring being strung into adjacent rooms.

### Recommendations

A. The existing clock system is in good working condition and can remain. Add new Primex clocks to the existing system as necessary.

B. We recommend locating the Primex GPS transmitter in a location not accessible by students and providing the proper, dedicated connections adjacent to the transmitter. Moving this equipment to a secured area will alleviate the risk of damage to the transmitter.

### Public Address System Observations

A. The existing public address system was installed more than 10 years ago. The existing public address system is a proprietary system that was built and serviced by a local contractor.

B. Numerous types of speakers are located throughout the facility of different ages and types. A majority of the speakers throughout the facility are round, ceiling mounted, recessed speakers in areas with lay-in ceiling grid and surface, wall mounted speakers in areas with hard ceiling surfaces or exposed structure.



## ELECTRICAL (CONTINUED)

### Recommendations

A. The existing public address system is functional and can be expanded; however, due to the age of the equipment and the system being only serviceable by the contractor that built the system, a new public address system should be considered. We recommend an all new Valcom or Carehawk Hybrid IP public address system with all new speakers and wiring throughout the building.

### Data System

#### Observations

A. The MDF data rack is located on the 2nd floor in a server room adjacent to the Library. There are (2) additional IDF data closets located throughout the building. The MDF data closet is fed with fiber and fiber is used to connect all switches throughout the building.

B. The data system consists of a mixture of CAT 5 and CAT 5E type data cable which is routed to patch panels in the data rack.

C. The building has wireless access points.

D. Through random sampling of data cable, we found CAT 5 and CAT 5E plenum and non plenum rated data cabling.

### Recommendations

A. A possible upgrade to the cabling is to provide all new plenum rated CAT 6 type data cabling to increase the speed of the network. New cabling also makes sense if large areas of ceilings are removed to accommodate other work.

B. Additional CAT 6 data cabling can be

added to rooms as needed.

C. We believe the number of data drops could be reduced in each room if new cabling was provided; Two for a wireless access point, two for a teacher station and one for a media delivery device per classroom.

D. Remove all abandoned phone and coaxial cabling throughout the entire facility.

### CCTV System

#### Observations

A. There is an existing Exacqvision IP based security camera system in the facility that was installed during the 2010 renovation project. The existing system is in good working condition. We noticed a few areas that could use additional coverage.

B. The security cameras located throughout the building are a mixture of Sony, Samsung and Axis type cameras.

### Recommendations

A. Add additional or modify cameras as required if remodeling to the building is proposed.

B. This system is in good operating condition, but the system appears to be dated and new IP technology may be considered as an upgrade. Further discussion with district is required to determine exact intent of a new system.

### Keyless Entry System

#### Observations

A. There is an S2 browser based keyless entry system installed in the facility. The system was installed during the 2010

renovation project. The facility was recently upgraded with encrypted card readers, hard wired from control panels to select doors.

### Recommendations

- A. Expand the existing door access control system as required if more doors are desired to have Card readers/Strike control added or if additions to the building are proposed that require card access.
- B. The system is in good operating condition, but new technology may be considered as an upgrade. Further discussion with the district is required to determine exact intent of a new system.

### Security System Observations

- A. There is a Honeywell security system in the facility with security motion detectors located throughout corridor areas and large collaboration spaces. Staff indicated that the system is operational without any issues.

### Recommendations

- A. Expand the existing security system with additional motion detectors or security keypads as necessary.



# PLUMBING

The following report is the result of a site visit by Alex Feudner of MSA Professional Services, Inc. that occurred on Wednesday, July 12, 2023. Site observations and interviews with staff were all used in the preparation of this report.

The original building was constructed in 1927 with building additions and/or renovations in 1938, 1950 1957, 1991 and 2010.

## Domestic Water Piping System Observations

A. The building is supplied by the municipal water utility. It has a 4" ductile iron water service with a 4" water meter. The system piping material is type L copper. The isolations valves are gate and ball valves. There are backflow preventers that serves the HVAC boilers. The system consist of cold water hard, hot water supply and hot water return. Pipe insulation is in fair condition. The system pressure is 45-55psig. The hot water delivery time to the most remote fixture is 60 seconds. There are minor reports of leaks and of hard to operate isolation valves. The overall system is in fair condition.

## Recommendations

A. Any future renovations and or additions, shall account for the resizing of the domestic water pipe mains in order to provide adequate pressure and flow to any new and existing fixtures. Current plumbing and energy codes required faster hot water delivery time to all fixtures. This will extend

the domestic hot water piping system piping closer to all hand washing type fixtures and increase the size of the pipe main and circulation pump.

## Fire Suppression Piping System Observations

A. The building contains an automatic fire sprinkler system for the 2010 addition. It has a 6" ductile iron separate from the water service. There is 1 flow and 2 tamper switches. The overall system is in fair condition.

## Recommendations

A. The fire sprinkler service appears to be properly sized to support a fire sprinkler system for the entire building for any future renovations and or additions. The existing water service is not capable of providing an automatic fire sprinkler system for the entire building for any future renovations and or additions. A new properly sized water service will be required to support an automatic fire sprinkler system.

## Sanitary Drain, Waste and Vent Piping System Observations

A. The building system discharges to the municipal sewer. Floor areas that are prone to spills have floor drains. The HVAC boilers are served by hub drains. The main system piping material is hub and spigot cast iron with PVC piping material installed for repairs and in renovated areas. The main drain piping are cleaned annually. Sections

of existing hub and spigot cast iron piping are routinely replaced as back-up arise and as part of the preventative maintenance schedule. The overall system is in poor condition.

B. The lower level is served by a sanitary ejector basin and pump.

### Recommendations

A. Replace the entire cast iron piping system with new piping since it is past its life expectancy. This includes underground, above floor and tunnel piping.

### Storm and Clear Water Drain, Waste and Vent Piping System Observations

A. The building system discharges to on-site storm sewer drainage. The roof is served by internal roof drains. The HVAC air handling equipment are served by hub drains. The system piping material is hub and spigot cast iron and PVC. Pipe insulation is in fair to poor condition. There are no reports of back-up or system issues. The overall system is in poor condition.

### Recommendations

A. Replace the entire piping system with new piping since it is past its life expectancy. This includes underground, above floor and tunnel piping.

### Natural Gas Piping System Observations

A. The building is supplied by the local

gas utility. The system serves the HVAC, plumbing and kitchen equipment. Main system pressure is 2-5lb with a 7"-14" w.c. pressure regulator serving the equipment. The system piping material is black iron steel. The isolations valves are ball valves. The overall system is in fair condition.

### Recommendations

A. None at this time

### Compressed Air Piping System Observations

A. The system is served by an air compressor which is piped to equipment. The overall system is in fair condition.

### Recommendations

A. None at this time.

### Plumbing Equipment Observations

A. Water Heater – Eastside of Building – 98 gallon 75,100btu atmospheric vented gas water heater with expansion tank and re-circulating. Fair Condition.

B. Water Heater – Westside of Building – 50 gallon, 9kw Electric Water heater with expansion tank and re-circulating pump. Fair Condition.

C. Circulating Pumps – Northside of Building – Fair Condition.

D. Circulating Pumps – Eastside of Building – Fair Condition

E. Sanitary Ejector Basin and Pump – Lower Level – Was not able to inspect at

## PLUMBING (CONTINUED)

time of site visit.

F. Clearwater Sump Basin and Pump – Foundation Drain Tile – Was not able to inspect at time of site visit.

### Recommendations

A. Any future renovations and or additions, shall account for the resizing of the domestic hot water equipment to meet the demands of the any new and existing fixtures. Provide power vent, high efficiency gas water heater(s) with expansion tank and re-circulating pump to and from new hot water storage tank and distribution system circulating pump(s).

B. Increase the water heater water temperature outlet to 140 degree to prevent legionnaire bacteria growth inside of the hot water storage tank. Provide a thermostatic mixing valve to serve the hot water storage tank outlet piping. The thermostatic mixing valve shall be digital type.

### Plumbing Fixtures Observations

A. Water Closets – Vitreous china wall and floor mount with brass chrome plated sensor hardwired flush valve. Poor Condition.

B. Lavatories – Vitreous china wall mount with brass chrome plated sensor hardwired faucets. Fair Condition.

C. Wash Stations – Wall mount with sensor hard wired faucets. Fair Condition.

D. Urinals – Vitreous china wall with brass chrome plated sensor hardwired flush valve. Fair Condition.

E. Kitchen Sinks – Stainless steel drop in mount with brass chrome plated manual lever

faucets. Fair Condition.

F. General Sinks – Stainless steel drop-in with brass chrome plated manual lever faucets. Fair Condition.

G. Classroom Sinks – Cast iron enamel finish drop-in with brass chrome plated manual lever faucets and drinking fountain. Fair Condition.

H. Art Room Sinks – Stainless steel floor mount and drop-in with brass chrome plated manual lever faucets and point of use solid interceptors. Fair Condition.

I. Science Room Sinks – Epoxy resin under mount with brass chrome plated manual lever faucets and vacuum breaker spouts. Poor Condition.

J. Service Sinks – Mold PVC and Terrazzo wall and floor mount with brass chrome plated manual lever faucets and vacuum breaker spouts. Fair Condition.

K. Showers – Stainless steel single use brass manual lever showers valves. Poor Condition.

L. Electric Water Cooler – Single use with and without bottle filling station. Fair Condition.

### Recommendations

A. Replace all plumbing fixtures that are 15 years and older. Provide wall mount fixtures were possible and sensor operated flush valves / faucets in toilet rooms to improve hygiene and sanitary efforts.

B. Provide floor drains with trap seal protection in all toilet rooms.

C. Provide monthly testing of emergency fixtures.

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# MAINTENANCE LIST

No.	Issue	Proposed Solution	Discipline	Cost	Priority
1	Auto door operator push plate not located at area of pavement on east side entry (A100)	Extend concrete to push plate.	ACCESSIBILITY	\$7,148	2
2	Northwest corner entry stairway (C114) behind stage is inaccessible	Provide proper clearances to stairwell	ACCESSIBILITY	\$10,721	2
3	Main entrance has no accessible access.	Provide ramp to main entry	ACCESSIBILITY	\$10,721	2
4	Hooks/shelves extend too far into corridors on all levels and do not provide cane detection per current code.	Remove hooks/shelves and replace with cubbies.	ACCESSIBILITY	\$10,721	2
5	Main office B122 door does not meet accessible clearance requirements	Remove or relocate door location	ACCESSIBILITY	\$28,590	2
6	Toilet B118 in workroom B117 does not allow for clear floor space required by current accessibility codes.	Renovate room and allocate more space for toilet room or remove toilet room	ACCESSIBILITY	\$571,800	2
7	Toilet B118 in workroom B120 does not allow for clear floor space required by current accessibility codes.	Renovate room and allocate more space for toilet room or remove toilet room	ACCESSIBILITY	\$571,800	2
8	Toilet B130 in kindergarten room B127 does not allow for clear floor space required by current accessibility codes.	Renovate room and allocate more space for toilet room or remove toilet room	ACCESSIBILITY	\$57,180	2
9	Toilet B142 in conference room B143 does not allow for clear floor space required by current accessibility codes.	Renovate room and allocate more space for toilet room or remove toilet room	ACCESSIBILITY	\$57,180	2
10	Majority of doors that were not updated in the 2018 renovation do not have accessible push/pull clearances	Replace doors	ACCESSIBILITY	\$428,850	2
11	Drinking fountains on east and west ends of first floor corridor do not meet current accessibility requirements and are not up to current code requirements	Replace drinking fountains	ACCESSIBILITY	\$20,013	2
12	Drinking fountains on east and west ends of second floor corridor do not meet current accessibility requirements and are not up to current code requirements	Replace drinking fountains	ACCESSIBILITY	\$20,013	2
13	Doors that have not been updated in the 2018 renovation do not have accessible hardware (knobs instead of levers)	Replace hardware	ACCESSIBILITY	\$375,244	2
14	Accessibility to the art and music wing is circuitous/difficult.	Provide accessible elevator at this end of the building.	ACCESSIBILITY	\$142,950	3

No.	Issue	Proposed Solution	Discipline	Cost	Priority
15	Railing at northwest entry (ST-B4) does not comply with current code	Extend railing	SAFETY/ SECURITY	\$10,721	1
16	Both north and south stairwells in ST-C1 do not meet current code requirements, mainly due to railing extensions and continuity, as well as lack of visual contrast strips on treads.	Extend/connect railings and provide adhesive contrast strips to meet code requirements.	SAFETY/ SECURITY	\$35,738	1
17	Stairwell ST-B1 does not meet current code requirements, mainly due to railing extensions and continuity, as well as lack of visual contrast strips on treads.	Extend/connect railings and provide adhesive contrast strips to meet code requirements.	SAFETY/ SECURITY	\$ 35,738	1
18	Stairwell ST-B2 does not meet current code requirements, mainly due to railing extensions and continuity, as well as lack of visual contrast strips on treads.	Extend/connect railings and provide adhesive contrast strips to meet code requirements.	SAFETY/ SECURITY	\$35,738	1
19	Southwest entry door 2 does not have a railing	Provide railing	SAFETY/ SECURITY	\$5,003	1
20	Landing on first floor of stairwell ST-B2 is too close to doorway	Remove doors	SAFETY/ SECURITY	\$14,295	1
21	Landing on first floor of stairwell ST-B5 is too close to doorway	Remove doors	SAFETY/ SECURITY	\$14,295	1
22	Immediate step down at northwest entry stair (ST-B4)	Repair and/or replace landing to level entry	SAFETY/ SECURITY	\$14,295	1
23	Gymnasium C109 is in poor condition. Egress doors do not include panic hardware, wood partition panels underneath the stage, ceiling tiles are dated, and wood backboards on basketball hoops	Replace doors, remove wood partitions, and replace ceiling and basketball hoops	SAFETY/ SECURITY	\$50,033	1
24	No railing at east entry stair (ST-B1)	Provide railing	SITE	\$32,164	1
25	No railing at northeast entry stair (ST-B3)	Provide railing	SITE	\$ 32,164	1
26	Northwest corner entry (C114) behind stage has pavement cracking and improper drainage	Replace pavement and provide proper drainage methods	SITE	\$7,148	1
27	No dumpster enclosure present on site.	Add dumpster enclosure with WFB compliant screening and bollards.	SITE	\$71,475	2

## MAINTENANCE LIST (CONTINUED)

No.	Issue	Proposed Solution	Discipline	Cost	Priority
28	Uneven pavement at east entry (A103)	Level pavement	SITE	\$7,148	2
29	Site wall at front entry is falling and ineffective at retaining mulch, dirt, and plants	Replace wall	SITE	\$60,039	2
30	Site pavement is heaving and cracking	Pavement to be repaired/patched/mudjacked as possible. Limited areas to be replaced.	SITE	\$114,360	3
31	Chain link fence around perimeter damaged	Replace fence	SITE	\$71,475	3
32	Pavement along west side of school is cracking and not level	Replace pavement	SITE	\$50,033	3
33	Southwest entry door 3 has a damaged lintel	Repair lintel	EXT	\$3,574	1
34	All brick and stonework at grade west of main entry to entry door 2 is worn and cracked	Apply a new skim coat	EXT	\$2,287	2
35	Ground floor windows at northeast elevation are too close to grade for proper drainage.	Excavate earth near windows to create window well.	EXT	\$15,010	2
36	Ground floor windows on west elevation are too close to grade for proper drainage.	Excavate earth near windows to create window well.	EXT	\$71,475	2
37	Sealant missing and cracked at front elevation windows, specifically the 6 first floor windows east of the main entry	Remove existing sealant and replace with new non-hardening sealant.	EXT	\$32,164	2
38	Ground floor windows at northwest elevation are too close to pavement for proper drainage.	Remove pavement near windows and provide proper flashing and window wells.	EXT	\$21,443	2
39	Damaged brick around exterior corner of Mech B023	Repair brick	EXT	\$7,148	2
40	Cast in place steps are cracking at northwest entry (ST-B4)	Repair steps	EXT	\$ 21,443	2
41	Stonework is damaged at northeast entry stair (ST-B3)	Repair stonework	EXT	\$22,872	2

No.	Issue	Proposed Solution	Discipline	Cost	Priority
42	Roofs from 2004 (B, C, C1, C2, C3, and D) are due for replacement	Replace roofs	EXT	\$411,696	2
43	Northwest exterior corner behind the original gym stage has dated vents and lintels. Brick is damaged	Replace vents, lintels, and brick	EXT	\$42,885	2
44	Windows are showing signs of age. Some parts are no longer available to repair in original building	Replace windows	EXT	\$743,340	2
45	Window flashing is missing and/or worn in several locations.	Cut in metal flashing were possible.	EXT	\$14,295	3
46	Exteriorexposed wood trim located above northwest exterior door 5 and entry stair (ST-C1)	Remove wood trim	EXT	\$1,430	3
47	Window lintels at front elevation are rusting/chipping	Strip, prep, and paint lintels.	EXT	\$71,475	3
48	Classroom C107 walls and casework are in poor condition and chipping	Patch walls and replace casework	INT	\$32,879	1
49	Some classrooms have layers of flooring on top of original wood floor on sleepers. Due to movement the upper layers are failing.	Remove existing flooring and infill floor to level and replace tiles	INT	\$1,143,600	2
50	Floor tiles are cracking and provide an uneven surface	Replace floor	INT	\$85,770	2
51	Interior door frames are in poor condition and worn	Strip and repaint all hollow metal frames.	INT	\$111,501	2
52	Several classrooms have original chalkboards with damaged trim.	Remove chalk boards, patch wall.	INT	\$21,443	3
53	Casework and lockers are damaged and dated	Replace casework and lockers	INT	\$450,293	3
54	Door leafs are worn with damage to faces	Replace doors	INT	\$1,300,845	3
55	General electrical recommendation.	Complete an Arc Flash Coordination Study of the existing electrical system and add arc flash labels to all panelboards.	ELEC	\$28,590	1

## MAINTENANCE LIST (CONTINUED)

No.	Issue	Proposed Solution	Discipline	Cost	Priority
56	The Primex GPS transmitter was observed to be resting on a window ledge in the 2nd floor corridor.	Relocate GPS transmitter to location not accessible by students with proper, dedicated connections.	ELEC	\$14,295	1
57	Several older style Square D NQOB type panelboards and one very old Square D Fusible panelboard located in lower level have reached the end of the useful life.	Replace with new panelboards.	ELEC	\$89,344	1
58	Some areas are not well covered by existing camera system.	Add new cameras as required.	ELEC	\$142,950	2
59	Public address system is dated and proprietary (can only be serviced by single contractor).	Plan for new public address system (IP) with all new speakers and wiring.	ELEC	\$357,375	3
60	Some receptacles and toggle switches show wear and damage.	Replace damaged wiring devices.	ELEC	\$142,950	3
61	Some egress lighting are old incandescent fixtures.	Replace with new LED fixtures.	ELEC	\$107,213	3
62	Through random sampling of data cable, some non plenum rated CAT 5 and 5E was found.	Upgrade all cabling to new plenum rated CAT 6 data cabling.	ELEC	\$1,429,500	3
63	Water closets, science room sinks, and showers were noted to be in poor condition.	Replace all plumbing fixtures that are over 15 years old. Provide wall mounted fixtures where possible. Faucets and flush valves to be sensor operated.	PLUMB	\$285,900	1
64	Most of the storm piping system is past its life expectancy. The system is in poor condition, with fair to poor pipe insulation, but there are no reports of back ups or issues.	Replace entire piping system with new. This includes underground, above floor, and tunnel piping.	PLUMB	\$1,429,500	1
65	Within the sanitary piping system sections of existing hub and spigot cast iron piping are routinely replaced as back-ups arise and as part of the preventative maintenance schedule. The overall system is in poor condition.	Replace the entire cast iron piping system with new piping (past life expectancy). This includes underground, above floor and tunnel piping.	PLUMB	\$1,429,500	1
66	General plumbing recommendation.	Provide a thermostatic mixing valve to serve the hot water storage tank outlet piping (digital).	PLUMB	\$ 71,475	2
67	Some toilet rooms do not have floor drains, or floor drains with trap seal protection.	Provide floor drains with trap seal protection in all toilet rooms.	PLUMB	\$ 85,770	3
68	There are minor reports of leaks and hard to operate isolation valves. However, domestic water piping is overall in fair condition.	Replace and/or repair at areas of concern.	PLUMB	\$285,900	3
69	IT room is not air conditioned.	Add DX split system cooling to IT room.	MECH	\$21,200	2

No.	Issue	Proposed Solution	Discipline	Cost	Priority
70	Classrooms do not have thermal controllability expected from a modern building.	Add slip in style VAV boxes (Qty 51) to existing ductwork for classroom air handling unit. Provide ten (10) additional zones.	MECH	\$584,400	2
71	Gym AHUs are past their useful life expectancy.	Replace 1957 gym air handling units (Qty 2) and add DX Cooling.	MECH	\$281,500	2
72	Exhaust fans are past useful life expectancy.	Replace 1991 exhaust fans (Qty 3) and add thermal equalizers (Qty 4) to gym.	MECH	\$38,100	2
73		Add a high efficiency condensing boiler for spring, fall, and summer use.	MECH	\$364,400	3
74	Office 1991 AHU is starting to reach useful life expectancy.	Replace 1991 office air handling unit and associated DX condensing unit.	MECH	\$82,000	3
75	Large 1991 AHU is starting to reach useful life expectancy.	Replace motors and parts on 1991 large built up classroom air handling unit.	MECH	\$85,770	3
76	Building has dated and inefficient pneumatic controls.	Replace remaining pneumatic and proprietary DDC controls components with Niagara Tridium platform compatible DDC controls systems.	MECH	\$756,500	3
<b>CUMBERLAND ELEMENTARY TOTAL</b>				<b>\$15,817,785</b>	



# WHITEFISH BAY MIDDLE SCHOOL

**ADDRESS:** 1144 E Henry Clay St.

**SITE SIZE:** 2.8 acres

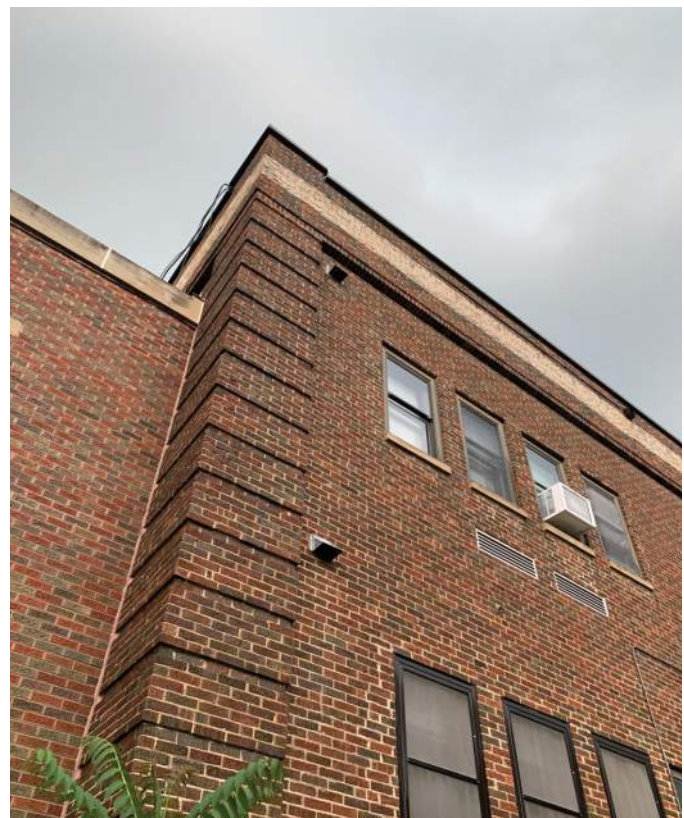
**BUILDING SIZE:** 127,186 SF

**ENROLLMENT:** 624 students

**BUILDING AGE:** 1918  
(additions in 1930s, 1980S, and 1996)

**GRADE LEVELS:** 6th - 8th

**SPRINKLERED:** No





SCHOOL TYPE	MIN. ACREAGE	PLUS	RECOMMENDED SIZE	ACTUAL SIZE	ADEQUATE SIZE
MIDDLE	2.8 ACRES	1 ACRE PER 100 STUDENTS	17 ACRES	9.1 ACRES	NO

**CONDITION KEY**

GOOD	No major needs anticipated in next 15 years. Meets or exceeds expectations for a modern educational facility.
GOOD TO FAIR	No major needs anticipated in next 10 years. Meets minimum expectations for a modern educational facility.
FAIR	No major needs anticipated in next 5 years. Components may be at or nearing expected service life.
FAIR TO POOR	No major immediate needs. Components are likely past expected service life.
POOR	Major immediate needs. Components are at or nearing failure.

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## SITE

The following report is the result of a site visit by Nick Kent, Nicole Dryden, and Grant Heimerdinger that occurred in June of 2023. Site observations and interviews with staff were used in preparation of this report.

### OBSERVATIONS

Athletic fields are in good condition. Pavement has some areas of noticeable cracking and heaving. There is little room to expand and there are issues with ponding and drainage against the building.

### RECOMMENDATIONS

See maintenance list for all specific areas of concern.



## EXTERIOR

The following report is the result of a site visit by Nick Kent, Nicole Dryden, and Grant Heimerdinger that occurred in June of 2023. Site observations and interviews with staff were used in preparation of this report.

### OBSERVATIONS

Whitefish Bay Middle School exterior materials are overall in a fair to poor condition. Brick trim and EIFS panels are becoming aged and worn. Some windows are beginning to show signs of age and wear. Damaged exterior brick and mortar causes the district to perform yearling tuckpointing and maintenance.

### RECOMMENDATIONS

See maintenance list for all specific areas of concern.



## INTERIOR

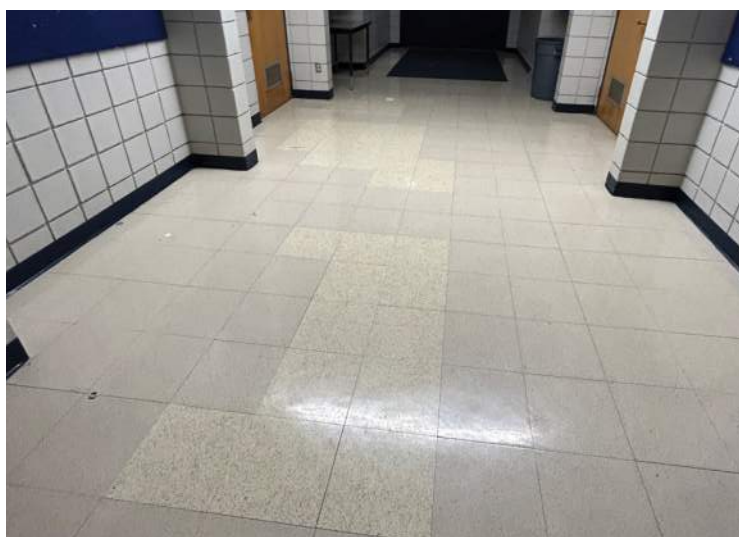
The following report is the result of a site visit by Nick Kent, Nicole Dryden, and Grant Heimerdinger that occurred in June of 2023. Site observations and interviews with staff were used in preparation of this report.

### OBSERVATIONS

The overall condition of interior materials are showing signs of age/wear and nearing end of their usable life span. VCT flooring in corridors and classrooms are cracked and damaged. Many doors and frames are worn and in poor condition.

### RECOMMENDATIONS

See maintenance list for all specific areas of concern.



# ACCESSIBILITY

The following report is the result of a site visit by Nick Kent, Nicole Dryden, and Grant Heimerdinger that occurred in June of 2023. Site observations and interviews with staff were used in preparation of this report.

## OBSERVATIONS

Accessibility at Whitefish Bay Middle School is fair to poor. Level changes are difficult to navigate. Certain areas such as offices and the old gym can only be accessed through circuitous means. Some classroom entrances have clearance concerns. A few bathrooms throughout are entirely inaccessible. Sporadic door hardware throughout is non compliant.

## RECOMMENDATIONS

See maintenance list for all specific areas of concern.



## MECHANICAL

The Whitefish School District contracted separately with Nexus Solutions to develop a comprehensive report and maintenance recommendation for the mechanical systems. The results and pricing are included in our compiled maintenance list.

# ELECTRICAL

The following report is the result of a site visit by Mike Pasineau of MSA Professional Services, Inc. that occurred on Wednesday, July 12, 2023. Site observations, existing drawing review and interviews with facility staff were used in preparing this report.

The original building was constructed in 1932 with building additions and/or renovations in 1995 and 2010.

## Main Electrical Service Observations

- A. The middle school building is fed by one main electrical service that was installed as part of the 1996 renovation project. This service is a 120/208 volt, 3-phase, 4-wire, 3000 amp service and is fed from a pad mounted utility transformer on the west side of the building. The C/T cabinet and meter socket are both located inside the main electrical room adjacent to the service switchboard. The service switchboard is a Square D QED type switchboard that was installed in 1996, appears to be in good working condition and has room for additional breakers.
- B. The service switchboard serves as the power distribution for the majority of the building; however, the switchboard also feeds a 150kVA, 208V – 240V buck-boost transformer and 240V, 3- phase, 3-wire, grounded B-phase distribution panel. This 240V, 3-phase distribution panel feeds HVAC loads throughout the building as well as the elevator.
- C. The existing service does not have a surge suppression device.
- D. The serving utility is WE Energies.

## Recommendations

- A. The existing electric service and service switchboard is in good working condition, in general has room for additional breakers and can remain. It appears that there is adequate service capacity on the service in the building. Add to the existing service as necessary.
- B. 240V, 3-phase, 3-wire electrical equipment is being phased out. We recommend feeding any future HVAC equipment replaced in the facility at 208V, 3-phase power.
- C. If a large building addition is constructed or construction is located at the existing service location(s), a new larger service or relocation may be required.

## Panelboards Observations

- A. There are a variety of panelboards located throughout this facility. A majority of the panelboards were replaced during the 1995 addition and renovation project. These panelboards are Square D NQOD type panelboards, in general have room for additional breakers, and appear to be in good working condition.
- B. We also noted a few old Square D QO Loadcenters located throughout the building that still remain in the facility from previous renovation projects. These panels are nearing the end of their useful life and do not have room for additional breakers.

## Recommendations

A. The old Square D QO Loadcenters have exceeded their useful lifespan and should be replaced based on their age and condition.

B. The Square D NQOD type panelboards installed during the 1996 renovation project are in good working condition, in general have room for additional breakers and can remain. Add to the existing panelboards as necessary.

C. Complete an Arc Flash Coordination Study of the existing electrical system and add arc flash labels to all electrical panelboards. This will increase the safety of the personnel maintaining or operating equipment along with occupants in the vicinity of the equipment.

D. We noted numerous locations throughout the building where the area directly in front of panelboards was used as storage space. Ensure that a minimum of 3 feet of clearance is maintained in front of all panelboards throughout the facility.

## Generator

### Observations

A. The emergency generator is a Cummins natural gas fired, 25kW generator set. This generator set was installed as part of the 2010 addition and renovation project. This generator is regularly tested, and the owner indicated it is in good working condition. The generator set is pad mounted on the west side of the building.

B. There is (1) transfer switch located in a first floor mechanical room, was installed during the 2010 addition and renovation

project and appears to contain only life-safety loads.

## Recommendations

A. The existing standby generator and transfer switch are in good working condition and appear to be compliant with today's code requirements.

B. Continue providing routine testing and service to generator and transfer switch.

## Interior Lighting and Control

### Observations:

A. All the lighting was recently replaced with new LED type fixtures throughout the facility and no issues were reported by the owner.

## Recommendations

A. None

## Emergency Lighting

### Observations

A. Emergency lighting in corridors are provided with LED light fixtures fed off of the standby generator. We did not verify full egress compliance during our walk through.



## ELECTRICAL (CONTINUED)

### Recommendations

A. Add egress lighting to the emergency generator as necessary to comply with current codes.

### Exterior Lighting Observations

A. The building outdoor light fixtures were recently updated to LED wall pack type fixtures.

### Recommendations

A. None

### Wiring Devices Observations

A. The receptacles and toggle switches are a mixture of commercial grade 15A and 20A with a mix of plastic and stainless steel wall plates. The devices vary in age and condition and for the most part show signs of general wear and tear.

### Recommendations

- A. Replace wiring devices and plates that are damaged.
- B. Add additional receptacles and circuits as necessary.
- C. We did not verify shared neutral loads on any existing circuits; this should be done by a qualified electrician prior to adding any additional devices. We would recommend a separate neutral be installed on any shared neutral loads or add multipole breakers to bring the circuiting up to code compliance.

D. We did not verify if circuits contained independent grounding conductors. This should be done by a qualified electrical contractor or at a minimum verify if grounding continuity in all circuits. It was common in schools in Wisconsin to use the conduit as a grounding system on some older facilities. Over time, the conduit may have been disconnected causing ungrounded circuit conditions. We always recommend a separate grounding conductor be installed for every circuit.

### Fire Alarm System Observations

- A. The fire alarm is an EST Voice Annunciated Addressable fire alarm system. The head end and devices were recently installed in 2019. The fire alarm system appears to be in good working condition and staff indicated it is operating properly.
- B. There are pull stations by exterior doors.
- C. There are speaker and speaker/strobe devices in all public spaces including corridors and classrooms.
- D. There are smoke detectors present throughout the building.

### Recommendations

A. The system was installed in 2019, is compliant to today's code requirements and is in good working condition. Add devices to the existing system as necessary.

### Clock System Observations

A. The existing clock system consists of

a Primex head end GPS transmitter located in the Mechanical Mezzanine. The existing clocks throughout the building are battery powered Primex and simplex type clocks.

### Recommendations

A. The existing clock system is in good working condition and can remain. Add new Primex clocks to the existing system as necessary.

### Public Address System Observations

A. The existing public address system was installed more than 10 years ago. The existing public address system is a proprietary system that was built and serviced by a local contractor.

B. Numerous types of speakers are located throughout the facility of different ages and types. A majority of the speakers throughout the facility are round, ceiling mounted, recessed speakers in areas with lay-in ceiling grid and surface, wall mounted speakers in areas with hard ceiling surfaces or exposed structure.

### Recommendations

A. The existing public address system is functional and can be expanded; however, due to the age of the equipment and the system being only serviceable by the contractor that built the system, a new public address system should be considered. We recommend an all new Valcom or Carehawk Hybrid IP public address system with all new speakers and wiring throughout the building.

### Data, Telephone Observations

- A. The MDF data rack is located on the 2nd floor in a storage room. There are (3) additional IDF data closets located throughout the building. The MDF data closet is fed with fiber and fiber is used to connect all switches throughout the building.
- B. The data system consists of a mixture of CAT 5 and CAT 5E type data cable which is routed to patch panels in the data rack.
- C. The building has wireless access points.
- D. Through random sampling of data cable, we found CAT 5 and CAT 5E plenum and non-plenum rated data cabling.

### Recommendations

- A. A possible upgrade to the cabling is to provide all new plenum rated CAT 6 type data cabling to increase the speed of the network. New cabling also makes sense if large areas of ceilings are removed to accommodate other work.
- B. Additional CAT 6 data cabling can be added to rooms as needed.
- C. We believe the number of data drops could be reduced in each room if new cabling was provided; Two for a wireless access point, two for a teacher station and one for a media delivery device per classroom.
- D. Remove all abandoned phone and coaxial cabling throughout the entire facility.

## ELECTRICAL (CONTINUED)

### CCTV System Observations

- A. There is an existing Exacqvision IP based security camera system in the facility that was installed during the 2010 renovation project. The existing system is in good working condition. We noticed a few areas that could use additional coverage.
- B. The security cameras located throughout the building are a mixture of Sony, Samsung and Axis type cameras.

### Recommendations

- A. Add additional or modify cameras as required if remodeling to the building is proposed.
- B. This system is in good operating condition, but the system appears to be dated and new IP technology may be considered as an upgrade. Further discussion with district is required to determine exact intent of a new system.

### Keyless Entry System Observations

- A. There is an S2 browser based keyless entry system installed in the facility. The system was installed during the 2010 renovation project. The facility was recently upgraded with encrypted card readers, hard wired from control panels to select doors.

### Recommendations

- A. Expand the existing door access control system as required if more doors are desired to have Card readers/Strike control

added or if additions to the building are proposed that require card access.

- B. The system is in good operating condition, but new technology may be considered as an upgrade. Further discussion with the district is required to determine exact intent of a new system.

### Security System Observations

- A. There is a Honeywell security system in the facility with security motion detectors located throughout corridor areas and large collaboration spaces. Staff indicated that the system is operational without any issues.

### Recommendations

- A. Expand the existing security system with additional motion detectors or security keypads as necessary.



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# PLUMBING

The following report is the result of a site visit by Alex Feudner of MSA Professional Services, Inc. that occurred on Wednesday, July 12, 2023. Site observations and interviews with staff were all used in the preparation of this report.

The original building was constructed in 1932 with building additions and/or renovations in 1995 and 2010.

## Domestic Water Piping System Observations

A. The building is supplied by the municipal water utility. It has a 4" ductile iron water service with a 3" water meter. The system piping material is type L copper. The isolations valves are gate and ball valves. There are backflow preventers that serves the kitchen equipment and HVAC boilers. The system consist of cold water hard, hot water supply and hot water return. Pipe insulation is in fair to poor condition with some being wrapped in asbestos. The hot water delivery time to the most remote fixture is 60 seconds.

## Recommendations

A. Any future renovations and or additions, shall account for the resizing of the domestic water pipe mains in order to provide adequate pressure and flow to any new and existing fixtures. Current plumbing and energy codes required faster hot water delivery time to all fixtures. This will extend the domestic hot water piping system piping closer to all hand washing type fixtures

and increase the size of the pipe main and circulation pump.

B. Replace the entire piping system of unrenovated or remodeled areas with new piping since it is past its life expectancy. This includes underground, above floor and tunnel piping.

## Fire Suppression Piping System Observations

A. The building does not contain an automatic fire sprinkler system.

## Recommendations

A. The existing water service is not capable of providing an automatic fire sprinkler system for the entire building for any future renovations and or additions. A new properly sized water service will be required to support an automatic fire sprinkler system.

## Sanitary Drain, Waste and Vent Piping System Observations

A. The building system discharges to the municipal sewer. Floor areas that are prone to spills have floor drains. The HVAC boilers are served by hub drains. The main system piping material is hub and spigot cast iron with PVC piping material installed for repairs and in renovated areas and/or additions. The kitchen area fixtures and equipment are served by a grease interceptor with PVC grease waste piping material. The science room sinks are not served by an acid neutralization basin with glass acid waste

pipng material. Sections of existing hub and spigot cast iron piping have been replaced as required. The overall system is in poor condition.

### Recommendations

A. Replace the piping system in unrenovated areas older than 2010 work with new piping since it is past its life expectancy. This includes underground, above floor and tunnel piping.

### Storm and Clear Water Drain, Waste and Vent Piping System Observations

A. The building system discharges to on-site storm sewer drainage. The roof is served by internal roof drains. The HVAC air handling equipment are served by hub drains. The system piping material is hub and spigot cast iron and PVC. Pipe insulation is in poor condition. There are no reports of back-up or system issues. The overall system is in poor condition.

B. The foundation drain tile is served by a clear water sump basin and pump.

C. The elevator is served by a clear water sump basin and pump.

### Recommendations

A. Replace the piping system in unrenovated areas older than 2010 work with new piping since it is past its life expectancy. This includes underground, above floor and tunnel piping.

### Natural Gas Piping System Observations

B. The building is supplied by the local gas utility. The system serves the HVAC, plumbing and kitchen equipment. Main system pressure is 2-5lb with a 7"-14" w.c. pressure regulator serving the equipment. The system piping material is black iron steel. The isolations valves are ball valves. The overall system is in fair condition.

### Recommendations

A. None at this time

### Compressed Air Piping System Observations

A. The system is served by an air compressor which is piped to equipment. The overall system is in fair condition.

### Recommendations

B. None at this time.

### Plumbing Equipment Observations

A. Water Heater – Eastside of Building – 100 gallon 199,000btu atmospheric vented gas water heater with expansion tank and re-circulating pump. Poor Condition.

B. Circulating Pumps – South of Building –15gpm pump. Temperature is 120degrees. Fair Condition.

C. Grease Interceptor – Good Condition.

D. Clearwater Sump Basin and Pump – Foundation Drain Tile – Was not able to

## PLUMBING (CONTINUED)

inspect at time of site visit.

E. Clearwater Sump Basin and Pump – Elevator – Was not able to inspect at time of site visit.

### Recommendations

A. Any future renovations and or additions, shall account for the resizing of the domestic hot water equipment to meet the demands of the any new and existing fixtures. Provide power vent, high efficiency gas water heater(s) with expansion tank and re-circulating pump to and from new hot water storage tank and distribution system circulating pump(s).

B. Increase the water heater water temperature outlet to 140 degree to prevent legionnaire bacteria growth inside of the hot water storage tank. Provide a thermostatic mixing valve to serve the hot water storage tank outlet piping. The thermostatic mixing valve shall be digital type.

### Plumbing Fixtures Observations

A. Water Closets – Vitreous china wall and floor mount with brass chrome plated manual lever and sensor hardwired flush valve. Poor Condition.

B. Lavatories – Vitreous china wall mount with brass chrome plated manual lever faucets. Poor Condition.

C. Wash Stations – Wall mount with sensor hard wired faucets. Fair Condition.

D. Urinals – Vitreous china wall and floor mount with brass chrome plated manual lever and sensor hardwired flush valve. Poor Condition.

E. Kitchen Sinks – Stainless steel floor mount with brass chrome plated manual lever faucets. Fair Condition.

F. General Sinks – Stainless steel drop-in with brass chrome plated manual lever faucets. Fair Condition.

G. Classroom Sinks – Stainless steel drop-in with brass chrome plated manual lever faucets. Fair Condition.

H. Art Room Sinks – Stainless steel floor mount and drop-in with brass chrome plated manual lever faucets and point of use solid interceptors. Fair Condition.

I. Science Room Sinks – Stainless steel drop-in with brass chrome plated manual lever faucets. Fair Condition.

J. Service Sinks – Mold PVC floor mount with brass chrome plated manual lever faucets and vacuum breaker spouts. Poor Condition.

K. Showers – Stainless steel single and multiply use brass manual lever showers valves. Poor Condition.

L. Electric Water Cooler – Single use with and without bottle filling station. Fair Condition.

M. Emergency Fixture – Swing eyewash with cold water supply only. Fair Condition.

### Recommendations

A. Replace all plumbing fixtures that are 15 years and older. Provide wall mount fixtures were possible and sensor operated flush valves / faucets in toilet rooms to improve hygiene and sanitary efforts.

B. Provide floor drains with trap seal protection in all toilet rooms.

C. Provide monthly testing of emergency fixtures.

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# MAINTENANCE LIST

No.	Issue	Proposed Solution	Discipline	Cost	Priority
1	PLTW Lab does not have an accessible sink station.	Add accessible sink station.	ACCESSIBILITY	\$5,718	2
2	Art room does not have an ADA sink	Add ADA sink	ACCESSIBILITY	\$14,295	2
3	Science labs do not have an ADA station present.	Add ADA work station and sink.	ACCESSIBILITY	\$85,770	2
4	Sloped surface into old gym is not accessible (lift available at opposite end) and not a recommended slope for any use.	Add stairs and compliant ramp (and/or replacement of lift) in place of dramatically sloped surfaces at entries.	ACCESSIBILITY	\$214,425	2
5	Toilet rooms at north side of the building are located at the mid-level landing of stairs and are entirely inaccessible. There are no other toilet rooms on or near the first floor. These also pose a supervision issue.	Build new toilet rooms with accessible access and stalls on the first floor.	ACCESSIBILITY	\$714,750	2
6	Lockerroom toilets do not have accessible stall. These are the only toilet rooms on this level.	Install accessible stall and toilet, likely replacing last two fixtures present.	ACCESSIBILITY	\$21,443	2
7	Clinic, student services suite, upper floor office, and upper floor hall single user toilet rooms are entirely inaccessible (access, clearances, fixtures)	Rebuild toilet room in place with proper clearances, taking space from surrounding areas.	ACCESSIBILITY	\$251,592	2
8	Lockerroom toilets off boys lockerroom does not have accessible pull clearance at door.	Relocate wash bar in boys lockerroom toilet.	ACCESSIBILITY	\$35,738	2
9	Door hardware throughout the building is largely older knob style.	Replace with new lever style door hardware.	ACCESSIBILITY	\$1,400,910	2
10	Toilet rooms on the lower level do not have accessible push/pull clearances at doors.	Widen doorways, move wing walls, and reverse door swing. Patch walls and ceilings as affected.	ACCESSIBILITY	\$214,425	2
11	Gym drinking fountains are not compliant with current code for protruding objects or accessibility.	Replace with new EWCs.	ACCESSIBILITY	\$11,436	3
12	Offices at landing levels of stairwells are entirely inaccessible.	Turn space to storage and building out new offices elsewhere in building.	ACCESSIBILITY	\$42,885	3
13	Curb cuts on north and south of site have no vehicular protection.	Add bollards or gate at all curb cuts large enough for vehicles.	SAFETY/ SECURITY	\$35,738	1
14	Railings (stair) throughout the building are not compliant with current code (extensions, continuity, etc.)	Provide all new stair railings throughout building.	SAFETY/ SECURITY	\$214,425	1

No.	Issue	Proposed Solution	Discipline	Cost	Priority
15	Egress hardware through much of the building was not compliant with current code.	Replace all egress hardware at building exits and gathering spaces.	SAFETY/ SECURITY	\$270,176	1
16	Bike racks are in poor condition and staff reports there are too few.	Replace with new ground mounted bike racks.	SITE	\$50,033	1
17	All asphalt paving on site shows cracking, degradation, and signs of repeated patching.	Replace asphalt.	SITE	\$400,260	2
18	Site furnishings (primarily benches) are showing wear/damage.	Replace benches.	SITE	\$21,443	2
19	Site basketball hoops are showing wear.	Replace with new outdoor basketball hoops.	SITE	\$28,590	2
20	Areas of concrete around front entry are starting to sink or heave.	Level concrete.	SITE	\$42,885	3
21	No dumpster enclosure exists on site.	Provide dumpster enclosure with materials/screening compliant with WFB ordinances and bollards.	SITE	\$71,475	3
22	Site fencing is starting to list and shows damage/rust.	Replace site fencing.	SITE	\$28,590	3
23	Several downspouts were noted to discharge at building perimeter.	Add downspout extender where possible. If at hard pavement, connect to underground storm system.	EXT	\$35,738	1
24	Railings on the north side of the building do not meet current code.	Replace with new painted metal railing with extensions.	EXT	\$10,721	1
25	Windows throughout much of the building are original to their additions and significantly dated/in poor condition. They are largely inefficient single pane windows.	Replace with new thermally broken aluminum storefront in openings.	EXT	\$929,175	1
26	Brick around perimeter of building is showing multiple instances of spalling, cracking, and damage.	Provide allowance with tuckpointing/replacement.	EXT	\$357,375	2
27	Areas of applied EIFS are showing signs of moisture retention and are likely reaching recommended lifespan.	Remove EIFS and replace areas with rainscreen cladding with proper moisture barrier and drainage plane.	EXT	\$107,213	2
28	Roofs from 2002 and 2003 (A, A1, B, C, C1, D, E, E1, E2, F, G, J, K, L) are due for replacement	Replace roofs	EXT	\$686,160	2

## MAINTENANCE LIST (CONTINUED)

No.	Issue	Proposed Solution	Discipline	Cost	Priority
29	Area wells around perimeter of building are shallow and low slope with flush drains in full slabs of concrete. These are likely prone to back up.	Replace with deeper area wells with gravel. Provide dampproofing against existing wall.	EXT	\$50,033	2
30	Windows from 1996 addition are dated with signs of wear. They are largely inefficient single pane windows.	Replace with new thermally broken aluminum storefront in openings.	EXT	\$557,505	2
31	Soffits/overhangs show signs of damage/wear.	Strip and repaint soffits.	EXT	\$21,443	3
32	Instances of stained ceiling tiles and leaks were noted throughout the building.	Maintenance noted that many of these issues stem from HVAC issues. Investigate each for underlying cause, repair, and replace ceiling tile.	INT	\$178,688	1
33	Wall damage was present in old gym.	Patch and repaint walls. Add wall pads as required.	INT	\$14,295	1
34	Cracking present in northwest stairwell is showing signs of movement/settling.	Repair cracking. Watch for additional movement.	INT	\$14,295	1
35	Instances of warped, cracking, and non-level flooring were present throughout the building (especially at connections between additions)	Level floors wherever possible. Add movement joints at all building connections.	INT	\$107,213	2
36	Doors throughout the building are damaged with instances of peeling and chipping common.	Replace all door leafs with new wood doors.	INT	\$2,001,300	2
37	VCT flooring throughout the building was noted to be in fair to poor condition, with some small areas cracking or lifting.	Replace flooring with new hard surface floor.	INT	\$343,080	2
38	Some wood door frames still existing throughout original parts of the building. They are showing wear and are generally not well suited to school use.	Replace with new hollow metal door frames.	INT	\$100,065	2
39	Old gym wood flooring is worn.	Refinish gym floor or replace with new athletic multipurpose flooring.	INT	\$51,462	3
40	Gym floor is showing wear.	Refinish gym floor.	INT	\$72,047	3
41	Art room casework is showing wear/damage.	Replace art room casework.	INT	\$22,872	3
42	Gym backboards for practice courts are showing wear.	Replace backboards with new District standard.	INT	\$42,885	3

No.	Issue	Proposed Solution	Discipline	Cost	Priority
43	Gym bleachers are showing significant wear and do not provide any ADA seating. The current bank adjacent to the entrance of the boys lockerroom does not allow for an accessible pull clearance.	Replace bleachers. Shift away from boys lockerroom door when replaced.	INT	\$71,475	3
44	Classroom and teacher area casework is starting to show wear/damage	Replace casework	INT	\$1,007,798	3
45	Ceilings are showing signs of wear and damage throughout spaces on the lower level.	Replace ceilings.	INT	\$80,052	3
46	Carpet throughout the building is showing signs of wear and should be planned for replacement.	Replace flooring with new carpet tiles.	INT	\$786,225	3
47	Lockers show signs of damage and wear (primarily on the interior)	Replace lockers.	INT	\$142,950	3
48	General electrical recommendation.	Complete an Arc Flash Coordination Study of the existing electrical system and add arc flash labels to all panelboards.	ELEC	\$28,590	1
49	Some Square D QO Loadcenters remain in the building and are at the end of their useful life.	Replace Square D QO Loadcenter panels.	ELEC	\$89,344	1
50	Some areas are not well covered by existing camera system.	Add new cameras as required.	ELEC	\$71,475	2
51	Public address system is dated and proprietary (can only be serviced by single contractor).	Plan for new public address system (IP) with all new speakers and wiring.	ELEC	\$142,950	3
52	Some receptacles and toggle switches show wear and damage.	Replace damaged wiring devices.	ELEC	\$71,475	3
53	Through random sampling of data cable, some non plenum rated CAT 5 and 5E was found.	Upgrade all cabling to new plenum rated CAT 6 data cabling.	ELEC	\$357,375	3
54	Water closets, lavatories, urinals, service sinks, and showers were noted to be in poor condition.	Replace all plumbing fixtures that are over 15 years old. Provide wall mounted fixtures where possible. Faucets and flush valves to be sensor operated.	PLUMB	\$142,950	1
55	Entirety of storm piping system is past its life expectancy. The system is in poor condition, including pipe insulation, but there are no reports of back ups or issues.	Replace entire piping system with new. This includes underground, above floor, and tunnel piping.	PLUMB	\$714,750	1
56	Most of sanitary piping system is past its life expectancy. The system is in poor condition and sections have been replaced over the years.	Replace piping system in areas older than 2010 with new. This includes underground, above floor, and tunnel piping.	PLUMB	\$714,750	1

## MAINTENANCE LIST (CONTINUED)

No.	Issue	Proposed Solution	Discipline	Cost	Priority
57	Water heater on east side of building is in poor condition.	Replace water heater.	PLUMB	\$71,475	1
58	Science room sinks are not served by an acid neutralization basin with glass acid waste piping material.	Install acid neutralization.	PLUMB	\$35,738	2
59	General plumbing recommendation.	Provide a thermostatic mixing valve to serve the hot water storage tank outlet piping (digital).	PLUMB	\$71,475	2
60	Entirety of domestic water piping system is past or nearing its life expectancy. The system is in fair to poor condition, including pipe insulation.	Replace entire piping system with new. This includes underground, above floor, and tunnel piping.	PLUMB	\$714,750	2
61	Some toilet rooms do not have floor drains, or floor drains with trap seal protection.	Provide floor drains with trap seal protection in all toilet rooms.	PLUMB	\$57,180	3
62	Kitchen does not have make up air unit and has undersized hood.	Add kitchen make up air unit. Replace undersized kitchen hood.	MECH	\$259,900	2
63	Chiller does not operate.	Replace 1966 water cooled chiller and associated chilled water pumping system with an air cooled chiller.	MECH	\$995,100	2
64	Exhaust fans are nearing or past useful life expectancy.	Replace 1995 exhaust fans (Qty 11).	MECH	\$104,300	2
65	Unit ventilators are nearing or past useful life expectancy.	Replace classroom unit ventilators (Qty 16) serving choir, band, 1st and 2nd floor classrooms, and lower level classrooms.	MECH	\$311,880	2
66	Air handling unit is nearing useful life expectancy.	Replace 1990 gym air handling unit and add chilled water cooling.	MECH	\$51,980	3
67	Unit ventilators are nearing or past useful life expectancy.	Replace 1996 art room classroom unit ventilator and fan coil with air handling unit with chilled water cooling.	MECH	\$208,700	3
68	Unit ventilators are nearing or past useful life expectancy.	Replace 1996 cafeteria classroom unit ventilators with rooftop/air handling unit with chilled water cooling.	MECH	\$77,970	3
69	Air handling unit is nearing useful life expectancy.	Replace 1996 gym air handling unit and add chilled water cooling.	MECH	\$51,980	3
70	Air handling unit is nearing useful life expectancy.	Replace 1996 office air handling unit (AC-1) and associated condensing unit. Convert new air handling unit to chilled water cooling.	MECH	\$51,980	3

No.	Issue	Proposed Solution	Discipline	Cost	Priority
71	Boilers are nearing useful life expectancy.	Replace five (5) 1995 existing atmospheric boilers with three (3) high efficiency sealed combustion boilers.	MECH	\$905,700	3
72	Building has dated and inefficient pneumatic controls.	Replace remaining pneumatic and proprietary DDC controls components with Niagara Tridium platform compatible DDC controls systems.	MECH	\$560,500	3
<b>MIDDLE TOTAL</b>				<b>\$ 18,833,327</b>	



# WHITEFISH BAY HIGH SCHOOL

**ADDRESS:** 1200 E Fairmount Ave

**SITE SIZE:** 19 acres

**BUILDING SIZE:** 376,136 SF

**ENROLLMENT:** 932 students

**BUILDING AGE:** 1932  
(additions in 1950s, 1967, and 2010)

**GRADE LEVELS:** 9th - 12th

**SPRINKLERED:** No





SCHOOL TYPE	MIN. ACREAGE	PLUS	RECOMMENDED SIZE	ACTUAL SIZE	ADEQUATE SIZE
HIGH	19 ACRES	1 ACRE PER 100 STUDENTS	17 ACRES	9.1 ACRES	YES

**CONDITION KEY**

GOOD	No major needs anticipated in next 15 years. Meets or exceeds expectations for a modern educational facility.
GOOD TO FAIR	No major needs anticipated in next 10 years. Meets minimum expectations for a modern educational facility.
FAIR	No major needs anticipated in next 5 years. Components may be at or nearing expected service life.
FAIR TO POOR	No major immediate needs. Components are likely past expected service life.
POOR	Major immediate needs. Components are at or nearing failure.

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## SITE

The following report is the result of a site visit by Nick Kent, Nicole Dryden, and Grant Heimerdinger that occurred in June of 2023. Site observations and interviews with staff were used in preparation of this report.

### OBSERVATIONS

The overall site conditions are fair although there are known areas of poor drainage that have to be regularly monitored. Noticeable site pavement heaving and cracking. The site and athletic field fencing is in poor condition and has started listing in some areas.

### RECOMMENDATIONS

See maintenance list for all specific areas of concern.



## EXTERIOR

The following report is the result of a site visit by Nick Kent, Nicole Dryden, and Grant Heimerdinger that occurred in June of 2023. Site observations and interviews with staff were used in preparation of this report.

### OBSERVATIONS

Leaks and water damage are continuously occurring around the bell tower due to method of original construction. These issues are likely to continue to occur as they have even after roofing improvements in the past.

### RECOMMENDATIONS

See maintenance list for all specific areas of concern.



## INTERIOR

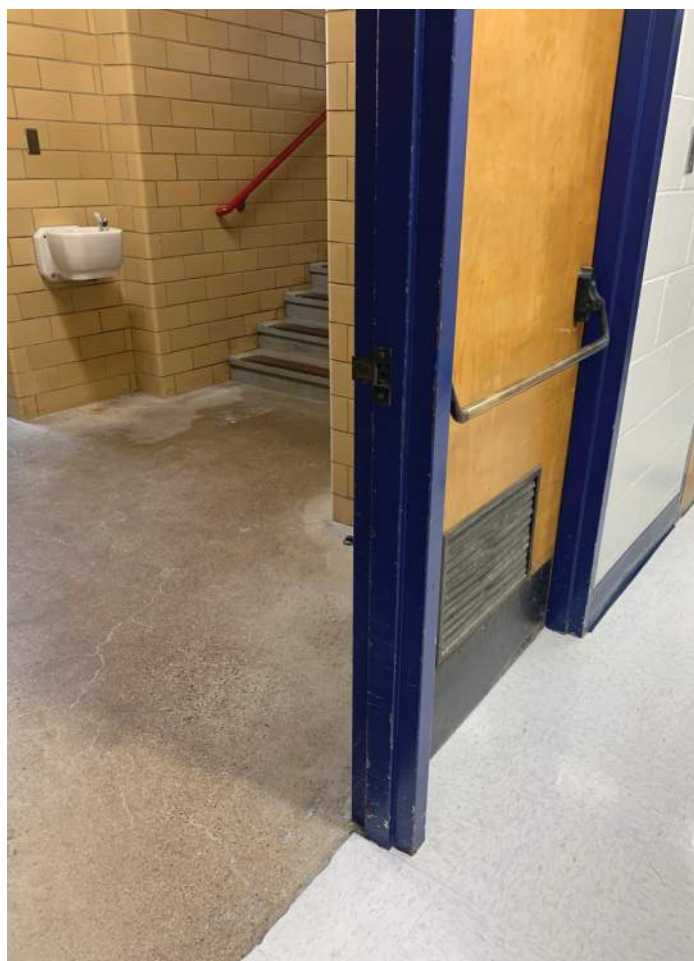
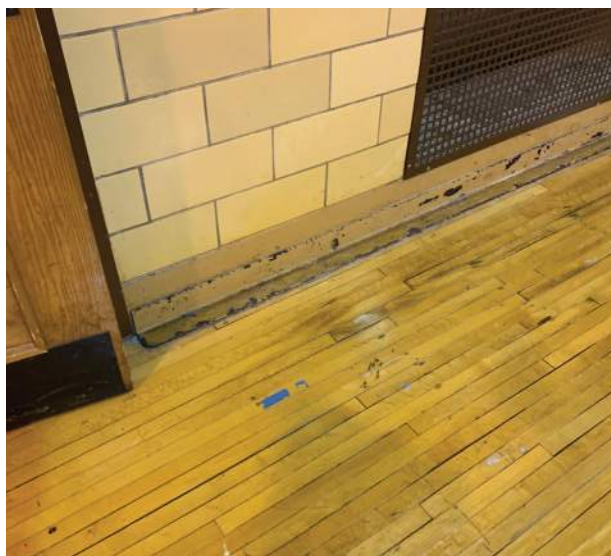
The following report is the result of a site visit by Nick Kent, Nicole Dryden, and Grant Heimerdinger that occurred in June of 2023. Site observations and interviews with staff were used in preparation of this report.

### OBSERVATIONS

The condition of interior materials at Whitefish Bay High School are mostly fair, apart from in some corridors and classrooms. There are many portions of flooring and ceiling tiles in need of replacement throughout as well as damaged/worn doors and frames.

### RECOMMENDATIONS

See maintenance list for all specific areas of concern.



# ACCESSIBILITY

The following report is the result of a site visit by Nick Kent, Nicole Dryden, and Grant Heimerdinger that occurred in June of 2023. Site observations and interviews with staff were used in preparation of this report.

## OBSERVATIONS

Fair to poor accessibility was observed throughout Whitefish Bay High School. The majority of lower level is inaccessible or difficult to maneuver through. There is no access to fieldhouse locker rooms. Memorial gym balcony is inaccessible. Old pool and associated lockers lack an entrance with appropriate maneuvering clearances. Many classrooms have clearance concerns and most door hardware is non compliant.

## RECOMMENDATIONS

See maintenance list for all specific areas of concern.



## MECHANICAL

The Whitefish School District contracted separately with Nexus Solutions to develop a comprehensive report and maintenance recommendation for the mechanical systems. The results and pricing are included in our compiled maintenance list.

# ELECTRICAL

The following report is the result of a site visit by Mike Pasineau of MSA Professional Services, Inc. that occurred on Wednesday, July 12, 2023. Site observations, existing drawing review and interviews with facility staff were used in preparing this report.

The original building was constructed in 1930 with building additions in 1941, 1956, 1967, 1991 and 2010.

## Main Electrical Service Observations

A. The high school building is fed by two main electrical services. Both electric services were installed during the 2010 addition and renovations project. One service is a 277/480 volt, 3-phase, 4-wire, 1600 amp and is fed from a pad mounted utility transformer on the northeast side of the building. The C/T cabinet is pad mounted adjacent to the utility transformer. The service switchboard is a Square D QED type switchboard, was installed in the 2010 addition and renovation project, appears to be in good operating condition and has room for additional breakers.

B. The second service is a 120/208 volt, 3-phase, 4-wire, 1200 amp service fed from a pad mounted utility transformer and a wall mounted C/T cabinet located on the east side of the field house. The service panelboard is an Eaton Cutler-Hammer PRL4A type distribution panelboard, was installed during the 2010 addition and renovation project, appears to be in good operating condition and has room for additional breakers.

C. Both services have surge suppression devices.

D. The serving utility is WE Energies.

## Recommendations

A. This facility is served by (2) electric services. Both services are in good working condition and can remain. Space is available on both services for small building additions. If no large additions are planned for this facility, both services are adequately sized and can remain. Add additional loads to the existing services as necessary.

B. If a large building addition is constructed or construction is located at the existing service location(s), a new larger service or relocation may be required.

## Panelboards Observations

A. There are a variety of panelboards located throughout this facility. A majority of the panelboards were replaced during the 2010 addition and renovation project. These panelboards are Eaton Cutler Hammer PRL1a and PRL2a panelboards, in general have room for additional breakers, and appear to be in good working condition.

B. We also noted a few Square D NQOB type panelboards that still remained in the facility from previous renovation projects. These panels are nearing the end of their useful life and do not appear to have room for additional breakers.

## Recommendations

- A. The old Square D NQOB type panelboards have exceeded their useful lifespan and should be replaced based on their age and condition.
- B. The newer Eaton Cutler Hammer PRL1a and PRL2a type panelboards are in good working condition, in general have room for additional breakers and can remain. Add to the existing panelboards as necessary.
- C. Complete an Arc Flash Coordination Study of the existing electrical system and add arc flash labels to all electrical panelboards. This will increase the safety of the personnel maintaining or operating equipment along with occupants in the vicinity of the equipment.
- D. We noted numerous locations throughout the building where the area directly in front of panelboards was used as storage space. Ensure that a minimum of 3 feet of clearance is maintained in front of all panelboards throughout the facility.

## Generator Observations

- A. The emergency generator is a Kohler natural gas fired, 96kVA generator set. This unit is located in the lower level boiler room and staff indicated that the generator set is operational and regularly tested. We noted the exhaust piping for the generator set is very long. It would appear that the emergency generator set is more than 30 years old and shows signs of general wear and tear.
- B. There is (1) transfer switch located in a

first floor electrical room and contains mixed loads.

## Recommendations

- A. The emergency generator is located in the same room as the existing boilers which is not code compliant to today's requirements. Additionally, the emergency generator is more than 30 years old and is nearing the end of its useful life. To bring the facility up to current codes, we recommend providing a new exterior rated natural gas generator. We recommend the generator to be sized to feed life-safety loads such as emergency egress lighting and fire alarm, as well as non-life-safety loads such as the main office complex, data closets, phone, intercom, boiler, boiler circulating pump and cooler/freezer.
- B. We also recommend providing (2) new transfer switches fed from the generator which would separate life-safety and non-life-safety loads throughout the building. To bring the facility up to code, the new transfer switches would be required to be located in a separate room from the main electrical service and boilers.

## Interior Lighting and Control Observations:

- A. All the lighting was recently replaced with new LED type fixtures throughout the facility and no issues were reported by the owner.

## Recommendations

- A. None

## ELECTRICAL (CONTINUED)

### Emergency Lighting Observations

A. Emergency lighting is provided with a mixture of LED fixtures and wall mounted bug-eye type fixtures fed off of the standby generator. We did not verify full egress compliance during our walk through but assume some areas could use upgraded egress lighting to comply with current codes.

### Recommendations

A. Add egress lighting to the emergency generator as necessary to comply with current codes.

### Exterior Lighting Observations

A. The building outdoor light fixtures were recently updated to LED wall pack type fixtures.

### Recommendations

A. None

### Wiring Devices Observations

A. The receptacles and toggle switches are a mixture of commercial grade 15A and 20A with a mix of plastic and stainless steel wall plates. The devices vary in age and condition and for the most part show signs of general wear and tear.

### Recommendations

- A. Replace wiring devices and plates that are damaged.
- B. Add additional receptacles and circuits as necessary.
- C. We did not verify shared neutral loads on any existing circuits; this should be done by a qualified electrician prior to adding any additional devices. We would recommend a separate neutral be installed on any shared neutral loads or add multipole breakers to bring the circuiting up to code compliance.
- D. We did not verify if circuits contained independent grounding conductors. This should be done by a qualified electrical contractor or at a minimum verify if grounding continuity in all circuits. It was common in schools in Wisconsin to use the conduit as a grounding system on some older facilities. Over time, the conduit may have been disconnected causing ungrounded circuit conditions. We always recommend a separate grounding conductor be installed for every circuit.

### Fire Alarm System Observations

- A. The fire alarm is a Simplex 4100U Addressable fire alarm system. The head end and devices were installed during the 2010 addition and renovation project. The fire alarm system appears to be in good working condition and staff indicated it is operating properly.
- B. There are pull stations by exterior doors
- C. There are horn/strobe devices in all public spaces including corridors and

classrooms.

D. There are smoke detectors present throughout the building.

E. The external devices were code compliant at time of installation.

### Recommendations

A. The system was installed in 2010 and is in good working condition. Add devices to the existing system as necessary.

### Clock System Observations

A. The existing clock system consists of a Primex head end GPS transmitter located in the MDF data closet. The existing clocks throughout the building are a mixture of battery powered Primex and Simplex type clocks.

### Recommendations

A. The existing clock system is in good working condition and can remain. Add new Primex clocks to the existing system as necessary.

### Public Address System Observations

A. The existing public address system was installed more than 10 years ago. The existing public address system is a proprietary system that was built and serviced by a local contractor.

B. Numerous type of speakers are located throughout the facility of different ages and types. A majority of the speakers

throughout the facility are round, ceiling mounted, recessed speakers in areas with lay-in ceiling grid and surface, wall mounted speakers in areas with hard ceiling surfaces or exposed structure.

### Recommendations

A. The existing public address system is functional and can be expanded, however, due to the age of the equipment and the system being only serviceable by the contractor that built the system, a new public address system should be considered. We recommend an all new Valcom or Carehawk Hybrid IP public address system with all new speakers throughout the building.



## ELECTRICAL (CONTINUED)

### Data, Telephone Observations

- A. The MDF data rack is located on the 2nd floor adjacent to the library. There are numerous additional IDF data closets throughout the building. The MDF data closet is fed with fiber and fiber is used to connect all switches throughout the building.
- B. The data system consists of a mixture of CAT 5 and CAT 5E type data cable which is routed to patch panels in the data rack.
- C. The building has wireless access points.
- D. Through random sampling of data cable, we found CAT 5 and CAT 5E plenum and non plenum rated data cabling.

### Recommendations

- A. A possible upgrade to the cabling is to provide all new plenum rated CAT 6 type data cabling to increase the speed of the network. New cabling also makes sense if large areas of ceilings are removed to accommodate other work.
- B. Additional CAT 6 data cabling can be added to rooms as needed.
- C. We believe the number of data drops could be reduced in each room if new cabling was provided; Two for a wireless access point, two for a teacher station and one for a media delivery device per classroom.
- D. Remove all abandoned phone and coaxial cabling throughout the entire facility.

### CCTV System Observations

- A. There is an existing Exacqvision IP

based security camera system in the facility that was installed during the 2011 renovation project. The existing system is in good working condition. We noticed a few areas that could use additional coverage.

- B. The security cameras located throughout the building are a mixture of Sony and Axis type cameras.

### Recommendations

- A. Add additional or modify cameras as required if remodeling to the building is proposed.
- B. This system is in good operating condition, but the system appears to be dated and new IP technology may be considered as an upgrade. Further discussion with district is required to determine exact intent of a new system.

### Keyless Entry System Observations

- A. There is an S2 browser based keyless entry system installed in the facility. The system was installed during the 2010 renovation project. The facility was recently upgraded with encrypted card readers, hard wired from control panels to select doors.

### Recommendations

- A. Expand the existing door access control system as required if more doors are desired to have Card readers/Strike control added or if additions to the building are proposed that require card access.
- B. The system is in good operating condition, but new technology may be

considered as an upgrade. Further discussion with the district is required to determine exact intent of a new system.

### **Security System Observations**

A. There is a Honeywell security system in the facility with security motion detectors located throughout corridor areas and large collaboration spaces. Staff indicated that the system is operational without any issues.

### **Recommendations**

A. Expand the existing security system with additional motion detectors or security keypads as necessary.



# PLUMBING

The following report is the result of a site visit by Justin Monk and Madeline Shimota of MSA Professional Services, Inc. that occurred on Wednesday, July 12, 2023. Site observations and interviews with staff were all used in the preparation of this report.

The original building was constructed in 1930 with building additions in 1941, 1956, 1967, 1991 and 2010.

## Domestic Water Piping System Observations

A. The building is supplied by the municipal water utility. It has a 4" ductile iron water service with a 4" water meter. The majority of system piping material in remodeled and renovated areas is type L copper. The majority of system piping material in unrenovated areas and walls is galvanized. The isolations valves are gate and ball valves. There are backflow preventers that serve science room equipment, pool equipment and HVAC. The system consist of cold water hard, hot water supply and hot water return. Pipe insulation is in fair to poor condition. The system pressure is 70-80psig. The hot water delivery time to the most remote fixture is 60 seconds and there were reports of difficulty balancing the system.

## Recommendations

A. Any future renovations and or additions, shall account for the resizing of the domestic water pipe mains in order to provide adequate pressure and flow to any

new and existing fixtures. Current plumbing and energy codes required faster hot water delivery time to all fixtures. This will extend the domestic hot water piping system piping closer to all hand washing type fixtures and increase the size of the pipe main and circulation pump.

B. Replace the underground and in wall piping with new piping since it is past its life expectancy. This includes underground and tunnel piping. Above floor domestic water piping not in walls was replaced during the last building addition.

## Fire Suppression Piping System Observations

A. The building contains an automatic fire sprinkler system for the 2010 addition. It has a 6" ductile iron separate from the water service. There are 2 flow and 4 tamper switches. The system pressure is 70-80psig. The overall system is in fair condition.

## Recommendations

A. The fire sprinkler service appears to be properly sized to support a fire sprinkler system for the entire building for any future renovations and or additions. The existing water service is not capable of providing an automatic fire sprinkler system for the entire building for any future renovations and or additions. A new properly sized water service will be required to support an automatic fire sprinkler system.

### Sanitary Drain, Waste and Vent Piping System

#### Observations

- A. The building system discharges to the municipal sewer. Floor areas that are prone to spills have floor drains. The HVAC boilers are served by hub drains. The main system piping material is hub and spigot cast iron with PVC piping material installed for repairs and in renovated areas. The science room sinks are served by an acid neutralization basin with glass acid waste piping material. The overall system is in poor condition.
- B. The lower level is served by a sanitary ejector basin and pump.

#### Recommendations

- A. Replace the entire piping system in unrenovated areas older than the 2010 addition with new piping since it is past its life expectancy. This includes underground, above floor and tunnel piping.

### Storm and Clear Water Drain, Waste and Vent Piping System

#### Observations

- A. The building system discharges to on-site storm sewer drainage. The roof is served by internal roof drains. The HVAC air handling equipment are served by hub drains. The system piping material is hub and spigot cast iron and PVC. Pipe insulation is in poor condition. There are no reports of back-up or system issues. The overall system is in poor condition.
- B. The foundation drain tile is served by a clear water sump basin and pump.

- C. The elevator is served by a clear water sump basin and pump.

#### Recommendations

- A. Replace the entire piping system in unrenovated areas older than the 2010 addition with new piping since it is past its life expectancy. This includes underground, above floor and tunnel piping.

### Natural Gas Piping System

#### Observations

- A. The building is supplied by the local gas utility. The system serves the HVAC, plumbing and kitchen equipment. Main system pressure is 2-5lb with a 7"-14" w.c. pressure regulator serving the equipment. The system piping material is black iron steel. The isolations valves are ball valves. The overall system is in fair condition.

#### Recommendations

- A. None at this time.

### Compressed Air Piping System

#### Observations

- A. The system is served by an air compressor which is piped to, equipment. The overall system is in fair condition.

#### Recommendations

- A. None at this time.

## PLUMBING (CONTINUED)

### Plumbing Equipment Observations

- A. Water Heaters – Northeast side of Building – (2) 40 gallon 399,000btu atmospheric vented gas water heater with expansion tank and re-circulating pump. Temperature is 130degrees. Poor Condition.
- B. Circulating Pumps – Northeast side of Building –15gpm pump. Temperature is 130degrees. Fair Condition.
- C. Acid Neutralization Basin – Basement Area – 115-150gpm. fair Condition.
- D. Sanitary Ejector Basin and Pump – Lower Level – Was not able to inspect at time of site visit.
- E. Clearwater Sump Basin and Pump – Foundation Drain Tile – Was not able to inspect at time of site visit. The maintenance staff is having issues with the clearwater system as a whole. Poor condition.
- F. Clearwater Sump Basin and Pump – Elevator – Was not able to inspect at time of site visit.

### Recommendations

- A. Any future renovations and or additions, shall account for the resizing of the domestic hot water equipment to meet the demands of the any new and existing fixtures. Provide power vent, high efficiency gas water heater(s) with expansion tank and re-circulating pump to and from new hot water storage tank and distribution system circulating pump(s).
- B. Increase the water heater water temperature outlet to 140 degree to prevent legionnaire bacteria growth inside of the hot water storage tank. Provide a thermostatic mixing valve to serve the hot water storage

tank outlet piping. The thermostatic mixing valve shall be digital type.

### Plumbing Fixtures Observations

- A. Water Closets – Vitreous china wall and floor mount with brass chrome plated manual lever and sensor hardwired flush valve. Poor Condition.
- B. Lavatories – Vitreous china wall mount with brass chrome plated manual lever faucets. Poor Condition.
- C. Wash Stations – Wall mount with sensor hard wired faucets. Fair Condition.
- D. Urinals – Vitreous china wall and floor mount with brass chrome plated manual lever and sensor hardwired flush valve. Poor Condition.
- E. General Sinks – Stainless steel drop-in with brass chrome plated manual lever faucets. Poor Condition.
- F. Classroom Sinks – Stainless steel drop-in with brass chrome plated manual lever faucets. Poor Condition.
- G. Art Room Sinks – Stainless steel floor mount and drop-in with brass chrome plated manual lever faucets and point of use solid interceptors. Fair Condition.
- H. Science Room Sinks – Epoxy resin under mount with brass chrome plated manual lever faucets and vacuum breaker spouts. Poor Condition.
- I. Service Sinks – Mold PVC floor mount with brass chrome plated manual lever faucets and vacuum breaker spouts. Poor Condition.
- J. Showers – Stainless steel single and multiply use brass manual lever showers valves. Poor Condition.

- K. Electric Water Cooler – Single use with and without bottle filling station. Fair Condition.
- L. Emergency Fixture – Shower with cold water supply only. Fair Condition.

### Recommendations

- A. Replace all plumbing fixtures that are 15 years and older. Provide wall mount fixtures where possible and sensor operated flush valves / faucets in toilet rooms to improve hygiene and sanitary efforts.
- B. Provide floor drains with trap seal protection in all toilet rooms.
- C. Provide monthly testing of emergency fixtures.



# MAINTENANCE LIST

No.	Issue	Proposed Solution	Discipline	Cost	Priority
1	Majority of classroom entrances have pull/push clearance issues	Provide accessible clearances to meet current code requirements. This will require widening entry and all associated work. Replace doors where applicable	ACCESSIBILITY	\$3,752,438	2
2	Locker rooms underneath fieldhouse do not have easy accessible route	Provide code compliant access	ACCESSIBILITY	\$142,950	2
3	Toilet rooms in both locker rooms underneath fieldhouse are not ADA compliant	Provide code compliant access	ACCESSIBILITY	\$107,213	2
4	Majority of lower level is inaccessible or difficult to maneuver with no access to fieldhouse locker rooms	Provide accessible route (elevator and ramp)	ACCESSIBILITY	\$1,786,875	2
5	Storage and toilet rooms underneath stage have a single entry point and do not meet current ADA code requirements	Provide proper access	ACCESSIBILITY	\$300,195	2
6	Light switch height does not follow code requirements	Relocate switches to within ADA reach range	ACCESSIBILITY	\$250,163	2
7	Non-ADA toilet adjacent from nurse/health room. Door width is 2'8"	Replace door	ACCESSIBILITY	\$7,148	2
8	All door hardware needs to be addressed in the fieldhouse	Replace door hardware	ACCESSIBILITY	\$125,081	2
9	Most interior door hardware is not compliant with current accessibility code - old knob style - and does not provide desired locking functionality.	Replace door hardware with new levers.	ACCESSIBILITY	\$285,900	2
10	Art and woods wing doors do not meet push/pull clearances or correct hardware for code requirements	Rework doors to allow for accessible clearances and replace hardware.	ACCESSIBILITY	\$53,606	2
11	Main entry ramp (just east of doors) is unlevel	Level pavement	ACCESSIBILITY	\$14,295	3
12	Ramp from west street to field house is too steep and not level	Level ramp and provide railing	ACCESSIBILITY	\$114,360	3
13	Original pool and adjoining locker rooms do not have accessible access.	Provide accessible access (elevator)	ACCESSIBILITY	\$142,950	3
14	Memorial gym balcony is inaccessible	Provide accessible access (elevator) with ramp to bathrooms	ACCESSIBILITY	\$142,950	3

No.	Issue	Proposed Solution	Discipline	Cost	Priority
15	Auditorium receiving area on east elevation is not compliant with current code requirements	Provide accessible route	ACCESSIBILITY	\$89,344	3
16	Auditorium does not provide ADA seating or proper railing requirements	Provide accessible seating and compliant railings.	ACCESSIBILITY	\$233,918	3
17	Greenhouse and bell tower are not accessible.	Provide ADA access	ACCESSIBILITY	\$107,213	3
18	Serving line in cafeteria is non-compliant with current code requirements	Provide ADA height serving line	ACCESSIBILITY	\$28,590	3
19	Bleachers within fieldhouse are not ADA compliant	Provide ADA seating	ACCESSIBILITY	\$77,973	3
20	Men's toilet room between boiler and wrestling pit is not ADA compliant	Provide code compliant access	ACCESSIBILITY	\$42,885	3
21	Bleachers for softball have no direct path	Provide concrete sidewalk to bleachers.	ACCESSIBILITY	\$21,443	3
22	Eastern dugout has no direct path	Provide concrete sidewalk to dugout.	ACCESSIBILITY	\$42,885	3
23	Fire escapes are not compliant with current code.	Ensure egress is able to be provided through building or at grade exits.	SAFETY/ SECURITY	\$142,950	1
24	Main entry railing is not compliant with current code requirements	Extend railing to meet current code requirements	SAFETY/ SECURITY	\$35,738	1
25	Railing at entry door 2 does not meet current code requirements	Extend railing to meet current code requirements	SAFETY/ SECURITY	\$35,738	1
26	Railing up to Auditorium wing does not meet current code requirements	Extend railing to meet current code requirements	SAFETY/ SECURITY	\$10,007	1
27	Second and third floor stairs generally do not have code compliant railings	Extend railing to meet current code requirements	SAFETY/ SECURITY	\$464,588	1
28	Stairs to fieldhouse mezzanine do not meet code requirements	Provide access, replace stairs, remove chain link	SAFETY/ SECURITY	\$42,885	1

## MAINTENANCE LIST (CONTINUED)

No.	Issue	Proposed Solution	Discipline	Cost	Priority
29	Most ground floor stairs are too narrow, lack visual strips, and do not have proper railing distances	Provide code compliant access, visuals, and extend railing	SAFETY/ SECURITY	\$228,720	1
30	Entry door 3 has does not provide a railing	Provide railing	SAFETY/ SECURITY	\$35,738	1
31	Entry door 4 has does not provide a railing	Provide railing	SAFETY/ SECURITY	\$35,738	1
32	No railing provided at exterior doors 7A or 7B	Provide railing	SAFETY/ SECURITY	\$57,180	1
33	Entry door 5A exits to step and does not meet current code requirements	Provide ramp	SAFETY/ SECURITY	\$35,738	1
34	Visual strips are needed at middle junction point to pool and science block	Provide visual strips	SAFETY/ SECURITY	\$14,295	1
35	Curved stairwell northwest of the pool is too narrow and does not meet code requirements	Replace and resize stair	SAFETY/ SECURITY	\$107,213	1
36	Both northern sets of egress doors do not have panic hardware and do not block acoustics well	Replace doors and hardware	SAFETY/ SECURITY	\$30,020	1
37	Compartmentalization doors do not comply with code requirements	Replace hardware and relocate to meet code requirements	SAFETY/ SECURITY	\$228,720	1
38	Fire kiosks are in poor condition throughout the building	Replace kiosks	SAFETY/ SECURITY	\$142,950	1
39	Railings to west entry of fieldhouse do not comply with current code requirements and is damaged	Replace railing	SAFETY/ SECURITY	\$100,065	1
40	Wheel stops in tennis parking lot damaged, missing, or in disarray	Replace wheel stops	SAFETY/ SECURITY	\$21,443	1
41	Gate and fence at the north most parking lot adjacent to the tennis courts is rusting and in poor condition	Replace gate and fence	SITE	\$35,738	1
42	No dumpster enclosure is present. Trash is located at the northeast entry to the school adjacent to the fieldhouse	Provide dumpster enclosure with materials/screening allowable by WFB ordinance and bollards.	SITE	\$71,475	2

No.	Issue	Proposed Solution	Discipline	Cost	Priority
43	Main entry steps are cracking and heaving	Repair steps	SITE	\$107,213	2
44	Fencing surrounding entire site is uneven and rusting	Replace fence	SITE	\$571,800	2
45	Fence and gate to softball field is rusting and dated	Replace fence and gate	SITE	\$21,443	2
46	Gate and fence around garden is damaged, angled, and dated	Replace gate and fence	SITE	\$21,443	2
47	Gate, fence, and path adjacent to tennis courts to track is damaged	Replace gate, fence, and path	SITE	\$28,590	2
48	Main bleacher are rusting	Strip, prep, and paint	SITE	\$120,078	2
49	Fence and gate just past the garbage bin adjacent to fieldhouse is rusting and dated	Strip, prep, and paint gate and fence	SITE	\$14,295	2
50	Entry door 5 has cracked and unlevel pavement	Level and repair pavement	SITE	\$64,328	3
51	Soccer and football practice goals are damaged and slanted	Remove goals	SITE	\$7,148	3
52	Press box is showing signs of water damage	Repair damage and leak	SITE	\$35,738	3
53	Pavement and ramp at the west entry of fieldhouse are cracking and uneven	Repair pavement	SITE	\$15,010	3
54	Asphalt at both the north (back of house) parking lot and the tennis parking lot are cracking and unlevel	Replace asphalt	SITE	\$457,440	3
55	Bollards around the site are damaged and/or rusting	Replace bollards	SITE	\$192,983	3
56	Liner along fence under bleachers is ripped and damaged	Replace liner	SITE	\$42,885	3

## MAINTENANCE LIST (CONTINUED)

No.	Issue	Proposed Solution	Discipline	Cost	Priority
57	Pavement and sidewalk surrounding the site perimeter is cracking and unlevel	Replace pavement and sidewalk	SITE	\$332,359	3
58	Ramp to bleachers is rusting	Replace ramp	SITE	\$15,725	3
59	Site wall retaining earth in-between softball and fieldhouse is dated, worn, and listing	Replace retaining wall	SITE	\$102,924	3
60	Planter wall at west corner of the school is cracked and angled	Replace wall	SITE	\$89,344	3
61	Birds nest are present in majority of "historic" lighting mounted on the school	Remove nests. Reseal or repair lights.	EXT	\$17,869	1
62	Greenery and vines have overgrown areas of building and pavement and may be causing shell degradation	Remove vegetation	EXT	\$25,016	1
63	West elevation of fieldhouse brick and metal panel around "Blue Dukes" sign is worn	Clean brick and metal panel	EXT	\$20,585	2
64	Bell tower area is actively leaking despite reroofing and multiple repairs	Rebuild entirety of roof around bell tower. THIS IS A TEMPORARY FIX AND NOT INCLUSIVE OF ALL ADDITIONAL FINDINGS IN CURRENT STUDY.	EXT	\$114,360	2
65	Lintels and stonework are cracking (limited instances) at the north face of building adjacent to parking lot	Repair lintels and stonework	EXT	\$178,688	2
66	Both door frames on north egress doors from fieldhouse are damaged and worn	Replace door frames	EXT	\$214,425	2
67	Drainage from pool to garden is ineffective	Replace drainage system	EXT	\$48,246	2
68	Both drains west of main entry are rusting and dated	Replace drains	EXT	\$28,590	2
69	Roofs from 2000, 2002, 2004 and 2005 (C, D, E, F, F1, G, H, I, J, L, M, O, P, R, S, T, T1) are due for replacement	Replace roofs	EXT	\$1,147,889	2
70	Window sealant is cracking or decaying at many windows.	Replace sealant and/or windows	EXT	\$1,072,125	2

No.	Issue	Proposed Solution	Discipline	Cost	Priority
71	Vent at entry door 3 is dated and rusting	Replace vent	EXT	\$14,295	2
72	Air vents and louvers are damaged and dated	Replace vents and louvers	EXT	\$178,688	2
73	Majority of exterior metal is rusting and failing. This includes doors, lintels and flashing (if present)	Strip, prep, and paint doors, and lintels. Repair and provide flashing where applicable	EXT	\$214,425	2
74	Pavement and stonework at main entry landing is cracked and damaged	Repair pavement and stonework	EXT	\$14,295	3
75	Stonework cracking at exterior door 8	Repair stonework	EXT	\$14,295	3
76	Window wells are showing signs of ineffective drainage and contain organic growth	Replace window wells with new concrete surrounds and gravel fill. Add waterproofing against wall during excavation.	EXT	\$243,015	3
77	Sealant joints east of main entry along walkway are cracking	Replace with non-hardening sealant.	EXT	\$2,144	3
78	Tennis parking lot posts are damaged and rusting	Strip, prep, and paint	EXT	\$7,148	3
79	Eastern vestibule and corridor have an active leak	Patch and/or replace where applicable	INT	\$21,443	1
80	Several leaks are active in tunnels under renovated pool	Refinish floor, ceiling, walls, and provide compliant access	INT	\$107,213	1
81	Stage floor and curtain is in poor condition	Replace floor and curtain	INT	\$142,950	1
82	Water damage located in boiler and mechanical rooms below	Patch and/or replace where applicable	INT	\$17,869	2
83	Multiple chipped paint and damaged flooring locations in the fieldhouse	Repair chips and damage	INT	\$285,900	2
84	Doors and door frames are in fair to poor condition	Replace doors and frames	INT	\$3,573,750	2

## MAINTENANCE LIST (CONTINUED)

No.	Issue	Proposed Solution	Discipline	Cost	Priority
85	Many locations have inefficient single pane glass windows	Replace glass panels	INT	\$428,850	2
86	Stairwell northeast of the Memorial Gym has peeling inlay grate and in in fair to poor condition	Replace grate and surrounding damaged areas	INT	\$21,443	2
87	Auditorium has poor sound quality and emergency egress lighting	Replace lighting	INT	\$204,419	2
88	Skylights and casework are damaged in the lobby between fieldhouse and pool	Replace skylights and casework	INT	\$71,475	2
89	Pool starter blocks are worn and damaged	Replace starter blocks	INT	\$71,475	2
90	Windows, sills, and blinds are dated and inefficient	Replace windows	INT	\$1,858,350	2
91	Storage room and adjoining toilet room across from wrestling pit are ineffective and out of commission	Refinish floor, ceiling, walls, and provide compliant access	INT	\$220,143	3
92	Damaged partition and damaged backboards in Memorial Gym	Remove partition and backboards	INT	\$35,738	3
93	Ceilings are in fair condition with a slight sag in most areas	Replace ceiling where applicable	INT	\$1,751,138	3
94	Dated and damaged carpet, ceiling, and walls within English wing above renovated pool	Replace doors, ceiling, floors and repair walls	INT	\$286,186	3
95	Pool skylights are worn and likely not efficient.	Replace skylights	INT	\$171,540	3
96	Lockers are in fair condition	Replace where applicable	INT	\$100,065	3
97	General electrical recommendation.	Complete an Arc Flash Coordination Study of the existing electrical system and add arc flash labels to all panelboards.	ELEC	\$28,590	1
98	Some areas are not well covered by existing camera system.	Add new cameras as required.	ELEC	\$142,950	2

No.	Issue	Proposed Solution	Discipline	Cost	Priority
99	Some Square D NQOB panelboards remain in the building and are nearing the end of their useful life.	Replace Square D panelboards.	ELEC	\$357,375	2
100	Public address system is dated and proprietary (can only be serviced by single contractor).	Plan for new public address system (IP) with all new speakers and wiring.	ELEC	\$1,429,500	3
101	Generator is nearing the end of its useful life and shows signs of general wear. The current location does not meet current code.	Provide new exterior rated natural gas generator.	ELEC	\$142,950	3
102	The building currently has one transfer switch which contains mixed loads.	Provide two new transfer switches fed from the new generator in a new, rated room.	ELEC	\$107,213	3
103	Some receptacles and toggle switches show wear and damage.	Replace damaged wiring devices.	ELEC	\$214,425	3
104	Through random sampling of data cable, some non plenum rated CAT 5 and 5E was found.	Upgrade all cabling to new plenum rated CAT 6 data cabling.	ELEC	\$1,429,500	3
105	Water closets, lavatories, urinals, general sinks, classroom sinks, science room sinks, service sinks, and showers were noted to be in poor condition.	Replace all plumbing fixtures that are over 15 years old. Provide wall mounted fixtures where possible. Faucets and flush valves to be sensor operated.	PLUMB	\$1,143,600	1
106	Most of the sanitary piping system is past its life expectancy. The system is in poor condition.	Replace the entire piping system in unrenovated areas older than 2010 addition with new piping (past life expectancy). This includes underground, above floor and tunnel piping.	PLUMB	\$7,147,500	1
107	Most of the storm piping system is past its life expectancy. The system is in poor condition, including pipe insulation, but there are no reports of back ups or issues.	Replace the entire piping system in unrenovated areas older than 2010 addition with new piping (past life expectancy). This includes underground, above floor and tunnel piping.	PLUMB	\$7,147,500	1
108	Water heaters on the northeast side of the building are in poor condition.	Replace with new water heaters.	PLUMB	\$714,750	1
109	Maintenance staff reports repeated issues with clearwater system (sump, pump, etc)	Investigate further and replace as required.	PLUMB	\$357,375	2
110	General plumbing recommendation.	Provide a thermostatic mixing valve to serve the hot water storage tank outlet piping (digital).	PLUMB	\$71,475	2

## MAINTENANCE LIST (CONTINUED)

No.	Issue	Proposed Solution	Discipline	Cost	Priority
111	Much of the domestic water piping system is past its life expectancy. The pipe insulation in all unrenovated areas is in fair to poor condition, and there are reports of difficulty balancing the system	Replace the underground and in wall piping with new piping (past life expectancy). This includes underground and tunnel piping. Above floor domestic water piping not in walls was replaced during the last building addition.	PLUMB	\$2,859,000	2
112	Some toilet rooms do not have floor drains, or floor drains with trap seal protection.	Provide floor drains with trap seal protection in all toilet rooms.	PLUMB	\$285,900	3
113	IT spaces are not cooled.	Add fan coil and DX cooling to IT spaces and adjacent offices (rooms 101,102, and two (2) adjacent offices).	MECH	\$233,200	2
114	Difficulties with thermal confort and controls in certain spaces.	Add slip in style VAV boxes (qty 14) to existing ductwork for 2nd floor classroom air handling units AHU-4 and AHU-5.	MECH	\$109,500	2
115	Air handlers have exceeded useful life expectancy.	Replace 1957 AHU-4 and AHU-5 serving 2nd floor classrooms and convert from DX cooling to chilled water.	MECH	\$415,600	2
116	Air handlers have exceeded useful life expectancy.	Replace 1957 air handling unit AHU-15 and AHU-16 serving rooms 204 and 210 and add cooling.	MECH	\$255,400	2
117	Boilers have exceeded useful life expectancy.	Replace 1957 steam boilers with high efficiency hot water condensing boilers.	MECH	\$1,252,200	2
118	Boilers have exceeded useful life expectancy.	Replace 1967 hot water boilers with high efficiency hot water condensing boilers.	MECH	\$1,018,300	2
119	Unit ventilators have exceeded useful life expectancy.	Replace classroom unit ventilators (qty 68) serving the classrooms on all three floors with central systems with hot water heating and chilled water cooling.	MECH	\$5,661,700	2
120	Exhaust fans have exceeded useful life expectancy.	Replace exhaust fans (Qty 30) and add thermal equalizers (Qty 14) to fieldhouse and Memorial Gym.	MECH	\$396,600	2
121	Pneumatics do not provide expected building controllability.	Replace Trane pneumatic VAV boxes (qty 25) serving office area.	MECH	\$273,400	2
122		Convert areas served by 1957 steam boilers from steam to hot water replacing steam terminal heating devices and replacing the steam coils in air handling units AC-1 (office) and media center (re-use air handling units).	MECH	\$12,634,900	3

No.	Issue	Proposed Solution	Discipline	Cost	Priority
123		HV-1 (wrestling and storage): Replace steam coil with hot water coil and add chilled water coil to provide cooling (insulate supply air ductwork). Re-use the air handling unit and add VFD.	MECH	\$121,400	3
124	Air handler has exceeded useful life expectancy.	Replace 1957 auditorium air handling unit and add cooling (cooling currently not operational).	MECH	\$388,800	3
125	Air handler has exceeded useful life expectancy.	Replace 1957 auxiliary pool air handling units AHU-1 and add chilled water cooling. New units and ductwork to have pool environment construction.	MECH	\$379,800	3
126	Air handlers have exceeded useful life expectancy.	Replace 1957 lower cafeteria air handling units CC-1 and CC-2 and add chilled water cooling.	MECH	\$336,200	3
127	Air handlers have exceeded useful life expectancy.	Replace 1957 Memorial Gym air handling units (AHU-2 and AHU-3) and add chilled water cooling.	MECH	\$434,600	3
128	Air handler has exceeded useful life expectancy.	Replace 1957 shooting range air handling unit AHU-1 (upper Memorial Gym) and add chilled water cooling.	MECH	\$187,400	3
129	Air handler has exceeded useful life expectancy.	Replace 1957 upper cafeteria air handling unit BCU-1 and add chilled water cooling.	MECH	\$244,000	3
130	Air handlers have exceeded useful life expectancy.	Replace 1967 fieldhouse air handling units (quantity 5: AHU 8-12) and associated ductwork and add chilled water cooling.	MECH	\$1,639,300	3
131	Air handler has exceeded useful life expectancy.	Replace 1967 fieldhouse lobby and offices air handling unit AHU-7 and add chilled water cooling.	MECH	\$245,800	3
132	Air handlers have exceeded useful life expectancy.	Replace 1967 fieldhouse team room air handling units AHU-13 and AHU-14 and add chilled water cooling.	MECH	\$162,600	3
133	Air handlers have exceeded useful life expectancy.	Replace 1967 pool air handling units AHU-2 and AHU-3 as well as pool spectator area AHU-6 and add chilled water cooling. New units and ductwork to have pool environment construction.	MECH	\$977,900	3
134	Unit ventilators are nearing or past life expectancy and are not efficient for this type of space.	Replace classroom unit ventilators in wood shop with an air handling unit with chilled water cooling.	MECH	\$253,000	3

## MAINTENANCE LIST (CONTINUED)

No.	Issue	Proposed Solution	Discipline	Cost	Priority
135	Fan coils are nearing or have exceeded useful life expectancy.	Replace fan coils (Qty 4) serving central core spaces (133-135, 231-235, and 331-335) and add chilled water cooling.	MECH	\$690,000	3
136	Pneumatics do not provide expected building controllability. Replacement parts are difficult to find.	Replace remaining pneumatic and proprietary DDC controls components with Niagara Tridium platform compatible DDC controls systems.	MECH	\$1,981,700	3
<b>HIGH TOTAL</b>				<b>\$78,786,989</b>	

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# LYDELL COMMUNITY CENTER

**ADDRESS:** 5205 N Lydell Ave

**SITE SIZE:** 5.8 acres

**BUILDING SIZE:** 21,665 SF

**BUILDING AGE:** 1955

**ADDITIONAL USES:**  
Daycare + Community Center

**SPRINKLERED:** No





**CONDITION KEY**

GOOD	No major needs anticipated in next 15 years. Meets or exceeds expectations for a modern educational facility.
GOOD TO FAIR	No major needs anticipated in next 10 years. Meets minimum expectations for a modern educational facility.
FAIR	No major needs anticipated in next 5 years. Components may be at or nearing expected service life.
FAIR TO POOR	No major immediate needs. Components are likely past expected service life.
POOR	Major immediate needs. Components are at or nearing failure.

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## SITE

The following report is the result of a site visit by Nick Kent, Nicole Dryden, and Grant Heimerdinger that occurred in June of 2023. Site observations and interviews with staff were used in preparation of this report.

### OBSERVATIONS

Site conditions are fair to poor with areas of cracking and heaving in pavement and concrete. No vehicular protection exists around most of the building. Site walls and fencing are damaged. The baseball diamond has not been maintained.

### RECOMMENDATIONS

See maintenance list for all specific areas of concern.



## EXTERIOR

The following report is the result of a site visit by Nick Kent, Nicole Dryden, and Grant Heimerdinger that occurred in June of 2023. Site observations and interviews with staff were used in preparation of this report.

### OBSERVATIONS

Portions of Lydell's exterior are in fair to poor condition. Base courses of brick around the building are spalling/crumbling, likely due to salt against the building.

### RECOMMENDATIONS

See maintenance list for all specific areas of concern.



# INTERIOR

The following report is the result of a site visit by Nick Kent, Nicole Dryden, and Grant Heimerdinger that occurred in June of 2023. Site observations and interviews with staff were used in preparation of this report.

## OBSERVATIONS

The overall condition of interior materials at Lydell is fair for their age. Some interior materials are at or nearing expected life span while the gym is experiencing humidity issues causing damage to ceiling tiles and the gym floor.

## RECOMMENDATIONS

See maintenance list for all specific areas of concern.



## ACCESSIBILITY

The following report is the result of a site visit by Nick Kent, Nicole Dryden, and Grant Heimerdinger that occurred in June of 2023. Site observations and interviews with staff were used in preparation of this report.

### OBSERVATIONS

Accessibility is fair at Lydell. Toilet rooms lack ADA stalls and the majority of classrooms and egress doors have incorrect hardware.

### RECOMMENDATIONS

See maintenance list for all specific areas of concern.



## MECHANICAL

The Whitefish School District contracted separately with Nexus Solutions to develop a comprehensive report and maintenance recommendation for the mechanical systems. The results and pricing are included in our compiled maintenance list.

# ELECTRICAL

The following report is the result of a site visit by Mike Pasineau of MSA Professional Services, Inc. that occurred on Wednesday, July 12, 2023. Site observations, existing drawing review and interviews with facility staff were used in preparing this report.

The original building was constructed with building additions and/or renovations in 2010.

## Main Electrical Service Observations

- A. The middle school building is fed by one main electrical service. This service is a 120/240 volt, single phase, 3-wire, 600 amp service and is fed from a pole mounted utility transformer and wall mounted C/T and meter cabinet located on the south side of the building. The main service distribution panelboard is a Square D HCM I-Line type panelboard that appears to have been installed within the last 10 years. The distribution panelboard appears to be in good working condition and has room for additional breakers.
- B. The existing service does not have a surge suppression device.
- C. The serving utility is WE Energies.

## Recommendations

- A. The existing electric service and service switchboard are in good working condition, in general has room for additional breakers and can remain. It appears that there is adequate service capacity on the service in the building. Add to the existing service as necessary.

- B. If a building addition is constructed or construction is located at the existing service location(s), a new larger service or relocation may be required.

## Panelboards Observations

- A. The panelboards throughout this facility are a mixture of old Trumbull Electric type panels that appear to be original to the construction of the building as well as numerous Square D NQOB type panels that were installed during a renovation project. These panelboards have exceeded their useful lifespan and in general have limited space for additional breakers.

## Recommendations

- A. The old Square D NQOB and Trumbull Electric type panelboards have exceeded their useful lifespan and should be replaced based on their age and condition. Provide new replacement panelboards and new feeders in existing conduit in each of these locations.
- B. Complete an Arc Flash Coordination Study of the existing electrical system and add arc flash labels to all electrical panelboards. This will increase the safety of the personnel maintaining or operating equipment along with occupants in the vicinity of the equipment.
- C. We noted numerous locations throughout the building where the area directly in front of panelboards was used as storage space. Ensure that a minimum of 3 feet of clearance is maintained in front of all panelboards throughout the facility.

**Generator****Observations**

A. This building does not have a generator.

**Recommendations**

A. One option is to continue the use of battery backup exit lights and egress fixtures.

B. Another option would be to consider adding a new generator and remove battery backup exit lights and egress lighting, provide power to data closets, phone, keyless entry, coolers and freezers as well as circulation pumps on boilers. Provide complete, new, code approved egress lighting paths throughout the facility if new generator set is added.

**Interior Lighting and Control****Observations:**

A. A majority of the fixtures throughout the facility are T8 fluorescent type fixtures consisting of different sized fixtures and quantity of lamps. There is zoned switching in the classroom spaces.

B. Some occupancy sensors are present in the building.

**Recommendations**

A. A possible upgrade to all LED interior lighting should be considered with all new motion controls and dimmer switches.

**Emergency Lighting****Observations**

A. Emergency lighting and exit lighting is accomplished through a mixture of battery backup light fixtures and battery backup combination exit lights and bug-eye type fixtures with some of them being old incandescent type light fixtures.

B. We did not verify full egress compliance during our walk through but assume some areas could use upgraded egress lighting to comply with current codes.

**Recommendations**

A. See recommendations from generator section.

B. Add interior and exterior egress lighting to emergency generator to comply with current codes.

C. Replace old incandescent egress light fixtures.

**Exterior Lighting****Observations**

A. The building outdoor light fixtures consist of LED wall pack type fixtures.

**Recommendations**

A. None

## ELECTRICAL (CONTINUED)

### Wiring Devices Observations

A. The receptacles and toggle switches are a mixture of commercial grade 15A and 20A with a mix of plastic and stainless steel wall plates. The devices vary in age and condition and for the most part show signs of general wear and tear.

### Recommendations

- A. Replace wiring devices and plates that are damaged.
- B. Add additional receptacles and circuits as necessary.
- C. We did not verify shared neutral loads on any existing circuits; this should be done by a qualified electrician prior to adding any additional devices. We would recommend a separate neutral be installed on any shared neutral loads or add multipole breakers to bring the circuiting up to code compliance.
- D. We did not verify if circuits contained independent grounding conductors. This should be done by a qualified electrical contractor or at a minimum verify if grounding continuity in all circuits. It was common in schools in Wisconsin to use the conduit as a grounding system on some older facilities. Over time, the conduit may have been disconnected causing ungrounded circuit conditions. We always recommend a separate grounding conductor be installed for every circuit.

### Fire Alarm System Observations

A. The fire alarm is a Simplex 4100U Addressable fire alarm system. The head end

and devices were installed during the 2010 renovation project. The fire alarm system appears to be in good working condition and staff indicated it is operating properly.

B. There are pull stations by exterior doors

C. There are horn/strobe devices in all public spaces including corridors and classrooms.

D. There are smoke detectors present throughout the building.

E. The external devices were code compliant at time of installation.

### Recommendations

A. The system was installed in 2010 and is in good working condition. Add devices to the existing system as necessary.

### Clock System Observations

A. The existing clock system consists of an old Simplex clock system with a Simplex Time Control Center master clock with 120V synchronized clocks throughout the building.

### Recommendations

A. Consider upgrading to a new Primex wireless master clock with a GPS receiver and utilize battery powered analog Primex clocks to match the other schools throughout the district. This system would have the ability to be interfaced to an upgraded paging system.

### Public Address System Observations

A. The existing public address system is currently operated using IP phones and an amplifier. A majority of the speakers throughout the building are round, ceiling mounted, recessed speakers in lay-in ceiling grid. Staff indicated the system is functioning properly.

**Recommendations**

A. None at this time.

**Data, Telephone Observations**

- A. There is one data rack centrally located in the building. The data rack is fed with fiber.
- B. The data system consists of a mixture of CAT 5 and CAT 5E type data cable which is routed to patch panels in the data rack.
- C. The building has wireless access points, but staff indicated there are numerous dead zones in the building where the wireless signal does not reach.
- D. Through random sampling of data cable, we found CAT 5 and CAT 5E non plenum rated data cabling.

**Recommendations**

- A. Consider providing additional wireless access points fed with new CAT 6 data cabling to increase the wireless coverage throughout the building.
- B. A possible upgrade to the cabling is to provide all new plenum rated CAT 6 type data cabling to increase the speed of the network. New cabling also makes sense if large areas of ceilings are removed to

accommodate other work.

- C. Additional CAT 6 data cabling can be added to rooms as needed.
- D. We believe the number of data drops could be reduced in each room if new cabling was provided; Two for a wireless access point, two for a teacher station and one for a media delivery device per classroom.
- E. Remove all abandoned phone and coaxial cabling throughout the entire facility.

**CCTV System Observations**

- A. There is an existing Exacqvision IP based security camera system in the facility that was installed during the 2010 renovation project. The existing system is in good working condition. We noticed a few areas that could use additional coverage.
- B. The security cameras located throughout the building are a mixture of Sony, Samsung and Axis type cameras.



## ELECTRICAL (CONTINUED)

### Recommendations

- A. Add additional or modify cameras as required if remodeling to the building is proposed.
- B. This system is in good operating condition, but the system appears to be dated and new IP technology may be considered as an upgrade. Further discussion with district is required to determine exact intent of a new system.

### Keyless Entry System Observations

- A. There is an S2 browser based keyless entry system installed in the facility. The system was installed during the 2010 renovation project. The facility was recently upgraded with encrypted card readers, hard wired from control panels to select doors.

### Recommendations

- A. Expand the existing door access control system as required if more doors are desired to have Card readers/Strike control added or if additions to the building are proposed that require card access.
- B. The system is in good operating condition, but new technology may be considered as an upgrade. Further discussion with the district is required to determine exact intent of a new system.

### Security System Observations

- A. There is an Ademco security system in the facility with security motion detectors located throughout corridor areas and large collaboration spaces. Staff indicated that the system is operational without any issues.

### Recommendations

- A. Expand the existing security system with additional motion detectors or security keypads as necessary.



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# PLUMBING

The following report is the result of a site visit by Alex Feudner of MSA Professional Services, Inc. that occurred on Wednesday, July 12, 2023. Site observations and interviews with staff were all used in the preparation of this report.

The original building was constructed in 1955 with building additions and/or renovations in 2010.

## Domestic Water Piping System Observations

A. The building is supplied by the municipal water utility. The water service was not able to be at time of site visit and staff did not know its location. It is assumed to be in the tunnels. The system piping material is type L copper. The isolations valves are gate and ball valves. There are backflow preventers that serve HVAC The system consists of cold water hard, hot water supply and hot water return. Pipe insulation is in fair to poor condition. The hot water delivery time to the most remote fixture is 60 seconds. There are minor reports of leaks in the system. The overall system is in poor condition.

## Recommendations

A. Any future renovations and or additions, shall account for the resizing of the domestic water pipe mains in order to provide adequate pressure and flow to any new and existing fixtures. Current plumbing and energy codes required faster hot water delivery time to all fixtures. This will extend

the domestic hot water piping system piping closer to all hand washing type fixtures and increase the size of the pipe main and circulation pump.

B. Replace the entire piping system with new piping since it is past its life expectancy. This includes underground, above floor and tunnel piping.

## Fire Suppression Piping System Observations

A. The building does not contain an automatic fire sprinkler system.

## Recommendations

A. The existing water service is most likely not capable of providing an automatic fire sprinkler system for the entire building for any future renovations and or additions. A new properly sized water service will be required to support an automatic fire sprinkler system.

## Sanitary Drain, Waste and Vent Piping System Observations

A. The building system discharges to the municipal sewer. The HVAC boilers are served by hub drains. The main system piping material is hub and spigot cast iron with PVC piping material installed for repairs and in renovated areas. Sections of existing hub and spigot cast iron piping are replaced. The overall system is in poor condition.

B. The lower level is served by a sanitary ejector basin and pump.

### Recommendations

A. Replace the entire piping system with new piping since it is past its life expectancy. This includes underground, above floor and tunnel piping.

### Storm and Clear Water Drain, Waste and Vent Piping System Observations

- A. The building system discharges to on-site storm sewer drainage. The roof is served by internal roof drains. The HVAC air handling equipment are served by hub drains. The system piping material is hub and spigot cast iron and PVC. Pipe insulation is in poor condition. There are no reports of back-up or system issues. The overall system is in poor condition.
- B. The foundation drain tile is served by a clear water sump basin and pump.
- C. The elevator is served by a clear water sump basin and pump.

### Recommendations

A. Replace the entire piping system with new piping since it is past its life expectancy. This includes underground, above floor and tunnel piping.

### Natural Gas Piping System Observations

A. The building is supplied by the local gas utility. The system serves the HVAC, plumbing and kitchen equipment. Main system pressure is 2-5lb with a 7"-14" w.c. pressure regulator serving the equipment.

The system piping material is black iron steel. The isolations valves are ball valves. The overall system is in fair condition.

### Recommendations

A. None at this time.

### Compressed Air Piping System Observations

A. The system is served an air compressor which is piped to equipment. The overall system is in fair condition.

### Recommendations

A. None at this time

### Plumbing Equipment Observations

- A. Water Heater – Southside of Building – 100 gallon 199,000btu atmospheric vented gas water heater with expansion tank - Fair Condition.
- B. Circulating Pumps – Southside of Building – Fair Condition.
- C. Sanitary Ejector Basin and Pump – Lower Level – Was not able to inspect at time of site visit.
- D. Clearwater Sump Basin and Pump – Foundation Drain Tile – Was not able to inspect at time of site visit.

### Recommendations

A. Any future renovations and or additions, shall account for the resizing of the domestic hot water equipment to meet

## PLUMBING (CONTINUED)

the demands of the any new and existing fixtures. Provide power vent, high efficiency gas water heater(s) with expansion tank and re-circulating pump to and from new hot water storage tank and distribution system circulating pump(s).

B. Increase the water heater water temperature outlet to 140 degree to prevent legionnaire bacteria growth inside of the hot water storage tank. Provide a thermostatic mixing valve to serve the hot water storage tank outlet piping. The thermostatic mixing valve shall be digital type.

### Plumbing Fixtures Observations

A. Water Closets – Vitreous china wall and floor mount with brass chrome plated manual lever flush valve and flush tank. Poor Condition.

B. Lavatories – Vitreous china wall mount with brass chrome plated manual lever faucets. Poor Condition.

C. Urinals – Vitreous china floor mount with brass chrome plated manual lever flush valve. Poor Condition.

D. Kitchen Sinks – Stainless steel floor mount with brass chrome plated manual lever faucets. Fair Condition.

E. General Sinks – Stainless steel drop-in with brass chrome plated manual lever faucets. Poor Condition.

F. Classroom Sinks – Stainless steel and cast iron enamel finish drop-in with brass chrome plated manual lever faucets and drinking fountain. Fair Condition.

G. Art Room Sinks – Stainless steel floor mount and drop-in with brass chrome plated manual lever faucets and point of use solid

interceptors. Fair Condition.

H. Science Room Sinks – Epoxy resin under mount with brass chrome plated manual lever faucets and vacuum breaker spouts. Poor Condition.

I. Service Sinks – Mold PVC wall and floor mount with brass chrome plated manual lever faucets and vacuum breaker spouts. Fair Condition.

J. Electric Water Cooler – Single use with and without bottle filling station. Fair Condition.

K. Emergency Fixture – Shower with cold water supply only. Poor Condition.

### Recommendations

A. Replace all plumbing fixtures that are 15 years and older. Provide wall mount fixtures were possible and sensor operated flush valves / faucets in toilet rooms to improve hygiene and sanitary efforts.

B. Provide floor drains with trap seal protection in all toilet rooms.

C. Provide monthly testing of emergency fixtures.



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# MAINTENANCE LIST

No.	Issue	Proposed Solution	Discipline	Cost	Priority
1	Group bathrooms are not compliant with current ADA/ANSI standards, with narrow entries and no ADA stall.	Renovate bathrooms to allow for proper access and entries. Combine two stalls to create ADA stall.	ACCESSIBILITY	\$257,310	2
2	Single user toilets throughout the building are not compliant with current ADA/ANSI standards, with no room for clearances.	Expand bathrooms to accommodate full ADA clearances, replace fixtures.	ACCESSIBILITY	\$228,720	2
3	Nearly all doors in building have door knobs, instead of the modern ADA-compliant levers.	Replace with levers.	ACCESSIBILITY	\$57,180	2
4	There is no separation between parking in west lot and building, including the daycare hallway with a large expanse of glass and several damaged window units.	Add wheel stops or bollards along entire face of building adjacent to parking.	SAFETY/ SECURITY	\$107,213	1
5	Asphalt lot and drive lanes are starting to crack.	Plan for eventual asphalt resurfacing.	SITE	\$120,078	2
6	Concrete pavement to the east and south of building is cracking and showing signs of wear and damage. Some is heaving or sinking.	Repair or replace as feasible.	SITE	\$42,885	3
7	Site railings are peeling and rusting.	Prep and paint railings.	SITE	\$2,859	2
8	Fence along the street edge of the play space has some damage, tilting, and rust.	Replace fencing.	SITE	\$26,446	3
9	Most site features, including site walls and caps, are heaving/tilting/damaged	Replace site walls.	SITE	\$71,475	2
10	Bike racks are significantly damaged/worn.	Replace bike racks.	SITE	\$4,289	2
11	Fence along parking lot side of play space has some tilting posts.	Plumb posts and reinforce with concrete base.	SITE	\$28,590	3
12	Asphalt parking lot is directly adjacent to building on north and west side. There is not obvious evidence of positive drainage. This likely contributes to noted brick issue.	Cut out pavement against building and implement stormwater management strategy. When asphalt is addressed, consider regrading.	SITE	\$178,688	3
13	Brick around perimeter of building is showing efflorescence and occasional spalling	Repair and tuckpoint brick.	EXT	\$257,310	3
14	Brick at west side of building (where pavement directly abuts building) is crumbling at lower courses, likely from salting.	Repair brick, replacement and flashing may be required.	EXT	\$21,443	2

No.	Issue	Proposed Solution	Discipline	Cost	Priority
15	The base of the frame for door 2 is disintegrating	Replace door frame.	EXT	\$14,295	1
16	Ceiling tiles are sagging in some rooms.	Replace ceiling tiles.	INT	\$27,018	3
17	Corridor VCT floor is worn, with occasional tiles due for replacement.	Continue addressing tile failure and plan for eventual replacement.	INT	\$48,746	3
18	Classroom flooring is worn (VCT and carpet)	Replace flooring.	INT	\$113,216	3
19	Painted concrete slabs in building are peeling, especially the perimeter of the vestibules (around inset walkoff).	Prep and paint slabs.	INT	\$3,216	2
20	Lockers throughout building are rusted/worn, but are not used regularly.	Prep and paint lockers.	INT	\$75,049	3
21	Doors and frames are starting to have some paint chipping.	Plan for regular repainting cycle.	INT	\$47,174	3
22	Concrete slab in the vestibule for door 5 is starting to erode.	Patch concrete, consider floor covering for pretection from salt.	INT	\$10,721	2
23	Mild wall damage (chipped paint, some impact) was noted near door 5	Repair wall, add corner guards as necessary.	INT	\$14,295	3
24	Casework throughout building is significantly worn.	Replace casework.	INT	\$210,137	3
25	Some ceiling tiles throughout building have water damage.	Investigate for underlying concerns, replace tiles.	INT	\$108,642	1
26	Panelboards (Square D NQOB and Trumbull Electric types) have exceed their useful lifespan.	Provide new replacement panelboards and new feeders in existing conduit in each of these locations.	ELEC	\$71,475	2
27	General electrical recommendation.	Complete an Arc Flash Coordination Study of the existing electrical system and add arc flash labels to all panelboards.	ELEC	\$28,590	1
28	Staff reported internet dead zones in the buildings.	Consider providing additional wireless access points fed with new CAT 6 data cabling to increase coverage.	ELEC	\$35,738	3



## MAINTENANCE LIST (CONTINUED)

No.	Issue	Proposed Solution	Discipline	Cost	Priority
29	Many receptacles and toggle switches show signs of wear.	Replace any damaged wiring devices and plates.	ELEC	\$35,738	3
30	Some areas are not well covered by existing camera system.	Add new cameras as required.	ELEC	\$71,475	2
31	Egress lighting paths do not meet current code requirements.	Install new egress lighting paths.	ELEC	\$71,475	1
32	Some exterior egress lighting are old incandescent fixtures.	Replace with new LED fixtures.	ELEC	\$71,475	3
33	Building has standalone clock system from the rest of the District that is an older Simplex type.	Replace with new Primex wireless master clock with GPS receiver and battery powered analog Primex clocks.	ELEC	\$107,213	3
34	Through random sampling of data cable, non plenum rated CAT 5 and 5E was found.	Upgrade all cabling to new plenum rated CAT 6 data cabling.	ELEC	\$214,425	3
35	A majority of light fixtures throughout the facility are T8 fluorescent type fixtures with limited occupancy sensors.	Upgrade all lighting to LED with motion controls.	ELEC	\$285,900	3
36	Some toilet rooms do not have floor drains, or floor drains with trap seal protection.	Provide floor drains with trap seal protection in all toilet rooms.	PLUMB	\$57,180	3
37	Water closets, lavatories, urinals, general sinks, and emergency fixtures were noted to be in poor condition.	Replace all plumbing fixtures that are over 15 years old. Provide wall mounted fixtures where possible. Faucets and flush valves to be sensor operated.	PLUMB	\$85,770	1
38		Replace 2010 atmospheric water heater with one (1) sealed combustion ultra high efficiency water heater.	PLUMB	\$33,800	3
39	General plumbing recommendation.	Provide a thermostatic mixing valve to serve the hot water storage tank outlet piping (digital).	PLUMB	\$71,475	2
40	Entirety of domestic water piping system is past its life expectancy. The system is in poor condition, including pipe insulation, and there are minor leaks reported.	Replace entire piping system with new. This includes underground, above floor, and tunnel piping.	PLUMB	\$357,375	1
41	Entirety of sanitary piping system is past its life expectancy. The system is in poor condition and sections have been replaced over the years.	Replace entire piping system with new. This includes underground, above floor, and tunnel piping.	PLUMB	\$357,375	1
42	Entirety of storm piping system is past its life expectancy. The system is in poor condition, including pipe insulation, but there are no reports of back ups or issues.	Replace entire piping system with new. This includes underground, above floor, and tunnel piping.	PLUMB	\$357,375	1

No.	Issue	Proposed Solution	Discipline	Cost	Priority
43	Exhaust fans are past useful life expectancy.	Replace exhaust fans (Qty 8).	MECH	\$75,800	2
44	Gym AHU is past useful life expectancy	Replace 1957 gym air handling unit and add DX Cooling.	MECH	\$157,800	2
45	Office does not meet ventilation requirements	Add fan coil to office to provide code required ventilation and DX cooling.	MECH	\$199,200	2
46		Replace existing single boiler with two (2) high efficiency condensing boilers for redundancy.	MECH	\$475,100	3
<b>LYDELL TOTAL</b>				<b>\$5,298,745</b>	

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CREATE

2

**EDUCATIONAL SPACE ADEQUACY**

# OVERVIEW

The second step in the Facility Study Process, includes the Educational Space Analysis. This critical step in the Master Planning Process takes into account District enrollment history and projections, current programming and services offered by the District as well as desired next steps in these areas as reflected in the District's strategic plan coupled with expressed community needs and expectations.

## **Industry Standards**

PRA regularly reviews best and next practice information from accrediting agencies as well as industry experts to ensure that this report is rooted in evidence-based data to assist your District in future planning efforts with the most current understanding. Some of these best practice standards that we utilized in our evaluation include:

Functional Building Capacity: This analysis incorporates an operational efficiency factor based upon the grade levels that occupy each building. The factors utilized are considered national benchmarks and are as follows:

- Elementary School (Grades EC-5): 90%
- Middle School (Grades 6 – 8): 90%
- High School (grades 9-12): 80%

These efficiency factors are used to compensate for scheduling inefficiencies and variations in class size. Operating a facility at or below these levels allows for the availability of time and space in the building to support teacher preparation and tutoring activities, the flexibility to accommodate scheduling conflicts between events and classes and unscheduled special assistance to individual students or small groups of students.

**Classroom Size:** Current elementary and middle school classroom standards are 950 SF minimum. High school classroom standards are also larger and more diverse in nature to support a wider variety of curricular offerings.

Modern design functionality now includes classroom and support spaces that can allow staff and students to quickly and easily transform spaces with little disruption to the flow of daily activities as teaching and learning has evolved and a greater need to accommodate multiple learning modalities simultaneously has arisen. Learning environments today typically accommodate greater visibility out to adjacent collaboration spaces and allow for physical connection to adjacent classroom areas. Allowing teachers and learners to quickly find the most appropriate space for a task provides for a more personal student engagement.

Through interviews with building principals and discussion with the district administrative team, the Existing Facilities Survey and space utilization data, this section provides a quantitative measure of spaces needed in each school to support current and desired future programming. This analysis includes Cumberland Elementary, Richards Elementary, Whitefish Bay Middle School and Whitefish Bay High School.

The number of classrooms indicated is based on current space utilization. Building enrollment numbers are based on data obtained from the Wisconsin Department of Public Instruction (DPI) Third Friday Enrollment Counts from the 2011-2012 through 2022-2023 school years.

While there is not a current Board Policy relative to Class Size, through discussions with administration, the following table of maximum classroom student population was determined as a baseline for establishing functional capacities:

Grade	Max.Student/ Teach Ratio
PK	15:1
4K	20:1
Kindergarten – Fifth Grade	25:1
Sixth – Eighth Grade	30:1

Ninth – Twelfth Grade 30:1  
 There are three questions that need to be reviewed to establish overall space needs. These questions are:

1. Is the existing capacity adequate to service the needs of the district today and in the future? If not, what are the additional space needs required? (Capacity)
2. Are there any building space deficiencies that should be addressed immediately? (Adequacy)
3. What facilities will be required to accommodate visionary programs? (Vision)

Functional Capacity evaluations assume the District will continue to place students based on available space with the same programming which allows the rooms to be used as identified currently.

# DETERMINING CAPACITY

Two calculations are utilized to establish the functional capacity of an educational facility. The “Maximum Capacity” is the point where every teaching station in a building is theoretically utilized at maximum occupancy for the specified number of periods throughout each day. At this point, the building does not have room to add students without exceeding class size limits. At elementary levels where students spend the majority of their day in a single classroom, this calculation can be an effective way of monitoring building enrollment; however, operating a building at this level will leave little to no scheduling flexibility for changes increases in enrollment or programmatic changes that impact room purpose and designation.

The second approach to determining functional building capacity is establishing a “Target Capacity.” This is the point where the building is functioning optimally as an educational facility. When a school exceeds this number, it is an indication that the organization should be planning and preparing for the future of the facility or other facilities within the system before reaching the identified maximum capacity. To arrive at this number, an efficiency factor is applied to the Maximum Capacity number established previously.

The capacity of an elementary school (Grades EC-5) can be determined by utilizing existing space configuration information and established guidelines on class size. The capacity can be determined by multiplying the district’s maximum student teacher ratio by grade by the number of rooms used (based on the current educational program) multiplied by 90% (which is a planning guideline for the student station utilization factor).

The capacity of a middle school can be viewed much like that of an elementary school. By utilizing existing space configuration information and established guidelines on class size. The capacity can be determined by multiplying the district’s maximum student teacher ratio by grade by the number of core curriculum rooms used (based on the current educational program) multiplied by 90% (which is a planning guideline for the student station utilization factor). While students do move from classroom to classroom throughout the day, all students do need to be accounted for within their core curriculum spaces supporting the approach of measuring capacity similar to the elementary schools. While some middle schools would use a lower utilization factor to account for increased scheduling diversity, because of the block core schedule, for purposes of this analysis, we will use the same factor as the elementary schools.

Calculating the capacity of a high school (Grades 9 – 12) is more complex than an elementary or middle school. It is based upon the number of educational spaces available within the building, the number of periods each space can be used per day and the number of students a space can accommodate. Because a high school typically supports a greater variety of course offerings, ultimate capacity determination can vary somewhat from year to year as schedules change.

To begin determining a functional capacity, the number of educational spaces is multiplied by the number of students to occupy the space, which has been determined by the District's Class Size Guidelines then multiplied by the usage factor. The usage factor is determined by the actual use of a classroom, divided by the number of periods that the building operates within an instructional day. The resultant calculation is then multiplied by an efficiency factor of 80% which is the planning guideline for the student station utilization in a high school setting. Each classroom or instructional space that has been assigned for student instruction will be factored into the calculation. This method will determine how many students are in an assigned instruction space at any one period of the day. After a period has ended, the students rotate to another instructional space. The periods that each instructional space is used will vary depending upon the administration's scheduling of the spaces, as will the target class size number, which is dependent upon the acceptable number of students assigned.

# ELEMENTARY SCHOOLS

## Capacity Determination Formula:

Number of Classrooms Available \* Class Size = Maximum Capacity

Number of Classrooms Available \* Class Size \* 90% = Target Capacity

## Functional Capacity Determination

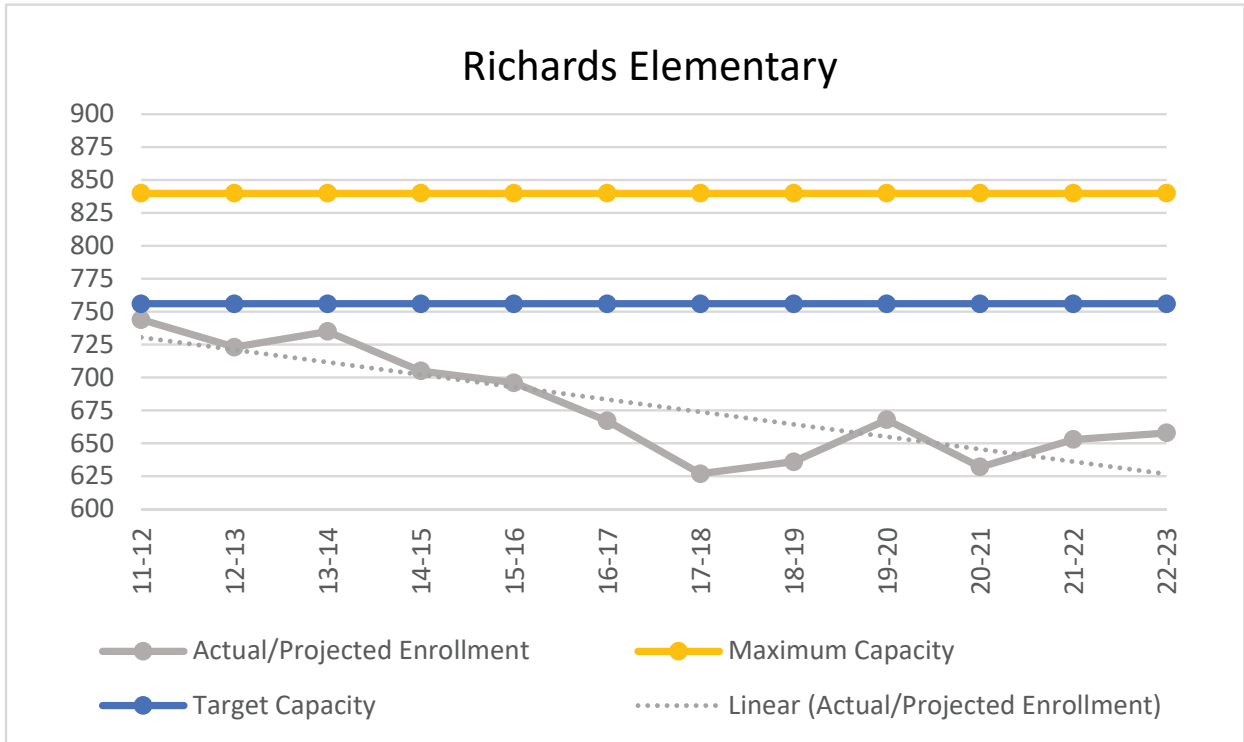
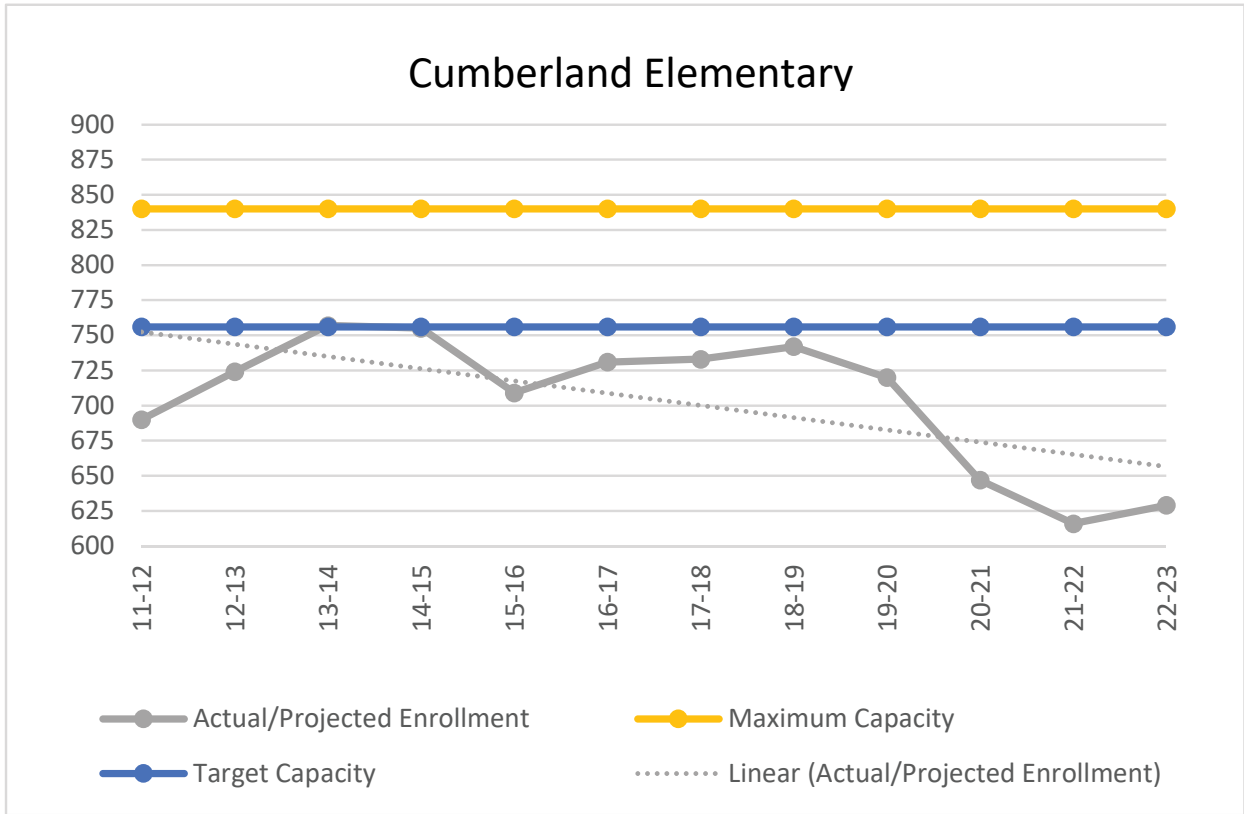
Cumberland and Richards Elementary Schools are near twins. Each built one year apart, the two schools serve the north and south sides of the district. Their floorplans are mirror images of each other with only minor differences. For purposes of this capacity determination, it is assumed that the two schools have the same functional capacities.

The Maximum Capacity for each of the elementary schools is 840 students and the Target Capacity is 756 students. As Whitefish Bay has been substantially built out since the 1950's, enrollment at the district's elementary schools has been largely dependent on demographic shifts within the community itself. A notable impact upon historic enrollment is the Chapter 220 program that allowed students from Milwaukee Public Schools to enroll into Whitefish Bay. The program ran from 1975 until its conclusion in 2015. The students already enrolled in the program are allowed to continue through graduation leading to a gradual "sunset" of this source of additional enrollment. This is contributing to a general decline in total student enrollment at both elementary schools.

At Cumberland Elementary, the 2022-23 school year enrollment was 629 students. The building is comfortably operating below the Target Capacity by approximately 127 students. Enrollment has been declining for nearly a decade but it should be noted that nine years ago, the enrollment reached Target Capacity.

At Richards Elementary, the 2022-23 school year enrollment was 658 students. The building is comfortably operating below the target capacity by approximately 98 students. Like Cumberland, the overall enrollment trend has been on declining for nearly a decade but it should be noted that ten years ago the enrollment also nearly reached Target Capacity.

# ASSESSING EDUCATIONAL SPACE ADEQUACY



## ASSESSING EDUCATIONAL SPACE ADEQUACY

Cumberland Elementary School was originally constructed at its current location in 1927 and has been expanded several times, most recently in 2011. Richards Elementary was constructed one year later and followed the same series of expansions over the years. These are a traditionally organized buildings with double loaded corridors and little to no connectivity between classroom spaces. Spread over three floors, the buildings are clearly organized and can support between four and five sections of students in grades 4K through Fifth.

Classrooms range in size from approximately 760 square feet (SF) to over 1,100 SF for grades one through five. While some rooms are smaller than desired, most are well-sized.

Two 4K and four Kindergarten classrooms located on the first floor are appropriately sized at approximately 1,100 SF including in-class single fixture toilet rooms.

Student support spaces are distributed around the building. Full-sized classrooms are currently being utilized as special education rooms. This is possible due to a lower enrollment in each of the buildings currently.

Two art rooms exist at each building. One larger room is very well-sized for elementary art. It is supplemented with a secondary, smaller room located nearby.

Music is accommodated in three separate spaces, all located within the arts wing of each building. The band and general music rooms are appropriately sized. The orchestra

room is undersized and has presented challenges to teaching staff and students for instrument storage and adequate practice space.

Furniture through the building generally matches the traditional character of the classrooms themselves. Classrooms are varied, lacking a unified standard for elementary education within the District.

The library / LMC is well-sized and has recently been renovated, reflecting the school colors and identity at each building while delivering equal opportunities at both schools. The attached Maker Spaces are well-designed and ready for the desired student experiences.

# ELEMENTARY SCHOOLS VISIONARY SPACE NEEDS

- Add collaboration spaces around the building including small group instruction (SGI) rooms to enhance flexibility and provide appropriate learning environments for the myriad activities that currently take place in hallways.
- Consider add connecting doors between classrooms to enhance flexibility.
- Capture and repurpose the large open space in front of the LMC at each building. Extend the flexible learning environment already created within the LMC further out to enhance the sense of a collaborative hub.
- Diverse flexible furniture options throughout the building, supported by grade level storage.



# WHITEFISH BAY MIDDLE SCHOOL

## Capacity Determination Formula:

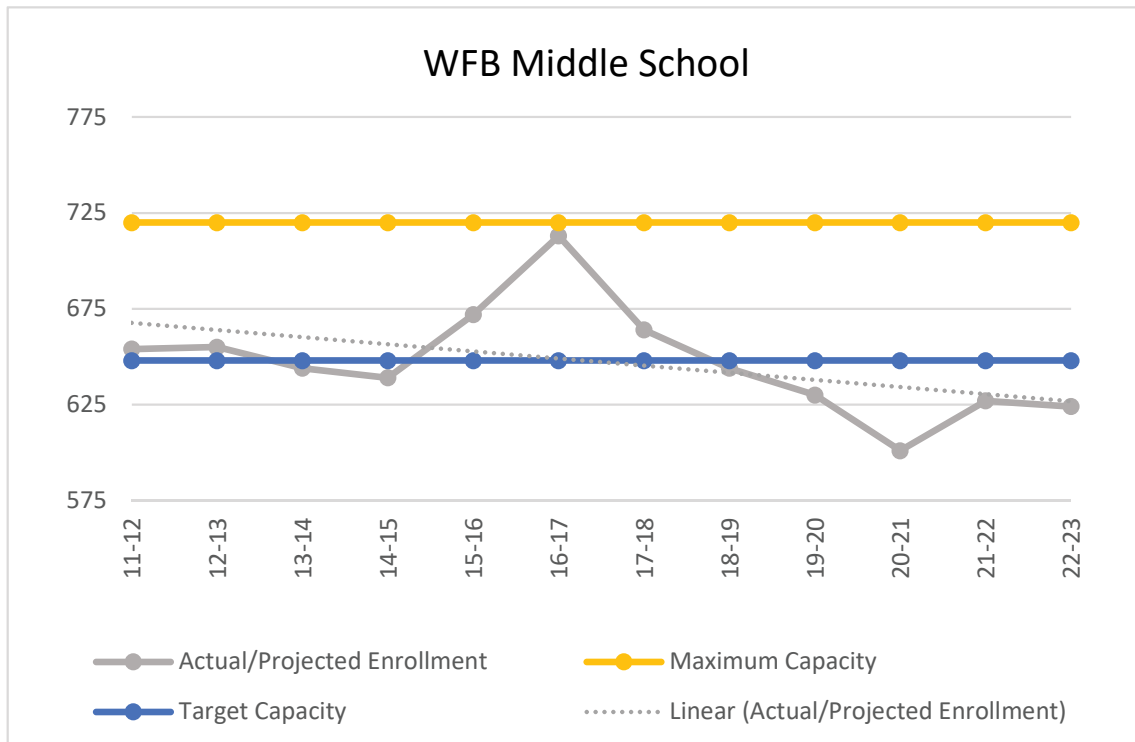
Number of Classrooms Available \* Class Size = Maximum Capacity

Number of Classrooms Available \* Class Size \* 90% = Target Capacity

Whitefish Bay Middle School, Grades 6-8

## Functional Capacity Determination

At Whitefish Bay Middle School, the Maximum Capacity is approximately 720 students and the Target Capacity is approximately 648 students. With a 2022-23 school year enrollment of 624 students the building is operating just below the target capacity. Like the elementary schools, the overall enrollment has been on a slight downward trend. The available capacity is a reflection of both the number of students per classroom (30) and the evaluation methodology accounting for all students in core curriculum spaces.



# ASSESSING EDUCATIONAL SPACE ADEQUACY

Whitefish Bay Middle School was initially constructed in 1918 as Henry Clay School and served as a Kindergarten through eighth grade school. Having been expanded and renovated multiple times, the central core of the building remains and is the oldest remaining infrastructure within the District. With declining enrollment, the building was closed in the 1980's and used as a community center. In the 1990's the district reorganized grade level alignment and created the middle school to serve grades six through eight within a renovated and expanded building.

Middle schools share some functional aspects of both elementary schools and high schools. As students make their way through some of the most transformative years of their lives, the spaces they learn in every day play an important role in shaping their experiences. Middle schools, however, are not high schools.

Classrooms vary significantly in size from approximately 780 SF to over 960 SF, with most classrooms near 950 SF. Rooms along the north side of the building are older and are undersized. The additional area within the classroom accommodates the greater variety of activities that happen every day. Additional space allows for greater flexibility to reposition furniture and allow students to personalize their space.

Classrooms at the middle school are organized around collaborative central spaces. Two of these spaces exist per floor. Generally divided by a triangular shaped support space, the net result is space that

is too small to accommodate larger groups or an entire grade level. Sightlines from classrooms to these spaces are also limited which presents a supervision challenge. Columns and other built elements within these spaces also limit their functionality. Additionally, the furniture in the collaboration spaces is limited and generally appears to be miscellaneous pieces brought from other parts of the building.

This organization does not encourage collaboration or facilitate breakout into smaller groups beyond the walls of the room. As student work continues to be more exploratory and more team based, finding spaces to meet and collaborate becomes more important. Collaboration areas should be considered to help support current and future teaching and learning practices.

While the classrooms themselves are generally appropriately sized, they lack connectivity between each other and to the collaboration spaces. As science and social studies have blended together in an integrated curriculum in grades six and seven, the need for enhanced flexibility within and between spaces is highlighted. Consideration for softening the hard walls between spaces may include the addition of sliding glass panels to allow for smoother cross collaboration between teaching spaces.

Additional small group instruction (SGI) rooms further add to the flexibility and sense of place. Creating opportunities to develop recognizable identities helps break down

# ASSESSING EDUCATIONAL SPACE ADEQUACY

the scale of a larger school environment. This modulation of scale can help students feel welcome and secure as they make their transition from elementary school to high school. Small learning spaces also support the many different activities that happen throughout the day, providing safe and recognizable spaces that anchor learning to a specific location.

Science labs are important spaces in a middle school, introducing students to a world of exploratory, hands-on learning in safe settings. The existing labs are appropriately sized but are dated. Renovation of these space should be considered to provide age and curricular appropriate accommodations as well as support the more collaborative, integrated learning that is now taking place.

Student support spaces are distributed around the building. Currently, full size classrooms are being utilized as special education rooms. Consider renovating spaces to provide more distributed, smaller spaces near each grade level neighborhood to support special education programming. Additionally, small group instruction rooms (SGI) could be utilized to provide quick pull out and additional instructional aid to students close to their primary classrooms. These SGI rooms also provide opportunities for focused student work, small group projects and conferencing between students and teachers.

The Middle School does not currently have a dedicated sensory room in the building. Contemporary schools, regardless of grade

levels served, are incorporating multiple safe places with the building to accommodate students in emotional stress. These spaces serve but are not dedicated solely to the special education program. These rooms, sometimes referred to as "calm rooms" provide a quiet place of respite for students to step away from a stress-inducing environment. As the caseload for special education continues to increase and the general demand for social-emotional health interventions and support also increase, a more thoughtful and intentional approach to meeting the space needs of these services becomes important.

The current library (LMC) is well sized and recently renovated. Its location is somewhat remote from many of the student learning areas potentially limiting some of its use as a flexible, impromptu collaborations space. The Maker Space much like at the elementary schools is an opportunity for further development and evolution of use over time. It is well-sized and configured to support future flexibility.



# ASSESSING EDUCATIONAL SPACE ADEQUACY

Music spaces including band, orchestra and choir spaces are dated. The band room is well-sized but is separated from the orchestra room by an egress stairwell. Orchestra is undersized for the number of students served. The limit of space is driving scheduling. Choir is a well-sized space but separated from the remainder of the music team on the lower floor. All rooms are not optimally tuned as music spaces and visually are disconnected from the rest of the school.

As middle school students begin to explore future career paths through the “exploratory wheel” of specials including art, health, design & modeling, digital business in sixth grade and art, theater, computer science and green architecture in seventh grade. Eighth grades students have greater flexibility in their schedules to select from a wide range of special electives.

The current PLTW (Project Lead the Way) design lab and the adjacent workshop are located in the lower level of the building. The lab space is very tight on space with very limited floor clearance or project storage. Visibility to these spaces is nonexistent unless a student is going there specifically for class. For middle school students, spaces outfitted with equipment that supports exploratory design, prototyping and fabrication can open doors to the next chapter of learning at the High School. Visibility and accessibility are important characteristics to consider. Ideally, this space should be more conveniently located to core curriculum classrooms to support opportunities

for cross disciplinary collaboration and demonstration of relevancy of classroom-based learning through hands on learning as appropriate.

A recent survey of students indicated significant interest in culinary arts as an added elective. No facility currently exists in the building to accommodate this course offering. Interest in the culinary arts has surged in recent years and provides a great opportunity for students to explore career opportunities as well as recognize relevance of core curriculum in a hands-on learning environment.

The cafeteria is undersized to serve the students and a poor space for larger group gatherings. As Whitefish Bay does not offer a full food service program, the spatial needs are different than a typical middle school.

Today we commonly call these large spaces “Student Commons” and they are designed to comfortably provide students a place to eat but also function as large group instruction spaces and places for social gathering. A Student Commons often becomes the town square or social hub of a school community. Seating should be more diverse than simply the typical cafeteria tables. These need to be comfortable spaces that like other areas of the building, give students choice to find the space that is most comfortable for them. The current space is surrounded by walls, is undersized and has low ceilings and poor sightlines, making this an area that could be improved for supervision and utilization.

## ASSESSING EDUCATIONAL SPACE ADEQUACY

Currently the school is served by two gymnasiums. The “old” gym is original to the building and served both athletic purposes as well as an assembly space. It is a small, single station gym. The stage proscenium arch remains but has long since been closed and a room added to the former stage area. Tiered flooring at the back of the “house” also remains but seats are not present and the floor area is of limited function. This space is centrally located within the building and could be considered for another use if additional gym space was created elsewhere.

The “new” gym was constructed in the 1990s with the creation of the middle school. While larger than the old gym, this space too is a single station facility that is undersized by current middle school standards. Two teaching stations are required to meet current student load and curriculum demands. The creation of a true two station gymnasium with a divider curtain would provide the capacity the school needs and flexibility to serve the larger community after school hours.

Furniture throughout the building is generally dated and does not match the collaborative and exploratory matches the age and character of the classrooms themselves. Flexible furniture that is varied helps classrooms transform from lecture style direct instruction into collaborative team based environments quickly and with minimal disruption. A significant change in functionality can be realized through furniture improvements alone.

# WHITEFISH BAY MIDDLE VISIONARY SPACE NEEDS

- Improve shared collaborative learning environments to enhance students' sense of place and facilitate diversified learning styles.
- Add small group instruction spaces to support teaching and learning.
- Address classroom connectivity to allow increased flexibility and functionality.
- Renovate science classrooms to enhance flexibility and support integrated learning.
- Renovate Special Education spaces to be more accessible and more appropriately sized.
- Create a new, larger Student Commons to serve as a comfortable and welcoming "town square" for students, staff and community.
- Expand / consolidate gymnasium spaces to create a true two station, flexible athletic facility.
- Expand and renovate the band and choir spaces to support student engagement and participation.
- Renovate and enhance the Tech Ed spaces to support middle school students. Increase flexibility and visibility. Consider opportunities to more centrally locate this function within the building.



# WHITEFISH BAY MIDDLE VISIONARY SPACE NEEDS

- Create a culinary arts lab to meet student demand.
- Eyes on learning, engagement of the student with new opportunities through visibility and connection.
- Diverse flexible furniture options throughout the building, supported by grade level storage.



# WHITEFISH BAY MIDDLE VISIONARY SPACE NEEDS

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# WHITEFISH BAY HIGH SCHOOL

## Capacity Determination Formula:

Target Class Size:

Periods used / Periods in day = Usage Factor %

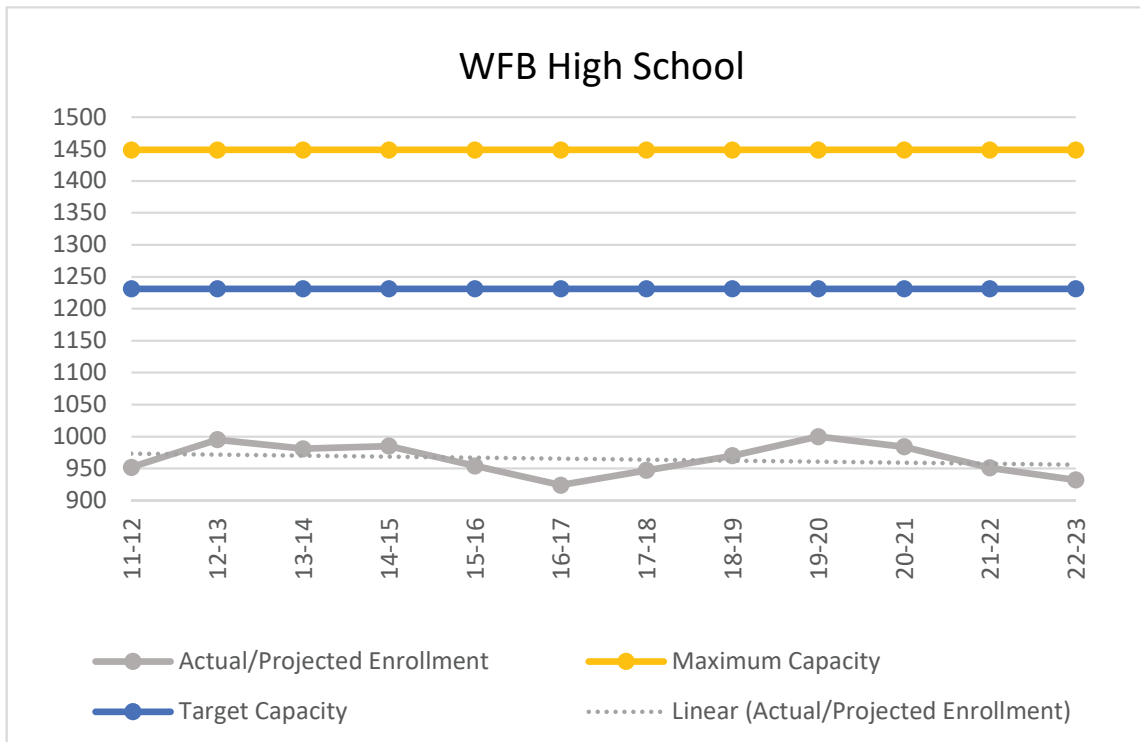
Number of Rooms \* Usage Factor % \* Class size = Capacity \* 80% = Target Capacity

Maximum Class Size:

Periods used / Periods in day = Usage Factor %

Number of Rooms \* Usage Factor % \* Class size = Maximum Capacity

As the following calculation chart indicates, the Target Capacity of the high school, as currently configured is 1,231 students. The Maximum Capacity is 1,449 students. This indicates that the building is operating well below the target capacity with a current enrollment of 932 students. The current building should have the flexibility to adapt space to the needs of current and most future programming demands. The chart below indicates enrollment has generally held steady over the last decade.



# ASSESSING EDUCATIONAL SPACE ADEQUACY

Whitefish Bay High School was originally built in 1931. Several additions and renovations have occurred in the proceeding decades with the last major project occurring in 2011. The traditional character of the building is a point of pride for the community and is something to be celebrated and preserved. A careful consideration and balance between preserving that character while reviewing the functional appropriateness of the school building as a teaching tool is a critical step toward establishing a long range facilities plan.

The current building spreads student spaces over four floors. As a result of the multiple additions, circulation routes between spaces are often long and circuitous. Wayfinding is a challenge and often requires navigating multiple stairwells. Improved wayfinding can be achieved through simpler actions such as clear and coordinated signage or through more impactful architectural interventions to reorganize circulation routes or use interior finishes to create identifiable landmarks within the large facility.

Administrative offices and pupil services are located at the heart of the school providing good access for staff and students. Separate entrances reduce the stigma associated with a student going to the office versus seeing a staff member in student services. The administrative office and the student services office are connected to each other but through adjoining offices. This configuration is not ideal and does not generally promote operational efficiency. A conference room is located across the hall

from the administrative suite which does require bringing parents or other outside visitors into the active school building for meetings. Direct access for those visitors into the office is present providing a proper secure entrance sequence. An accessible route is also present to the main school entrance.

District administration is also located within the High School building. Utilizing spaces existing with the building, much of the district team is located within a suite of spaces opposite the main entrance from the High School office. Visitors to the District Office are required to enter through the High School secure entrance which is workable and per discussion with the High School team, is not a disruption to their work flow. The District Administrator office and the District Human Resource offices are remote from this main office area. As part of any future larger scale renovation projects at the High School, consideration should be given to consolidating all District administration function within one suite of spaces. This consolidation can provide greater operational efficiency, better team collaboration opportunities and potentially a more efficient use of space.

Core curriculum classrooms are very traditional in their double-loaded, locker-lined corridor configuration. Because they have been constructed at different times over several decades, sizes vary widely. Some of the classrooms in the oldest portions of the building are less than 700 square feet in size while other rooms in the 1967 English wing are nearly 1,100

## ASSESSING EDUCATIONAL SPACE ADEQUACY

square feet. Social Studies classroom 223 is less than 600 square feet in area and programmed to serve up to 30 students at a time. Industry standards for a high school classroom for 30 students would be 960 SF.

Classrooms generally lack access to adjacent support and collaborative learning environments and are limited in overall flexibility within their four walls. The lack of space within many of these classrooms make it increasingly difficult to support multiple learning modalities within the rooms. The additional space in contemporary classrooms allows for not only student count but also flexibility to configure furniture to meet the diversity of student needs and functions that happen within the classroom.

The cafeteria is located in the lower level of the school. The space is not easily accessible to students. No access to daylight is available, and ceilings are low. As noted at the other schools, Whitefish Bay does not provide a full-service offering. At the High School, students are allowed to leave campus for lunch which further diminishes the desirability of this space. This space occupies a large footprint and generally is only used as an eating space for a few hours out of the day. Flexible furniture, writeable surfaces, and access to technology can transform this environment into an inviting, collaborative large group instruction space that drives greater utilization while providing additional opportunity for differentiated learning space.

The addition of a true student commons should be a high priority. These spaces are important social and community hubs. Students spend much of their day at the High School whether coming in early for ISHP time, working through their normal school schedule or studying after hours before athletic practice. Creating and supporting spaces like this can enhance the sense of place and foster connections to the larger school community while also serving important functional needs.

The library, like the elementary and middle schools, has recently been renovated. This project has proven to be very successful. Introducing flexible learning environments to the High School, the new library has immediately impacted how students use space. Students now have welcoming, varied space to use throughout their day. This project can be looked upon as a catalytic project and a test case for further study as potential changes to other areas of the building are studied.

As part of the library renovation project, three adjacent classrooms were transformed into two flexible learning studios for business education classes along with a collaboration space and a small group instruction (SGI) room between the two. This addition of flexible learning spaces has been used by not only the business courses which immediately open onto them but also the social studies classes located across the hall. Like library project itself, these spaces can serve as models to learn from and represent the flexibility and diversity of space types that are now common in

# ASSESSING EDUCATIONAL SPACE ADEQUACY

newer high school facilities as well as post-secondary institutions and professional workplaces. An emphasis on finding similar opportunities to transform traditional classroom space that may no longer be optimal for current teaching and learning modalities should be placed on future planning efforts.

Science labs are located in two general areas. Two labs were constructed as part of the 2011 project in Memorial Gym wing. These labs are well sized and organized. Six additional labs are stacked, two per floor, near the center of the school. While the labs are generally properly sized, they are outdated and present challenges to educational delivery. Significant storage and preparation spaces exist adjacent to the labs themselves. As part of a separate project, these six labs and their supporting spaces will be reinvented and renovated.

The visual arts are accommodated within four studio spaces. On the lower level of the building are the primary studios supporting 2D art, 3D art, and ceramics. These rooms are appropriately sized and outfitted. Additional visibility and connectivity may be considered but given the location the benefit may be muted as only a limited set of students will pass by. The fourth studio is the digital arts or Mac Lab. It is located on the second floor, adjacent to the library. This space too is well sized but is dated. The location remote from the main visual arts area is not ideal but the visibility and connectivity to the library presents opportunities to showcase the work being done there.

The performing arts are organized around a large, 1,100 seat auditorium. Constructed as the largest piece of the 2011 construction project, the suite of band, orchestra and choir spaces is well sized and, including the practice and ensemble rooms, serve the high demand of the students for these programs. The auditorium was constructed in 1967 and remains an outstanding facility for the school and community. Finishes and equipment are dated and a general refresh is needed.

Career and technical education, CTE, has a limited presence at Whitefish Bay High School. The woods lab is located on the lower level, adjacent to the visual arts suite. This location does provide opportunities for cross-curricular collaboration. The lab is well sized and does have reasonably good storage. The adjacent PLTW lab serves engineering based STEM curriculum. A direct connection to the woods lab could increase the ability of students to engage in rapid prototyping as part of their design thinking development. Consideration for additional "clean" prototyping space to house 3D printers, laser cutters and other technology driven tools should be considered.

A 4-station fieldhouse serves as the primary indoor athletic space for the school. It is a very well sized facility with great access to the outdoor athletic facilities and the adjacent main pool. A mezzanine within the fieldhouse accommodates a fitness center that is accessible to both students and the community. Direct access from

## ASSESSING EDUCATIONAL SPACE ADEQUACY

the fitness center down to the competition floor allows for good flexibility for training as well as physical education programming. Connecting the main pool and the fieldhouse is a large lobby space that can function as a surge space and community gather area before and during competitions. Additionally, a neighboring space call “the Link” provides further flexibility for large group gatherings and

An older, secondary pool remains in use in the lower level of high school. This pool is primarily used by community groups as part of the Recreation Department’s programming. It is dated and is somewhat buried within facility. It is served by its own small locker rooms. These locker rooms do not comply with accessibility requirements nor Title IX requirements.

A secondary gymnasium space, the Memorial Gym, is located in the 1946 wing of the building. This was the primary gymnasium prior to the addition of the fieldhouse. Today it is effectively a dedicated gymnastics facility with the entirety of the two station gym floor continuously occupied by equipment and matts to support both the high school team activities and the Recreation Department’s youth programming. The mezzanine space is now home to a tumbling pit and additional matts. While this gymnastics facility is an incredible asset to have, the long term viability of this space may need to be considered as this report has previously identified the mounting maintenance needs in this facility.

The final athletic space within the High School is the wrestling room. It was the original gym in the 1931 building and is located at the very lowest level of the building. This space is in very rough condition, is not full accessible and is not large enough to fully support the growth of the wrestling program. Old locker rooms across the hall from the wrestling room have been gutted out an now serve as building storage. In combination, these areas present a large space that could be converted into other multipurpose athletic areas with a significant renovation project.

Special education case load has been growing and is expected to continue to increase in years to come. The facilities currently utilized are primarily located on the third floor of the building. Spaces for students needing more specific services are grouped together and were partially renovated in 2011. These spaces are generally in good condition and meet the needs of the students.

Two smaller spaces on the third floor that are used for support skills services are appropriately sized but should be renovated to be brought up to a standard classroom level of fit and finish, similar to improvements recommended for the standard classrooms in the building. These spaces serve a unique role providing private, smaller learning environments for students who need more targeted instruction.

The larger challenges at the High School are not due to limited space or large swaths of poorly organized spaces. An overarching

# ASSESSING EDUCATIONAL SPACE ADEQUACY

challenge will be finding approaches to transform a building built nearly a century ago for a different era into a learning environment that supports and encourages “the four C’s,” Critical Thinking and Problem Solving, Communication, Collaboration and Creativity and Innovation. These are skills that are taught within the walls of the traditional classrooms but also can be encouraged by providing spaces that allow activity to spill out beyond those boundaries. These are the collaborative breakout spaces, the small group instruction or project rooms and other areas that are not scheduled but are available on an impromptu basis. Visibility to and from these types of spaces and classrooms are important for active and passive supervision and should be considered for implementation.

Just like the other district schools, furniture through the building is generally aged and does not provide the ability to transform learning spaces quickly into different teaching models. Furniture that is flexible, mobile, and varied can help students find their best learning place. Flexible furniture helps classrooms transform from lecture style spaces into collaborative team based environments quickly and with minimal disruption. A significant change in functionality can be realized through furniture improvements alone.

# WHITEFISH BAY HIGH VISIONARY SPACE NEEDS

- Create shared collaborative learning environments to nurture responsibility and choice of learning style.
- Add small group instruction spaces to support teaching and learning.
- Address undersized classrooms to allow for increased flexibility and functionality.
- Eyes on learning, connect curriculum and showcase opportunities to engage every student by adding transparency and connections between rooms.
- Renovate science classrooms to allow for increased flexibility and functionality.
- Add a student commons to the school to serve as a social center and a flexible, large group instructional area.
- Diverse flexible furniture options throughout the building, supported by department area storage.
- Renovate the wrestling room and surrounding area to accommodate additional multipurpose athletic space.



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# A

## APPENDIX

DISTRICT WIDE  
HVAC ASSESSMENT

# WHITEFISH BAY

School District



PROVIDED BY:

**nexus**  
SOLUTIONS®





## MECHANICAL CONTROLS SYSTEM IMPROVEMENTS

### Remaining Pneumatic to Direct Digital Controls (DDC) Conversion

The Lydell Community Center utilizes a combination of pneumatic and direct digital controls.

Pneumatic control systems are less energy efficient and are more difficult to maintain than modern Direct Digital Control (DDC) systems. Nexus recommends eliminating the remaining pneumatic controls systems and replacing them with new DDC components. This would allow the Lydell Community Center to utilize a DDC controls system building wide.

Nexus recommends removing the existing front end/user interface and integrating it to the existing Niagara platform. This replacement would include all new hardware, supervisor software and server, data base creation, and full graphic generation.

The new DDC controls would allow for building wide equipment monitoring and troubleshooting while on site or remotely while using a computer or a handheld device via the internet.





## › MECHANICAL CONTROLS SYSTEM IMPROVEMENTS

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### **LCC-MS-1** Remaining Pneumatic to Direct Digital Controls (DDC) Conversion

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- Remove remaining pneumatic control devices located in the building.
  - Provide new DDC control components.
  - Integrate new Niagara platform.
  - Provide all programming required for this conversion.
-



## MECHANICAL HEATING SYSTEM IMPROVEMENTS

### Replace Single (1) 2003 Boiler with Two (2) New Boilers for Redundancy

The Lydell Community Center is currently served by a single 2003 Weil McLain boiler. This existing hot water boiler has a capacity of 3,270,000 BTUs (British Thermal Units) and is natural gas fired. This existing 20-year-old hot water boiler plant is starting to increase in maintenance and is in need of replacement.

Nexus recommends replacing this single boiler with two (2) new hot water high-efficiency condensing boilers to provide a high-efficiency heating water plant to accommodate the entire building. Adding a second boiler would add redundancy for the school's heating system.

The new condensing, high-efficiency boilers will be specified and sequenced to take advantage of lower water temperatures and provide an aggressive hot water reset schedule.

A side-stream filter would also be added so it can collect any particulate, debris, and rust within the water volume. The filter can also effect control valves and heat transfer surfaces. Glycol will also be added to the new hot water system to prevent coil freezing. A glycol fill tank will also be installed to allow for ease of refilling the heating piping system when required.





› MECHANICAL HEATING SYSTEM IMPROVEMENTS

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**LCC-MS-2 Replace Single (1) 2003 Boiler with Two (2) New Boilers for Redundancy**

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- Remove existing 2003 boiler and pumps.
  - Install two (2) new fully modulating condensing boilers with integral primary boiler pumps and building loop pumps.
  - Install new side-stream filter.
  - Provide glycol for system freeze protection.
  - Install new glycol fill tank for ease of refill after maintenance.
  - Provide all associated electrical and general construction work as required.
-



## MECHANICAL HEATING SYSTEM IMPROVEMENTS

### Replace Original Terminal Heating Devices

There are several original terminal heating devices located in the building that have exceeded their service life and are in need of replacement. These devices include cabinet unit heaters, suspended unit heaters, and convectors.

Nexus recommends replacing these existing terminal heating devices one for one with new hot water heating devices. The new terminal heating devices would be sized as required to meet these spaces heating loads.





› MECHANICAL HEATING SYSTEM IMPROVEMENTS

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**LCC-MS-3** Replace Original Terminal Heating Devices

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- Remove existing cabinet unit heaters, suspended unit heaters, and convectors.
  - Provide new hot water cabinet unit heaters, suspended unit heaters, and convectors.
  - Provide all required electrical and general construction work.
-



## VENTILATION IMPROVEMENTS

### Replace 1957 Gym Air Handling Unit and Add Cooling

The Lydell Community Center is currently being served by a 1957 air handling unit with no means of dehumidification. This air handling unit well past its recommended service life and is in need of replacement.

The lack of dehumidification results in higher humidity levels and occupant discomfort in the Gym. It also makes these spaces unable to meet the American Society of Heating and Refrigeration Engineer's (ASHRAE) Thermal Environmental Conditions for Human Occupancy Standard 55-2020. This ASHRAE design standard specifies the combinations of personal and indoor thermal environmental requirements necessary to achieve an occupant comfort satisfaction rate of 80% or greater. These indoor environmental requirements include temperature, thermal radiation, humidity, and air speed.

Nexus recommends replacing this Gym air handling unit with a new air handling unit with a DX dehumidification coil and mated condensing unit. Refrigerant piping would be extended to the new air handling unit as required for dehumidification of the code required ventilation air.





## › VENTILATION IMPROVEMENTS

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### **LCC-MS-4** Replace 1957 Gym Air Handling Unit and Add Cooling

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- Remove existing 1957 Gym air handling unit, piping, and controls.
  - Provide a new air handling unit with hot water heating and DX cooling.
  - Provide mated condensing unit and refrigerant piping.
  - Provide variable speed drives for the supply and relief fans.
  - Provide DDC controls, sequencing, and programming.
  - Provide all associated general construction and electrical work as required.
-



## VENTILATION IMPROVEMENTS

### Add DX Cooling to Classroom Unit Ventilators

There are currently thirteen (13) 2021 existing unit ventilators that serve classrooms at the Lydell Community Center. These unit ventilators currently have no means of cooling.

The lack of cooling results in higher humidity levels and occupant discomfort in these classrooms. These spaces are also unable to meet the American Society of Heating and Refrigeration Engineer's (ASHRAE) Thermal Environmental Conditions for Human Occupancy Standard 55-2020. This ASHRAE design standard specifies the combinations of personal and indoor thermal environmental requirements necessary to achieve an occupant comfort satisfaction rate of 80% or greater. These indoor environmental requirements include temperature, thermal radiation, humidity, and air speed.

Nexus recommends adding DX cooling coils to these unit ventilators. Refrigerant piping would be extended to the new units from dedicated condensing units as required for cooling of the code required ventilation air.





## › VENTILATION IMPROVEMENTS

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### **LCC-MS-5 Add DX Cooling to Classroom Unit Ventilators**

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- Provide new DX cooling coils for all 2021 unit ventilators.
  - Install new refrigerant piping and condensing units as required for cooling addition.
  - Provide all associated electrical and general construction work.
-

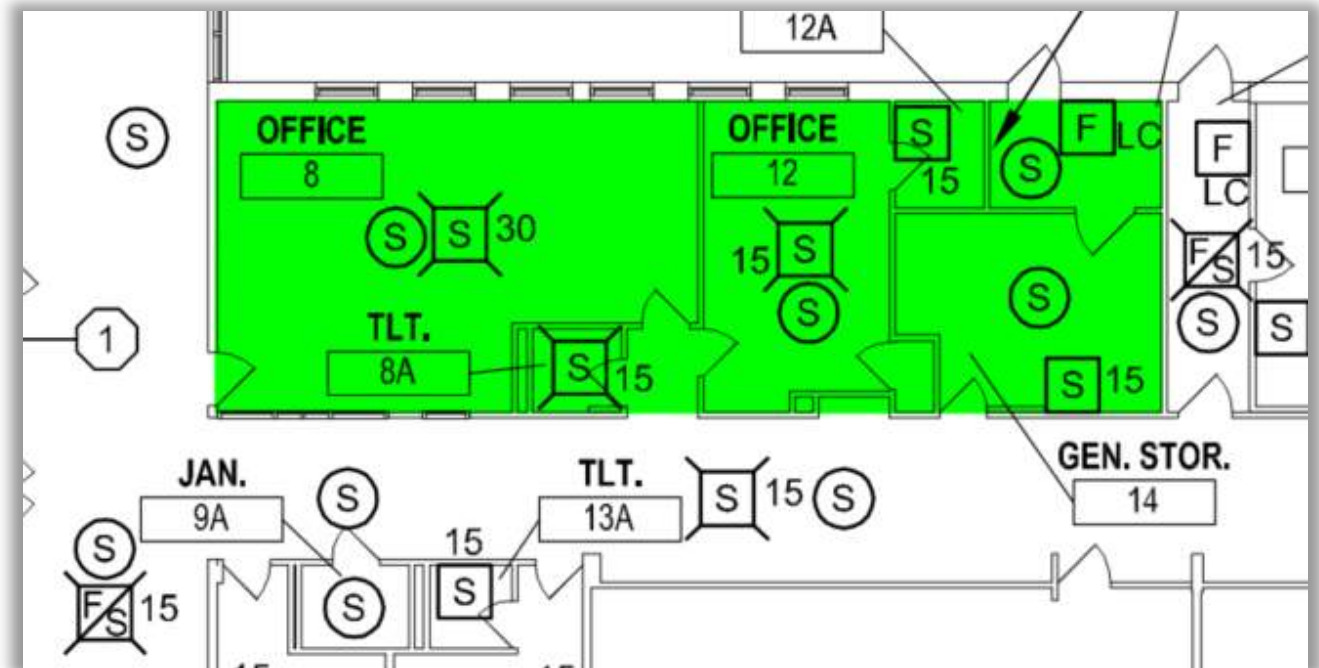


## VENTILATION IMPROVEMENTS

### New Office Fan Coil Air Handling Unit

There is currently no ventilation supplying air to the office area. Without ventilation, these spaces are not designed to meet current American Society of Heating and Refrigeration Engineer's (ASHRAE) Standard 62.1-2022 Ventilation and Acceptable Indoor Air Quality. This ASHRAE standard specifies the minimum ventilation rates to provide in order to satisfy human occupants and minimize health effects.

Nexus recommends adding a new fan coil air handling unit to serve the office area. The new fan coil air handling unit would include code compliant filters, heating water coils, DX dehumidification coils, access sections, and supply and relief fans with variable speed drives (VSD).





## › VENTILATION IMPROVEMENTS

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### **LCC-MS-6** New Office Fan Coil Air Handling Unit

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- Provide a new fan coil air handling unit with hot water heating and DX dehumidification.
  - Provide variable speed drives for the supply and relief fans.
  - Provide DDC controls, sequencing, and programming.
  - Provide all associated general construction and electrical work as required.
-

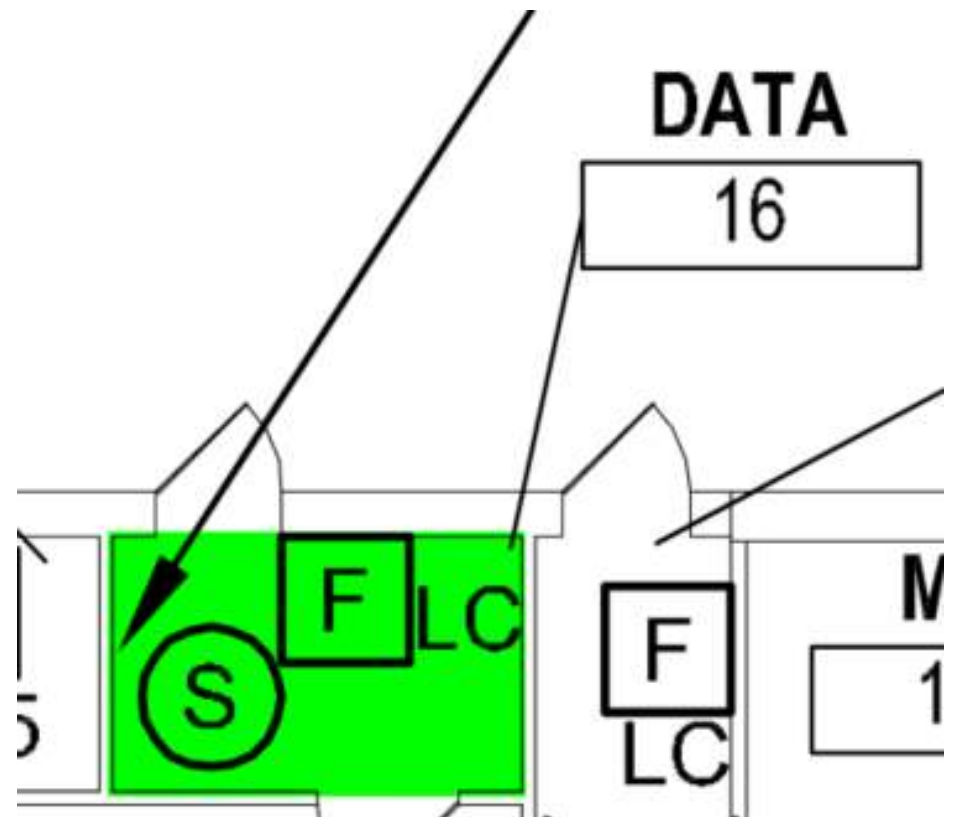


## IT COOLING SYSTEM UPGRADES

### Add Split System to IT Room

The existing IT room has no means of cooling which means the space is not capable of proper temperature control resulting in the risk of IT equipment failure.

Nexus recommends adding a new split system cooling unit to this space to alleviate overheating and operational concerns in this critical space.





## › IT COOLING SYSTEM UPGRADES

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### **LCC-MS-7** Add Split System to IT Room

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- Provide a new split system cooling unit appropriately sized to cool the IT room during all times of the year.
  - Provide associated electrical and general construction work.
-



## EXHAUST IMPROVEMENTS

### Replace Exhaust Fans (Qty 8)

There are several inline and rooftop exhaust fans serving the school that have exceeded their recommended service life and are in need of replacement.

Nexus recommends replacing some of these fans when major work is taking place so the best pricing can be obtained from the contractors. Nexus has budgeted for the replacement of eight (8) existing inline and rooftop exhaust fans for the school. Nexus will work along with the district on the priority of which ones want to be replaced.

Fans will be a direct replacement to the original size/capacity but will have premium efficiency motors installed to increase energy savings. The fan size/capacity may be reduced if engineering can justify where over ventilation is occurring.





› EXHAUST IMPROVEMENTS

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**LCC-MS-8 Replace Exhaust Fans (Qty 8)**

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- Remove existing exhaust fans and replace them with new fans.
  - Provide all roof and sealing work as required.
  - Provide all associated controls and electrical work.
-



## PLUMBING IMPROVEMENTS

### Water Heater Replacement

There is one (1) 2010 vintage water heater at the Lydell Community Center that is in need of replacement. The 2010 water heater is a standard efficiency, natural gas, atmospheric draft vent unit.

Nexus recommends replacing this water heater with new ultra-high efficiency, condensing-style, and sealed combustion water heater.





## › PLUMBING IMPROVEMENTS

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### **LCC-MS-9** Water Heater Replacement

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- Remove existing water heater.
  - Provide new ultra-high efficiency, sealed combustion water heater.
  - Extend hot water and hot water circulation piping to existing water heater connections.
  - Provide associated general and electrical work as required.
-



## PLUMBING IMPROVEMENTS

### Replace Galvanized Domestic Water Piping

There are some areas in the building that are still piped with galvanized steel domestic water piping. There is potential for entrainment of iron and lead into the potable water, as the soldered fittings and piping break down over time.

Nexus recommends the replacement of the galvanized domestic water piping with insulated copper piping to eliminate the potential for elevated lead and galvanized contaminants in the water supply.





› PLUMBING IMPROVEMENTS

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**LCC-MS-10 Replacement of Galvanized Domestic Water Piping**

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- Remove existing galvanized domestic water piping and components in building.
  - Install new insulated copper domestic water piping.
-



## HVAC RETRO-COMMISSIONING

### Retro-Commission HVAC Equipment

Building retro-commissioning is a systematic process that ensures all buildings perform as efficiently as possible according to the owner's operational needs as well as adjustment of HVAC equipment's operational parameters to meet current space use.

The Building Automation System (BAS) plays a crucial role in providing a comfortable, energy-efficient environment for students, parents, and staff. Over time, damper and valve controls have gone out of proper adjustment, components fail, and controls sequences are modified and may not be programmed to provide an optimal balance between comfort, indoor air quality, and energy efficiency.

This Nexus Retro-commissioning Team will identify the root cause of HVAC equipment operational issues and will provide adjustments to the sequences and outdoor air setting to improve occupant comfort while reducing energy consumption where possible. The retro-commissioning process will also identify components that require adjustment or replacement.

### Retro-commissioning activities include:

**HVAC Equipment:** Nexus will verify existing HVAC equipment operation and control sequences through observation. We will provide adjustment and tuning services to achieve optimal operation and improved occupant comfort. Documentation of the findings with corrections and recommendations for further improvements will be made.

### Services include:

- Ventilation study to assure all spaces are ventilated per the current code requirements and the outdoor air setpoints will be adjusted up or down based on current space occupancy
- Test point commands vs actual controller output at each device for heating, cooling, and mixed-air control
- Verify valve/damper operation on reheat coils and air handler coils
- Verify indicated vs actual (duct static, supply and return temperatures)
- Verify mixed-air operation (damper position and economizer operation)





**Valves and Dampers:** Nexus will test all existing rooftop (RTU) and indoor air handling unit (AHU) sequences along with the valve and damper operation to ensure control actuators are fully operational. We observe valve/damper/actuator operation and check for any physical signs of valve/damper leakage or binding, which results in operational issues and increased energy consumption. We check discharge temperature with valves in the fully open and closed positions. In addition, we will provide unit pricing to replace any defective valves and/or actuators. Proper RTU and AHU operation provides improved occupant comfort at optimal energy efficiency.

**Zone Reheat Valves:** Nexus will test existing zone reheat valves for proper operation. We ensure command valves fully open and close and observe valve/actuator operation. We inspect valves for any physical signs of valve leakage or binding, check discharge temperature with valve in the fully open and closed positions and provide unit pricing to replace any defective valves and/or actuators.

**Economizer:** Nexus will update the control sequence for mixed-air dampers to their setpoints with economizer lockout setpoints.

**Heating Water Pump Variable Speed Drives (VSDs):** Nexus will lower the pressure setpoint to allow drives to modulate down to the slowest speed required to satisfy the most critical room temperature sensor.

**Boilers:** Nexus will optimize sequencing and staging of equipment and adjust the water reset schedules based on outside air temperature.

The action steps noted above are part of the Nexus retro-commissioning process. The benefits of this process include improved temperature control and occupant comfort, reduced energy consumption, reduced maintenance, and extended HVAC equipment life.





## › HVAC RETRO-COMMISSIONING

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### **LCC-MS-11** Retro-Commission HVAC Equipment

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- Provide retro-commissioning of all existing HVAC systems.
  - Provide adjustments to existing sequences to improve HVAC system operation.
  - Verify operation of all dampers, actuators, valves, and terminal HVAC devices.
-



## MECHANICAL CONTROLS SYSTEM IMPROVEMENTS

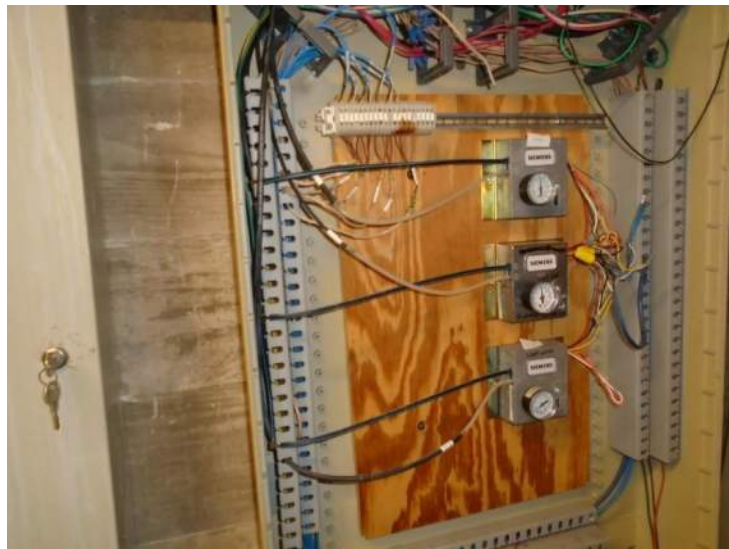
### Remaining Pneumatic to Direct Digital Controls (DDC) Conversion

The Cumberland Elementary School utilizes a combination of pneumatic and direct digital controls.

Pneumatic control systems are less energy efficient and are more difficult to maintain than modern Direct Digital Control (DDC) systems. Nexus recommends eliminating the remaining pneumatic controls systems and replacing them with new DDC components. This would allow the Cumberland Elementary School to utilize a DDC controls system building wide.

Nexus recommends removing the existing front end/user interface and integrating it to the existing Niagara platform. This replacement would include all new hardware, supervisor software and server, data base creation, and full graphic generation.

The new DDC controls would allow for building wide equipment monitoring and troubleshooting while on site or remotely while using a computer or a handheld device via the internet.





› MECHANICAL CONTROLS SYSTEM IMPROVEMENTS

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**CES-MS-1 Remaining Pneumatic to Direct Digital Controls (DDC) Conversion**

---

- Remove remaining pneumatic control devices located in the building.
  - Provide new DDC control components.
  - Integrate new Niagara platform.
  - Provide all programming required for this conversion.
-



## MECHANICAL HEATING SYSTEM IMPROVEMENTS

### Add New Condensing Boiler for Spring, Fall, and Summer and Add Glycol

The Cumberland Elementary School is currently served by a three (3) 2010 Burnham boilers. These existing hot water boilers have a capacity of 1,900,000 BTUs (British Thermal Units) each and are natural gas fired. When these boilers shut down for the year the building has no means of heating for those cooler Spring, Fall, and Summer days.

Nexus recommends adding a single new hot water high-efficiency condensing boiler to provide a high-efficiency heating water plant to accommodate the building during these times of the year.

The new condensing, high-efficiency boiler will be specified and sequenced to take advantage of lower water temperatures and provide an aggressive hot water reset schedule.

A side-stream filter would also be added so it can collect any particulate, debris, and rust within the water volume. The filter can also effect control valves and heat transfer surfaces.

Glycol will also be added to the entire existing heating system along with the new hot water system to prevent coil freezing. A glycol fill tank will also be installed to allow for ease of refilling the heating piping system when required.





› MECHANICAL HEATING SYSTEM IMPROVEMENTS

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**CES-MS-2 Add New Condensing Boiler for Spring, Fall, and Summer and Add Glycol**

---

- Install new fully modulating condensing boiler with integral primary boiler pump.
  - Provide glycol for existing and new system freeze protection.
  - Provide all associated electrical and general construction work as required.
-



## MECHANICAL HEATING SYSTEM IMPROVEMENTS

### Replace Cabinet and Suspended Unit Heaters

There are several cabinet and suspended unit heaters located in the building that have exceeded their service life and are in need of replacement.

Nexus recommends replacing these existing terminal heating devices one for one with new hot water cabinet and suspended unit heaters. The new cabinet and suspended unit heaters would be sized as required to meet these spaces heating loads.





› MECHANICAL HEATING SYSTEM IMPROVEMENTS

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**CES-MS-3** Replace Cabinet and Suspended Unit Heaters

---

- Remove existing cabinet unit heaters and suspended unit heaters.
  - Provide new hot water cabinet unit heaters and suspended unit heaters.
  - Provide all required electrical and general construction work.
-



## VENTILATION IMPROVEMENTS

### Replace 1957 Gym and 1991 Main Classroom Air Handling Units, Add Cooling, and Insulate Ductwork

The Cumberland Elementary School gym and main classrooms are currently being served by air handling units with no means of dehumidification. There are two (2) 1957 air handling units serving the gym and one (1) 1991 main classroom large air handling unit. These air handling units are well past their recommended service life and are in need of replacement.

The lack of dehumidification results in higher humidity levels and occupant discomfort in these spaces. It also makes these spaces unable to meet the American Society of Heating and Refrigeration Engineer's (ASHRAE) Thermal Environmental Conditions for Human Occupancy Standard 55-2020. This ASHRAE design standard specifies the combinations of personal and indoor thermal environmental requirements necessary to achieve an occupant comfort satisfaction rate of 80% or greater. These indoor environmental requirements include temperature, thermal radiation, humidity, and air speed.

Nexus recommends replacing the gym and main classroom air handling units with new air handling units with DX dehumidification coils and mated condensing units. Refrigerant piping would be extended to the new air handling unit as required for dehumidification of the code required ventilation air. The supply air ductwork for these units will be insulated as well to prevent ductwork condensation with the addition of cooling.





## › VENTILATION IMPROVEMENTS

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### **CES-MS-4, 5a, and 5b** Replace 1957 Gym and 1991 Main Classroom Air Handling Units, Add Cooling, and Insulate Ductwork

---

- Remove existing 1957 gym and 1991 main classroom air handling units, piping, and controls.
  - Provide new air handling units with hot water heating and DX cooling.
  - Provide mated condensing units and refrigerant piping.
  - Provide variable speed drives for the supply and relief fans.
  - Provide DDC controls, sequencing, and programming.
  - Provide all associated general construction and electrical work as required.
-



## VENTILATION IMPROVEMENTS

### Replace 1991 Office Air Handling Unit and Air-Cooled Condensing Unit

The existing 1991 office air handling unit is starting to increase in maintenance and is in need of replacement. This air handling unit currently has DX dehumidification.

Nexus recommends replacing this existing unit with a new air handling unit with DX cooling and mated condensing unit. Refrigerant piping would be extended to the new air handling unit as required for dehumidification of the code required ventilation air.





## › VENTILATION IMPROVEMENTS

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### **CES-MS-6** Replace Office Air Handling Unit and Air Cooled Condensing Unit

---

- Remove existing 1991 office air handling unit, piping, and controls.
  - Provide a new air handling unit with hot water heating and DX cooling.
  - Provide mated condensing unit and refrigerant piping.
  - Provide variable speed drives for the supply and relief fans.
  - Provide DDC controls, sequencing, and programming.
  - Provide all associated general construction and electrical work as required.
-



## VENTILATION IMPROVEMENTS

### Add DX Cooling to 2021 Classroom Unit Ventilators

There are currently six (6) 2021 existing unit ventilators that serve classrooms at the Cumberland Elementary School. These unit ventilators currently have no means of cooling.

The lack of cooling results in higher humidity levels and occupant discomfort in these classrooms. These spaces are also unable to meet the American Society of Heating and Refrigeration Engineer's (ASHRAE) Thermal Environmental Conditions for Human Occupancy Standard 55-2020. This ASHRAE design standard specifies the combinations of personal and indoor thermal environmental requirements necessary to achieve an occupant comfort satisfaction rate of 80% or greater. These indoor environmental requirements include temperature, thermal radiation, humidity, and air speed.

Nexus recommends adding DX cooling coils with shared condensing units to these unit ventilators. Refrigerant piping would be extended to the new units from dedicated condensing units as required for cooling of the code required ventilation air.





## › VENTILATION IMPROVEMENTS

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### **CES-MS-7 Add DX Cooling to 2021 Classroom Unit Ventilators**

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- Provide new DX cooling coils for all 2021 unit ventilators.
  - Install new refrigerant piping and condensing units as required for cooling addition.
  - Provide all associated electrical and general construction work.
-



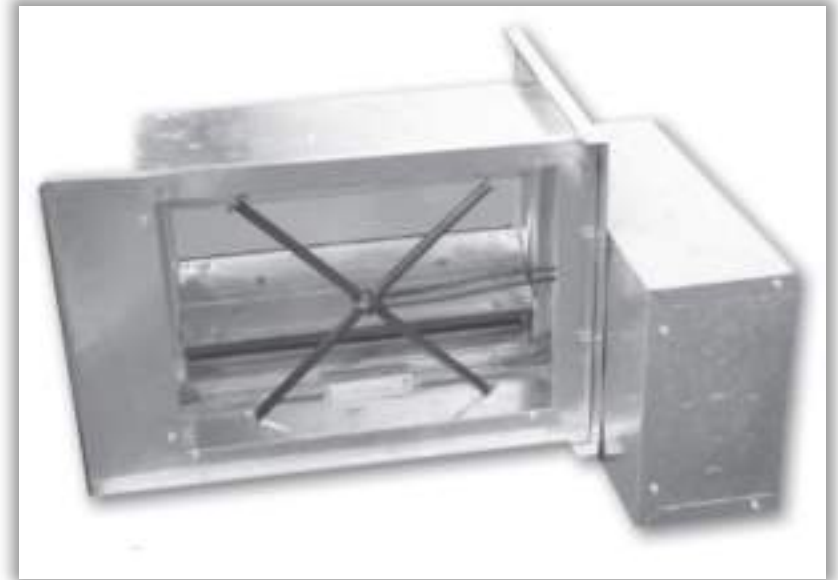
## VENTILATION IMPROVEMENTS

### Add Slip In Variable Air Volume (VAV) Boxes in Constant Volume Areas

There are currently about fifty-one (51) terminal hot water heating duct coils serving the building that are in good condition. These coils provide temperature control for each space but are constant volume and the airflow doesn't vary based on space needs.

Nexus recommends leaving the coils and adding variable air volume slip in boxes. The slip in VAVs would be located in the duct upstream of each coil. The existing overhead ductwork system would remain but would be insulated to reduce noise and prevent condensation. The addition of these VAV boxes would allow the space airflow to vary based on the space conditions. Nexus also recommends providing ten (10) additional duct boxes where current ductwork serves multiple zones.

Benefits of the HVAC system modifications include energy savings, reduced maintenance, improved indoor air quality, improved occupant comfort and improved learning/work environment.





› VENTILATION IMPROVEMENTS

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**CES-MS-8 Add Slip In Variable Air Volume (VAV) Boxes in Constant Volume Areas**

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- Provide fifty-one (51) slip in variable air volume (VAV) boxes.
  - Add ten (10) additional boxes for ductwork serving multiple zones.
  - Insulate and reuse existing heating piping and ductwork.
  - Provide the associated general and electrical construction work.
-

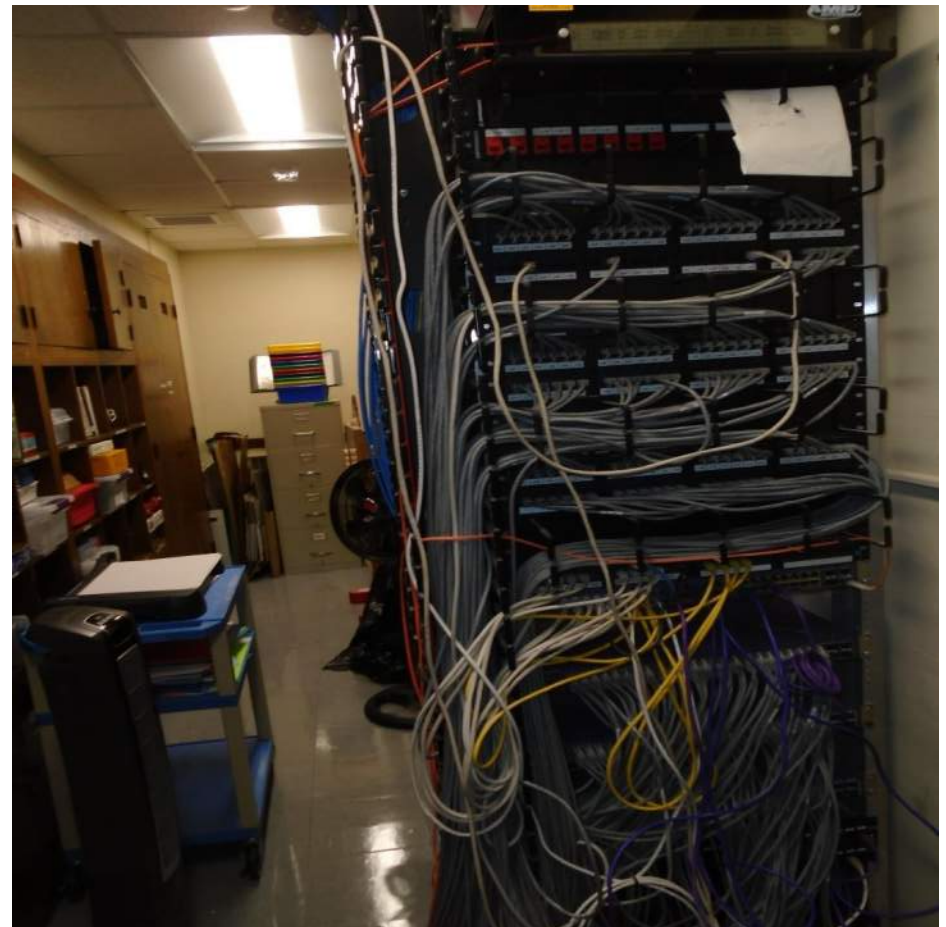


## IT COOLING SYSTEM UPGRADES

### Add Split System to IT Room

The existing IT room has no means of cooling which means the space is not capable of proper temperature control resulting in the risk of IT equipment failure.

Nexus recommends adding a new split system cooling unit to this space to alleviate overheating and operational concerns in this critical space.





## › IT COOLING SYSTEM UPGRADES

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### **CES-MS-9** Add Split System to IT Room

---

- Provide a new split system cooling unit appropriately sized to cool the IT room during all times of the year.
  - Provide associated electrical and general construction work.
-



## EXHAUST IMPROVEMENTS

### Replace 1991 Exhaust Fans (Qty 3)

There are several exhaust fans serving the school that have exceeded their recommended service life and are in need of replacement.

Nexus recommends replacing some of these fans when major work is taking place so the best pricing can be obtained from the contractors. Nexus has budgeted for the replacement of three (3) existing inline and rooftop exhaust fans for the school. Nexus will work along with the district on the priority of which ones want to be replaced.

Fans will be a direct replacement to the original size/capacity but will have premium efficiency motors installed to increase energy savings. The fan size/capacity may be reduced if engineering can justify where over ventilation is occurring.





## › EXHAUST IMPROVEMENTS

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### **CES-MS-10** Replace 1991 Exhaust Fans (Qty 3)

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- Remove existing exhaust fans and replace them with new fans.
  - Provide all roof and sealing work as required.
  - Provide all associated controls and electrical work.
-



## VENTILATION IMPROVEMENTS

### Add Thermal Equalizers to Gymnasium

The gymnasium currently suffers from temperature stratification due to the height of this space. Warmer air migrates to the ceiling making it difficult to achieve proper temperature control, especially in winter.

Nexus recommends the installation of four (4) thermal equalizer destratification fans in the elementary school gym to ensure proper ventilation.





## › VENTILATION IMPROVEMENTS

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### **CES-MS-10** Add Thermal Equalizers to Gymnasium

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- Install four (4) thermal equalizers in the gymnasium.
  - Wire thermal equalizers to wall switch/controls.
  - Provide all associated controls and electrical work.
-



## PLUMBING IMPROVEMENTS

### Replace Galvanized Domestic Water Piping

There is about 25% of the building that is still piped with galvanized steel domestic water piping. There is potential for entrainment of iron and lead into the potable water, as the soldered fittings and piping break down over time.

Nexus recommends the replacement of the galvanized domestic water piping with insulated copper piping to eliminate the potential for elevated lead and galvanized contaminants in the water supply.





› PLUMBING IMPROVEMENTS

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**CES-MS-11 Replacement of Galvanized Domestic Water Piping**

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- Remove existing galvanized domestic water piping and components in building.
  - Install new insulated copper domestic water piping.
-



## HVAC RETRO-COMMISSIONING

### Retro-Commission HVAC Equipment

Building retro-commissioning is a systematic process that ensures all buildings perform as efficiently as possible according to the owner's operational needs as well as adjustment of HVAC equipment's operational parameters to meet current space use.

The Building Automation System (BAS) plays a crucial role in providing a comfortable, energy-efficient environment for students, parents, and staff. Over time, damper and valve controls have gone out of proper adjustment, components fail, and controls sequences are modified and may not be programmed to provide an optimal balance between comfort, indoor air quality, and energy efficiency.

This Nexus Retro-commissioning Team will identify the root cause of HVAC equipment operational issues and will provide adjustments to the sequences and outdoor air setting to improve occupant comfort while reducing energy consumption where possible. The retro-commissioning process will also identify components that require adjustment or replacement.

### Retro-commissioning activities include:

**HVAC Equipment:** Nexus will verify existing HVAC equipment operation and control sequences through observation. We will provide adjustment and tuning services to achieve optimal operation and improved occupant comfort. Documentation of the findings with corrections and recommendations for further improvements will be made.

### Services include:

- Ventilation study to assure all spaces are ventilated per the current code requirements and the outdoor air setpoints will be adjusted up or down based on current space occupancy
- Test point commands vs actual controller output at each device for heating, cooling, and mixed-air control
- Verify valve/damper operation on reheat coils and air handler coils
- Verify indicated vs actual (duct static, supply and return temperatures)
- Verify mixed-air operation (damper position and economizer operation)





**Valves and Dampers:** Nexus will test all existing rooftop (RTU) and indoor air handling unit (AHU) sequences along with the valve and damper operation to ensure control actuators are fully operational. We observe valve/damper/actuator operation and check for any physical signs of valve/damper leakage or binding, which results in operational issues and increased energy consumption. We check discharge temperature with valves in the fully open and closed positions. In addition, we will provide unit pricing to replace any defective valves and/or actuators. Proper RTU and AHU operation provides improved occupant comfort at optimal energy efficiency.

**Zone Reheat Valves:** Nexus will test existing zone reheat valves for proper operation. We ensure command valves fully open and close and observe valve/actuator operation. We inspect valves for any physical signs of valve leakage or binding, check discharge temperature with valve in the fully open and closed positions and provide unit pricing to replace any defective valves and/or actuators.

**Economizer:** Nexus will update the control sequence for mixed-air dampers to their setpoints with economizer lockout setpoints.

**Heating Water Pump Variable Speed Drives (VSDs):** Nexus will lower the pressure setpoint to allow drives to modulate down to the slowest speed required to satisfy the most critical room temperature sensor.

**Boilers:** Nexus will optimize sequencing and staging of equipment and adjust the water reset schedules based on outside air temperature.

The action steps noted above are part of the Nexus retro-commissioning process. The benefits of this process include improved temperature control and occupant comfort, reduced energy consumption, reduced maintenance, and extended HVAC equipment life.





## › HVAC RETRO-COMMISSIONING

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### **CES-MS-12** Retro-Commission HVAC Equipment

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- Provide retro-commissioning of all existing HVAC systems.
  - Provide adjustments to existing sequences to improve HVAC system operation.
  - Verify operation of all dampers, actuators, valves, and terminal HVAC devices.
-



## MECHANICAL CONTROLS SYSTEM IMPROVEMENTS

### Remaining Pneumatic to Direct Digital Controls (DDC) Conversion

The Richards Elementary School utilizes a combination of pneumatic and direct digital controls.

Pneumatic control systems are less energy efficient and are more difficult to maintain than modern Direct Digital Control (DDC) systems. Nexus recommends eliminating the remaining pneumatic controls systems and replacing them with new DDC components. This would allow the Cumberland Elementary School to utilize a DDC controls system building wide.

Nexus recommends removing the existing front end/user interface and integrating it to the existing Niagara platform. This replacement would include all new hardware, supervisor software and server, data base creation, and full graphic generation.

The new DDC controls would allow for building wide equipment monitoring and troubleshooting while on site or remotely while using a computer or a handheld device via the internet.





## › MECHANICAL CONTROLS SYSTEM IMPROVEMENTS

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### **RES-MS-1** Remaining Pneumatic to Direct Digital Controls (DDC) Conversion

---

- Remove remaining pneumatic control devices located in the building.
  - Provide new DDC control components.
  - Integrate new Niagara platform.
  - Provide all programming required for this conversion.
-



## MECHANICAL HEATING SYSTEM IMPROVEMENTS

### Add New Condensing Boiler for Spring, Fall, and Summer and Add Glycol

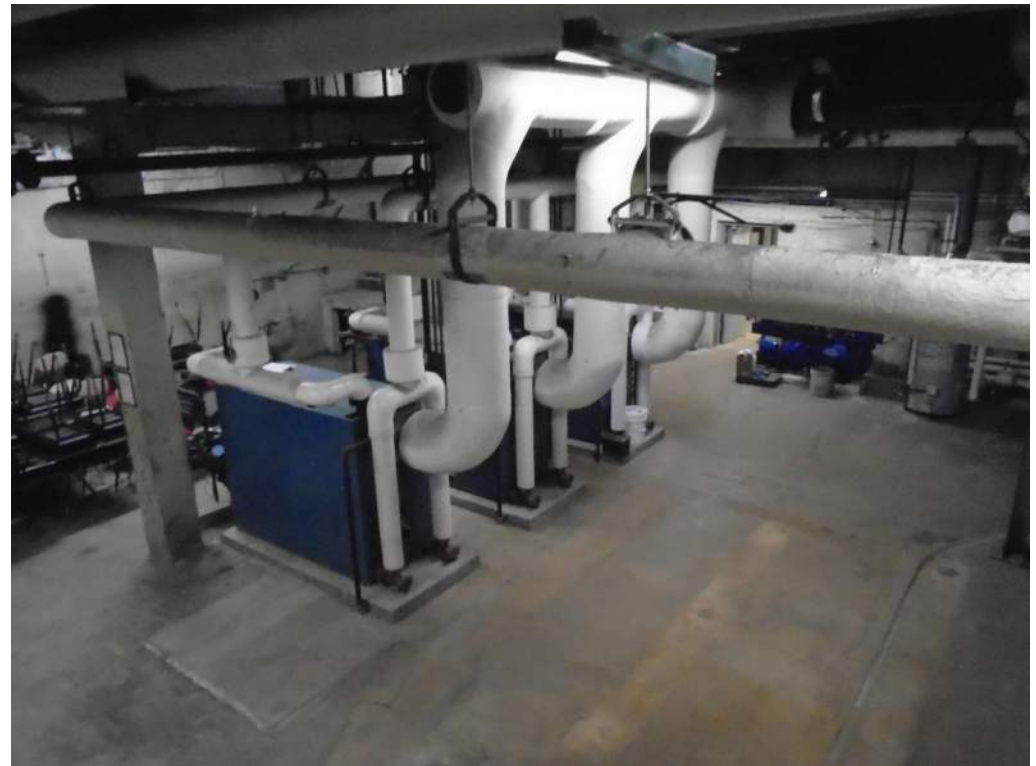
The Richards Elementary School is currently served by a three (3) 2010 Burnham boilers. These existing hot water boilers have a capacity of 1,900,000 BTUs (British Thermal Units) each and are natural gas fired. When these boilers shut down for the year the building has no means of heating for those cooler Spring, Fall, and Summer days.

Nexus recommends adding a single new hot water high-efficiency condensing boiler to provide a high-efficiency heating water plant to accommodate the building during these times of the year.

The new condensing, high-efficiency boiler will be specified and sequenced to take advantage of lower water temperatures and provide an aggressive hot water reset schedule.

A side-stream filter would also be added so it can collect any particulate, debris, and rust within the water volume. The filter can also effect control valves and heat transfer surfaces.

Glycol will also be added to the entire existing heating system along with the new hot water system to prevent coil freezing. A glycol fill tank will also be installed to allow for ease of refilling the heating piping system when required.





› MECHANICAL HEATING SYSTEM IMPROVEMENTS

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**RES-MS-2 Add New Condensing Boiler for Spring, Fall, and Summer and Add Glycol**

---

- Install new fully modulating condensing boiler with integral primary boiler pump.
  - Provide glycol for existing and new heating system freeze protection.
  - Provide all associated electrical and general construction work as required.
-



## MECHANICAL HEATING SYSTEM IMPROVEMENTS

### Replace Cabinet and Suspended Unit Heaters

There are several cabinet and suspended unit heaters located in the building that have exceeded their service life and are in need of replacement.

Nexus recommends replacing these existing terminal heating devices one for one with new hot water cabinet and suspended unit heaters. The new cabinet and suspended unit heaters would be sized as required to meet these spaces heating loads.





› MECHANICAL HEATING SYSTEM IMPROVEMENTS

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**RES-MS-3** Replace Cabinet and Suspended Unit Heaters

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- Remove existing cabinet unit heaters and suspended unit heaters.
  - Provide new hot water cabinet unit heaters and suspended unit heaters.
  - Provide all required electrical and general construction work.
-



## VENTILATION IMPROVEMENTS

### Replace 1957 Gym and 1991 Main Classroom Air Handling Units, Add Cooling, and Insulate Ductwork

The Richards Elementary School gym and main classrooms are currently being served by air handling units with no means of dehumidification. There are two (2) 1957 air handling units serving the gym and one (1) 1991 main classroom air handling unit. These air handling units are well past their recommended service life and are in need of replacement.

The lack of dehumidification results in higher humidity levels and occupant discomfort in these spaces. It also makes these spaces unable to meet the American Society of Heating and Refrigeration Engineer's (ASHRAE) Thermal Environmental Conditions for Human Occupancy Standard 55-2020. This ASHRAE design standard specifies the combinations of personal and indoor thermal environmental requirements necessary to achieve an occupant comfort satisfaction rate of 80% or greater. These indoor environmental requirements include temperature, thermal radiation, humidity, and air speed.

Nexus recommends replacing the gym and main classroom air handling units with new air handling units with DX dehumidification coils and mated condensing units. Refrigerant piping would be extended to the new air handling unit as required for dehumidification of the code required ventilation air. The supply air ductwork for these units will be insulated as well to prevent ductwork condensation with the addition of cooling.





## › VENTILATION IMPROVEMENTS

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### **RES-MS-4, 5a, and 5b** Replace 1957 Gym and 1991 Main Classroom Air Handling Units, Add Cooling, and Insulate Ductwork

---

- Remove existing gym and main classroom air handling units, piping, and controls.
  - Provide new air handling units with hot water heating and DX cooling.
  - Provide mated condensing units and refrigerant piping.
  - Provide variable speed drives for the supply and relief fans.
  - Provide DDC controls, sequencing, and programming.
  - Provide all associated general construction and electrical work as required.
-



## VENTILATION IMPROVEMENTS

### Replace 1991 Office Air Handling Unit and Air-Cooled Condensing Unit

The existing 1991 office air handling unit is starting to increase in maintenance and is in need of replacement. This air handling unit currently has DX dehumidification.

Nexus recommends replacing this existing unit with a new air handling unit with DX cooling and mated condensing unit. Refrigerant piping would be extended to the new air handling unit as required for dehumidification of the code required ventilation air.





## › VENTILATION IMPROVEMENTS

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### **RES-MS-6** Replace Office Air Handling Unit and Air Cooled Condensing Unit

---

- Remove existing 1991 office air handling unit, piping, and controls.
  - Provide a new air handling unit with hot water heating and DX cooling.
  - Provide mated condensing unit and refrigerant piping.
  - Provide variable speed drives for the supply and relief fans.
  - Provide DDC controls, sequencing, and programming.
  - Provide all associated general construction and electrical work as required.
-



## VENTILATION IMPROVEMENTS

### Add DX Cooling to 2021 Classroom Unit Ventilators

There are currently six (6) 2021 existing unit ventilators that serve classrooms at the Richards Elementary School. These unit ventilators currently have no means of cooling.

The lack of cooling results in higher humidity levels and occupant discomfort in these classrooms. These spaces are also unable to meet the American Society of Heating and Refrigeration Engineer's (ASHRAE) Thermal Environmental Conditions for Human Occupancy Standard 55-2020. This ASHRAE design standard specifies the combinations of personal and indoor thermal environmental requirements necessary to achieve an occupant comfort satisfaction rate of 80% or greater. These indoor environmental requirements include temperature, thermal radiation, humidity, and air speed.

Nexus recommends adding DX cooling coils to these unit ventilators. Refrigerant piping would be extended to the new units from dedicated condensing units as required for cooling of the code required ventilation air.





## › VENTILATION IMPROVEMENTS

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### **RES-MS-7 Add DX Cooling to 2021 Classroom Unit Ventilators**

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- Provide new DX cooling coils for all 2021 unit ventilators.
  - Install new refrigerant piping and condensing units as required for cooling addition.
  - Provide all associated electrical and general construction work.
-



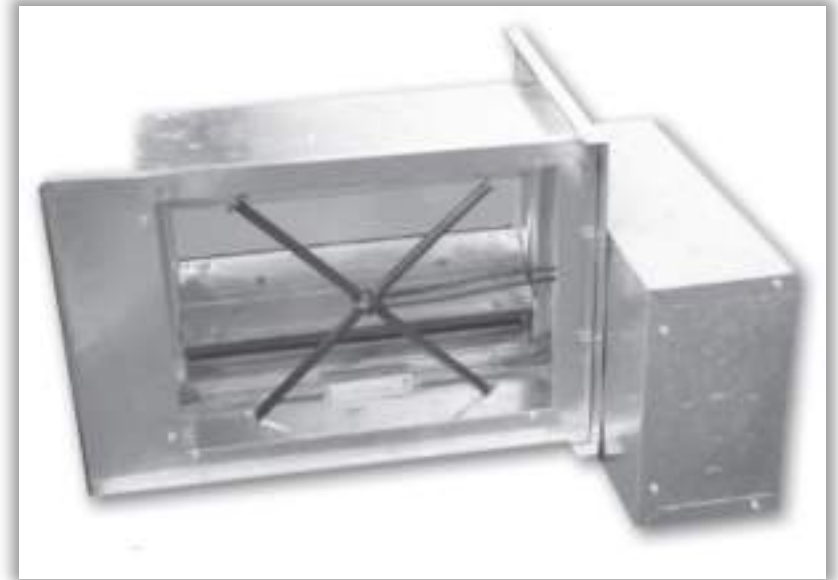
## VENTILATION IMPROVEMENTS

### **Add Slip In Variable Air Volume (VAV) Boxes in Constant Volume Areas**

There are currently about fifty-four (54) terminal hot water heating duct coils serving the building that are in good condition. These coils provide temperature control for each space but are constant volume and the airflow doesn't vary based on space needs.

Nexus recommends leaving the coils and adding variable air volume slip in boxes. The slip in VAVs would be located in the duct upstream of each coil. The existing overhead ductwork system would remain but would be insulated to reduce noise and prevent condensation. The addition of these VAV boxes would allow the space airflow to vary based on the space conditions. Nexus also recommends providing ten (10) additional duct boxes where current ductwork serves multiple zones.

Benefits of the HVAC system modifications include energy savings, reduced maintenance, improved indoor air quality, improved occupant comfort and improved learning/work environment.





## › VENTILATION IMPROVEMENTS

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### **RES-MS-8** Add Slip In Variable Air Volume (VAV) Boxes in Constant Volume Areas

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- Provide slip in variable air volume (VAV) boxes.
  - Insulate and reuse existing heating piping and ductwork.
  - Add ten (10) additional boxes for ductwork serving multiple zones.
  - Provide the associated general and electrical construction work.
-

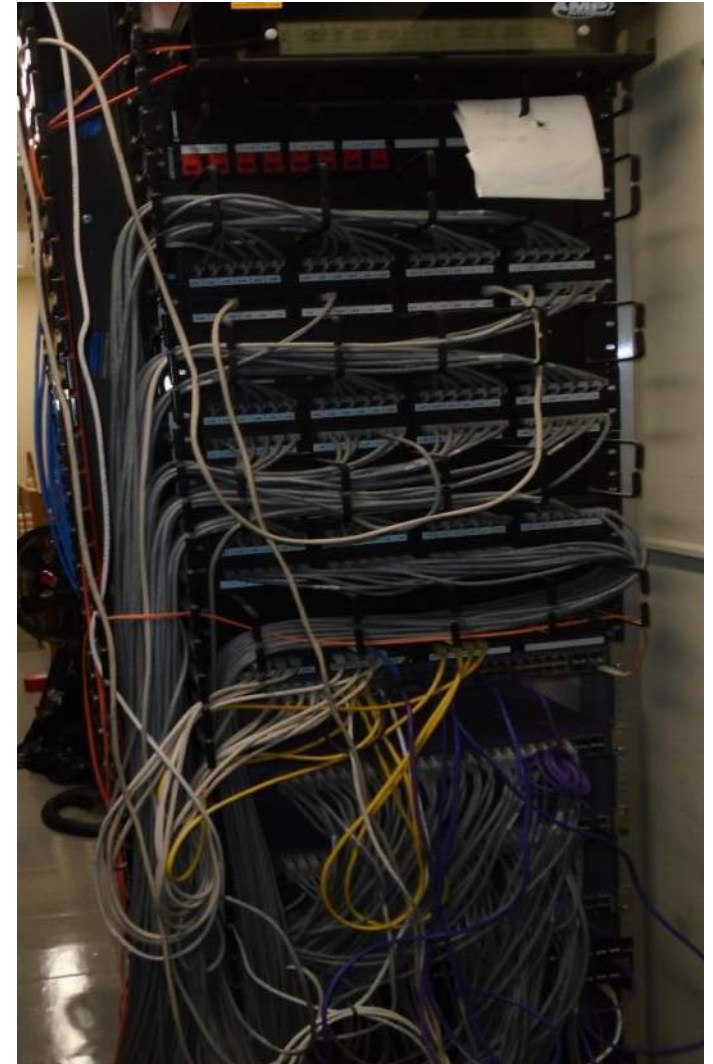


## IT COOLING SYSTEM UPGRADES

### Add Split System to IT Room

The existing IT room has no means of cooling which means the space is not capable of proper temperature control resulting in the risk of IT equipment failure.

Nexus recommends adding a new split system cooling unit to this space to alleviate overheating and operational concerns in this critical space.





## › IT COOLING SYSTEM UPGRADES

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### **RES-MS-9** Add Split System to IT Room

---

- Provide a new split system cooling unit appropriately sized to cool the IT room during all times of the year.
  - Provide associated electrical and general construction work.
-



## EXHAUST IMPROVEMENTS

### Replace 1991 Exhaust Fans (Qty 3)

There are several exhaust fans serving the school that have exceeded their recommended service life and are in need of replacement.

Nexus recommends replacing some of these fans when major work is taking place so the best pricing can be obtained from the contractors. Nexus has budgeted for the replacement of three (3) existing inline and rooftop exhaust fans for the school. Nexus will work along with the district on the priority of which ones want to be replaced.

Fans will be a direct replacement to the original size/capacity but will have premium efficiency motors installed to increase energy savings. The fan size/capacity may be reduced if engineering can justify where over ventilation is occurring.





› EXHAUST IMPROVEMENTS

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**RES-MS-10** Replace 1991 Exhaust Fans (Qty 3)

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- Remove existing exhaust fans and replace them with new fans.
  - Provide all roof and sealing work as required.
  - Provide all associated controls and electrical work.
-



## VENTILATION IMPROVEMENTS

### Add Thermal Equalizers to Gymnasium

The gymnasium currently suffers from temperature stratification due to the height of this space. Warmer air migrates to the ceiling making it difficult to achieve proper temperature control, especially in winter.

Nexus recommends the installation of four (4) thermal equalizer destratification fans in the elementary school gym to ensure proper ventilation.





## › VENTILATION IMPROVEMENTS

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### **RES-MS-10** Add Thermal Equalizers to Gym

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- Install four (4) thermal equalizers in the gym.
  - Wire thermal equalizers to wall switch/controls.
  - Provide all associated controls and electrical work.
-



## PLUMBING IMPROVEMENTS

### Replace Galvanized Domestic Water Piping

There is about 25% of the building that is still piped with galvanized steel domestic water piping. There is potential for entrainment of iron and lead into the potable water, as the soldered fittings and piping break down over time.

Nexus recommends the replacement of the galvanized domestic water piping with insulated copper piping to eliminate the potential for elevated lead and galvanized contaminants in the water supply.





› PLUMBING IMPROVEMENTS

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**RES-MS-11 Replacement of Galvanized Domestic Water Piping**

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- Remove existing galvanized domestic water piping and components in building.
  - Install new insulated copper domestic water piping.
-



## HVAC RETRO-COMMISSIONING

### Retro-Commission HVAC Equipment

Building retro-commissioning is a systematic process that ensures all buildings perform as efficiently as possible according to the owner's operational needs as well as adjustment of HVAC equipment's operational parameters to meet current space use.

The Building Automation System (BAS) plays a crucial role in providing a comfortable, energy-efficient environment for students, parents, and staff. Over time, damper and valve controls have gone out of proper adjustment, components fail, and controls sequences are modified and may not be programmed to provide an optimal balance between comfort, indoor air quality, and energy efficiency.

This Nexus Retro-commissioning Team will identify the root cause of HVAC equipment operational issues and will provide adjustments to the sequences and outdoor air setting to improve occupant comfort while reducing energy consumption where possible. The retro-commissioning process will also identify components that require adjustment or replacement.

### Retro-commissioning activities include:

**HVAC Equipment:** Nexus will verify existing HVAC equipment operation and control sequences through observation. We will provide adjustment and tuning services to achieve optimal operation and improved occupant comfort. Documentation of the findings with corrections and recommendations for further improvements will be made.

### Services include:

- Ventilation study to assure all spaces are ventilated per the current code requirements and the outdoor air setpoints will be adjusted up or down based on current space occupancy
- Test point commands vs actual controller output at each device for heating, cooling, and mixed-air control
- Verify valve/damper operation on reheat coils and air handler coils
- Verify indicated vs actual (duct static, supply and return temperatures)
- Verify mixed-air operation (damper position and economizer operation)





**Valves and Dampers:** Nexus will test all existing rooftop (RTU) and indoor air handling unit (AHU) sequences along with the valve and damper operation to ensure control actuators are fully operational. We observe valve/damper/actuator operation and check for any physical signs of valve/damper leakage or binding, which results in operational issues and increased energy consumption. We check discharge temperature with valves in the fully open and closed positions. In addition, we will provide unit pricing to replace any defective valves and/or actuators. Proper RTU and AHU operation provides improved occupant comfort at optimal energy efficiency.

**Zone Reheat Valves:** Nexus will test existing zone reheat valves for proper operation. We ensure command valves fully open and close and observe valve/actuator operation. We inspect valves for any physical signs of valve leakage or binding, check discharge temperature with valve in the fully open and closed positions and provide unit pricing to replace any defective valves and/or actuators.

**Economizer:** Nexus will update the control sequence for mixed-air dampers to their setpoints with economizer lockout setpoints.

**Heating Water Pump Variable Speed Drives (VSDs):** Nexus will lower the pressure setpoint to allow drives to modulate down to the slowest speed required to satisfy the most critical room temperature sensor.

**Boilers:** Nexus will optimize sequencing and staging of equipment and adjust the water reset schedules based on outside air temperature.

The action steps noted above are part of the Nexus retro-commissioning process. The benefits of this process include improved temperature control and occupant comfort, reduced energy consumption, reduced maintenance, and extended HVAC equipment life.





## › HVAC RETRO-COMMISSIONING

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### **RES-MS-12** Retro-Commission HVAC Equipment

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- Provide retro-commissioning of all existing HVAC systems.
  - Provide adjustments to existing sequences to improve HVAC system operation.
  - Verify operation of all dampers, actuators, valves, and terminal HVAC devices.
-



## MECHANICAL CONTROLS SYSTEM IMPROVEMENTS

### Remaining Pneumatic to Direct Digital Controls (DDC) Conversion

The Whitefish Bay Middle School utilizes a combination of pneumatic and direct digital controls, some of which was upgraded summer of 2022.

Pneumatic control systems are less energy efficient and are more difficult to maintain than modern Direct Digital Control (DDC) systems. Nexus recommends eliminating the remaining pneumatic controls systems and replacing them with new DDC components. This would allow the Whitefish Bay Middle School to utilize a DDC controls system building wide.

Nexus recommends continuing to integrate the building into the existing Niagara platform.

The continued upgrade to DDC controls would allow for building wide equipment monitoring and troubleshooting while on site or remotely while using a computer or a handheld device via the internet.





› MECHANICAL CONTROLS SYSTEM IMPROVEMENTS

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**WBMS-MS-1 Remaining Pneumatic to Direct Digital Controls (DDC) Conversion**

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- Remove remaining pneumatic control devices located in the building.
  - Provide new DDC control components.
  - Integrate new Niagara platform.
  - Provide all programming required for this conversion.
-



## MECHANICAL HEATING SYSTEM IMPROVEMENTS

### Replacement of 1995 Hot Water Boiler Plant

The existing Whitefish Bay Middle School hot water boiler plant consists of five (5) Weil-McLain boilers paired with seven (7) hot water heating pumps. The existing hot water boilers are 1995 vintage, have a capacity of 1,900,000 BTUs (British Thermal Units) each and are natural gas fired. This existing hot water boiler plant is nearing the end of its service life and starting to increase in maintenance.

Nexus recommends replacing these old inefficient boilers with new hot water high-efficiency condensing boilers to provide a high-efficiency heating water plant to the building.

Replacing these boilers will reduce gas consumption. The new condensing, high-efficiency boiler will be specified and sequenced to take advantage of lower water temperatures and provide an aggressive hot water reset schedule.

A side-stream filter would also be added so it can collect any particulate, debris, and rust within the water volume. The filter can also effect control valves and heat transfer surfaces. Glycol will also be added to the new hot water system to prevent coil freezing. A glycol fill tank will also be installed to allow for ease of refilling the heating piping system when required.





› MECHANICAL HEATING SYSTEM IMPROVEMENTS

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**WBMS-MS-2 Replacement of 1995 Hot Water Boiler Plant**

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- Remove existing 1995 boilers and pumps.
  - Install new fully modulating condensing boilers with integral primary boiler pumps and building loop pumps.
  - Install new side-stream filter.
  - Add glycol to the new piping system for freeze protection.
  - Install new glycol fill tank for ease of refill after maintenance.
-



## COOLING SYSTEM IMPROVEMENTS

### 1966 Water-Cooled Chiller Replacement

A portion of the building is currently served by a water-cooled chiller. This chiller is 1966 vintage and is starting to present a lot of operating and maintenance issues for the school.

Nexus recommends removing this existing chiller and pumps and replacing it with a new air-cooled chiller and pumps. The new chiller would be provided with variable frequency drives (VFDs) to provide maximum efficiency at part-load conditions when the chillers run most of the time. A sound attenuating package will be considered for noise reduction based on actual performance. The new chiller would be tied in to the DDC control system.





## › COOLING SYSTEM IMPROVEMENTS

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### **WBMS-MS-3 1966 Water-Cooled Chiller Replacement**

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- Remove existing water-cooled chiller, associated piping, and pumps.
  - Install new air-cooled chiller, pumps, and required piping.
  - Provide associated construction including general, electrical, and controls work required.
  - Update DDC building automation system to accommodate new chiller.
-



### VENTILATION IMPROVEMENTS

#### Air Handling and Fan Coil Unit Replacements

There are currently two (2) air handling units and two (2) fan coil units serving the Middle School which are already at or nearing the end of their useful service life. The spaces these air handling units and fan coil units serve are listed below.

- 1996 HV-1 that serves classrooms (DX Cooling)
- 1996 AC-1 that serves the office area (DX Cooling)
- 1996 UV-9 and fan coil that serves the art room (No Cooling)
- 2010 FC-1 and unit ventilator that serves the orchestra (DX Cooling)

Nexus recommends replacing all four (4) of these units with new double wall air handling units with chilled water-cooling coils. New chilled water piping would be extended to the new air handling units as required for cooling of the code required ventilation air. The new double wall air handling units would include code compliant filters, hot water heating coils, chilled water cooling coils, access sections, and supply and relief fans with variable speed drives (VSD).





## › VENTILATION IMPROVEMENTS

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### **WBMS-MS-4,7,10, and 11 Air Handling and Fan Coil Unit Replacements**

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- Remove existing fan coil and air handling units, piping, and controls.
  - Provide new air handling units with hot water heating and chilled water cooling.
  - Provide variable speed drives for the supply and relief fans.
  - Provide DDC controls, sequencing, and programming.
  - Provide all associated general construction and electrical work as required.
-



## VENTILATION IMPROVEMENTS

### Replace 1996 and 1990 Gym Air Handling Units and Add Cooling

The Old Gym 123 and Gymnasium 102 are currently being served by air handling units with no means of dehumidification. The air handling unit serving the Old Gym 123 is a 1996 vintage Trane unit labeled as HV-2 and the air handling unit serving Gymnasium 102 is a 1990 vintage Trane unit. These air handling units are well past their recommended service life and are in need of replacement.

The lack of dehumidification results in higher humidity levels and occupant discomfort in these gyms. It also makes these gyms unable to meet the American Society of Heating and Refrigeration Engineer's (ASHRAE) Thermal Environmental Conditions for Human Occupancy Standard 55-2020. This ASHRAE design standard specifies the combinations of personal and indoor thermal environmental requirements necessary to achieve an occupant comfort satisfaction rate of 80% or greater. These indoor environmental requirements include temperature, thermal radiation, humidity, and air speed.

Nexus recommends replacing both of the gym's air handling units with new air handling units with chilled water-cooling coils. Chilled water piping would be extended to the new air handling unit as required for dehumidification of the code required ventilation air.





## › VENTILATION IMPROVEMENTS

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### **WBMS-MS-8 and 9** Replace 1996 and 1990 Gym Air Handling Units and Add Cooling

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- Remove existing gym air handling units, piping, and controls.
  - Provide new air handling units with hot water heating and chilled water cooling.
  - Provide new chilled water piping.
  - Provide variable speed drives for the supply and relief fans.
  - Provide DDC controls, sequencing, and programming.
  - Provide all associated general construction and electrical work as required.
-



### VENTILATION IMPROVEMENTS

#### Replace Cabinet Unit Ventilators (CUVs) with Central System

There are several unit ventilators of different vintages serving areas of the Middle School. These unit ventilators are loud, maintenance intensive, do a poor job of air distribution, and are in need of replacement. See list below of current unit ventilators located in the building.

- Cafeteria
  - 1996 UV-4, UV-5 and UV-6
- Classrooms (1996 Unit Ventilators)
  - 1996 UV-2, UV-3, UV-7, UV-8, UV-10, UV-11, and UV-12
- Classrooms
  - UV-103, UV-103A, UV-105, UV-201A, UV-201B, UV-201E, UV-201S, UV-205, and UV-230
- Design and Construction
  - UV-19 and UV-19A

Nexus recommends removing these unit ventilators and going back with a new central air system consisting of new air handling units with an insulated duct distribution system. The new air handling units would include code compliant filtration, hot water heating coils, chilled water cooling coils, access sections, and supply and relief fans with variable speed drives (VSDs). Variable speed drives give the air handling units the ability to ramp the air up or down to satisfy the required cooling/heating load which in turn results in considerable energy savings.





## › VENTILATION IMPROVEMENTS

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### **WBMS-MS-5,6,12** Replace Cabinet Unit Ventilators (CUVs) with Central System

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- Remove existing unit ventilators.
  - Provide new air handling units with hot water heating coils, chilled water cooling coils, and variable speed drives.
  - Update DDC building automation system to accommodate these improvements.
  - Provide all associated electrical and general construction work.
-



## EXHAUST IMPROVEMENTS

### Replace Dust Collector and Ductwork

The existing dust collector is outdated and is in need of replacement.

Nexus recommends replacement of this dust collector unit with a new modern International Mechanical Code (IMC) compliant HVAC system. New dust collection ductwork would be installed and routed to each piece of equipment requiring dust collection.





› EXHAUST IMPROVEMENTS

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**WBMS-MS-6 Replace Dust Collector and Ductwork**

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- Demo existing dust collector and ductwork.
  - Provide new recirculating dust collector and dust collecting ductwork.
  - Provide code required fire protection for dust collector.
  - Provide all associated controls and electrical work.
-



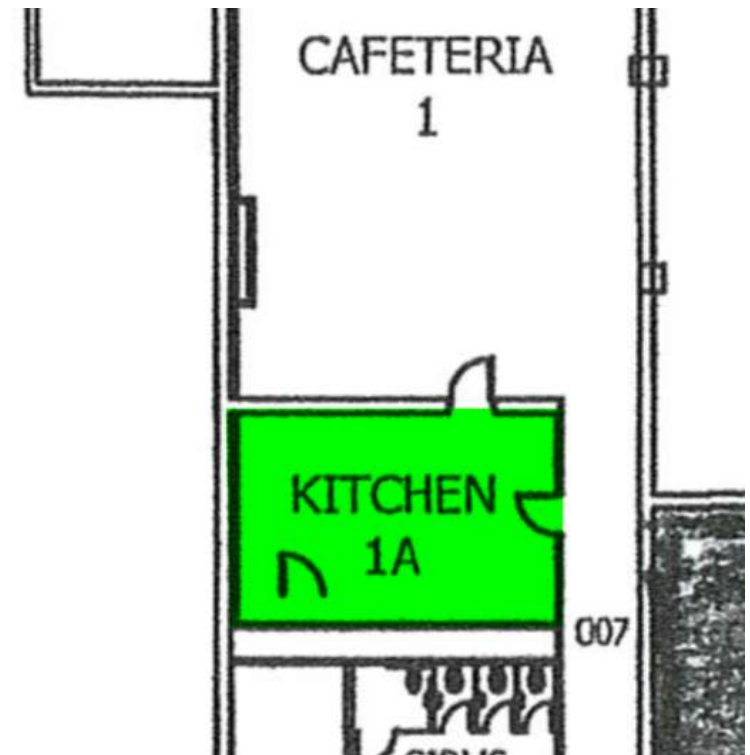
## KITCHEN VENTILATION AND EXHAUST IMPROVEMENTS

### **Add New Kitchen Make Up Air Handling Unit, Replace and Upsize Kitchen Hood, and Add Exhaust Hood to Dishwasher**

There is currently no make-up air unit serving the kitchen. Without a make-up air unit, there is not enough air being supplied to the space to make up for the air being exhausted. This causes the space to become overheated and uncomfortable for the staff.

Nexus recommends a new double wall make-up air handling unit with code compliant filtration, heating water coil, chilled water cooling coil, access sections, and supply fan with variable speed drive (VSD).

Nexus also recommends replacing and upsizing the existing kitchen hood and adding an exhaust hood to the dishwasher as part of this improvement.





› KITCHEN VENTILATION AND EXHAUST IMPROVEMENTS

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**WBMS-MS-13** Add New Kitchen Make Up Air Handling Unit, Replace and Upsize Kitchen Hood, and Add Exhaust Hood to Dishwasher

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- Provide new make up air handling unit with hot water heating and chilled water cooling coils.
  - Provide new upsized kitchen hood.
  - Provide new exhaust hood for dishwasher.
  - Provide variable speed drives for the supply.
  - Provide DDC controls, sequencing, and programming.
  - Provide all associated general and electrical construction work required.
-

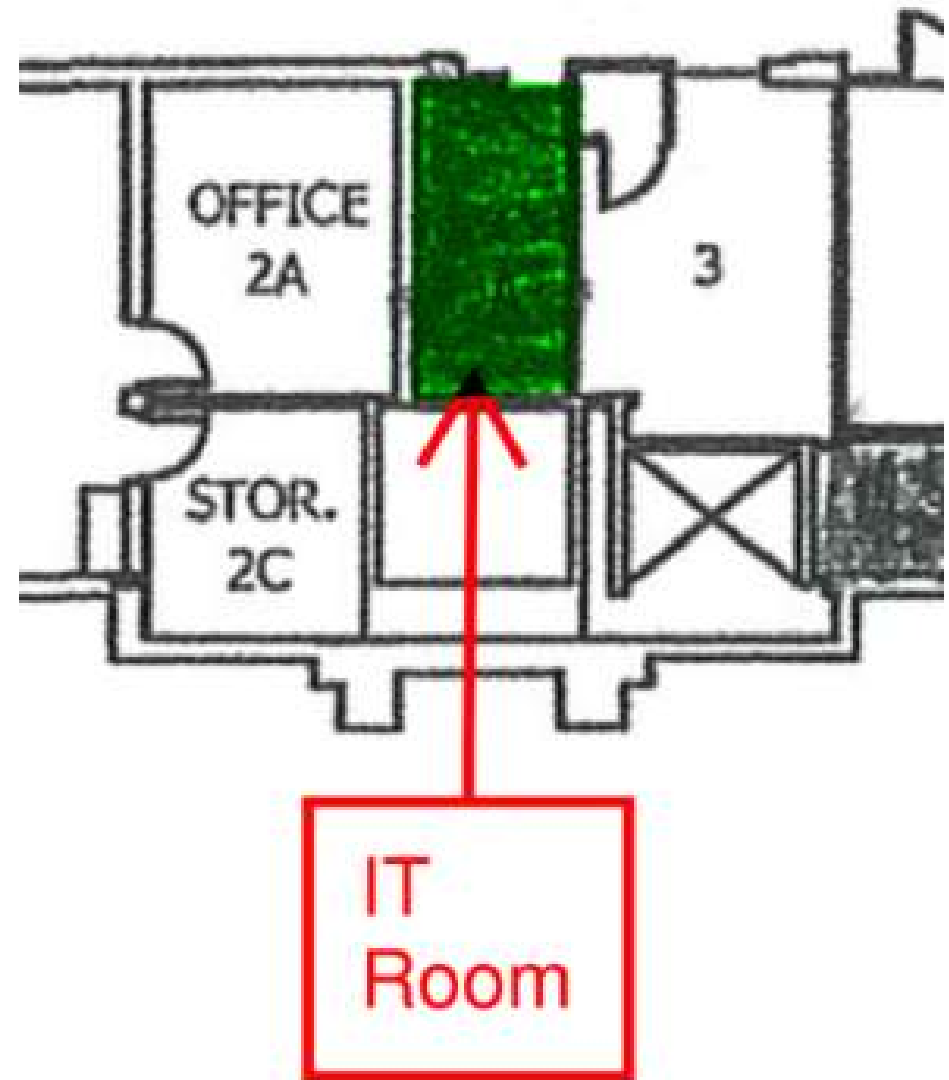


## IT COOLING SYSTEM UPGRADES

### Add DX Split System to IT Room

The existing IT room has no means of cooling which means the space is not capable of proper temperature control resulting in the risk of IT equipment failure.

Nexus recommends adding a new DX split system cooling unit to this space to alleviate overheating and operational concerns in this critical space.





## › IT COOLING SYSTEM UPGRADES

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### **WBMS-MS-14** Add DX Split System to IT Room

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- Provide a new DX split system cooling unit appropriately sized to cool the IT room during all times of the year.
  - Provide associated electrical and general construction work.
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## EXHAUST IMPROVEMENTS

### Replace 1995 Exhaust Fans (Qty 11)

There are several inline and rooftop exhaust fans serving the school that have exceeded their recommended service life and are in need of replacement.

Nexus recommends replacing some of these fans when major work is taking place so the best pricing can be obtained from the contractors. Nexus has budgeted for the replacement of eleven (11) existing inline and rooftop exhaust fans for the school. Nexus will work along with the district on the priority of which ones want to be replaced.

Fans will be a direct replacement to the original size/capacity but will have premium efficiency motors installed to increase energy savings. The fan size/capacity may be reduced if engineering can justify where over ventilation is occurring.





› EXHAUST IMPROVEMENTS

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**WBMS-MS-15** Replace 1995 Exhaust Fans (Qty 11)

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- Remove existing exhaust fans and replace them with new fans.
  - Provide all roof and sealing work as required.
  - Provide all associated controls and electrical work.
-



## PLUMBING IMPROVEMENTS

### 2005 Water Heater Replacement

There is one (1) 2005 vintage water heater at the Middle School that is in need of replacement. The 2005 water heater is a standard efficiency, natural gas, atmospheric draft vent unit.

Nexus recommends replacing this water heater with new ultra-high efficiency, condensing-style, and sealed combustion water heater.





› PLUMBING IMPROVEMENTS

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**WBMS-MS-16 2005 Water Heater Replacement**

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- Remove existing water heater.
  - Provide new ultra-high efficiency, sealed combustion water heater.
  - Extend hot water and hot water circulation piping to existing water heater connections.
  - Provide associated general and electrical work as required.
-



## PLUMBING IMPROVEMENTS

### Replace Galvanized Domestic Water Piping

There are areas of the building that are still piped with galvanized steel domestic water piping. There is potential for entrainment of iron and lead into the potable water, as the soldered fittings and piping break down over time.

Nexus recommends the replacement of the galvanized domestic water piping with insulated copper piping to eliminate the potential for elevated lead and galvanized contaminants in the water supply.





› PLUMBING IMPROVEMENTS

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**WBMS-MS-17 Replacement of Galvanized Domestic Water Piping**

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- Remove existing galvanized domestic water piping and components in building.
  - Install new insulated copper domestic water piping.
-



## HVAC RETRO-COMMISSIONING

### Retro-Commission HVAC Equipment

Building retro-commissioning is a systematic process that ensures all buildings perform as efficiently as possible according to the owner's operational needs as well as adjustment of HVAC equipment's operational parameters to meet current space use.

The Building Automation System (BAS) plays a crucial role in providing a comfortable, energy-efficient environment for students, parents, and staff. Over time, damper and valve controls have gone out of proper adjustment, components fail, and controls sequences are modified and may not be programmed to provide an optimal balance between comfort, indoor air quality, and energy efficiency.

This Nexus Retro-commissioning Team will identify the root cause of HVAC equipment operational issues and will provide adjustments to the sequences and outdoor air setting to improve occupant comfort while reducing energy consumption where possible. The retro-commissioning process will also identify components that require adjustment or replacement.

### Retro-commissioning activities include:

**HVAC Equipment:** Nexus will verify existing HVAC equipment operation and control sequences through observation. We will provide adjustment and tuning services to achieve optimal operation and improved occupant comfort. Documentation of the findings with corrections and recommendations for further improvements will be made.

Services include:

- Ventilation study to assure all spaces are ventilated per the current code requirements and the outdoor air setpoints will be adjusted up or down based on current space occupancy
- Test point commands vs actual controller output at each device for heating, cooling, and mixed-air control
- Verify valve/damper operation on reheat coils and air handler coils
- Verify indicated vs actual (duct static, supply and return temperatures)
- Verify mixed-air operation (damper position and economizer operation)





**Valves and Dampers:** Nexus will test all existing rooftop (RTU) and indoor air handling unit (AHU) sequences along with the valve and damper operation to ensure control actuators are fully operational. We observe valve/damper/actuator operation and check for any physical signs of valve/damper leakage or binding, which results in operational issues and increased energy consumption. We check discharge temperature with valves in the fully open and closed positions. In addition, we will provide unit pricing to replace any defective valves and/or actuators. Proper RTU and AHU operation provides improved occupant comfort at optimal energy efficiency.

**Zone Reheat Valves:** Nexus will test existing zone reheat valves for proper operation. We ensure command valves fully open and close and observe valve/actuator operation. We inspect valves for any physical signs of valve leakage or binding, check discharge temperature with valve in the fully open and closed positions and provide unit pricing to replace any defective valves and/or actuators.

**Economizer:** Nexus will update the control sequence for mixed-air dampers to their setpoints with economizer lockout setpoints.

**Heating Water Pump Variable Speed Drives (VSDs):** Nexus will lower the pressure setpoint to allow drives to modulate down to the slowest speed required to satisfy the most critical room temperature sensor.

**Boilers:** Nexus will optimize sequencing and staging of equipment and adjust the water reset schedules based on outside air temperature.

The action steps noted above are part of the Nexus retro-commissioning process. The benefits of this process include improved temperature control and occupant comfort, reduced energy consumption, reduced maintenance, and extended HVAC equipment life.





## › HVAC RETRO-COMMISSIONING

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### **WBMS-MS-18** Retro-Commission HVAC Equipment

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- Provide retro-commissioning of all existing HVAC systems.
  - Provide adjustments to existing sequences to improve HVAC system operation.
  - Verify operation of all dampers, actuators, valves, and terminal HVAC devices.
-



## MECHANICAL CONTROLS SYSTEM IMPROVEMENTS

### Remaining Pneumatic to Direct Digital Controls (DDC) Conversion

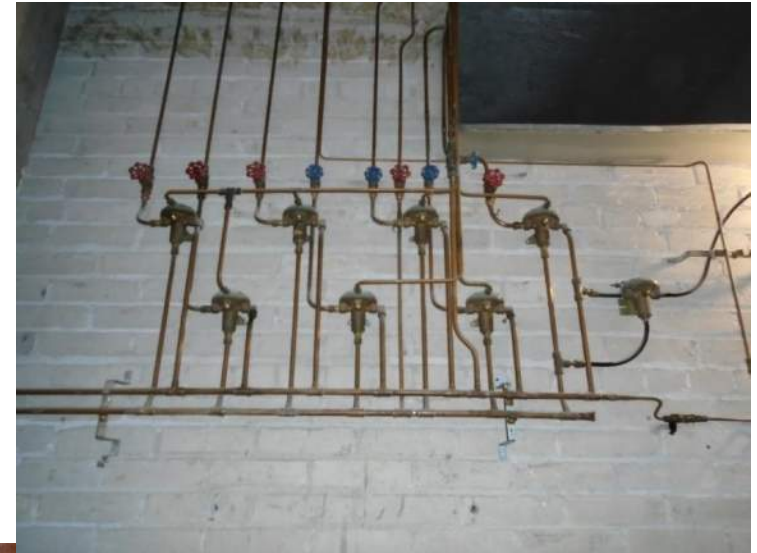
The Whitefish Bay High School utilizes a combination of pneumatic and direct digital controls.

Pneumatic control systems are less energy efficient and are more difficult to maintain than modern Direct Digital Control (DDC) systems. Nexus recommends eliminating the remaining pneumatic controls systems and replacing them with new DDC components. This would allow the Whitefish Bay High School to utilize a DDC controls system building wide.

Nexus recommends removing the multiple front end/user interfaces and integrating the new controls into the existing Niagara Tridium platform. This upgrade would require a rebuild of the entire data base and recreating all new graphics. This replacement would include all new hardware, supervisor software and server, database creation, and full graphic generation.

Nexus also recommends upgrading the existing DDC controls at the High School. The new DDC controls would be integrated into the building automation system platform which would allow for building wide equipment monitoring and troubleshooting while on site or remotely while using a computer or a handheld device via the internet.

The new DDC controls would be integrated into the building automation system platform which would allow for building wide equipment monitoring and troubleshooting while on site or remotely while using a computer or a handheld device via the internet.





› MECHANICAL CONTROLS SYSTEM IMPROVEMENTS

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**WBHS-MS-1 Remaining Pneumatic to Direct Digital Controls (DDC) Conversion**

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- Remove remaining pneumatic control devices located in the building.
  - Provide new DDC control components.
  - Integrate new Niagara Tridium platform.
  - Provide all programming required for this conversion.
-



## COOLING SYSTEM IMPROVEMENTS

### Chiller Replacements

There are currently two (2) existing chillers serving the Whitefish Bay High School that are not working properly and are starting to present a lot of operating and maintenance issues for the school.

Nexus recommends removing these existing chillers and creating two (2) new air cooled chiller plants. New air cooled chillers would be provided with the associated chilled water pumping system to serve the entire building except for the 2011 music addition which is already cooled via DX cooling.

The new air cooled chillers would be provided with variable frequency drives (VFDs) to provide maximum efficiency at part-load conditions when the chillers run most of the time. A sound attenuating package will be considered for noise reduction based on actual performance. The new chillers would be tied in to the DDC control system.





## › COOLING SYSTEM IMPROVEMENTS

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### **WBHS-MS-2** Chiller Replacements

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- Remove existing chillers, associated piping, and pumps.
  - Install new air-cooled chillers, pumps, and required piping.
  - Provide associated construction including general, electrical, and controls work required.
  - Update DDC building automation system to accommodate new chillers.
-



## MECHANICAL HEATING SYSTEM IMPROVEMENTS

### Replacement of 1967 Fieldhouse Hot Water Boiler Plant

The existing fieldhouse hot water boiler plant consists of two (2) 1967 Cleaver-Brooks boilers. These existing boilers have a capacity of 12,554,000 BTUs (British Thermal Units) each and are natural gas fired. This hot water boiler plant is well past its service life and starting to increase in maintenance.

Nexus recommends replacing these old inefficient boilers with new hot water high-efficiency condensing boilers to provide a high-efficiency heating water plant to accommodate the entire building.

Replacing these boilers will reduce gas consumption. Switching to a hot water heating system will result in considerable energy savings and less maintenance. The condensing, high-efficiency boilers will be specified and sequenced to take advantage of lower water temperatures and provide an aggressive hot water reset schedule.

A side-stream filter would also be added so it can collect any particulate, debris, and rust within the water volume. The filter can also effect control valves and heat transfer surfaces. Glycol will also be added to the new hot water system to prevent coil freezing. A glycol fill tank will also be installed to allow for ease of refilling the heating piping system when required.





› MECHANICAL HEATING SYSTEM IMPROVEMENTS

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**WBHS-MS-3 Replacement of 1967 Fieldhouse Hot Water Boiler Plant**

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- Remove existing 1967 boilers and pumps.
  - Install new fully modulating condensing boilers with integral primary boiler pumps and building loop pumps.
  - Install new side-stream filter.
  - Provide propylene glycol to the new piping system for freeze protection.
  - Install new glycol fill tank for ease of refill after maintenance.
  - Provide all necessary electrical and general construction work.
-



## MECHANICAL HEATING SYSTEM IMPROVEMENTS

### Steam Boiler Plant Conversion to Hot Water

The Whitefish Bay High School currently has a steam boiler plant consists of two (2) 1957 Cleaver-Brooks steam boilers. These existing boilers have a capacity of 12,000,000 BTUs (British Thermal Units) each and are natural gas fired. These boilers are well past their useful service life and are in need of replacement. Steam systems involve more maintenance than modern hot water systems due to steam traps, condensate transfer pumps, and continuous water treatment.

Nexus recommends removing the existing steam boilers and replacing with new high-efficiency hot water condensing boilers to provide a high-efficiency heating plant which can accommodate the whole building. New boiler primary pumps, building hot water pumps and hot water piping would be included with the new boilers.

A side-stream filter would also be added so it can collect any particulate, debris, and rust within the water volume. The filter can also effect control valves and heat transfer surfaces. Glycol will also be added to the new hot water system to prevent coil freezing. A glycol fill tank will also be installed to allow for ease of refilling the heating piping system when required.





To complete the steam to heating water conversion, the remaining steam devices must be replaced in the building. This includes the piping, air handling unit coils, terminal heating devices, valves and all related appurtenances. The following air handling units steam coils would be included as part of this conversion to hot water:

- Existing Office AC-1
- Existing Media Center AHU

This steam system would then be replaced with new hot water piping, new hot water coils and new hot water terminal heating devices. This conversion would provide better temperature control, extend heating system life and reduce maintenance.

Switching to a hot water heating system will result in considerable energy savings and less maintenance. The condensing, high-efficiency boiler will be specified and sequenced to take advantage of lower water temperatures and provide an aggressive hot water reset schedule.





## › MECHANICAL HEATING SYSTEM IMPROVEMENTS

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### **WBHS-MS-4a and 4b** Steam Boiler Plant Conversion to Hot Water

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- Remove existing 1957 steam boilers.
  - Provide new fully modulating condensing boilers with integral primary boiler pumps.
  - Provide propylene glycol for the heating system.
  - Remove existing steam air handling coils, piping, and terminal heating devices.
  - Remove existing condensate pumps and other steam related components.
  - Provide new heating water piping, air handling coils, and terminal heating devices as needed.
  - Provide all necessary electrical and general construction work.
-



## VENTILATION IMPROVEMENTS

### Replace Cabinet Unit Ventilators (Qty 68) with Central System

There are a number of classrooms in the High School being served by classroom unit ventilators. See floor plan maps on next page for cabinet unit ventilator locations. These classrooms unit ventilators are several different vintages. These unit ventilators are loud, maintenance intensive, do a poor job of air distribution, and are in need of replacement.

Nexus recommends removing these unit ventilators and going back with a new central air system consisting of new air handling units with an insulated duct distribution system. The new air handling units would include code compliant filtration, hot water heating coils, chilled water cooling coils, access sections, and supply and relief fans with variable speed drives (VSDs). Variable speed drives give the air handling units the ability to ramp the air up or down to satisfy the required cooling/heating load which in turn results in considerable energy savings.







## › VENTILATION IMPROVEMENTS

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### **WBHS-MS-5 and 20** Replace Cabinet Unit Ventilators (Qty 68) with Central System

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- Remove existing classroom and wood shop unit ventilators.
  - Provide new air handling units with hot water heating coils, chilled water-cooling coils, and variable speed drives.
  - Provide insulated duct distribution system.
  - Update DDC building automation system to accommodate these improvements.
  - Provide all associated electrical and general construction work.
-



### VENTILATION IMPROVEMENTS

#### Replace Air Handling and Fan Coil Units and Add Chilled Water Cooling

There are a number of air handling units serving the Whitefish Bay High School that are well past their recommended service life and are increasing in maintenance. A lot of these air handling units are utilizing steam heat and have no means of dehumidification. These air handling units are listed below.

- BCU-1 that serves the upper cafeteria and the building and grounds.
- CCU-1 that serves the cafeteria.
- CCU-2 that serves the cafeteria.
- AHU-1 that serves the shooting range and storage area.
- AHU-2 that serves the pool.
- AHU-3 that serves the pool.
- AHU-6 that serves the pool spectator area.
- AHU-1 that serves the auxiliary pool.
- AHU-8 that serves the auditorium.
- AHU-2 that serves the memorial gym.
- AHU-3 that serves the memorial gym.
- AHU-13 that serves the team rooms.
- AHU-14 that serves the team rooms.
- AHU-15 that serves classroom 204.
- AHU-16 that serves classroom 210.
- AHU-8, 9, 10, 11, and 12 that serve the fieldhouse.
- AHU-7 that serves the lobby and office area.
- AHU/fan coils (qty 4) units serving core spaces (133-135, 231-235, and 331-335).





The lack of dehumidification results in higher humidity levels and occupant discomfort in these spaces. It also makes these spaces unable to meet the American Society of Heating and Refrigeration Engineer's (ASHRAE) Thermal Environmental Conditions for Human Occupancy Standard 55-2020. This ASHRAE design standard specifies the combinations of personal and indoor thermal environmental requirements necessary to achieve an occupant comfort satisfaction rate of 80% or greater. These indoor environmental requirements include temperature, thermal radiation, humidity, and air speed.

Nexus recommends replacing all of these units with new double wall air handling units with chilled water-cooling coils. New chilled water piping would be extended to the new air handling units as required for cooling of the code required ventilation air. The new double wall air handling units would include code compliant filters, hot water heating coils, chilled water cooling coils, access sections, and supply and relief fans with variable speed drives (VSD).





› VENTILATION IMPROVEMENTS

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**WBHS-MS-6,10,11,12,13,14,15,16,17,18,19, and 23** Replace Air Handling and Fan Coil Units and Add Chilled Water Cooling

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- Remove existing air handling units, piping, and controls.
  - Provide new air handling units with hot water heating and chilled water cooling.
  - Provide new chilled water piping.
  - Provide variable speed drives for the supply and relief fans.
  - Provide DDC controls, sequencing, and programming.
  - Provide all associated general construction and electrical work as required.
-



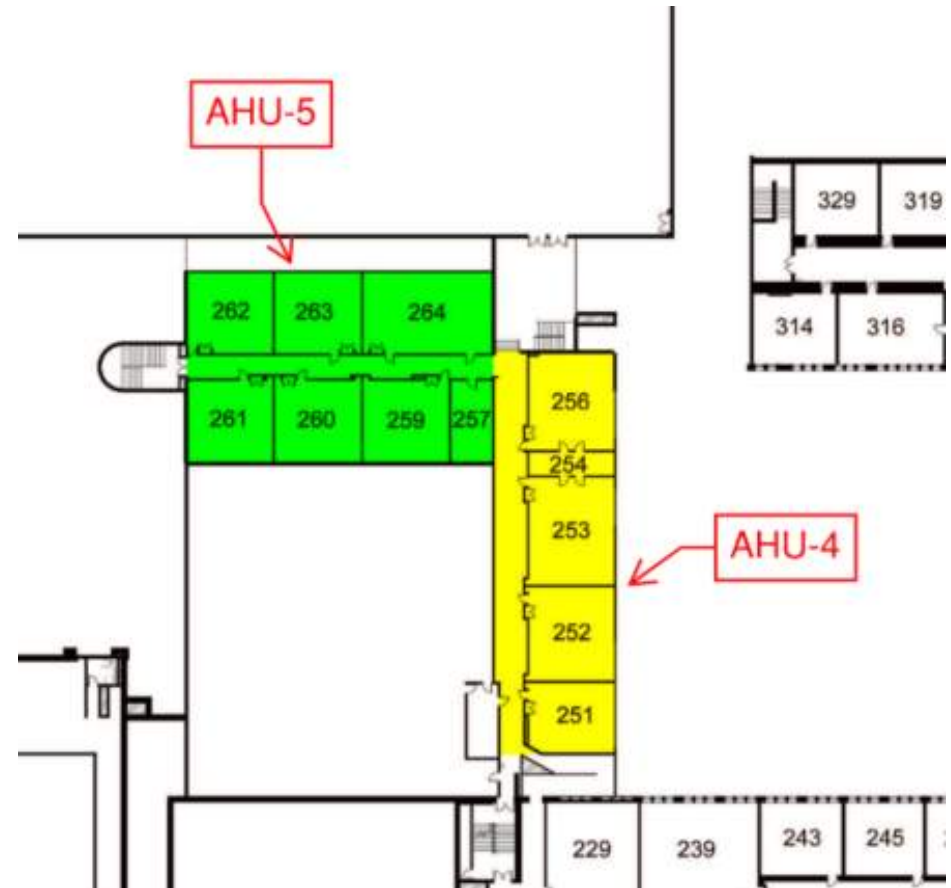
## VENTILATION IMPROVEMENTS

### Replace 1957 AHU-4 and AHU-5 and Convert DX to Chilled Water Cooling

There are two (2) air handling units serving classrooms on the second floor of the Whitefish Bay High School. These units are AHU-4 and AHU-5 that serve second-floor classrooms 251-256 and 257-264 respectively. These air handling units are 1957 vintage and are well past their useful service life.

Nexus recommends replacing these units one for one with new double wall air handling units with hot water heating coils. These units would also incorporate chilled water-cooling coils in lieu of DX cooling.

New hot water and chilled water piping would be extended to the new air handling units as required for heating and cooling of the code required ventilation air. The new double wall air handling units would include code compliant filters, hot water heating coils, chilled water cooling coils, access sections, and supply and relief fans with variable speed drives (VSD).





## › VENTILATION IMPROVEMENTS

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### **WBHS-MS-7** Replace 1957 AHU-4 and AHU-5 and Convert DX to Chilled Water Cooling

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- Remove existing air handling units, piping, and controls.
  - Provide new air handling units with hot water heating and chilled water cooling.
  - Provide variable speed drives for the supply and relief fans.
  - Provide DDC controls, sequencing, and programming.
  - Provide all associated general construction and electrical work as required.
-

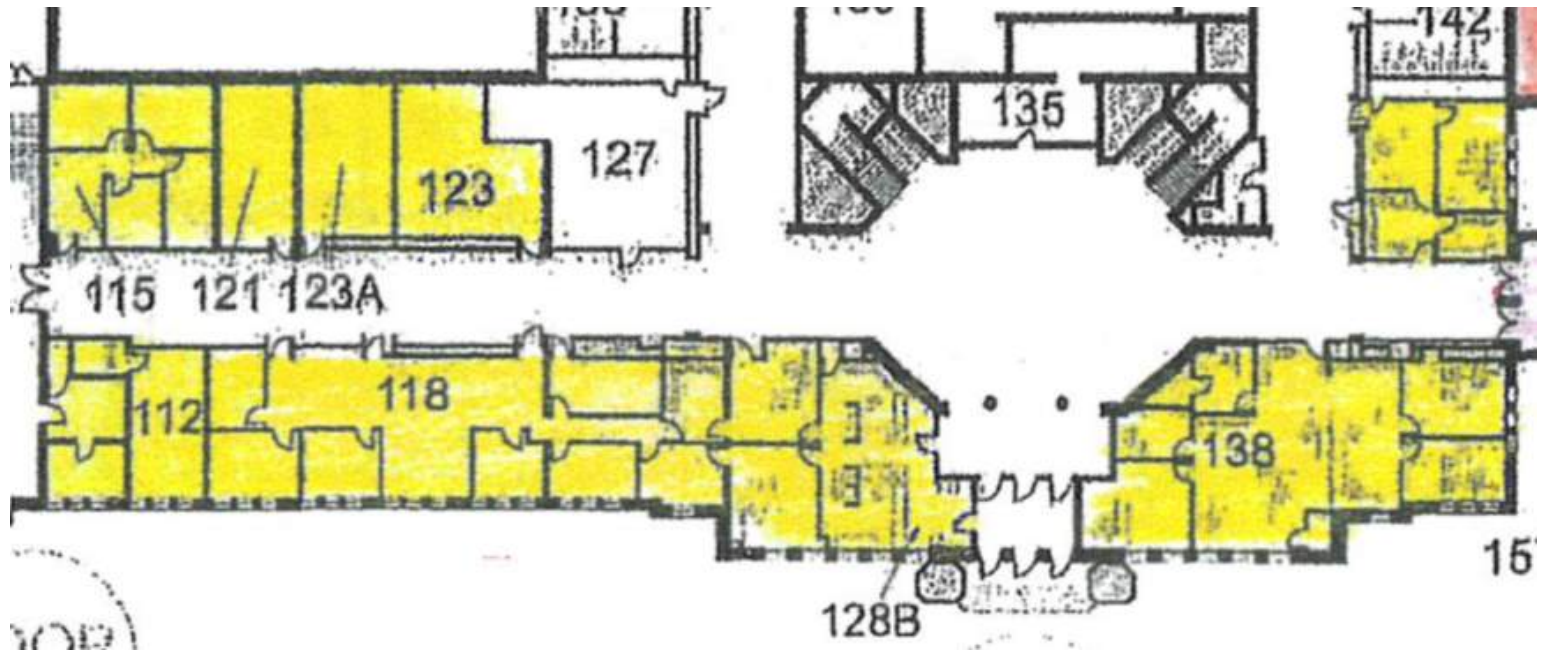


## VENTILATION IMPROVEMENTS

### Replace Trane Pneumatic Variable Air Volume (VAV) Boxes in Office Area (Qty 25)

There are several old Trane pneumatic variable air volume (VAV) boxes located in the office area that are past their recommended service life and are in need of replacement.

Nexus recommends replacing these variable air volume (VAV) boxes one for one with new hot water VAVs. Replacing these VAV boxes would allow them to be on direct digital controls (DDC) allowing for control on the building automation system. The existing overhead ductwork system would remain but would be modified as required to accommodate the new VAV boxes. Some of the VAV boxes in the office area were updated during the 2010 project so Nexus has budgeted for the replacement of twenty-five (25) VAV boxes.





› VENTILATION IMPROVEMENTS

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**WBHS-MS-8** Replace Trane Pneumatic Variable Air Volume (VAV) Boxes in Office Area (Qty 25)

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- Remove existing Trane Pneumatic VAV boxes, piping, and controls.
  - Provide new hot water VAV boxes.
  - Provide DDC controls, sequencing, and programming.
  - Provide all associated general construction and electrical work as required.
-

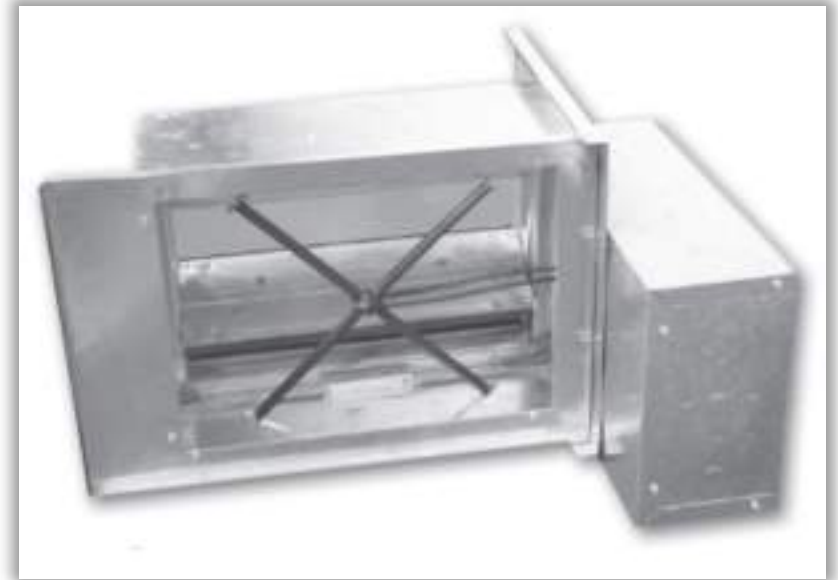


## VENTILATION IMPROVEMENTS

### Add Slip In Variable Air Volume (VAV) Boxes to AHU-4 and AHU-5

There are currently about fourteen (14) terminal hot water heating duct coils serving the building that are in good condition. These duct heating coils are being served off of air handling units AHU-4 and AHU-5. These coils provide temperature control for each space but are constant volume and the airflow doesn't vary based on space needs.

Nexus recommends leaving the coils and adding variable air volume slip in boxes. The slip in VAVs would be located in the duct upstream of each coil. The existing overhead ductwork system would remain but would be insulated to reduce noise and prevent condensation. The addition of these VAV boxes would allow the space airflow to vary based on the space conditions.





## › VENTILATION IMPROVEMENTS

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### **WBHS-MS-9** Add Slip In Variable Air Volume (VAV) Boxes to AHU-4 and AHU-5

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- Provide slip in variable air volume (VAV) boxes.
  - Insulate and reuse existing heating piping and ductwork.
  - Provide the associated general and electrical construction work.
-

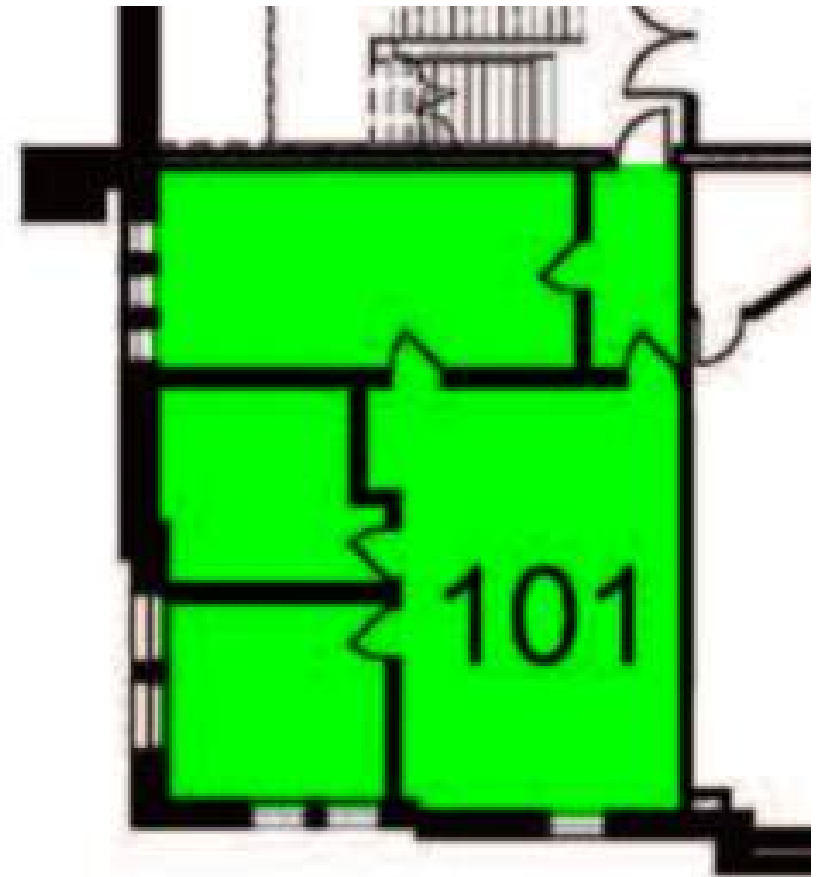


## VENTILATION IMPROVEMENTS

### Add Fan Coil Unit with AC for IT Area and Adjacent Offices

There is currently no ventilation supplying air to the IT area and adjacent offices. Without ventilation, these spaces are not designed to meet current American Society of Heating and Refrigeration Engineer's (ASHRAE) Standard 62.1-2022 Ventilation and Acceptable Indoor Air Quality. This ASHRAE standard specifies the minimum ventilation rates to provide in order to satisfy human occupants and minimize health effects.

Nexus recommends adding a new fan coil air handling unit to serve the IT area and offices. The new fan coil air handling unit would include code compliant filters, heating water coil, chilled water coil, access sections, and supply and relief fans with variable speed drives (VSD).





## › VENTILATION IMPROVEMENTS

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### **WBHS-MS-21 Add Fan Coil Unit with AC for IT Area and Adjacent Offices**

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- Provide a new fan coil air handling unit with hot water heating and chilled water cooling.
  - Provide variable speed drives for the supply and relief fans.
  - Provide DDC controls, sequencing, and programming.
  - Provide all associated general construction and electrical work as required.
-



## VENTILATION IMPROVEMENTS

### Add New Cooling and Hot Water Coils to HV-1

The existing wrestling and storage room on the lower level are currently being served by a 1991 air handling unit HV-1. This unit has been well maintained by the school but utilizes steam heating and has no means of cooling.

The lack of dehumidification results in higher humidity levels and occupant discomfort in the spaces being served. It also makes these spaces unable to meet the American Society of Heating and Refrigeration Engineer's (ASHRAE) Thermal Environmental Conditions for Human Occupancy Standard 55-2020. This ASHRAE design standard specifies the combinations of personal and indoor thermal environmental requirements necessary to achieve an occupant comfort satisfaction rate of 80% or greater. These indoor environmental requirements include temperature, thermal radiation, humidity, and air speed.

Nexus recommends replacing the existing steam heating coil with a new hot water coil. This improvement would only be applicable if the steam to hot water conversion is accepted. Nexus also recommends adding a new chilled water-cooling coil to the existing air handling unit. Hot water and chilled water piping would be extended to the new air handling unit as required for dehumidification of the code required ventilation air. Variable speed drives (VSDs) would also be added to HV-1. Variable speed drives give the air handling unit the ability to ramp the air up or down to satisfy the required cooling/heating load which in turn results in considerable energy savings





› VENTILATION IMPROVEMENTS

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**WBHS-MS-22 Add New Cooling and Hot Water Coils to HV-1**

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- Remove existing steam coil, piping, and controls.
  - Provide new chilled water cooling and hot water heating coils.
  - Provide new chilled water and heating water piping as required.
  - Provide variable speed drives for the supply and relief fans.
  - Provide DDC controls, sequencing, and programming.
  - Provide all associated general construction and electrical work as required.
-

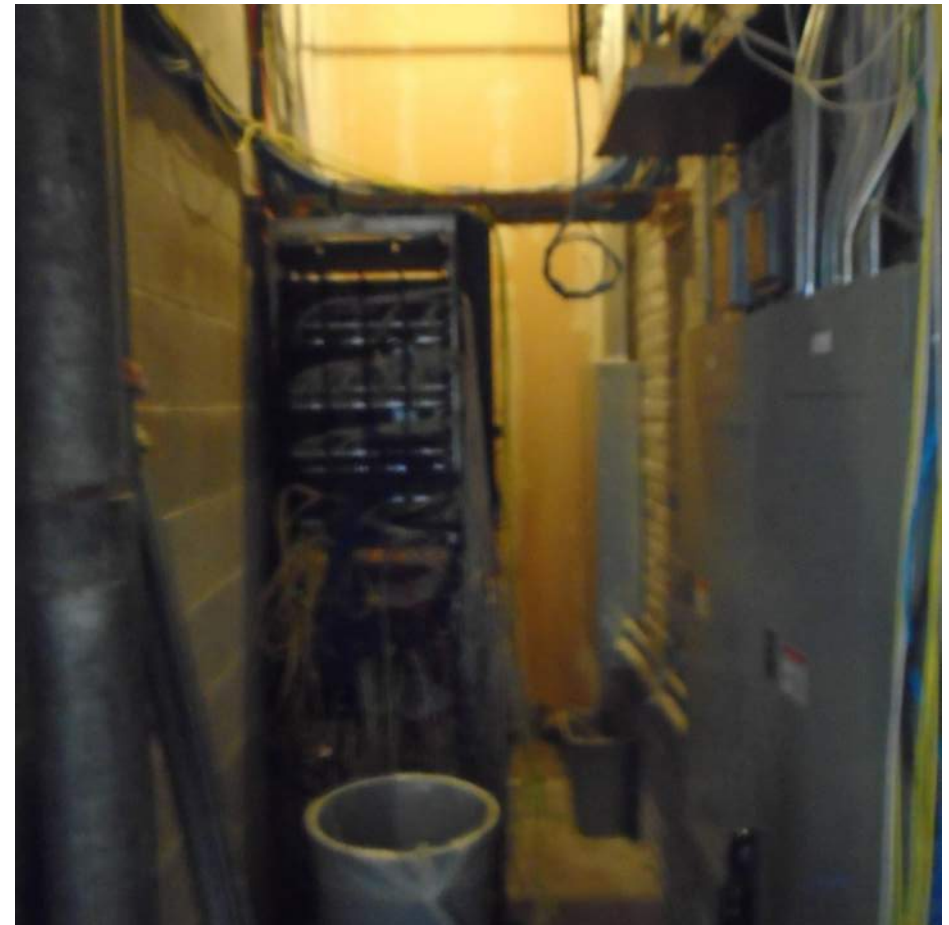


## IT COOLING SYSTEM UPGRADES

### Add DX Split Systems to IT Rooms (Qty 3)

The existing IT room has no means of cooling which means the space is not capable of proper temperature control resulting in the risk of IT equipment failure.

Nexus recommends adding a new DX split system cooling units to these spaces to alleviate overheating and operational concerns in this critical space.





› IT COOLING SYSTEM UPGRADES

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**WBHS-MS-24 Add DX Split System to IT Rooms (Qty 3)**

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- Provide a new split system cooling unit appropriately sized to cool the IT room during all times of the year.
  - Provide associated electrical and general construction work.
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## EXHAUST IMPROVEMENTS

### Replace Exhaust Fans (Qty 30)

There are exhaust fans serving the High School that have exceeded their recommended service life and are in need of replacement.

Nexus recommends replacing some of these fans when major work is taking place so the best pricing can be obtained from the contractors. Nexus has budgeted for the replacement of thirty (30) existing exhaust fans for the school. Nexus will work along with the district on the priority of which ones want to be replaced.

Fans will be a direct replacement to the original size/capacity but will have premium efficiency motors installed to increase energy savings. The fan size/capacity may be reduced if engineering can justify where over ventilation is occurring.





› EXHAUST IMPROVEMENTS

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**WBHS-MS-25** Replace Exhaust Fans (Qty 30)

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- Remove existing exhaust fans and replace them with new fans.
  - Provide all roof and sealing work as required.
  - Provide all associated controls and electrical work.
-

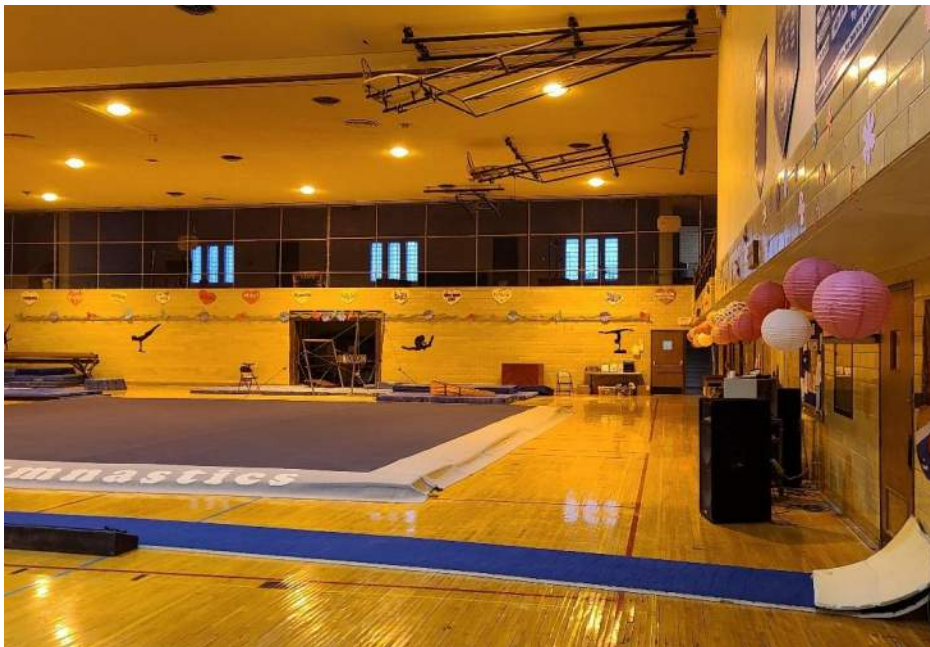


## VENTILATION IMPROVEMENTS

### Add Thermal Equalizers (Qty 14) to Memorial Gym and Fieldhouse

The Memorial Gym and Fieldhouse currently suffer from temperature stratification due to the height of this space. Warmer air migrates to the ceiling making it difficult to achieve proper temperature control, especially in winter.

Nexus recommends the installation of thermal equalizer destratification fans in the elementary school gym to ensure proper ventilation.





› VENTILATION IMPROVEMENTS

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**WBHS-MS-25 Add Thermal Equalizers (Qty 14) to Memorial Gym and Fieldhouse**

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- Install thermal equalizers in the Memorial Gym and Fieldhouse.
  - Wire thermal equalizers to wall switch/controls.
  - Provide all associated controls and electrical work.
-



## PLUMBING IMPROVEMENTS

### Drinking Fountain Replacement (Qty 20 Sets)

There are several drinking fountains located in the High School that are dated and in need of replacement. In addition to being unsightly, these water coolers are noisier and are less energy efficient than a self-contained electric water cooler.

Nexus recommends a self-contained electric water cooler with a bottle filler be installed, which allows for easier filling of reusable bottles and tracks usage for the school district to monitor its environmental impact on the community. Nexus has budgeted for the replacement of twenty (20) sets of drinking fountains for the school. Nexus will work along with the district on the priority of which ones want to be replaced.





› PLUMBING IMPROVEMENTS

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**WBHS-MS-26 Drinking Fountain Replacement (Qty 20 Sets)**

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- Remove existing drinking fountains.
  - Install new electric water coolers and reconnect plumbing piping as required.
  - Provide all associated electrical and general construction work.
-

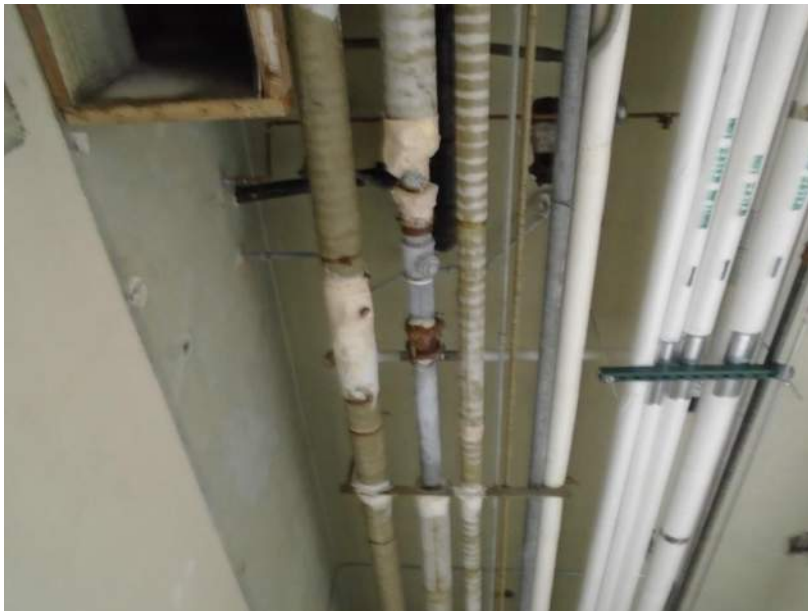


## PLUMBING IMPROVEMENTS

### Replace Galvanized Domestic Water Piping

There are areas of the High School (except 2011 addition) that are still piped with galvanized steel domestic water piping. There is potential for entrainment of iron and lead into the potable water, as the soldered fittings and piping break down over time.

Nexus recommends the replacement of the galvanized domestic water piping with insulated copper piping to eliminate the potential for elevated lead and galvanized contaminants in the water supply.





› PLUMBING IMPROVEMENTS

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**WBHS-MS-27 Replacement of Galvanized Domestic Water Piping**

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- Remove existing galvanized domestic water piping and components in building.
  - Install new insulated copper domestic water piping.
-



## HVAC RETRO-COMMISSIONING

### Retro-Commission HVAC Equipment

Building retro-commissioning is a systematic process that ensures all buildings perform as efficiently as possible according to the owner's operational needs as well as adjustment of HVAC equipment's operational parameters to meet current space use.

The Building Automation System (BAS) plays a crucial role in providing a comfortable, energy-efficient environment for students, parents, and staff. Over time, damper and valve controls have gone out of proper adjustment, components fail, and controls sequences are modified and may not be programmed to provide an optimal balance between comfort, indoor air quality, and energy efficiency.

This Nexus Retro-commissioning Team will identify the root cause of HVAC equipment operational issues and will provide adjustments to the sequences and outdoor air setting to improve occupant comfort while reducing energy consumption where possible. The retro-commissioning process will also identify components that require adjustment or replacement.

### Retro-commissioning activities include:

**HVAC Equipment:** Nexus will verify existing HVAC equipment operation and control sequences through observation. We will provide adjustment and tuning services to achieve optimal operation and improved occupant comfort. Documentation of the findings with corrections and recommendations for further improvements will be made.

### Services include:

- Ventilation study to assure all spaces are ventilated per the current code requirements and the outdoor air setpoints will be adjusted up or down based on current space occupancy
- Test point commands vs actual controller output at each device for heating, cooling, and mixed-air control
- Verify valve/damper operation on reheat coils and air handler coils
- Verify indicated vs actual (duct static, supply and return temperatures)
- Verify mixed-air operation (damper position and economizer operation)





**Valves and Dampers:** Nexus will test all existing rooftop (RTU) and indoor air handling unit (AHU) sequences along with the valve and damper operation to ensure control actuators are fully operational. We observe valve/damper/actuator operation and check for any physical signs of valve/damper leakage or binding, which results in operational issues and increased energy consumption. We check discharge temperature with valves in the fully open and closed positions. In addition, we will provide unit pricing to replace any defective valves and/or actuators. Proper RTU and AHU operation provides improved occupant comfort at optimal energy efficiency.

**Zone Reheat Valves:** Nexus will test existing zone reheat valves for proper operation. We ensure command valves fully open and close and observe valve/actuator operation. We inspect valves for any physical signs of valve leakage or binding, check discharge temperature with valve in the fully open and closed positions and provide unit pricing to replace any defective valves and/or actuators.

**Economizer:** Nexus will update the control sequence for mixed-air dampers to their setpoints with economizer lockout setpoints.

**Heating Water Pump Variable Speed Drives (VSDs):** Nexus will lower the pressure setpoint to allow drives to modulate down to the slowest speed required to satisfy the most critical room temperature sensor.

**Boilers:** Nexus will optimize sequencing and staging of equipment and adjust the water reset schedules based on outside air temperature.

The action steps noted above are part of the Nexus retro-commissioning process. The benefits of this process include improved temperature control and occupant comfort, reduced energy consumption, reduced maintenance, and extended HVAC equipment life.





› HVAC RETRO-COMMISSIONING

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**WBHS-MS-28** Retro-Commission HVAC Equipment

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- Provide retro-commissioning of all existing HVAC systems.
  - Provide adjustments to existing sequences to improve HVAC system operation.
  - Verify operation of all dampers, actuators, valves, and terminal HVAC devices.
-

# Whitefish Bay School District Project Selection Worksheet

Project Selection Worksheet			
Selected (X)	FIM #	Facility Improvement Measure (FIM) Description	Total Project Budget
<b>Whitefish Bay School District - Mechanical Systems</b>			
<b>Lydell Community Center</b>			
X	LCC-1	Replace remaining pneumatic and proprietary DDC controls components with Niagara Tridium platform compatible DDC controls systems.	\$196,900
X	LCC-2	Replace existing single boiler with two (2) high efficiency condensing boilers for redundancy. Add glycol for the entire heating system. Add side stream filter and glycol fill system.	\$475,100
X	LCC-3	Replace cabinet and suspended unit heaters as well as convectors (Qty 20).	\$160,400
X	LCC-4	Replace 1957 gym air handling unit and add DX Cooling.	\$157,800
X	LCC-5	Add DX cooling to existing 2021 unit ventilators (Qty 13) with shared condensing units.	\$451,900
X	LCC-6	Add fan coil to office to provide code required ventilation and DX cooling.	\$199,200
X	LCC-7	Add DX split system cooling to IT room.	\$21,200
X	LCC-8	Replace exhaust fans (Qty 8).	\$75,800
X	LCC-9	Replace 2010 atmospheric water heater with one (1) sealed combustion ultra high efficiency water heater.	\$33,800
X	LCC-10	Replace remaining galvanized domestic water piping.	\$584,700
X	LCC-11	Retro-Commission HVAC systems.	\$16,400
<b>Lydell Community Center Subtotal</b>			<b>\$2,373,200</b>
<b>Cumberland Elementary</b>			
X	CES-1	Replace remaining pneumatic and proprietary DDC controls components with Niagara Tridium platform compatible DDC controls systems.	\$756,500
X	CES-2	Add a high efficiency condensing boiler for spring, fall, and summer use. Add glycol for the entire heating system. Add side stream filter and glycol fill system.	\$364,400
X	CES-3	Replace cabinet and suspended unit heaters (Qty 7).	\$58,900
X	CES-4	Replace 1957 gym air handling units (Qty 2) and add DX Cooling.	\$281,500
	CES-5a	Replace 1991 large built up classroom air handling unit.	\$1,033,500
X	CES-5b	Add DX cooling to exiting 1991 large built up classroom air handling unit.	\$756,600
X	CES-6	Replace 1991 office air handling unit and associated DX condensing unit.	\$182,000
X	CES-7	Add DX cooling to existing 2021 unit ventilators (Qty 6) with shared condensing units.	\$224,000
X	CES-8	Add slip in style VAV boxes (Qty 51) to existing ductwork for classroom air handling unit. Provide ten (10) additional zones.	\$584,400
X	CES-9	Add DX split system cooling to IT room.	\$21,200
X	CES-10	Replace 1991 exhaust fans (Qty 3) and add thermal equalizers (Qty 4) to gym.	\$38,100
X	CES-11	Replace remaining galvanized domestic water piping.	\$675,800
X	CES-12	Retro-Commission HVAC systems.	\$60,900
<b>Cumberland Elementary Subtotal</b>			<b>\$4,004,300</b>

# Whitefish Bay School District Project Selection Worksheet

Project Selection Worksheet			
Selected (X)	FIM #	Facility Improvement Measure (FIM) Description	Total Project Budget
<b>Richards Elementary</b>			
X	RES-1	Replace remaining pneumatic and proprietary DDC controls components with Niagara Tridium platform compatible DDC controls systems.	\$663,000
X	RES-2	Add a high efficiency condensing boiler for spring, fall, and summer use. Add glycol for the entire heating system. Add side stream filter and glycol fill system.	\$364,400
X	RES-3	Replace cabinet and suspended unit heaters (Qty 9).	\$75,800
X	RES-4	Replace 1957 gym air handling units (Qty 2) and add DX cooling.	\$322,700
	RES-5a	Replace 1991 large built up classroom air handling unit.	\$1,054,700
X	RES-5b	Add DX cooling to exiting 1991 large built up classroom air handling unit.	\$767,200
X	RES-6	Replace 1991 office air handling unit and associated DX condensing unit.	\$171,200
X	RES-7	Add DX cooling to existing 2021 unit ventilators (Qty 6) with shared condensing units.	\$224,000
X	RES-8	Add slip in style VAV boxes (Qty 54) to existing ductwork for classroom air handling unit. Provide ten (10) additional zones.	\$608,200
X	RES-9	Add DX split system cooling to IT room.	\$21,200
X	RES-10	Replace 1991 exhaust fans (Qty 3) and add thermal equalizers (Qty 4) to gym.	\$38,100
X	RES-11	Replace remaining galvanized domestic water piping.	\$596,300
X	RES-12	Retro-Commission HVAC systems.	\$55,000
<b>Richards Elementary Subtotal</b>			<b>\$3,907,100</b>

# Whitefish Bay School District Project Selection Worksheet

Project Selection Worksheet			
Selected (X)	FIM #	Facility Improvement Measure (FIM) Description	Total Project Budget
<b>Middle School</b>			
X	MS-1	Replace remaining pneumatic and proprietary DDC controls components with Niagara Tridium platform compatible DDC controls systems.	\$560,500
X	MS-2	Replace five (5) 1995 existing atmospheric boilers with three (3) high efficiency sealed combustion boilers. Add glycol for the entire heating system. Add side stream filter and glycol fill system.	\$905,700
X	MS-3	Replace 1966 water cooled chiller and associated chilled water pumping system with an air cooled chiller.	\$995,100
X	MS-4	Replace 1996 classroom air handling unit (HV-1) and associated condensing unit. Convert new air handling unit to chilled water cooling.	\$532,800
X	MS-5	Replace classroom unit ventilators (Qty 16) serving choir, band, 1st and 2nd floor classrooms, and lower level classrooms with central systems with cooling.	\$1,941,000
X	MS-6	Replace shop classroom unit ventilators with air handling unit and add chilled water cooling. Replace dust collector and associated dust collection ductwork.	\$483,300
X	MS-7	Replace 1996 office air handling unit (AC-1) and associated condensing unit. Convert new air handling unit to chilled water cooling.	\$233,900
X	MS-8	Replace 1990 gym air handling unit and add chilled water cooling.	\$298,800
X	MS-9	Replace 1996 gym air handling unit and add chilled water cooling.	\$277,600
X	MS-10	Replace 1996 art room classroom unit ventilator and fan coil with air handling unit with chilled water cooling.	\$208,700
X	MS-11	Replace 2010 orchestra fan coil and classroom unit ventilator and condensing units with air handling unit with chilled water cooling.	\$268,000
X	MS-12	Replace 1996 cafeteria classroom unit ventilators with rooftop/air handling unit with chilled water cooling.	\$395,600
X	MS-13	Add kitchen make up air unit with chilled water cooling. Replace undersized kitchen hood. Add dishwasher exhaust hood and fan.	\$346,800
X	MS-14	Add DX split system cooling to IT room.	\$21,200
X	MS-15	Replace 1995 exhaust fans (Qty 11).	\$104,300
X	MS-16	Replace 2005 atmospheric water heater with one (1) sealed combustion ultra high efficiency water heater.	\$33,800
X	MS-17	Replace remaining galvanized domestic water piping.	\$2,421,700
X	MS-18	Retro-Commission HVAC systems (does not include work done in summer 2022)	\$54,600
<b>Middle School Subtotal</b>			<b>\$10,083,400</b>

# Whitefish Bay School District Project Selection Worksheet

Project Selection Worksheet			
Selected (X)	FIM #	Facility Improvement Measure (FIM) Description	Total Project Budget
<b>High School</b>			
X	HS-1	Replace remaining pneumatic and proprietary DDC controls components with Niagara Tridium platform compatible DDC controls systems.	\$1,981,700
X	HS-2	Add air cooled chiller plants (Qty 2) and associated chilled water pumping system to serve the entire building except for the music addition which is cooled via DX cooling.	\$5,253,700
X	HS-3	Replace 1967 hot water boilers with high efficiency hot water condensing boilers.	\$1,018,300
X	HS-4a	Replace 1957 steam boilers with high efficiency hot water condensing boilers.	\$1,252,200
X	HS-4b	Convert areas served by 1957 steam boilers from steam to hot water replacing steam terminal heating devices and replacing the steam coils in air handling units AC-1 (office) and media center (re-use air handling units).	\$12,634,900
X	HS-5	Replace classroom unit ventilators (qty 68) serving the classrooms on all three floors with central systems with hot water heating and chilled water cooling.	\$5,661,700
X	HS-6	Replace 1957 air handling unit AHU-15 and AHU-16 serving rooms 204 and 210 and add cooling.	\$255,400
X	HS-7	Replace 1957 AHU-4 and AHU-5 serving 2nd floor classrooms and convert from DX cooling to chilled water.	\$415,600
X	HS-8	Replace Trane pneumatic VAV boxes (qty 25) serving office area.	\$273,400
X	HS-9	Add slip in style VAV boxes (qty 14) to existing ductwork for 2nd floor classroom air handling units AHU4 and AHU-5.	\$109,500
X	HS-10	Replace fan coils (Qty 4) serving central core spaces (133-135, 231-235, and 331-335) and add chilled water cooling.	\$690,000
X	HS-11	Replace 1967 field house air handling units (quantity 5: AHU 8-12) and associated ductwork and add chilled water cooling.	\$1,639,300
X	HS-12	Replace 1967 field house lobby and offices air handling unit AHU-7 and add chilled water cooling.	\$245,800
X	HS-13	Replace 1967 field house team room air handling units AHU-13 and AHU-14 and add chilled water cooling.	\$162,600
X	HS-14	Replace 1957 memorial gym air handling units (AHU-2 and AHU-3) and add chilled water cooling.	\$434,600
X	HS-15	Replace 1957 auxiliary pool air handling units AHU-1 and add chilled water cooling. New units and ductwork to have pool environment construction.	\$379,800
X	HS-16	Replace 1967 pool air handling units AHU-2 and AHU-3 as well as pool spectator area AHU-6 and add chilled water cooling. New units and ductwork to have pool environment construction.	\$977,900
X	HS-17	Replace 1957 auditorium air handling unit and add cooling (cooling currently not operational).	\$388,800
X	HS-18	Replace 1957 lower cafeteria air handling units CC-1 and CC-2 and add chilled water cooling.	\$336,200
X	HS-19	Replace 1957 upper cafeteria air handling unit BCU-1 and add chilled water cooling.	\$244,000
X	HS-20	Replace classroom unit ventilators in wood shop with an air handling unit with chilled water cooling.	\$253,000

# Whitefish Bay School District Project Selection Worksheet

Project Selection Worksheet			
Selected (X)	FIM #	Facility Improvement Measure (FIM) Description	Total Project Budget
X	HS-21	Add fan coil and DX cooling to IT spaces and adjacent offices (rooms 101,102, and two (2) adjacent offices).	\$233,200
X	HS-22	HV-1 (wrestling and storage): Replace steam coil with hot water coil and add chilled water coil to provide cooling (insulate supply air ductwork). Re-use the air handling unit and add VFD.	\$121,400
X	HS-23	Replace 1957 shooting range air handling unit AHU-1 (upper memorial gym) and add chilled water cooling.	\$187,400
X	HS-24	Add DX split system cooling to IT rooms (qty 3).	\$63,600
X	HS-25	Replace exhaust fans (Qty 30) and add thermal equalizers (Qty 14) to field house and memorial gyms.	\$396,600
X	HS-26	Replace drinking fountains with electric water coolers with bottler fillers (qty 20 sets).	\$208,100
X	HS-27	Replace galvanized domestic water piping in the entire building (except for the 2011 addition).	\$8,655,200
X	HS-28	Retro-Commission HVAC systems.	\$114,400
<b>High School Subtotals</b>			<b>\$44,588,300</b>
<b>Whitefish Bay School District - Mechanical Systems Deferred Maintenance Total:</b>			<b>\$64,956,300</b>

<b>Annual Allowance for Inflation at 5% per annually</b>	<b>\$ 3,247,815</b>
<b>Whitefish Bay School District - Overall Mechanical Systems Total:</b>	<b>\$ 68,204,115</b>

# LYDELL COMMUNITY CENTER

Site/Location	Item Number	Type	Capacity	Includes AC?	Area Description	Area Number (Equipment Location)	Description (area served)	Manufacturer	Model Number	Serial Number	Fan CFM/ OA/Max	Motor HP/Volts	Drive Type	VFD/ HP Rating	Controlled by	Placed in Service	Life Expectancy (years)	Life Expectancy remain (years)	Notes
Lydell	LY Compressor	Air Compressor	N/A	N/A	Boiler Room	Boiler Room 4	Pneumatics	Quincy	QC00706D00208	20030206 - 0120	N/A	2 @ 2 / 208-3	Belt	N/A	Local Control	3/1/2003			
Lydell	LY AHU4 Gym (1957)	Air Handling Unit (AHU) w/ HW Coil	324 MBH	No	Gym stage	Gym	Serves gym	Trane		Unknown	4200 / 2700	230-3	Belt	N/A	Alerton	9/1/1957	30-35	-35	
Lydell	LY AHU4 (1957)	AHU4 Relief/Exh Fan	N/A	No	Gym	Gym	Gym			Unknown	1500	3/4 / 230-1	Belt	N/A	Alerton	9/1/1957	30-35	-35	
Lydell	LY Boiler	Boilers	4113 MBH	N/A	Boiler Room	Boiler Room 4	Serves full building	Weil McClain	No. 1388	70309486	N/A	Blower Motor 240-1 Control Voltage 120-1	N/A	N/A	Tridium	9/1/1957	25-30	10-15	
Lydell	LY Pump 1	Circulating Pump		N/A	Boiler Room	Boiler Room 4	Serves full building	Taco	F12507E2EAJL0A	281819/13	N/A	5 / 230-1	Direct	N/A	Tridium	8/1/2003	20-25	1-5	
Lydell	LY Pump 2	Circulating Pump		N/A	Boiler Room	Boiler Room 4	Serves full building	Taco	F12507E2EAJL0A	281819/13	N/A	5 / 230-1	Direct	N/A	Tridium	8/1/2003	20-25	1-5	
Lydell	LY Pump 4	Circulating Pump		N/A	Boiler Room	Boiler Room 4	Floor heat	Armstrong	H-32 BF		N/A		Direct	N/A	Tridium	8/1/1999	20-25	-5	
Lydell	LY EF1	Exhaust Fan	N/A	N/A	Boys & Girls Toilets	Boys & Girls Toilets	Boys & Girls Toilets 18,20	Fantech	5DDD10A		800	1/6 / 115-1	Direct	N/A	Manual Switch	9/1/1957	30-35	-35	
Lydell	LY EF2	Exhaust Fan	N/A	N/A	Office 10 Tilt	Office 10 Tilt	Office 10 Tilt	Fantech	5DDD085A		100	1/25 / 115-1	Direct	N/A	Manual Switch	9/1/1957	30-35	-35	
Lydell	LY EF3	Exhaust Fan	N/A	N/A	Tilt 5B	Tilt 5B	Tilt 5B	Fantech	5DDD085A		100	1/25 / 115-1	Direct	N/A	Manual Switch	9/1/1957	30-35	-35	
Lydell	LY EF4	Exhaust Fan	N/A	N/A	Kindergarten 2 Tilt	Kindergarten 2 Tilt	Kindergarten 2 Tilt	Fantech	5DDD085A		100	1/25 / 115-1	Direct	N/A	Manual Switch	9/1/1957	30-35	-35	
Lydell	LY EF5	Exhaust Fan	N/A	N/A	Kindergarten 3Tilt	Kindergarten 3Tilt	Kindergarten 3Tilt	Fantech	5DDD085A		100	1/25 / 115-1	Direct	N/A	Manual Switch	9/1/1957	30-35	-35	
Lydell	LY EF6	Exhaust Fan	N/A	N/A	Office 12 Tilt	Office 12 Tilt	Office 12 Tilt	Fantech	5DDD085A		100	1/25 / 115-1	Direct	N/A	Manual Switch	9/1/1957	30-35	-35	
Lydell	LY EF7	Exhaust Fan	N/A	N/A	Tilt 13A, Storage 11	Tilt 13A, Storage 11	Tilt 13A, Storage 11	Fantech	5DDD085A		100	1/25 / 115-1	Direct	N/A	Manual Switch	9/1/1957	30-35	-35	
Lydell	LY AHU2 (1957)	AHU2 Exh Fan	N/A	No	Kitchen	Kitchen	Kitchen				1300	1/3 / 115-1	Belt	N/A	No Control	9/1/1957	30-35	20-25	Not Working
Lydell	LY UV1	Unit Vent W/ HW Coil	61.7 MBH	No	Classroom 15	Classroom 15	Classroom 15	Daiken	UAVS9V10	E032634300100	1000	1/3 / 115-1	N/A	N/A	Alerton	7/1/2021	20-25	20-25	
Lydell	LY UV2	Unit Vent W/ HW Coil	61.7 MBH	No	Classroom 17	Classroom 17	Classroom 17	Daiken	UAVS9V10	E032634300100	1000	1/3 / 115-1	N/A	N/A	Alerton	7/1/2021	20-25	20-25	
Lydell	LY UV3	Unit Vent W/ HW Coil	61.7 MBH	No	Classroom 19	Classroom 19	Classroom 19	Daiken	UAVS9V10	E032634300100	1000	1/3 / 115-1	N/A	N/A	Alerton	7/1/2021	20-25	20-25	
Lydell	LY UV4	Unit Vent W/ HW Coil	61.7 MBH	No	Classroom 21	Classroom 21	Classroom 21	Daiken	UAVS9V10	E032634300100	1000	1/3 / 115-1	N/A	N/A	Alerton	7/1/2021	20-25	20-25	
Lydell	LY UV5	Unit Vent W/ HW Coil	61.7 MBH	No	Classroom 23	Classroom 23	Classroom 23	Daiken	UAVS9V10	E032634300100	1000	1/3 / 115-1	N/A	N/A	Alerton	7/1/2021	20-25	20-25	
Lydell	LY UV6	Unit Vent W/ HW Coil	61.7 MBH	No	Classroom 25	Classroom 25	Classroom 25	Daiken	UAVS9V10	E032634300100	1000	1/3 / 115-1	N/A	N/A	Alerton	7/1/2021	20-25	20-25	
Lydell	LY UV7	Unit Vent W/ HW Coil	61.7 MBH	No	Classroom 22	Classroom 22	Classroom 22	Daiken	UAVS9V10	E032634300100	1000	1/3 / 115-1	N/A	N/A	Alerton	7/1/2021	20-25	20-25	
Lydell	LY UV8	Unit Vent W/ HW Coil	61.7 MBH	No	Classroom 24	Classroom 24	Classroom 24	Daiken	UAVS9V10	E032634300100	1000	1/3 / 115-1	N/A	N/A	Alerton	7/1/2021	20-25	20-25	
Lydell	LY UV9	Unit Vent W/ HW Coil	61.7 MBH	No	Classroom 26	Classroom 26	Classroom 26	Daiken	UAVS9V10	E032634300100	1000	1/3 / 115-1	N/A	N/A	Alerton	7/1/2021	20-25	20-25	
Lydell	LY UV10	Unit Vent W/ HW Coil	61.7 MBH	No	Classroom 28	Classroom 28	Classroom 28	Daiken	UAVS9V10	E032634300100	1000	1/3 / 115-1	N/A	N/A	Alerton	7/1/2021	20-25	20-25	
Lydell	LY UV11	Unit Vent W/ HW Coil	42.8 MBH	No	Classroom 2	Classroom 2	Classroom 2	Daiken	UAHF9V10		1000	1/3 / 115-1	N/A	N/A	Alerton	7/1/2021	20-25	20-25	
Lydell	LY UV12	Unit Vent W/ HW Coil	42.8 MBH	No	Classroom 3	Classroom 3	Classroom 3	Daiken	UAHF9V10		1000	1/3 / 115-1	N/A	N/A	Alerton	7/1/2021	20-25	20-25	
Lydell	LY FCU-1	Cabinet Unit Heater W/ HW Coil	56.0 MBH	No	Office 30	Office 30	Office 30	Daiken	FHVC112		1250	1/4 115-1	N/A	N/A	Alerton	7/1/2021	20-25	20-25	
Lydell	LY UV-1 (1957)	Unit Vent W/ HW Coil	15.0 MBH	No	Office 9	Office 9	Office 9	Trane	11	J-91756	200	1/40 / 115-1	N/A	N/A	Pneumatic	9/1/1957	30-35	-35	
Lydell	LY CH (1957)	Cabinet Heaters	N/A	N/A	1957 Vestibules	1957 Vestibules	1957 (Qty of 3)	Trane			N/A	N/A	N/A	N/A	Pneumatic	9/1/1957	30-35	-35	
Lydell	LY UH-1 (1957)	Suspended Unit Heater	26.7 MBH	N/A	Receiving 6	Receiving 6	Receiving 6	Trane	No 72 H		500	1/30 / 110-1	N/A	N/A	Pneumatic	9/1/1957	30-35	-35	
Lydell	LY FTR (1957)	Fin Tube (60 LF)	950 BTU/LF	N/A	Corridor 02	Corridor 02	Corridor 02				N/A	N/A	N/A	N/A	Pneumatic	9/1/1957	30-35	-35	
Lydell	LY DHWH	Water Heater	100 Gal	N/A	Boiler Room	4	Domestic Hot Water	AO Smith	BTR 197 118	1014M001212	N/A	115-1	N/A	N/A	Local Control	9/1/2010	10-15	5-10	
Lydell	LY Pump 3	Domestic Water Pump	N/A	N/A	Boiler Room	4	LY full building	B & G	PL-30B	1BL013LF K01	N/A	115-1	N/A	N/A	Local Control	Unknown	20-25		



# CUMBERLAND ELEMENTARY SCHOOL CONTINUED

Cumberland	CU UH (2022)	Suspended Unit Heater	N/A	N/A	Mech Tower	C300	Mech Tower (Qty of 1)	N/A			N/A	N/A	N/A	N/A	Varies	12/1/2022	25-30	25-30	
Cumberland	CU UH (2011)	Suspended Unit Heater	N/A	N/A	2011 Addition	2011 Addition	2011 Addition (Qty of 2)	N/A			N/A	N/A	N/A	N/A	Varies	9/1/2011	25-30	10-15	
Cumberland	CU UH (1991)	Suspended Unit Heater	N/A	N/A	1991 Remodel	1991 Remodel	1991 Remodel (Qty of 2)	N/A			N/A	N/A	N/A	N/A	Varies	9/1/1991	25-30	-2	
Cumberland	CU UH (1957)	Suspended Unit Heater	N/A	N/A	1957	1957	1957 (Qty of 2)	N/A			N/A	N/A	N/A	N/A	Varies	9/1/1957	30-35	-35	
Cumberland	RI FTR (2011)	Fin Tube	N/A	N/A	2011 Addition	Varies	2011 Addition (Qty of 6)	Ritting			N/A	N/A	N/A	N/A	Varies	9/1/2011	25-30	10-15	
Cumberland	RI FTR (1991)	Fin Tube	N/A	N/A	1991 Remodel	Varies	1991 Remodel (Qty of 130)				N/A	N/A	N/A	N/A	Varies	9/1/1991	25-30	-2	
Cumberland	RI FTR (1957)	Fin Tube	N/A	N/A	1957	1957	1957 (Qty of 20)				N/A	N/A	N/A	N/A	Varies	9/1/1991	25-30	-2	
Cumberland	CU DHWH 2	Water Heater	50 Gallon	N/A	Mechanical Room	2011 addition - 222	Cafeteria domestic hot water heater	Bradford White	MII5093SF08	GL14171682 D/N	N/A	N/A	N/A	N/A	Local Control	10/3/2011	10-15	1-5	
Cumberland	CU DWP-2	Domestic Water Pump		N/A	Mechanical Room	2011 addition - 222	Cafeteria domestic hot water heater	Bell & Gossett	PL-30B	1BL013LF	N/A	1/12 / 115-1	N/A	N/A	Local Control	9/1/2011	20-25	5-10	
Cumberland	CU DHWH 1	Water Heater	100 Gallon	N/A	Boiler Room	11	Main building domestic hot water heater	AO Smith	BT-100 400	1914114367707	N/A	N/A	N/A	N/A	Local Control	10/22/2019	10-15	5-10	
Cumberland	CU DWP-1	Domestic Water Pump		N/A	Boiler Room	11	Main building domestic hot water heater	Bell & Gossett	NBF-12F/LW		N/A	55 Watts / 115-1	N/A	N/A	Local Control	10/22/2019	20-25	5-10	



## RICHARDS ELEMENTARY SCHOOL CONTINUED

Richards	RI CE-7 (1991)	Ceiling Exhaust	N/A	N/A	N/A	Jan 27A	Jan 27A	Cook			250 CFM	165 Watts/120-1	Direct	N/A	Manual Switch	9/1/1957	30-35	-35	
Richards	RI EX-1 (1957)	Utility Exhaust	N/A	N/A	Northeast Gym Mech Rm	Northeast Gym Mech Rm	Multipurpose West	Trane	1303FC4819	RR5285			Belt	N/A		9/1/1957	30-35	-35	
Richards	RI CH (2011)	Cabinet Heaters	N/A	N/A	2011 Addition	2011 Addition	2011 Addition (Qty of 4)	N/A			N/A	N/A	N/A	N/A	Varies	9/1/2011	25-30	10-15	
Richards	RI CH (1991)	Cabinet Heaters	N/A	N/A	1991 Remodel	1991 Remodel	1991 Remodel (Qty of 9)	N/A			N/A	N/A	N/A	N/A	Varies	9/1/1991	25-30	-2	
Richards	RI CH (1957)	Cabinet Heaters	N/A	N/A	1957	1957	1957 (Qty of 2)	N/A			N/A	N/A	N/A	N/A	Varies	9/1/1957	30-35	-35	
Richards	RI UH (2022)	Suspended Unit Heater	N/A	N/A	Mech Tower	C300	Mech Tower (Qty of 1)	N/A			N/A	N/A	N/A	N/A	Varies	12/1/2022	25-30	25-30	
Richards	RI UH (2011)	Suspended Unit Heater	N/A	N/A	2011 Addition	2011 Addition	2011 Addition (Qty of 2)	N/A			N/A	N/A	N/A	N/A	Varies	9/1/2011	25-30	10-15	
Richards	RI UH (1991)	Suspended Unit Heater	N/A	N/A	1991 Remodel	1991 Remodel	1991 Remodel (Qty of 5)	N/A			N/A	N/A	N/A	N/A	Varies	9/1/1991	25-30	-2	
Richards	RI UH (1957)	Suspended Unit Heater	N/A	N/A	1957	1957	1957 (Qty of 2)	N/A			N/A	N/A	N/A	N/A	Varies	9/1/1957	30-35	-35	
Richards	RI FTR (2011)	Fin Tube	N/A	N/A	2011 Addition	Varies	2011 Addition (Qty of 6)	N/A			N/A	N/A	N/A	N/A	Varies	9/1/2011	25-30	10-15	
Richards	RI FTR (1991)	Fin Tube	N/A	N/A	1991 Remodel	Varies	1991 Remodel (Qty of 123)				N/A	N/A	N/A	N/A	Varies	9/1/1991	25-30	-2	
Richards	RI FTR (1957)	Fin Tube	N/A	N/A	1957	1957	1957 (Qty of 15)				N/A	N/A	N/A	N/A	Varies	9/1/1957	25-30	-2	
Richards	RI DHWH 2	Water Heater	N/A	N/A	Mechanical Room	2011 addition - 224	Cafeteria domestic hot water heater	Bradford White	MI15093SF08	GL14171682 D/N	N/A	N/A	N/A	N/A	Local Control	10/3/2011	10-15	1-5	
Richards	RI DWP-2	Domestic Water Pump		N/A	Mechanical Room	2011 addition - 224	Cafeteria domestic hot water heater	Bell & Gossett	PL-30B	1BL013LF	N/A	1/12 / 115-1	N/A	N/A	Local Control	9/1/2011	20-25	5-10	
Richards	RI DHWH 1	Water Heater	100 Gallon	N/A	Boiler Room	11	Main building domestic hot water heater	AO Smith	BT-100 400	1914114367707	N/A	N/A	N/A	N/A	Local Control	10/22/2019	10-15	5-10	
Richards	RI DWP-1	Domestic Water Pump		N/A	Boiler Room	11	Main building domestic hot water heater	Armstrong	Astro -30B	101 031630	N/A	80 Watts / 115-1	N/A	N/A	Local Control	10/22/2019	20-25	5-10	

# WHITEFISH BAY MIDDLE SCHOOL

Site/Location	Item Number	Type	Capacity	Includes AC?	Area Description	Area Number (Equipment Location)	Description (area served)	Manufacturer	Model Number	Serial Number	Fan CFM/ OA/Max	Motor HP/Volts	Drive Type	VFD/ HP Rating	Controlled by	Placed In Service	Life Expectancy (years)	Life Expectancy remain (years)	Notes
Middle School	MS Compressor	Air Compressor		N/A	Boiler Room	Boiler Room	MS pneumatics	Quincy	QTS5CCDT00096	20071219-0165	N/A	2 @ 2 / 200-3	Belt	N/A	Local Control	9/1/2011	25-30	15-20	
Middle School	MS F-1 (2013)	Furnace w/ DX Coil	N/A	Yes - Cond-1	Guidance 1st Floor	Work Rm 104E	Guidance 1st Floor	Trane	TAM4A0C48S\$1SCA	132358P52V	400/40	1/2 / 208-1	N/A	N/A	Trane	9/1/2013	30-35	25-30	
Middle School	MS Cond-1 (2013)	DX Condensing unit R410A	4.0 Tons	N/A	Roof	Roof	Guidance 1st Floor	Trane	4TTB4048E1000AB	12013TUE2F	N/A	208-1	N/A	N/A	Trane	9/1/2013	25-30	15-20	
Middle School	MS FC-1 (2011)	Fan Coil Unit w/ HW Coil & DX Coil		Yes - CCU-2	2nd Floor	Orchestra Office 125A	Orchestra Office 125A	Trane	BCHC018A1E0A22A1G	T11C11261			Belt	N/A	Trane	9/1/1996	30-35	5-10	
Middle School	MS CCU-2 (2011)	DX Condensing unit R410A	3.5 Tons	N/A	Roof	Roof	Orchestra Office 125A	Trane	4TTB3018D1000AA	1043RBM3F	N/A	208-1	N/A	N/A	Trane	9/1/2011	25-30	15-20	
Middle School	MS FC-2 (2011)	Fan Coil Unit w/ HW Coil & DX Coil	29.0 MBH	Yes - Cond-1	2nd Floor	Work Rm 231	Work Rm 231	Goodman	ARI B-1	304413837	400/40	1/5 / 208/240-1	Belt	N/A	Trane	9/1/1996	30-35	5-10	
Middle School	MS Cond-1 (2011)	DX Condensing unit R22	1.5 Tons	N/A	Roof	Roof	Work Rm 231	Goodman	CKL18-1C	305470916	N/A	208-1	N/A	N/A	Trane	9/1/2012	25-30	15-20	
Middle School	MS HV-1 (1996)	Air Handling Unit w/ HW Coil	3560 MBH	Yes - ACCU-1	Penthouse (1996)	Penthouse (1996)	Classrooms	Trane	MCCA066HBC0A0B0AA00	K95L88826	33000/10550	25 / 208/240-3	Belt	ABB- 25 HP	Trane	9/1/1996	30-35	5-10	
Middle School	MS CF-1 (1996)	Return Fan HV-1	N/A	N/A	Penthouse (1996)	Penthouse (1996)	Classrooms	Trane	MCAA006GALOABA000	K95L89322	33000	15 / 208/240-3	Belt	ABB- 15 HP	Trane	9/1/1996	30-35	5-10	
Middle School	MS ACCU-1 (2021)	DX Condensing unit for HV-1, R410A	100 Tons	N/A	Roof	Roof	Classrooms	Trane	RAUJD10EBE0320D0010	C21D02834	N/A	208-3	N/A	N/A	Trane	9/1/2021	25-30	25-30	
Middle School	MS HV-2 (1996)	Air Handling Unit w/ HW Coil	1620 MBH	No	Computer Rm 221	Attic above Computer Rm 221	Old Gym	Trane	MCCA012GALOABA000	K95L86447	6150/1540	7.5 / 208/240-3	Belt	N/A	Trane	9/1/1996	30-35	5-10	
Middle School	MS AC-1 (1996)	Air Handling Unit (AHU) No Heat & DX Coil	N/A	Yes - CCU-1	1st Floor	PE Storage 102A	First Floor Office Suite	Trane	MCAA006GALOABA000	K95L86212	2350/270	5 / 208/240-3	N/A	N/A	Trane	9/1/1996	30-35	5-10	
Middle School	MS CCU-1 (1996)	DX Condensing unit (AC) R22	7.5 Tons	N/A	Roof	Roof	First Floor Office Suite	Trane	TTA090A300CB	K4643CMAH	N/A	208-3	N/A	N/A	Trane	9/1/1996	25-30	1-5	
Middle School	MS HV-1 (1996)	Air Handling Unit w/ DX Coil	7.5 Tons	Yes	Computer Rm 221	Attic above Computer Rm 221	Computer Rm 221, Classroom 121	Carrier	39LB1081AA5021-R	2491T17554			Belt	N/A	Trane	9/1/1996	30-35	5-10	
Middle School	MS CCU-1 (1996)	DX Condensing unit (AC) R22	7.5 Tons	N/A	Roof	Roof	Computer Rm 221, Classroom 121												
Middle School	MS FC-3 (1993)	Fan Coil Unit w/ Elec Coil & DX Coil		Yes - Cond-3	2nd Floor	Computer Lab 201A	Computer Lab 201A	Trane	THE060A100BA	H28177472	400/40	3/4 / 208-1	N/A	N/A	Trane	9/1/1996	30-35	5-10	
Middle School	MS Cond-3 (1993)	DX Condensing unit R22	5 Tons	N/A	Roof	Roof	Computer Lab 201A	Goodman	CK60-1	108466041	N/A	208-1	N/A	N/A	Trane	9/1/1993	25-30	1-5	
Middle School	MS HV-1 (1989)	Air Handling Unit w/ HW Coil	182.0 MBH	No	Penthouse (1989)	Penthouse (1989)	New Gym	Trane	CCDB12ANOJ	KE9D12429	6000/2120	3 / 230-3	Belt	N/A	Trane	9/1/1989	30-35	1-5	
Middle School	RI AHU-1 VAV's (2022)	Slip InVAV	N/A	Yes	Classrooms	Classrooms	Classrooms (Qty of 35)	Nailor	D30RW	N/A	N/A	N/A	N/A	N/A	Trane	9/1/2022	20-25	20-25	
Middle School	RI AHU-1 VAV's (2022)	Vav w/ HW Coil	N/A	Yes	Classrooms	Classrooms	Classrooms (Qty of 7)	Nailor	D30RW	N/A	N/A	N/A	N/A	N/A	Trane	9/1/2022	20-25	20-25	
Middle School	MS UV-103	Unit Vent W/ HW Coil	N/A	N/A	1st Floor	Fitness Center 103	Fitness Center 103	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Trane	9/1/1966	20-25	-25	
Middle School	MS UV-103A	Unit Vent W/ HW Coil	N/A	N/A	1st Floor	Classroom 103A	Classroom 103A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Trane	9/1/1966	20-25	-25	
Middle School	MS UV-105	Unit Vent W/ HW Coil	N/A	N/A	1st Floor	Classroom 105	Classroom 105	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Trane	9/1/1966	20-25	-25	
Middle School	MS UV-125	Unit Vent W/ HW Coil	68.3 MBH	N/A	1st Floor	Orchestra 125	Orchestra 125	N/A	N/A	N/A	1250 / 225	1/2 / 120/1	N/A	N/A	Trane	9/1/2010	25-30	15-20	
Middle School	MS UV-126N	Unit Vent W/ HW Coil	28.4 MBH	N/A	1st Floor	Band 126	Band 126	Trane	N/A	N/A	1000 / 200	1/6 / 120/1	N/A	N/A	Trane	9/1/1996	20-25	-3	
Middle School	MS UV-126S	Unit Vent W/ HW Coil	28.4 MBH	N/A	1st Floor	Band 126	Band 126	Trane	N/A	N/A	1000 / 200	1/6 / 120/1	N/A	N/A	Trane	9/1/1996	20-25	-3	
Middle School	MS UV-19	Unit Vent W/ HW Coil	N/A	N/A	Lower Level	Design & Construction 19	Design & Construction 19	Dakin	UAHF	E025093100100	N/A	1/3 / 120/1	N/A	N/A	Trane	9/1/2016	20-25	15-20	
Middle School	MS UV-19A	Unit Vent W/ HW Coil	N/A	N/A	Lower Level	Design & Construction 19	Design & Construction 19	Dakin	UAHF	E025093100200	N/A	1/3 / 120/1	N/A	N/A	Trane	9/1/2016	20-25	15-20	
Middle School	MS UV-1C	Unit Vent W/ HW Coil	58.1	N/A	Lower Level	Cafeteria 1	Cafeteria 1	Trane	N/A	N/A	1250 / 440	1/4 / 120/1	N/A	N/A	Trane	9/1/1996	20-25	-3	
Middle School	MS UV-1N	Unit Vent W/ HW Coil	58.1	N/A	Lower Level	Cafeteria 1	Cafeteria 1	Trane	N/A	N/A	1250 / 440	1/4 / 120/1	N/A	N/A	Trane	9/1/1996	20-25	-3	
Middle School	MS UV-1S	Unit Vent W/ HW Coil	58.1	N/A	Lower Level	Cafeteria 1	Cafeteria 1	Trane	N/A	N/A	1250 / 440	1/4 / 120/1	N/A	N/A	Trane	9/1/1996	20-25	-3	
Middle School	MS UV-2	Unit Vent W/ HW Coil	39.2 MBH	N/A	Lower Level	Classroom 2	Classroom 2	Trane	N/A	N/A	1500 / 300	1/6 / 120/1	N/A	N/A	Trane	9/1/1996	20-25	-3	
Middle School	MS UV-201A	Unit Vent W/ HW Coil	N/A	N/A	2nd Floor	Media Center 201A	Media Center 201A	Trane	N/A	N/A	N/A	N/A	N/A	N/A	Trane	9/1/1966	20-25	-25	
Middle School	MS UV-201B	Unit Vent W/ HW Coil	N/A	N/A	2nd Floor	Media Center 201A	Media Center 201A	Trane	N/A	N/A	N/A	N/A	N/A	N/A	Trane	9/1/1966	20-25	-25	
Middle School	MS UV-201E	Unit Vent W/ HW Coil	N/A	N/A	2nd Floor	Media Center 201A	Media Center 201A	Trane	N/A	N/A	N/A	N/A	N/A	N/A	Trane	9/1/1966	20-25	-25	
Middle School	MS UV-201S	Unit Vent W/ HW Coil	N/A	N/A	2nd Floor	Media Center 201A	Media Center 201A	Trane	N/A	N/A	N/A	N/A	N/A	N/A	Trane	9/1/1966	20-25	-25	
Middle School	MS UV-205	Unit Vent W/ HW Coil	N/A	N/A	2nd Floor	Classroom 205	Classroom 205	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Trane	9/1/1966	20-25	-25	
Middle School	MS UV-226	Unit Vent W/ HW Coil	43.8	N/A	2nd Floor	Classroom 226	Classroom 226	Trane	N/A	N/A	1000 / 200	1/6 / 120/1	N/A	N/A	Trane	9/1/1996	20-25	-3	
Middle School	MS UV-228N	Unit Vent W/ HW Coil	52.7 MBH	N/A	2nd Floor	Choir 228	Choir 228	Trane	N/A	N/A	1000 / 350	1/6 / 120/1	N/A	N/A	Trane	9/1/1996	20-25	-3	
Middle School	MS UV-228S	Unit Vent W/ HW Coil	52.7 MBH	N/A	2nd Floor	Choir 228	Choir 228	Trane	N/A	N/A	1000 / 350	1/6 / 120/1	N/A	N/A	Trane	9/1/1996	20-25	-3	
Middle School	MS UV-230	Unit Vent W/ HW Coil	N/A	N/A	2nd Floor	PT /OT 230	PT /OT 230	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Trane	9/1/1966	20-25	-25	
Middle School	MS UV-232	Unit Vent W/ HW Coil	N/A	N/A	2nd Floor	Art 232	Art 232	Trane	N/A	N/A	1500 / 300	1/4 / 120/1	N/A	N/A	Trane	9/1/1996	20-25	-3	
Middle School	MS UV-4	Unit Vent W/ HW Coil	43.8 MBH	N/A	Lower Level	Classroom 4	Classroom 4	Trane	N/A	N/A	1000 / 200	1/6 / 120/1	N/A	N/A	Trane	9/1/1996	20-25	-3	
Middle School	MS Boiler 1	Boilers	1892 MBH	N/A	Boiler Room	Boiler Room	Serves full building	Weil McClain	988			Blower Motor 208-3 Control Voltage 120-1	N/A	N/A	Trane	9/1/1996	25-30	1-5	
Middle School	MS Boiler 2	Boilers	1892 MBH	N/A	Boiler Room	Boiler Room	Serves full building	Weil McClain	988			Blower Motor 208-3 Control Voltage 120-1	N/A	N/A	Trane	9/1/1996	25-30	1-5	
Middle School	MS Boiler 3	Boilers	1892 MBH	N/A	Boiler Room	Boiler Room	Serves full building	Weil McClain	988			Blower Motor 208-3 Control Voltage 120-1	N/A	N/A	Trane	9/1/1996	25-30	1-5	
Middle School	MS Boiler 4	Boilers	1892 MBH	N/A	Boiler Room	Boiler Room	Serves full building	Weil McClain	988			Blower Motor 208-3 Control Voltage 120-1	N/A	N/A	Trane	9/1/1996	25-30	1-5	
Middle School	MS Boiler 5	Boilers	1892 MBH	N/A	Boiler Room	Boiler Room	Serves full building	Weil McClain	988			Blower Motor 208-3 Control Voltage 120-1	N/A	N/A	Trane	9/1/1996	25-30	1-5	
Middle School	MS Pump 1	Circulating Pump		N/A	Lower Level	Classroom Closet - 17A									Trane				
Middle School	MS Pump P-1 HW Circulating Pump (1989)	Circulating Pump		N/A	Classroom Closet - 17A	Classroom Closet - 17A	Classroom Unit Ventilators	Armstrong	H-68-3 BF	0901	N/A	1.5 / 208/240-3	N/A	N/A	Trane	1/18/2021	20-25	20-25	
Middle School	MS Pump P-2 HW Circulating Pump (1996)	Circulating Pump	155 GPM	N/A	Boiler Room	Boiler Room	Main Building	Taco	CE2508		N/A	5 / 208/240-3	N/A	N/A	Trane	9/1/1996	20-25	-3	
Middle School	MS Pump P-3 HW Circulating Pump (1996)	Circulating Pump	155 GPM	N/A	Boiler Room	Boiler Room	Standby P-2 (1996)	Taco	CE2508		N/A	5 / 208/240-3	N/A	N/A	Trane	9/1/1996	20-25	-3	

# WHITEFISH BAY MIDDLE SCHOOL CONTINUED

Middle School	MS Pump P-4 CW Circulating Pump (1966)	Circulating Pump	98 GPM	N/A	Chiller Room	Chiller Room	Classroom Unit Ventilators	Bell & Gossett	2-1/2A 6-3/8 BF	521719	N/A	2 / 208/240-3	N/A	N/A	Trane			
Middle School	MS Pump P-6 CW Circulating Pump (1966)	Tower Cond Pump	150 GPM	N/A	Chiller Room	Chiller Room	Tower Cond Pump	Bell & Gossett	2-1/2A 6-1/2 BF	521717	N/A	2 / 208/240-3	N/A	N/A	Trane			
Middle School	MS Pump P-7 CW Circulating Pump (1966)	Circulating Pump	98 GPM	N/A	Chiller Room	Chiller Room	Standby P-4 (1996)	Bell & Gossett	2-1/2A 6-3/8 BF	521719	N/A	2 / 208/240-3	N/A	N/A	Trane			
Middle School	MS Pump P-8 HW Circulating Pump (????)	Circulating Pump	60 GPM	N/A	Boiler Room	Boiler Room	Main Building	Bell & Gossett	1531	1526333	N/A	7.5 / 208/240-3	N/A	N/A	Trane			
Middle School	MS Pump P-9 HW Circulating Pump (????)	Circulating Pump	30 GPM	N/A	Boiler Room	Boiler Room	Standby P-10 (1996)	Bell & Gossett	1531	1526333	N/A	1 / 208/240-3	N/A	N/A	Trane			
Middle School	MS Pump P-10 HW Circulating Pump (????)	Circulating Pump	30 GPM	N/A	Boiler Room	Boiler Room	Main Building	Bell & Gossett	1531		N/A	1 / 208/240-3	N/A	N/A	Trane			
Middle School	MS Pump P-11 HW Circulating Pump (1996)	Circulating Pump	135 GPM	N/A	Boiler Room	Boiler Room	East Addition (1996)	Taco	CE2008		N/A	7.5 / 208/240-3	N/A	N/A	Trane	9/1/1996	20-25	-3
Middle School	MS Pump P-12 HW Circulating Pump (1996)	Circulating Pump	135 GPM	N/A	Boiler Room	Boiler Room	Standby P-11 (1996)	Taco	CE2008		N/A	7.5 / 208/240-3	N/A	N/A	Trane	9/1/1996	20-25	-3
Middle School	MS RE-1 (1996) ?	Roof Exhaust	N/A	N/A	Roof	Media Center		Greenheck	CBH-1-4	77129	900 CFM	1/2 /120-1	Belt	N/A	Manual Switch	9/1/1996	20-25	-3
Middle School	MS RE-2 (1996) ?	Roof Exhaust	N/A	N/A	Roof	Media Center		PennBarry	DX16R	J08FZ41359	900 CFM	1/2 /120-1	Belt	N/A	Manual Switch	9/1/1996	20-25	-3
Middle School	MS RE-3 (1996) ?	Roof Exhaust	N/A	N/A	Roof	Girls Locker 102B	Girls Locker 102B	Fantech	5DDU085AY			1/25 /120-1	Direct	N/A	Manual Switch	9/1/1996	20-25	-3
Middle School	MS RE-4 (1996) ?	Roof Exhaust	N/A	N/A	Roof	Boys Locker 102J	Boys Locker 102J	Fantech	5DDU085AY			1/25 /120-1	Direct	N/A	Manual Switch	9/1/1996	20-25	-3
Middle School	MS RE-5 (1996) ?	Roof Exhaust	N/A	N/A	Roof	Work Rm 231	Work Rm 231	PennBarry	DX16R	J08FZ41359	900 CFM	1/2 /120-1	Belt	N/A	Manual Switch	9/1/1996	20-25	-3
Middle School	MS RE-7 (1996) ?	Roof Exhaust	N/A	N/A	Roof	Choir		Dayton	4YU93	15916577 19F	900 CFM	1/2 /120-1	Belt	N/A	Manual Switch	9/1/1996	20-25	-3
Middle School	MS RE-7 (1996) ?	Roof Exhaust	N/A	N/A	Roof	Choir		Dayton	4YU93	15916574 19F	900 CFM	1/2 /120-1	Belt	N/A	Manual Switch	9/1/1996	20-25	-3
Middle School	MS RE-8 (1996) ?	Roof Exhaust	N/A	N/A	Roof	ART 207		Greenheck	CBH-1 4-1	77133	900 CFM	1/2 /120-1	Belt	N/A	Manual Switch	9/1/1996	20-25	-3
Middle School	MS RE-9 (1996) ?	Roof Exhaust	N/A	N/A	Roof	Classroom 226		PennBarry	DX16R	A09LZ22743	900 CFM	1/2 /120-1	Belt	N/A	Manual Switch	9/1/1996	20-25	-3
Middle School	MS RE-10 (1996) ?	Roof Exhaust	N/A	N/A	Roof	Old Gym		PennBarry	DX16R		900 CFM	1/2 /120-1	Belt	N/A	Manual Switch	9/1/1996	20-25	-3
Middle School	MS RE-11 (1996) ?	Roof Exhaust	N/A	N/A	Roof	Lockers 220		PennBarry	DX16R	J08FZ41359	900 CFM	1/2 /120-1	Belt	N/A	Manual Switch	9/1/1996	20-25	-3
Middle School	MS RE-12 (1996) ?	Roof Exhaust	N/A	N/A	Roof	Science Stor Rm 212A	Science Stor Rms 11A,112A 212A	Cook	120C3B	012 S41723800 1295	900 CFM	1/4 /120-1	Belt	N/A	Manual Switch	9/1/1996	20-25	-3
Middle School	MS CE-1 (2011)	Ceiling Exhaust	N/A	N/A	Tilt 101D (Office)	Tilt 101D (Office)	Tilt 101D (Office)	Cook	GC-164 (From 2011 Drawings)		150 CFM	76 Watts/120-1	Direct	N/A	Manual Switch	9/1/2011	20-25	5-10
Middle School	MS CE-1 (1996)	Inline Exhaust	N/A	N/A	Practice Rm B	Practice Rm B	Practice Rm B	Broan	362 (From 1996 Drawings)		180 CFM	115 Watts/120-1	Direct	N/A	Manual Switch	9/1/1996	20-25	-3
Middle School	MS CE-2 (1996)	Inline Exhaust	N/A	N/A	Practice Rm C	Practice Rm C	Practice Rm C	Broan	362 (From 1996 Drawings)		180 CFM	115 Watts/120-1	Direct	N/A	Manual Switch	9/1/1996	20-25	-3
Middle School	MS CE-3 (1996)	Inline Exhaust	N/A	N/A	Practice C,D,E,F Choir 228	Practice C,D,E,F Choir 228	Practice C,D,E,F Choir 228	Broan	375 (From 1996 Drawings)		400 CFM	435 Watts/120-1	Direct	N/A	Manual Switch	9/1/1996	20-25	-3
Middle School	MS CE-4 (1996)	Inline Exhaust	N/A	N/A	Practice Rooms	Practice Rooms	Practice Rooms (Could Not locate but is in Schedule)	Broan	375 (From 1996 Drawings)		300 CFM	435 Watts/120-1	Direct	N/A	Manual Switch	9/1/1996	20-25	-3
Middle School	MS CE-5 (1996)	Inline Exhaust	N/A	N/A	LD 117	LD 117	LD 117	Broan	362 (From 1996 Drawings)		200 CFM	115 Watts/120-1	Direct	N/A	Manual Switch	9/1/1996	20-25	-3
Middle School	MS CE-6 (1996)	Inline Exhaust	N/A	N/A	Office 2A	Office 2A	Office 2A	Broan	375 (From 1996 Drawings)		300 CFM	435 Watts/120-1	Direct	N/A	Manual Switch	9/1/1996	20-25	-3
Middle School	MS CE-7 (1996)	Inline Exhaust	N/A	N/A	Classroom 205 Tilt	Classroom 205 Tilt	Classroom 205 Tilt	Broan	362 (From 1996 Drawings)		180 CFM	115 Watts/120-1	Direct	N/A	Manual Switch	9/1/1996	20-25	-3
Middle School	MS CE-8 (1996)	Inline Exhaust	N/A	N/A	Boys Locker Rm Stor K	Boys Locker Rm Stor K	Boys Locker Rm Stor K	Broan	375 (From 1996 Drawings)		260CFM	435 Watts/120-1	Direct	N/A	Manual Switch	9/1/1996	20-25	-3
Middle School	MS IF-1 (1996)	Inline Exhaust	N/A	N/A	Kitchen Storage	Kitchen Storage	Kitchen Storage	Greenheck	BSQ 100 (From 1996 Drawings)		800 CFM	1/3 /120-1	Belt	N/A	Manual Switch	9/1/1996	20-25	-3
Middle School	MS IF-2 (1989)	Inline Exhaust	N/A	N/A	D & C 19	D & C 19	D & C 19	Twin City Fan	122 FVC	72014-1	1200 CFM	1/4 /120-1	Belt	N/A	Manual Switch	9/1/1989	20-25	-8
Middle School	MS IF-5 (1989)	Inline Wall Exhaust	N/A	N/A	Kitchen 1A Dishwasher	Kitchen 1A Dishwasher	Kitchen 1A Dishwasher	Greenheck	SDE 14-32 G	71940			Direct	N/A	Manual Switch	9/1/1989	20-25	-8
Middle School	MS EF-1 (1967)	Wall Exhaust Fan		N/A	Fitness Center	Ground Floor - 103	Ground Floor - 103									9/1/1967	20-25	-25
Middle School	MS CE-1 (1967)	Exhaust Fan		N/A	Guidance 104E	Guidance 104E	Guidance 104E									9/1/1967	20-25	-25
Middle School	MS CE-2 (1967)	Exhaust Fan		N/A	Staff Restroom 129	Staff Restroom 129	Staff Restroom 129									9/1/1967	20-25	-25
Middle School	MS CE-3 (1967)	Exhaust Fan		N/A	Kitchen 1A SE	Kitchen 1A SE	Kitchen 1A SE									9/1/1967	20-25	-25
Middle School	MS CE-4 (1967)	Exhaust Fan		N/A	1NE	1NE	1NE									9/1/1967	20-25	-25
Middle School	MS CE-5 (1967)	Exhaust Fan		N/A	Staff Restroom 203	Staff Restroom 203	Staff Restroom 203									9/1/1967	20-25	-25
Middle School	MS CE-6 (1967)	Exhaust Fan		N/A	Electrical Room 22	Electrical Room 22	Electrical Room 22									9/1/1967	20-25	-25
Middle School	MS CE-7 (1967)	Exhaust Fan		N/A	Kitchen Hood	Kitchen Hood	Kitchen Hood									9/1/1967	20-25	-25
Middle School	MS UF-1 1967	Utility Fan	N/A	N/A	Mech 122	Mech 122	Bath Exhaust 1	Trane	15 FC	15787			Belt	N/A		9/1/1967	20-25	-25
Middle School	MS UF-2 1967	Utility Fan	N/A	N/A	Mech 122	Mech 122	Bath Exhaust 2	Trane	18 FC	M4712			Belt	N/A		9/1/1967	20-25	-25
Middle School	MS UF-3 1967	Utility Fan	N/A	N/A	Mech 122	Mech 122	Bath Exhaust 3	Trane	10 FC	M4711			Belt	N/A		9/1/1967	20-25	-25
Middle School	MS ROOF COOLING TOWER (1966)	Chilled Water		N/A	Roof	Roof	Not in Service	Marley	4429	2074	N/A	N/A	N/A	N/A		9/1/1966	20-25	-30
Middle School	MS CH (1996)	Cabinet Heater	N/A	N/A	1996 Addition	1996 Addition	1996 Addition (Qty of 1)	N/A			N/A	N/A	N/A	N/A	Trane	9/1/1996	25-30	5-10
Middle School	MS CH (1989)	Cabinet Heater	N/A	N/A	1989 Addition	1989 Addition	1989 Addition (Qty of 6)	N/A			N/A	N/A	N/A	N/A	Pneumatic	9/1/1989	25-30	-5
Middle School	MS CH (1966)	Cabinet Heater	N/A	N/A	1966 Addition	1966 Addition	1966 Addition (Qty of 6)	N/A			N/A	N/A	N/A	N/A	Pneumatic	9/1/1966	25-30	-25
Middle School	MS UH (1996)	Suspended Unit Heater	N/A	N/A	1996 Addition	1996 Addition	1996 Addition (Qty of 2)	N/A			N/A	N/A	N/A	N/A	Wall Stat	9/1/1996	25-30	5-10
Middle School	MS UH (1989)	Suspended Unit Heater	N/A	N/A	1989 Addition	1989 Addition	1989 Addition (Qty of 1)	N/A			N/A	N/A	N/A	N/A	Wall Stat	9/1/1996	25-30	5-10
Middle School	MS FTR (1996)	Fin Tube Radiation	N/A	N/A	1996 Addition	1996 Addition	1996 Addition (Qty of 30)	N/A			N/A	N/A	N/A	N/A	Pneumatic	9/1/1996	25-30	5-10
Middle School	MS FTR (1966)	Fin Tube Radiation	N/A	N/A	1966 Addition	1966 Addition	1966 Addition (Qty of 5)	N/A			N/A	N/A	N/A	N/A	Pneumatic	9/1/1966	25-30	-25
Middle School	MS DHWH 1	Water Heater	100 Gallon	N/A	Mech Rm 101E	101E	Main building domestic hot water heater	AO Smith	BTR 197 110	C05M006255	N/A	120-1	N/A	N/A	Local Control	9/1/2005	10-15	-3
Middle School	MS DWP-1	Domestic Water Pump		N/A	Mech Rm 101E	101E	Main building domestic hot water heater				N/A	1/3 / 115-1	N/A	N/A	Local Control	9/1/2005	20-25	5-10

# WHITEFISH BAY HIGH SCHOOL

Site/Location	Item Number	Type	Capacity	Includes AC?	Area Description	Area Number (Equipment Location)	Description (area served)	Manufacturer	Model Number	Serial Number	Fan CFM/ OA/Max	Motor HP/Volts	Drive Type	VFD/ HP Rating	Controlled by	Placed In Service	Life Expectancy (years)	Life Expectancy remain (years)	Notes
High School	HS Compressor	Air Compressor		N/A	Compressor Room	23	HS building pneumatics	Quincy	QC03012D00166	20030206-0187		2 @ 2 / 230/460-3			Local Control	3/1/2003	25-30	15-20	
High School	HS Compressor	Air Compressor		N/A	Boiler Room 51 Room	Boiler Room 51 Room	HS building pneumatics	Quincy	QC02008D00225	5147583		2 @ 2 / 230/460-3			Local Control	3/1/2003	25-30	15-20	
High School	HS BCU-1 Library (2020)	Blower Coil Unit w/ HW coil & DX Coil	179 MBH	Yes	Project Rm 234E	Project Rm 234E	Library 234C	Trane	UCCAG10C0F0FCG130000	H20E45726	4000 / 525	4 / 208-3	Direct	N/A	Trane	9/1/2020	30-35	30-35	
High School	HS BCU-1 Condensing Unit CCU-4 (2022)	DX Condensing unit R410A	15 Tons	N/A	Roof	Roof	Library 234C	Trane			N/A		N/A	N/A	Trane	9/1/2020	25-30	20-25	
High School	HS IF-1A (2022)	Inline Relief	N/A	N/A	Library 234C	Library 234C	Library 234C	Cook	SQND-150-EC		2000 CFM	1/2 / 120-1		N/A	Trane	9/1/2020	30-35	30-35	
High School	HS IF-1B (2022)	Inline Relief	N/A	N/A	Library 234C	Library 234C	Library 234C	Cook	SQND-150-EC		2000 CFM	1/2 / 120-1		N/A	Trane	9/1/2020	30-35	30-35	
High School	HS AC01 Music (2011)	Air Handling Unit (AHU) w/ HW coil & DX Coil	315 MBH	Yes	Music Boiler Room	Music Boiler Room	Music wing - 2011 addition	Trane	CSAA030UAB00	K10J91832	16000 / 2000	25 / 460-3	Belt	ABB / 25 HP	Trane	9/1/2011	30-35	20-25	
High School	HS AC01 Condensing Unit CCU-1 (2011)	DX Condensing unit R410A	40 Tons	N/A	Roof	Roof	Serves Music Wing	Trane	RAUJC404BB0300D000010	C10L05629	N/A	460-3	N/A	N/A	Trane	9/1/2011	25-30	15-20	
High School	HS RE-1 (2011)	AC01 Relief Fan	N/A	No	Roof	Roof	Serves Music Wing	Cook	300 TLC 300TLC-B	012SD43458-00/0001701	12500	5 / 460-3	Belt	ABB / 5 HP	Trane	9/1/0211	30-35	20-25	
High School	HS BCU-1 (2011)	Air Handling Unit (AHU) w/ HW coil & DX Coil	91.5 MBH	Yes	Lower Level	Proj Lead The Way 46	Proj Lead The Way 46	Trane	BCHC054G1E0A21F000000A	T10L63508	2000 / 300			N/A	Trane	9/1/2011	30-35	20-25	
High School	HS BCU-1 Condensing Unit CCU-3 (2011)	DX Condensing unit R410A	5 Tons	N/A	Outside of door 9	Outside of door 9	Proj Lead The Way 46	Trane	4TTA3060A4000BB	10452S3B2F	N/A	460-3	N/A	N/A	Trane	9/1/2011	25-30	15-20	
High School	HS AC-1 Office (1991)	Air Handling Unit (AHU) w/ Steam Coil & CW Coil		Yes	Mech Room 127	Mech Room 127	Office Area 1st Floor	Trane	MCCA030HBB000A0AA00	K91G24242	15400 / 1540	20 / 208-3	Belt	ABB / 20 HP	Siemens	9/1/1991	30-35	1-5	
High School	HS WC-1 Air Cooled Water Chiller for AC-1	Air Cooled Water Chiller	60 Tons	N/A	Roof	Roof	Office Area 1st Floor	Trane	RAUJC60		N/A	460-3	N/A	N/A	Siemens	9/1/1991	25-30	-2	
High School	HS EF-1 (1991)	AC-1 Return Fan	N/A	No	Mech Room 127	Mech Room 127	Office Area 1st Floor	Trane	MCCA030GAB0A0A0000A0518	K91G24241	15400	10 / 208-3	Belt	ABB / 10 HP	Siemens	9/1/1991	30-35	1-5	
High School	HS HV-1 Office (1991)	Air Handling Unit (AHU) w/ Steam Coil		Yes	Mech Room 23	Mech Room 23	Womens Locker 18, Wrest 14	Trane	MCCA012GAB0A0C0000B1	K91G23582	8000 / 4600	7.5 / 200-3	Belt	N/A	Siemens	9/1/1991	30-35	1-5	
High School	HS Fan Coils (1991)	Fan Coil w/ HW Coil		N/A	N/A	2nd & 3rd Floor Offices	1991 (Qty of 9)					N/A	N/A	N/A	Siemens	9/1/1991	30-35	1-5	
High School	HS BCU-1 B & G (1967)	Air Handling Unit (AHU) w/ HW coil & DX Coil		Yes	Lower Level	B&G Office closet	Serves Upper cafeteria and B&G offices	Trane	2-12	C-16026		2 / 240-3	Belt	N/A	Siemens	9/1/1967	30-35	-20	
High School	HS AHU-1 Memorial Gym (1967)	Air Handling Unit (AHU) w/ HW coil		No	Gym Attic	Gym Attic 111	Upper Mezzanine	Trane	SPEC	C-16033		2 / 220/440-3	Belt	N/A	Siemens	9/1/1967	30-35	-20	
High School	HS AHU-2 Memorial Gym (1967)	Air Handling Unit (AHU) w/ HW coil		No	Gym Attic	Gym Attic 111	North Gym 111	Trane	1-27	C-16032		5 / 220/440-3	Belt	N/A	Siemens	9/1/1967	30-35	-20	
High School	HS AHU-3 Memorial Gym (1967)	Air Handling Unit (AHU) w/ HW coil		No	Gym Attic	Gym Attic 111	South Gym 111	Trane	1-27	C-16031		5 / 220/440-3	Belt	N/A	Siemens	9/1/1967	30-35	-20	
High School	HS AHU-4 Memorial Gym (1967)	Air Handling Unit (AHU) w/ HW coil		No	Gym Attic		Not in Service	Trane	1-12	C-16030			Belt	N/A	Siemens	9/1/1967	30-35	-20	
High School	HS AHU-15 Memorial Gym (1967)	Air Handling Unit (AHU) w/ HW coil		No	Gym Attic	Gym Attic 111	Serves 204	Trane	L-6	KOK191370		1/2 / 115/230-1	Belt	N/A	Trane	9/1/1967	30-35	-20	
High School	HS AHU-16 Memorial Gym (1967)	Air Handling Unit (AHU) w/ HW coil		No	Gym Attic	Gym Attic 111	Serves 210	Trane	L-6	KOK191369		1/2 / 115/230-1	Belt	N/A	Trane	9/1/1967	30-35	-20	
High School	HS C-1 Lower Cafeteria (1967)	Air Handling Unit (AHU) w/ Steam coil		No	Lower Level	Mech Rm 3B	Classrooms 9, 10	Trane	2-12	C-16028		2 / 220/440-3	Belt	N/A	Siemens	9/1/1967	30-35	-20	
High School	HS C-2 Lower Cafeteria (1967)	Air Handling Unit (AHU) w/ Steam coil		No	Lower Level	Mech Rm 3B	Lower Cafeteria 3	Trane	2-12	C-16027		2 / 220/440-3	Belt	N/A	Siemens	9/1/1967	30-35	-20	
High School	HS VAV's	VAV W/ HW Coil	N/A	N/A	Main HS building	Main HS building	Main HS building (Qty of 45)	Varies	N/A	N/A	N/A	N/A	N/A	N/A	Varies	N/A	N/A	N/A	
High School	HS UV's (1967)	UV W/ Steam Coil	Varies	N/A	3rd Floor	Classrooms/Offices 327,329E,329W,343	Classrooms/Offices 327,329E,329W,343	Trane	N/A	N/A	N/A	N/A	N/A	N/A	JC	9/1/1967	20-25	-30	
High School	HS UV's (1967)	UV W/ Steam Coil	Varies	N/A	2nd Floor	Classrooms/Offices 229,231,234N,234S,239E,239W,243	Classrooms/Offices 229,231,234N,234S,239E,239W,243	Trane	N/A	N/A	N/A	N/A	N/A	N/A	JC	9/1/1967	20-25	-30	
High School	HS UV's (1991)	UV W/ Steam Coil	Varies	N/A	Lower Level	Classrooms 35,37E,37W,39E,39W,40C,40N,40S,47E,47W	Classrooms 35,37E,37W,39E,39W,40C,40N,40S,47E,47W	Varies	N/A	N/A	N/A	N/A	N/A	N/A	Trane	9/1/1991	20-25	-5	
High School	HS UV's (1991)	UV W/ Steam Coil	Varies	N/A	2nd Floor	Classrooms/Offices 215,216,218,219,223,224,224A	Classrooms/Offices 215,216,218,219,223,224,224A	Varies	N/A	N/A	N/A	N/A	N/A	N/A	Trane/JC	9/1/1991	20-25	-5	
High School	HS UV's (1991)	UV W/ Steam Coil	Varies	N/A	3rd Floor	Classrooms/Offices 314,315,316,319,321,324,36E,336W,340,340A,342,345	Classrooms/Offices 314,315,316,319,321,324,336E,336W,340,340A,342,345	Daikin	UVAS	N/A	N/A	N/A	N/A	N/A	JC	9/1/2001	20-25	5-10	
High School	HS UV's (2001)	UV W/ Steam Coil	Varies	N/A	1st Floor	Classrooms/Offices 101,101B,102,104E,104W,106,129E,129W,139A,139E,139W,143,146,147,149,150	Classrooms/Offices 101,101B,102,104E,104W,106,129E,129W,139A,139E,139W,143,146,147,149,150	Daikin	UVAS	N/A	N/A	N/A	N/A	N/A	Trane	9/1/2001	20-25	5-10	
High School	HS UV's (2003)	UV W/ Steam Coil	Varies	N/A	2nd Floor	Classrooms 245,246,249,250	Classrooms 245,246,249,250	Varies	N/A	N/A	N/A	N/A	N/A	N/A	Siemens	9/1/2003	20-25	5-10	
High School	HS UV's (2003)	UV W/ Steam Coil	Varies	N/A	3rd Floor	Classrooms 334E,334W,339E,339W,346,349,350	Classrooms 334E,334W,339E,339W,346,349,350	Daikin	UVAS	N/A	N/A	N/A	N/A	N/A	Siemens	9/1/2003	20-25	5-10	
High School	HS UV (2020)	UV W/ Steam Coil	Varies	N/A	2nd Floor	Classrooms 218	Classrooms 218	Trane	N/A	N/A	N/A	N/A	N/A	N/A	Trane	9/1/2020	20-25	20-25	

# WHITEFISH BAY HIGH SCHOOL CONTINUED

High School	HS AHU 8 (1967)	Air Handling Unit w/ Steam Coil		Yes	Auditorium Mech Room	Auditorium Mech Room	Auditorium	Trane	2-27A	CC15217		10 / 220/440-3	Belt	N/A	Siemens	9/1/1967	25-30	-15	
High School	HS AHU 9 (1967)	Air Handling Unit (AHU)			Auditorium Mech Room	Auditorium Mech Room	Return for AHU-8	Trane	2-24FC	B94136		7.5 / 200-3	Belt	N/A	Siemens	9/1/1967	25-30	-15	
High School	HS AHU 8 condensing unit/chiller - OUT OF SERVICE since 2011	Chiller		N/A	Auditorium Chiller Room	Auditorium Chiller Room	Auditorium	Carrier	5H120-149	740069		100 / 220-3							
High School	HS AHU 8 Cooling Tower - OUT OF SERVICE since 2011	Cooling Tower		N/A	Auditorium Roof	Auditorium Roof	Auditorium	Baltimore Aircoil	FXV D33	90600947P			Belt						
High School	HS FWP 1	Boiler Feed Pump		N/A	Boiler Room		Feed water pump	Aurora	Aurora G6										11/25/2019
High School	HS FWP 2	Boiler Feed Pump		N/A	Boiler Room		Feed water pump												
High School	HS P-1 Pump Library (2022)	HW System	70 GPM	N/A	Mech 127	Mech 127	Library 234	Taco	Cl 15000-?		N/A	3 / 208-3	N/A	Danfoss / 3 HP	Trane	9/1/2020	10-15	10-15	
High School	HS IP-5 Pump Library (2022)	BCU-1 HW System	9.5 GPM	N/A			Library 234	Taco	00e Seris VR		N/A	3/4 / 120-1	N/A	N/A	Trane	9/1/2020	10-15	10-15	
High School	HS IP-1 Pump Music Wing (2011)	B-1 Primary Pump	35 GPM	N/A	Music Boiler Room	Music Wing	Music wing	Taco	1911C1E1		N/A	.33 / 120-1	N/A	N/A	Trane	9/1/2011	10-15	1-5	
High School	HS B- 1 Music Wing (2011)	Boiler	475 MBH	N/A	Music Boiler Room	Music Wing	Music wing	Burnham	APEX500F-2L07	65223097	N/A	120-1	N/A	N/A	Trane	9/1/2011	25-30	15-20	
High School	HS B- 2 Music Wing (2011)	Boiler	475 MBH	N/A	Music Boiler Room	Music Wing	Music wing	Burnham	APEX500F-2L07	65223091	N/A	120-1	N/A	N/A	Trane	9/1/2011	25-30	15-20	
High School	HS IP-2 Pump Music Wing (2011)	B-2 Primary Pump	35 GPM	N/A	Music Boiler Room	Music Wing	Music wing	Taco			N/A	.33 / 120-1	N/A	N/A	Trane	9/1/2011	10-15	1-5	
High School	HS IP-3 Pump Music Wing (2011)	HW System	80 GPM	N/A	Music Boiler Room	Music Wing	Music wing	Taco	1919C1E1		N/A	2 / 208/480-3	N/A	ABB / 2 HP	Trane	9/1/2011	10-15	1-5	
High School	HS IP-4 Pump Music Wing (2011)	Standby IP-3	80 GPM	N/A	Music Boiler Room	Music Wing	Music wing	Taco	1919C1E1		N/A	2 / 208/480-3	N/A	ABB / 2 HP	Trane	9/1/2011	10-15	1-5	
High School	HS P-2 Pump Office Area (1991)	Primary CW Pump	130 GPM	N/A	Attic	Attic	Office Area 1st Floor	Taco	FM2008 7.6 B2E1B110		N/A	5 / 200-3	N/A	N/A	Local Control	9/1/1991	10-15	-15	
High School	HS P-3 Pump Office Area (1991)	Primary CW Pump	47 GPM	N/A	Attic	Attic	Office Area 1st Floor	Bell & Gossett	1.5AG 6.875 BF	2290783	N/A	3/2 / 208/460-3	N/A	N/A	Local Control	9/1/1991	10-15	-15	
High School	HS P-4 Pump Office Area (1991)	Second CW Pump	42 GPM	N/A	Attic	Attic	Office Area 1st Floor	Taco	FM1206 5.2 B2A1IL0		N/A	1/2 / 200-3	N/A	N/A	Local Control	9/1/1991	10-15	-15	
High School	HS P-5 Pump Office Area (1991)	Second CW Pump	130 GPM	N/A	Attic	Attic	Office Area 1st Floor	Taco	FM12006 .3 B2C1AIL0		N/A	1.5 / 208-3	N/A	N/A	Local Control	9/1/1991	10-15	-15	
High School	HS HX-1 Heat Exchanger (2020)	Heat Exchanger	70 GPM	N/A	Mech Room 127	Mech Room 127	Office Area 1st Floor	Taco	G08410S		N/A	N/A	N/A	N/A	N/A	9/1/2020	25-30	25-30	
High School	HS HX-1 Heat Exchanger (1991)	Heat Exchanger	51 GPM	N/A	Mech Room 127	Mech Room 127	Office Area 1st Floor	Taco	1935E1E1		N/A	N/A	N/A	N/A	N/A	9/1/1991	25-30	-2	
High School	HS Boiler 1 Steam (1957)	Steam Boiler		N/A	Boiler Room 23A	Boiler Room 23A	Main HS building	Cleaver Brooks	LR-407-35	0-16638	N/A	3 / 208/460-3	N/A	N/A	Local Control	9/1/1957	25-30	-35	
High School	HS Boiler 2 Steam (1957)	Steam Boiler		N/A	Boiler Room 23A	Boiler Room 23A	Main HS building	Cleaver Brooks	LR-407-35	0-16639	N/A	3 / 208/460-3	N/A	N/A	Local Control	9/1/1957	25-30	-35	
High School	HS C-1 Pump B-1, 2	Condensate Pump		N/A	Boiler Room 23A	Boiler Room 23A	Boiler 1, Boiler 2	Armstrong	LR4678		N/A	1/6 /120-1	N/A	N/A	Local Control		10-15		
High School	HS C-2 Pump B-1, 2	Condensate Pump		N/A	Boiler Room 23A	Boiler Room 23A	Boiler 1, Boiler 2	Armstrong	LR4678		N/A	1/6 /120-1	N/A	N/A	Local Control		10-15		
High School	HS CP-1 Pump (1957)	Condensate Pump		N/A	Storage	Storage					N/A		N/A	N/A	Siemens	9/1/1957	10-15	-35	Could Not Find
High School	HS CP-2 Pump (1957)	Condensate Pump		N/A	Old Pool Mech	Old Pool Mech					N/A		N/A	N/A	Siemens	9/1/1957	10-15	-35	Could Not Find
High School	HS CP-3 Pump (1957)	Condensate Pump		N/A	25	25					N/A		N/A	N/A	Siemens	9/1/1957	10-15	-35	Could Not Find
High School	HS CP-4 Pump (1957)	Condensate Pump		N/A	Mech Room	Mech Room					N/A		N/A	N/A	Siemens	9/1/1957	10-15	-35	Could Not Find
High School	HS C-1 Pump AHU-8	Condensate Pump		N/A	Auditorium Chiller Room	Auditorium Chiller Room	AHU-8				N/A	1/2 /120/230-1	N/A	N/A	Local Control		10-15		
High School	HS C-2 Pump AHU-8	Condensate Pump		N/A	Auditorium Chiller Room	Auditorium Chiller Room	AHU-8				N/A	1/2 /120/230-1	N/A	N/A	Local Control		10-15		
High School	HS C-1 Pump C-1, C-2	Condensate Pump		N/A	Mech Rm 3B	Mech Rm 3B	AHU-C-1, AHU-C-2	Skidmore	54527 XC2D211	129745	N/A	1/3 /120/230-1	N/A	N/A	Local Control		10-15		
High School	HS C-2 Pump C-1, C-2	Condensate Pump		N/A	Mech Rm 3B	Mech Rm 3B	AHU-C-1, AHU-C-2	Skidmore	54527 XC2D211	129745	N/A	1/3 /120/230-1	N/A	N/A	Local Control		10-15		
High School	HS RE-3 (2011)	Roof Exhaust	N/A	N/A	Roof	Biology 204	Biology 204	Cook	195 TLC 195TLC-B	012SD43458-00/0004401	2500 CFM	1/2 /120-1	Belt	N/A	Local Switch	9/1/2011	20-25	10-15	
High School	HS RE-4 (2011)	Roof Exhaust	N/A	N/A	Roof	Biology Storage	Biology Storage	Cook	120 TLC 120TLC-B	012SD43458-00/0005801	1000 CFM	1/2 /120-1	Belt	N/A	Local Switch	9/1/2011	20-25	10-15	
High School	HS RE-5 (2011)	Roof Exhaust	N/A	N/A	Roof	Chemistry 210	Chemistry 210	Cook	195 TLC 195TLC-B	012SD43458-00/00037201	2500 CFM	1/2 /120-1	Belt	N/A	Local Switch	9/1/2011	20-25	10-15	
High School	HS RE-6 (2011)	Roof Exhaust	N/A	N/A	Roof	Biology 204 Fume Hood	Biology 204 Fume Hood	Cook	120 TLC 120TLC-B	012SD43458-00/0008601	1000 CFM	1/2 /120-1	Belt	N/A	Local Switch	9/1/2011	20-25	10-15	
High School	HS RE-7 (2011)	Roof Exhaust	N/A	N/A	Roof	Chemistry 210 Fume Hood	Chemistry 210 210 Fume Hood	Cook	120 TLC 120TLC-B	012SD43458-00/0010001	1000 CFM	1/2 /120-1	Belt	N/A	Local Switch	9/1/2011	20-25	10-15	
High School	HS CE-1 (2011)	Inline Exhaust	N/A	N/A	Tit 151	Tit 151	Tit 151	Cook	GN-720		350 CFM	1/4 /120-1	Direct	N/A	Local Switch	9/1/2011	20-25	10-15	
High School	HS CE-2 (2011)	Inline Exhaust	N/A	N/A	Classroom 324 Tit	Classroom 324 Tit	Classroom 324 Tit	Cook	GC-740		400 CFM	1/4 /120-1	Direct	N/A	Local Switch	9/1/2011	20-25	10-15	
High School	HS IF-1 (2011)	Inline Exhaust	N/A	N/A	Biology 204A	Biology 204A Acid Cabinet	Biology 204A Acid Cabinet	Fantech	FR150		150 CFM	120-1	Direct	N/A	Local Switch	9/1/2011	20-25	10-15	
High School	HS IF-2 (2011)	Inline Exhaust	N/A	N/A	Chemistry 210	Chemistry 210	Biology 204A Flammable Cabinet	Fantech	FR150		100 CFM	120-1	Direct	N/A	Local Switch	9/1/2011	20-25	10-15	
High School	HS CE-2 (1999)	Inline Exhaust	N/A	N/A	Dark Rm 330	Dark Rm 330	Dark Rm 330	Cook	GN-720		440 CFM	440 Watts /120-1	Direct	N/A	Local Switch	9/1/1991	20-25	-5	



# WHITEFISH BAY HIGH SCHOOL - FIELDHOUSE

Site/Location	Item Number	Type	Capacity	Includes AC?	Area Description	Area Number (Equipment Location)	Description (area served)	Manufacturer	Model Number	Serial Number	Fan CFM/ OA/Max	Motor HP/Volts	Drive Type	VFD/ HP Rating	Controlled by	Placed in Service	Life Expectancy (years)	Life Expectancy remain (years)	Notes
High School Fieldhouse	HS AC02 Link (2011)	Air Handling Unit (AHU) w/ HW coil & DX Coil	350 MBH	Yes	Link	Link Mech Room	Link	Trane	CSAA014UAB00	K10J91848	7500 / 2085	10 / 460-3	Belt	ABB / 10 HP	Trane	9/1/2011	30-35	20-25	
High School Fieldhouse	HS AC01 Condensing Unit CCU-2 (2011)	DX Condensing unit R410A	25 Tons	N/A	Roof	Roof	Link	Trane	RAUJC25EBB0300D000010	C10L05630	N/A	208-3	N/A	N/A	Trane	9/1/2011	25-30	15-20	
High School Fieldhouse	FH AHU-2 (1970)	Air Handling Unit (AHU) w/ Steam coil		No	Pool	Pool Mech Rm 54	Pool	Trane			8000 / 8000	5 / 208-3	Belt	N/A	Siemens	9/1/1970	30-35	-15	
High School Fieldhouse	FH AHU-3 (1970)	Air Handling Unit (AHU) w/Steam coil		No	Pool	Pool Mech Rm 54	Pool	Trane			8000 / 8000	5 / 208-3	Belt	N/A	Siemens	9/1/1970	30-35	-15	
High School Fieldhouse	FH AHU-6 (1970)	Air Handling Unit (AHU) w/ HW coil		No	Pool	Tilt 161	Pool - Spectator Area	Trane	T-9	K121368	5300 / 5300	3 / 208-3	Belt	N/A	Siemens	9/1/1970	30-35	-15	
High School Fieldhouse	FH AHU-7 (1970)	Air Handling Unit (AHU) w/ HW coil		No	Fieldhouse Lobby	Tilt 164	FH Lobby and Offices	Trane	I-12X	K121369	7000 / 2100	3 / 220/460-3	Belt	N/A	Siemens	9/1/1970	30-35	-15	
High School Fieldhouse	FH AHU-8 (1970)	Air Handling Unit (AHU) w/ HW coil		No	Fieldhouse	Fieldhouse	Fieldhouse	Trane			22500 / 6500		Belt	N/A	Siemens	9/1/1970	30-35	-15	
High School Fieldhouse	FH AHU-9 (1970)	Air Handling Unit (AHU) w/ HW coil		No	Fieldhouse	Fieldhouse	Fieldhouse	Trane			22500 / 6500		Belt	N/A	Siemens	9/1/1970	30-35	-15	
High School Fieldhouse	FH AHU-10 (1970)	Air Handling Unit (AHU) w/ HW coil		No	Fieldhouse	Fieldhouse	Fieldhouse	Trane			22500 / 6500		Belt	N/A	Siemens	9/1/1970	30-35	-15	
High School Fieldhouse	FH AHU-11 (1970)	Air Handling Unit (AHU) w/ HW coil		No	Fieldhouse	Fieldhouse	Fieldhouse	Trane			22500 / 6500		Belt	N/A	Siemens	9/1/1970	30-35	-15	
High School Fieldhouse	FH AHU-12 (1970)	Air Handling Unit (AHU) w/ HW coil		No	Fieldhouse	Fieldhouse Balcony	Fieldhouse Balcony	Trane			9000 / 5400		Belt	N/A	Siemens	9/1/1970	30-35	-15	
High School Fieldhouse	FH AHU-13 (1970)	Air Handling Unit (AHU) w/ HW coil		No	Fieldhouse	Team Rm 170A	Team Rm 170A	Trane	T-8X	K121371	3500 / 0		Belt	N/A	Siemens	9/1/1970	30-35	-15	
High School Fieldhouse	FH AHU-14 (1970)	Air Handling Unit (AHU) w/ HW coil		No	Fieldhouse	Team Rm 166B	Team Rm 166B	Trane	T-8X	K121370	3500 / 0		Belt	N/A	Siemens	9/1/1970	30-35	-15	
High School Fieldhouse	HS AHU-4 (1967)	Air Handling Unit (AHU) w/ HW coil & DX Coil		Yes	Mechanical Room	S251A	Serves 250 wing	American Standard	Size 20A	H Order# 2-87510-2	6400 / ?	5 / 208-3	Belt	N/A	Siemens	9/1/1967	30-35	-20	
High School Fieldhouse	HS CF-3 (1967)	AHU-4 Return Fan	N/A	No	Mechanical Room	S251-B	Serves 250 wing	American Standard	10L	H Order# 2-87510-5	6400	2 / 220/460-3	Belt	ABB / 10 HP	Siemens	9/1/1967	30-35	-20	
High School Fieldhouse	HS AHU-4 Condensing Unit CCU-5 (1967)	DX Condensing unit R22A	5 Tons	N/A	Roof	Roof	Serves 250 wing	Trane	RAUA-2006-E	2D-23926	N/A	208-3	N/A	N/A	Trane	9/1/1967	25-30	-15	
High School Fieldhouse	HS AHU-5 (1967)	Air Handling Unit (AHU) w/ HW coil & DX Coil		Yes	Mechanical Room	S251-B	Serves 260 wing	American Standard	Size 16A	H Order# 2-87510-8	7000 / ?		Belt	N/A	Siemens	9/1/1967	30-35	-20	
High School Fieldhouse	HS CF-5 (1967)	AHU-5 Return Fan	N/A	No	Mechanical Room	S251-B	Serves 260 wing	American Standard			7000		Belt	N/A	Siemens	9/1/1967	30-35	-20	
High School Fieldhouse	HS AHU-5 Condensing Unit CCU-5 (1967)	DX Condensing unit R410A	5 Tons	N/A	Roof	Roof	Serves 260 wing	Trane	RAUA-2506-B	2D-24002	N/A	208-3	N/A	N/A	Trane	9/1/1967	25-30	-15	
High School Fieldhouse	FH AHU-1 (1967)	Air Handling Unit (AHU) w/ Steam coil		No	Boiler Room 51	Boiler Room 51	Pool Lockers	Trane	T-21	K121365		5 / 220/460-3	Belt	N/A	Siemens	9/1/1967	30-35	-25	
High School Fieldhouse	FH FCU-1 (1967)	Fan Coil Unit w/ Steam coil		No	Old Pool Boys Locker	Old Pool Boys Locker	Old Pool Boys Locker							N/A	Local Control	9/1/1967	30-35	-25	
High School Fieldhouse	FH FCU-2 (1967)	Fan Coil Unit w/ Steam coil		No	Old Pool Girls Locker	Old Pool Girls Locker	Old Pool Girls Locker							N/A	Local Control	9/1/1967	30-35	-25	
High School Fieldhouse	HS Boiler 3 (2019)	Summer Boiler	1000 MBH	N/A	Boiler Room 51	Boiler Room 51	Serves FH, Pool, EW, Link	Thermal Solutions	EVS1000BN	65674278	N/A	120-1	N/A	N/A	Siemens	9/1/2019	25-30	20-25	
High School Fieldhouse	HS Boiler 3 Pump (2019)	Circulating Pump		N/A	Boiler Room 51	Boiler Room 51	Serves FH, Pool, EW, Link	Taco	1935E1E1			.5 / 120-1	N/A	N/A	Siemens	9/1/2019	10-15	5-10	
High School Fieldhouse	HS Boiler 1 Steam East (1967)	Steam Boiler	12554 MBH	N/A	Boiler Room 51	Boiler Room 51	Serves FH, Pool, EW, Link	Cleaver Brooks	CB266-300	1-43173	N/A		N/A	N/A	Siemens	9/1/1967	25-30	-25	
High School Fieldhouse	HS Boiler 2 Steam West (1967)	Steam Boiler	12554 MBH	N/A	Boiler Room 51	Boiler Room 51	Serves FH, Pool, EW, Link	Cleaver Brooks	CB266-300	1-43172	N/A		N/A	N/A	Siemens	9/1/1967	25-30	-25	
High School Fieldhouse	HS P-1 Pump (1967)	HW System	625 GPM	N/A	Boiler Room 51	Boiler Room 51	Serves FH Main Heat	Hydro Flo	4BB 9-1/2 BF	554821	N/A	15 / 230 / 460-3	N/A	N/A	Siemens	9/1/1967	10-15	-35	
High School Fieldhouse	HS P-3 Pump (1967)	HW System	80 GPM	N/A	Boiler Room 51	Boiler Room 51	Serves FH Radiant Heat	Bell & Gossett	2BB 8-7/8 BF	554878	N/A	5 / 230 / 460-3	N/A	N/A	Siemens	9/1/1967	10-15	-35	
High School Fieldhouse	HS C-1 Pump (1967)	HW System		N/A	Boiler Room 51	Boiler Room 51	New Pool Deck Heat	Armstrong	H-64-3 BF/BI	917	N/A	3/4 / 230 / 460-3	N/A	N/A	Siemens	9/1/1967	10-15	-35	
High School Fieldhouse	HS P-5 Pump (1967)	HW System		N/A	Boiler Room 51	Boiler Room 51	Pool Heat Exchanger				N/A	1-1/2 / 230 / 460-3	N/A	N/A	Siemens	9/1/1967	10-15	-35	
High School Fieldhouse	HS RE-4 (2013)	Roof Exhaust	N/A	N/A	Pool Roof	Area B	English Wing Corridor	Cook	135 ACE 135C5B	012SE76136-00/0005301	1700	1/2 / 115-1	Belt	N/A	Trane	9/1/2013	20-25	10-15	
High School Fieldhouse	HS RE-8 (2013)	Roof Exhaust	N/A	N/A	Fieldhouse Roof	Area A	Fieldhouse S Exhaust						Belt	N/A	Trane	9/1/2013	20-25	10-15	
High School Fieldhouse	HS RE-9 (2013)	Roof Exhaust	N/A	N/A	Fieldhouse Roof	Area A	Fieldhouse SW Exhaust						Belt	N/A	Trane	9/1/2013	20-25	10-15	
High School Fieldhouse	HS RE-10 (2013)	Roof Exhaust	N/A	N/A	Fieldhouse Roof	Area A	Fieldhouse NW Exhaust						Belt	N/A	Trane	9/1/2013	20-25	10-15	
High School Fieldhouse	HS RE-11 (2013)	Roof Exhaust	N/A	N/A	Fieldhouse Roof	Area A	Fieldhouse W Exhaust						Belt	N/A	Trane	9/1/2013	20-25	10-15	
High School Fieldhouse	HS RE-12 (2013)	Roof Exhaust	N/A	N/A	Fieldhouse Roof	Area A	Fieldhouse Tilts Exhaust						Belt	N/A	Trane	9/1/2013	20-25	10-15	

## WHITEFISH BAY HIGH SCHOOL - FIELDHOUSE CONTINUED

High School Fieldhouse	HS RE-13 (2013)	Roof Exhaust	N/A	N/A	Fieldhouse Roof	Area A	Fieldhouse Trainers RM						Belt	N/A	Trane	9/1/2013	20-25	10-15	
High School Fieldhouse	HS RE-14 (2013)	Roof Exhaust	N/A	N/A	Fieldhouse Roof	Area A	Fieldhouse North Team Rm						Belt	N/A	Trane	9/1/2013	20-25	10-15	
High School Fieldhouse	HS RE-15 (2013)	Roof Exhaust	N/A	N/A	Pool Roof	Area A	Fieldhouse Concessions	Cook	135 ACE 135C5B	012SE76136-00/0002401	1500	1/2 / 115-1	Belt	N/A	Trane	9/1/2013	20-25	10-15	
High School Fieldhouse	HS RE-16 (2013)	Roof Exhaust	N/A	N/A	Pool Roof	Area B	Fieldhouse Lobby Tlts						Belt	N/A	Trane	9/1/2013	20-25	10-15	
High School Fieldhouse	HS RE-17 (2013)	Roof Exhaust	N/A	N/A	Fieldhouse Roof	Area A	Fieldhouse Lobby						Belt	N/A	Trane	9/1/2013	20-25	10-15	
High School Fieldhouse	FH CF-1 (1967)	Cabinet Fan		N/A	S251A	Girls 54	Girls Locker Rm				4000					9/1/1967	25-30	-15	
High School Fieldhouse	FH CF-2 (1967)	Cabinet Fan		N/A	S251A	S251A	Boys Locker Rm	American Standard	12A	Order# 2-87510-4	7000	60 / 230/460-3	Belt	N/A	Trane	9/1/1967	25-30	-15	
High School Fieldhouse	FH CF-5 (1967)	Cabinet Fan		N/A	S251A	S251A	Boiler Rm vent				5400					9/1/1967	25-30	-15	
High School Fieldhouse	FH DSS-1 (Outdoor Unit)	Ductless Split System	24 MBH	Yes	Roof	Roof	Office 162, 163	Panasonic	CU-4KS24NBU	00 20322	N/A	208-1	N/A	N/A	Local Tstat		20-25		
High School Fieldhouse	FH DSS-1 (Indoor Unit)	Ductless Split System	12 MBH	Yes	Office 163	Office 163	Office 163	Panasonic	CS-MKS12NKU	00 15921	N/A	208-1	N/A	N/A	Local Tstat		20-25		
High School Fieldhouse	FH DSS-1 (Indoor Unit)	Ductless Split System	12 MBH	Yes	Office 162	Office 162	Office 162	Panasonic	CS-MKS12NKU		N/A	208-1	N/A	N/A	Local Tstat		20-25		
High School Fieldhouse	FH DHWH-1	Water Heater- Camus Boiler	400 MBH	N/A	Link Mech Room	Link	Main building domestic hot water heater	Camus	THNW-039-MSI-HL	111012172	N/A	N/A	N/A	N/A	Local Control	10/22/2019	10-15	5-10	
High School Fieldhouse	FH DHWH-1	Water Heater- Camus Boiler	400 MBH	N/A	Link Mech Room	Link	Main building domestic hot water heater	Camus	THNW-039-MSI-HL	111012173	N/A	N/A	N/A	N/A	Local Control	10/22/2019	10-15	5-10	
High School Fieldhouse	FH DWP-1	Domestic Water Pump		N/A	Link Mech Room	Link	Main building domestic hot water heater	Bell & Gossett	PL-50B	1BL017	N/A	190 Watts / 115-1	N/A	N/A	Local Control	10/22/2019	20-25	5-10	