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# Oconto Falls School District
# FACILITY ASSESSMENT

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Oconto Falls School District

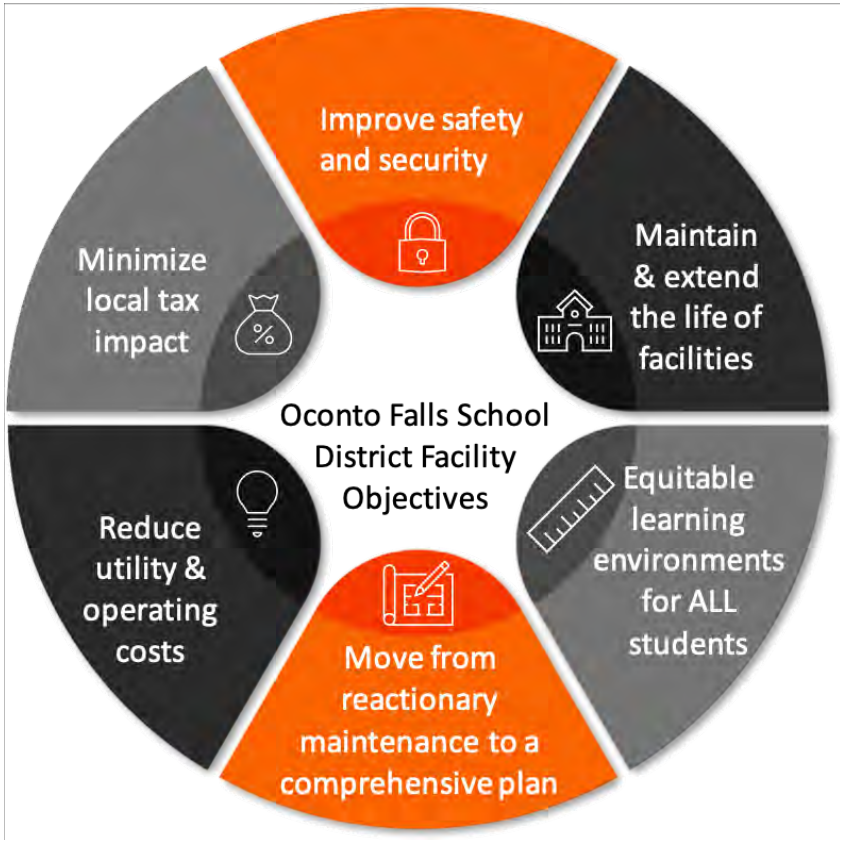
# FACILITY ASSESSMENT

## SECTION 1

## Executive Summary

# INTRODUCTION

This facility assessment is the result of work completed by Nexus Solutions for the Oconto Falls School District from May to December 2020. The following report documents the physical condition of existing buildings, sites and systems, as well as the educational adequacy of each school environment. The facility improvements identified in this report provide the framework and direction for the Oconto Falls School District's Facilities Master Plan and include detailed measures for the necessary systemic improvements and/or renovations needed across the District. In this section, you will find an overall summary of the methodology used to identify needs, the solutions recommended to address needs and the costs estimated for implementation. Sections 2-7 of this report contain detailed descriptions of each identified deficiency, along with recommended solutions and corresponding budgets.



## Our Methodology

This assessment was facilitated by Nexus Solutions and utilized a wide variety of data collection and analysis, including:

- building tours and review of existing drawings
- interactive sessions with District Leaders, Staff and Faculty
- expertise from a team comprised of master planners, architects, engineers from multiple disciplines, designers and building envelope professionals

This comprehensive assessment relied on two critical components, a detailed Facility Condition Assessment and a thorough Educational Adequacy Analysis, both of which are summarized on the following pages.

# FACILITIES CONDITION ASSESSMENT

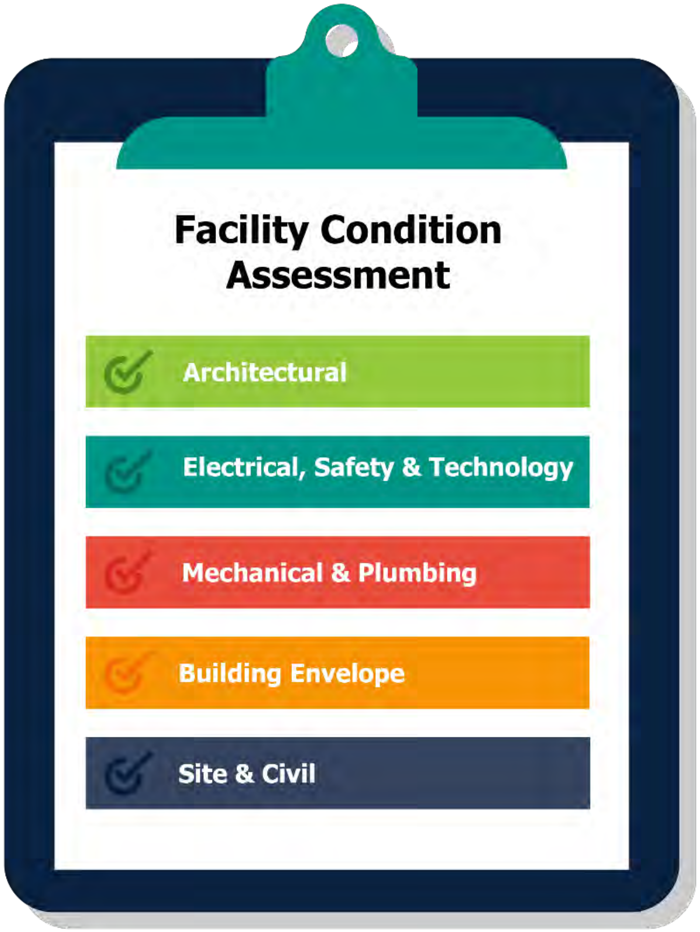
A complete and multi-disciplinary audit of each building was conducted to estimate the cost of restoring, replacing or maintaining defective assets. This audit focused on five distinct facility systems which included Interior Finishes & Food Service, Site & Civil, Building Envelope, Electrical & Safety, Mechanical & Environmental.

Once each system was assessed, the associated costs for each system were rolled into a total cost per building and evaluated by comparing the cost of repairs versus replacement. These two costs also determined the buildings Facility Condition Index (FCI), which can be used to guide decisions when considering the most cost-effective solutions. A building's FCI is calculated by **dividing** the **cost to repair** it by the **cost to replace** it, resulting in a percent (%) of building new.

As the chart below indicates, the individual school's FCI range from a low (good) of 7.66% at Oconto Falls High School, to a high (poor) of 63.95% at Washington Middle School. Both elementary schools are in relatively good shape with an FCI of 13.02% at Abrams Elementary and 13.15% at Oconto Falls Elementary.

| | |
|---|---|
| Oconto Falls High School | 7.66% |
| Washington Middle School | 63.95% |
| Abrams Elementary School | 13.02% |
| Oconto Falls Elementary School | 13.15% |

Typically, when planning PK-12 school improvements, guidelines for school construction recommend carefully considering the cost of reinvestment versus replacement when a school's FCI is over 60%.



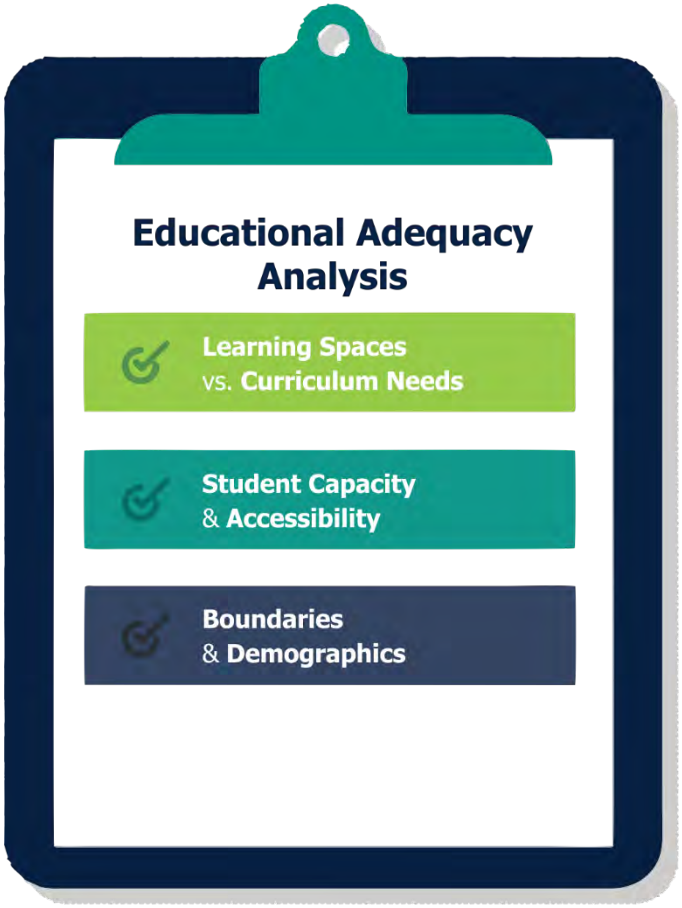
# EDUCATIONAL ADEQUACY ANALYSIS

Educational Adequacy (EA) is determined by assessing how effectively a school building supports current and planned educational programs. In this step we evaluated entrance security, special education spaces, ADA accessibility (internally and externally) and the learning environments at each school.

Capacity planning is another major component considered when evaluating. educational space. In this step we evaluated the capacity of each school – elementary, middle and high school level – to determine how it aligns with District policies adopted by the Board of Education. For example, if there is a physical space capacity for 30 students, but a Board policy dictates 25 students per classroom, spaces may require adjustments to accommodate the additional students. These are key factors considered when planning space requirements and the number of sections per grade.

After interviewing principals at each school and assessing how each school building was currently being used, the data was analyzed to determine if it met the requirements for delivering modern education curriculums and supporting student achievement. Once each building was evaluated, it received a scorecard which ranked 22 different components as Green=Adequate, Yellow=Questionable or Red=Inadequate.

The Districtwide scorecard on the following page illustrates the deficiencies that have been identified at each school building.



# DISTRICTWIDE EDUCATIONAL ADEQUACY SCORECARD

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21<br>FCI | Suitability for Reinvestment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Abrams ES | 🟩 | 🟨 | 🟩 | 🟨 | 🟥 | 🟨 | 🟥 | 🟨 | 🟨 | 🟨 | 🟨 | 🟩 | 🟩 | 🟨 | 🟩 | 🟨 | 🟥 | 🟩 | 🟨 | 🟩 | 🟩 | Questionable |
| Oconto Falls ES | 🟨 | 🟨 | 🟩 | 🟩 | 🟥 | 🟥 | 🟥 | 🟩 | 🟩 | 🟩 | 🟥 | 🟩 | 🟨 | 🟨 | 🟨 | 🟥 | 🟥 | 🟩 | 🟨 | 🟨 | 🟩 | Adequate |
| Washington | 🟥 | 🟥 | 🟨 | 🟥 | 🟨 | 🟨 | 🟥 | 🟨 | 🟨 | 🟥 | 🟥 | 🟥 | 🟥 | 🟨 | 🟨 | 🟥 | 🟥 | 🟨 | 🟨 | 🟨 | 🟥 | Inadequate |
| Oconto Falls HS | 🟨 | 🟩 | 🟩 | 🟩 | 🟨 | 🟩 | 🟥 | 🟨 | 🟩 | 🟨 | 🟥 | 🟩 | 🟨 | 🟩 | 🟩 | 🟥 | 🟨 | 🟩 | 🟨 | 🟩 | 🟩 | Adequate |

1. Site Traffic, Safe Routes, Parking
2. Site Size, Outdoor Fields & Greenspace Areas
3. Security/Supervision
4. ADA Accessibility
5. Administrative/Nurse/Student Support Spaces
6. Cafeteria/Serving/Kitchen
7. Staff Planning/Collaboration Areas
8. Restrooms-Student/Staff
9. Support Spaces (Lockers, Book Room, Storage, Receiving, etc.)
10. Circulation/Wayfinding
11. Community Space
12. Building Aesthetics (Interior & Exterior)
13. Classroom Quantity, Size & Suitability
14. Science/STEM Classrooms
15. Music, Art, Performance Spaces
16. Flexible Learning Spaces, Student Project/Breakout Spaces
17. Makers Space/FAB Lab/Career & Tech. Ed. Spaces
18. Phy. Ed. & Athletics Spaces
19. Library/Media Center/Learning Commons
20. Special Education Spaces
21. FCI
22. Expansion

As indicated by both the FCI and the EA Scorecard, repairs and upgrades at both elementary schools and the high school would be considered sound investments. However, Washington Middle School appears to be less suitable for reinvestment due to a high FCI and rankings from its EA Scorecard. When comparing the needs of the middle school (repairs/upgrades and educational adequacy improvements) to the cost of a new building, the District should also factor in the age of the building (64 years) and the site (green space, parking) for long-term suitability and use.

# OVERVIEW OF DEFICIENCIES, SOLUTIONS & COSTS

The following pages provide a summarized overview of the identified deficiencies, proposed solutions and estimated costs Districtwide. School-specific details can be found in Sections 2 -5 of this comprehensive facility assessment.

Based on facility walkthroughs and stakeholder interviews (with the District's Administration, School Principals and Specialists), significant upgrades are needed at each school facility to address deferred maintenance and ensure learning environments accommodate the modern educational programming expected of public schools today.

**Recommendations included in this report will outline solutions for:**

- Updates and repairs to Abrams Elementary School
- Updates and repairs to Oconto Falls Elementary School
- Replacing Washington Middle School with a new facility
- Updates and repairs to Oconto Falls High School

While upgrades to both elementary schools and the high school are sound investments that will pay long-term dividends, Washington Middle School requires considerable repairs, upgrades and educational adequacy improvements. Based on the estimated cost of nearly $25 million to upgrade (See school specific details in Section 4), we recommend building a slightly larger 85,000 square foot, energy-efficient building with significantly lower operating costs.

## GUIDING PRINCIPLES

### District Facilities Will Ensure:

| | |
|---|---|
| Appropriate learning spaces for special education programs | Increased ability to provide consistent social and emotional support for students |
| Learning spaces support current teaching and learning methods | Appropriate learning spaces for special education programs |
| Efficient and effective scheduling of spaces to support curriculum needs | Building infrastructure provides safe, healthy and comfortable learning environments |
| Facilities are well-maintained, efficient and sustainable for long-term use | Fiscally responsible approach to protecting the community's most valued asset |

**Needs, Priorities & Estimated Costs by School:**

The comprehensive analysis resulted in six key categories of recommended solutions to address both deferred maintenance and educational adequacy needs across the District. Please note, the budgets are shown in 2020 dollars. The final master plan will include an allowance for future inflation, which will impact the total budget needed. Nexus is not suggesting that all identified needs be addressed at this time. Rather, Nexus recommends the needs be prioritized through a series of highly collaborative meetings involving the administration, Board of Education, and community. The result will be a community-driven long-term, master plan for your facilities.

### 0-20 Year Priorities | $72,921,500 Districtwide

| Building | Site | Architectural | Electrical | Envelope | Mechanical | Ed Adequacy | Total |
|---|---|---|---|---|---|---|---|
| Oconto Falls High School | $1,202,000 | $6,041,500 | $2,017,500 | $1,967,000 | $7,618,000 | $4,350,000 | $23,196,000 |
| Washington Middle School | $551,500 | $2,922,000 | $1,163,500 | $1,308,500 | $12,315,500 | $6,715,500 | $24,976,500 |
| Abrams Elementary School | $359,500 | $2,330,000 | $728,000 | $1,148,500 | $4,231,500 | $2,105,500 | $10,903,000 |
| Oconto Falls Elementary School | $601,000 | $2,771,000 | $817,000 | $1,546,500 | $2,934,500 | $5,176,000 | $13,846,000 |
| Total | $2,714,000 | $14,064,500 | $4,726,000 | $5,970,500 | $27,099,500 | $18,347,000 | $72,921,500 |

** Detailed breakdowns for each school, by facility improvement measure (FIM), can be found in each individual school assessment (Section 7). **

### Recommendations for Districtwide Prioritization

Even with three of the four schools assessed in this facility study being suitable for repairs and upgrades, our assessment illustrates there are significant deficiencies Districtwide. The attached comprehensive assessment identifies approximately $73 million worth of facility needs for the Oconto Falls School District to consider over the next 20 years. And while it is common for a District's needs to outweigh their budget dollars, this study also outlines recommendations for which needs are most critical and should be addressed over the next five years.

**Districtwide:** deferred maintenance priorities over the next five years should include ADA-code compliance, fire alarm system replacements, generator additions, LED lighting and controls upgrades.

**Abrams Elementary School:** deferred maintenance priorities over the next five years should include gymnasium roof repair, HVAC updates and interior repairs to floors, ceilings, walls, lockers.

**Oconto Falls Elementary School:** deferred maintenance priorities over the next five years should include roof and masonry repairs, HVAC updates, window replacements and interior repairs to floors and doors.

**Washington Middle School:** there is a significant amount of deferred maintenance which – due to building age, green space limitations and parking restrictions – warrants careful consideration of whether to reinvest in the current school or invest in a new building for long-term use. The District and its taxpayers would be much better served by replacing the current building with a new school that could be designed and built to satisfy the instructional needs identified in the educational adequacy analysis, while gaining budgetary benefits from a more energy efficient building that would require significantly less maintenance over the next decade.

**Oconto Falls High School:** deferred maintenance priorities over the next five years should include roofing, gutters, exterior concrete wall and pavement repairs, electrical panels, public address and clock systems and interior repairs to ceilings, walls, doors and casework.

### WHAT'S NEXT?

Review needs and recommendations

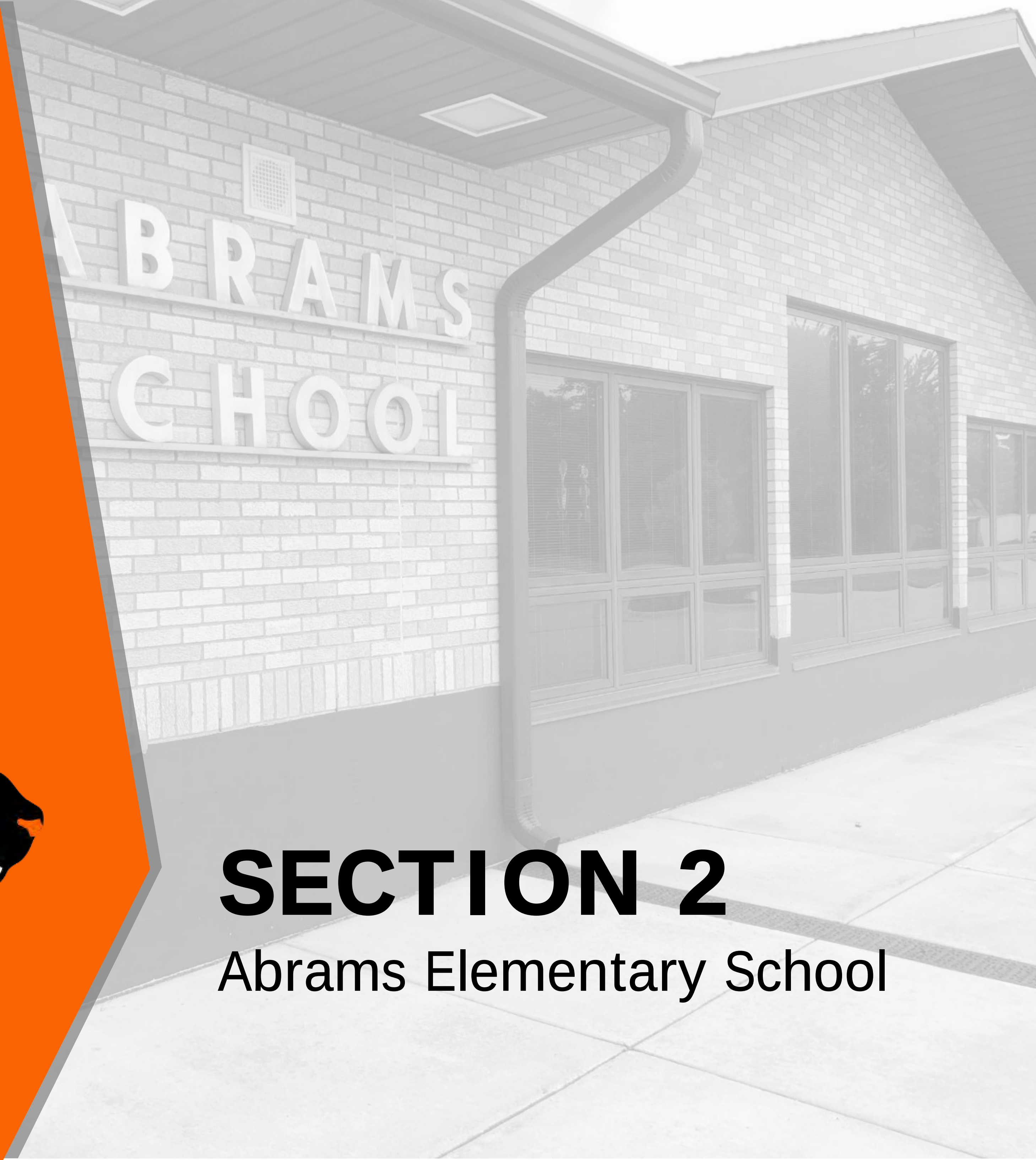
Present report to the School Board

Finalize a Facilities Master Plan with Community Input

Determine funding solutions

Oconto Falls School District

**FACILITY ASSESSMENT**



# SECTION 2

## Abrams Elementary School

# INTERIOR FINISHES

## Doors

Throughout the school the interior wood doors and frames are in good shape, there are a few that are chipping and damaged.

Approximately six doors should be replaced with new wood doors. Only one door was identified without an ADA compliant doorknob. This hardware should be replaced with a level style handle. There are door grilles that need painting or replacing due to chipped paint, rust spots, or dents.

All the exterior doors and frames are hollow metal. The doors and frames are showing wear and rust.

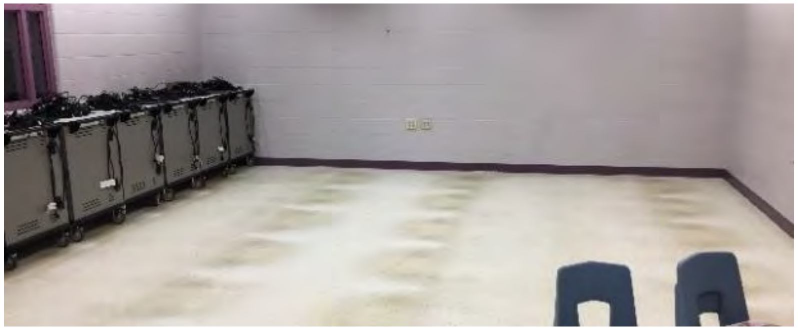
Recommendation is to replace the exterior doors and frames with aluminum and FRP doors and frames for durability, maintenance and longevity.

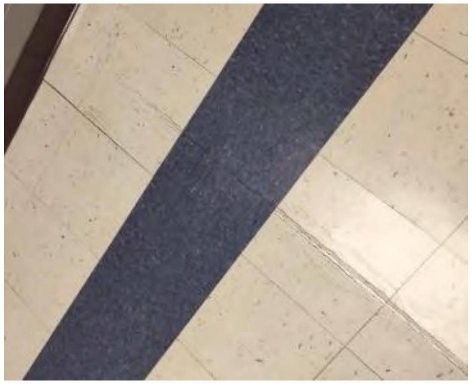
### Floors

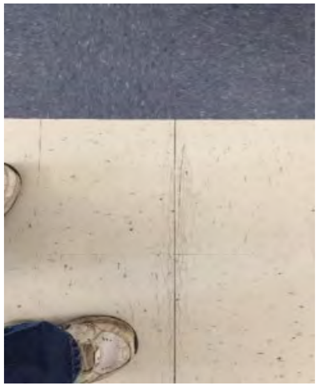
Throughout the school there are concerns with the flooring. The majority of the flooring is VCT (vinyl composition tile). This floor product requires regular stripping and waxing. If the product is not stripped on a regular basis prior to applying the new wax, the dirt will get trapped in the flooring. VCT flooring throughout the school is discolored and appears 'dirty'.

There are multiple locations where the VCT has cracks in it. VCT is a hard and brittle product. If there are cracks in the concrete below the VCT, it is likely to transfer through the VCT; if the cracking below the VCT is not addressed (filled or stopped) replacing the existing VCT with new VCT will likely result in the same type of cracking. A more flexible, resilient flooring product (like a solid vinyl or rubber) or polishing the concrete, is recommended.

There is significant cracking in the east end classrooms where the concrete floor appears to have settled. The flooring should be replaced after the settling issue is resolved.





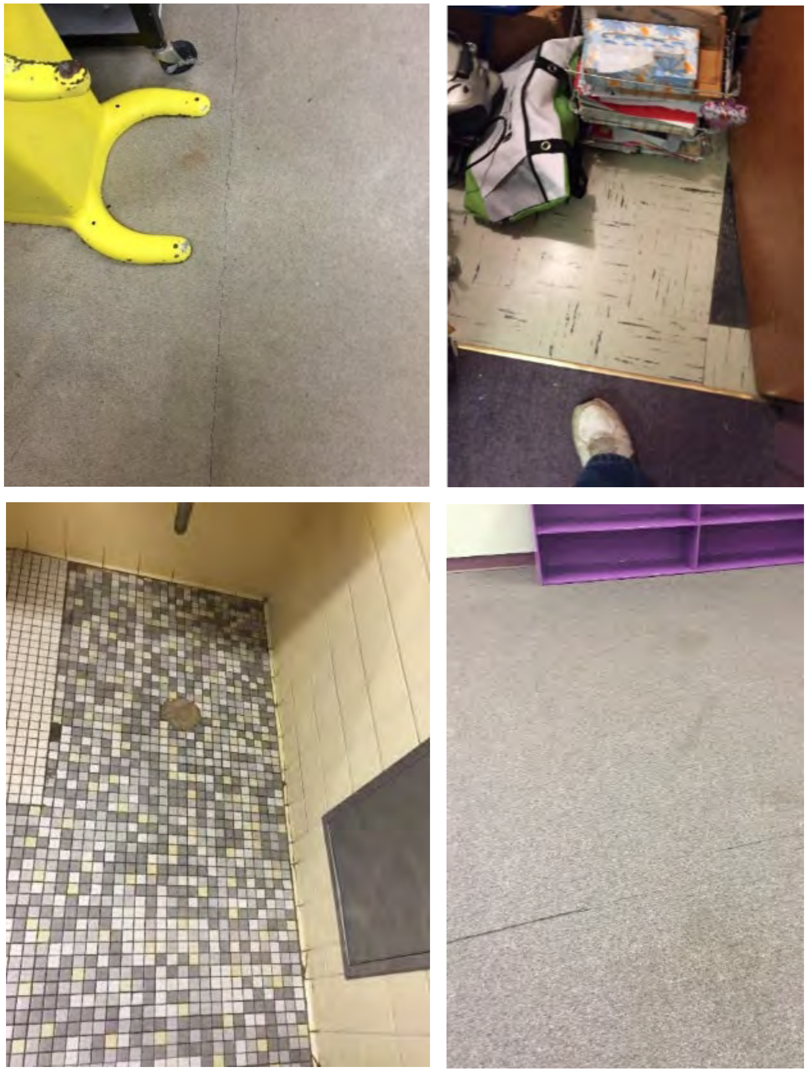


One area had visible indications that hazardous materials may be present. It is possible that there are more areas that have been carpeted over.

The epoxy flooring in the restrooms, kitchen, and lockers has discolored, however, it still functions as designed. There are cracks in the epoxy flooring in the kitchen and associated restroom that should be filled for sanitary reasons.

Ceramic tile flooring and base in the older restrooms has cracking and should be replaced.

There is minimal carpet in the building, however, there are a number of the carpet areas that have significant wear, including tears and rippling.



### Walls

One pair of restrooms has wall damage where there appears to have been water infiltration.  The plaster finish should be repaired and the walls repainted.

### Ceilings

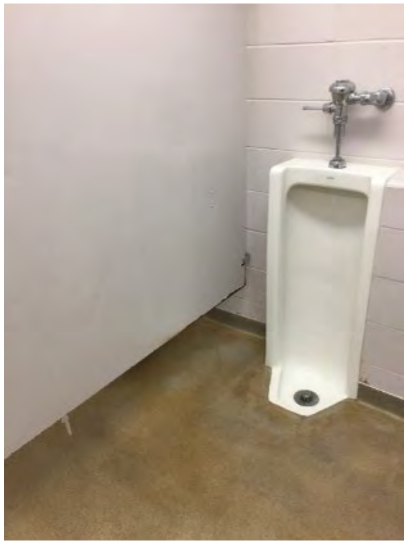
A portion of the school includes 2 x 4 ceiling tile and grid which is showing age, sagging and discolored.  This ceiling should be replaced with 2 x 2 ceiling tile and grid to match the remainder of the school.

### Toilet Partitions

One pair of restrooms has metal toilet partitions which are beginning to rust. These partitions should be replaced with solid plastic partitions similar to the other restrooms in the building.

### Lockers

One hallway of metal lockers has visible rust spots on the lockers.  These lockers may be able to be repaired and repainted or replaced.



## ADA ACCESSIBILITY

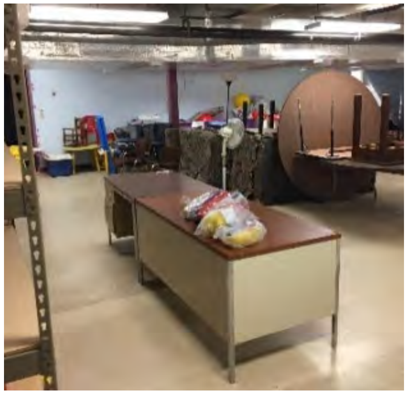
### Lifts & Handrails

The existing Abrams Elementary consists of a main first floor and two lower-level spaces. One lower-level area includes a music room and auxiliary classroom space. These spaces are used by students and staff. These spaces meet ADA requirements because they are accessible by a lift.

The other lower-level space includes mechanical rooms, classrooms, lounge, and kitchen space that is no longer used. The space is currently used for mechanical equipment and general storage. This section of the school is not accessible by lift or elevator and does not meet ADA requirements. Any occupied use of this section of the school must be duplicated on an accessible level; for example, if an art room is located on the lower level, there must also be an art room located on the accessible level.

The handrails at the stairs to the lower level do not meet code for the required handrail extensions. Replacing the handrails with code compliant handrails with extensions would be recommended.

Based on the current use and capacity of the school, the addition of a lift or elevator to this section of the school is not recommended. Proper use of these spaces, mechanical and storage areas not occupied by staff or students, is recommended.



## Restrooms

The building does have accessible ADA compliant restrooms. Since there are restrooms that are not ADA compliant, signs should be included at the non-compliant restrooms directing users to the compliant restrooms.

In addition, there are non-compliant restrooms that are labeled with accessible signs (with the wheelchair symbol).

Items contributing to the non-compliance include narrow entrance to the restroom, small stalls, sink piping without pipe wrap. Signs should be changed to remove the accessible symbol from the signs at these restrooms.

| FIM # | Interior Finishes Upgrades |
|---|---|
| AES-INT-1<br>Through<br>AES-INT-4 | Door Hardware<br>• Provide ADA compliant level style hardware (one door)<br>• Replace grilles on doors with damaged grilles (approximately 6)<br>• Replace damaged wood doors (approximately 6)<br>• Replace exterior hollow metal doors and frames (approximately 15 pair)<br>Flooring Upgrade<br>• Replace cracked VCT<br>• Fill cracks in Epoxy Floor<br>• Replace cracking restroom tile<br>• Abate and replace any hazardous flooring tile<br>• Replace worn and torn carpet<br>Walls Upgrade<br>• Repair damaged wall plaster and finish in restrooms<br>Ceiling Upgrade<br>• Replace 2 x 4 ceiling tile and grid with 2 x 2 ceiling tile and grid<br>Toilet Partition Upgrade<br>• Replace rusting metal toilet partitions<br>Locker Upgrade<br>• Replace or repair rusting metal lockers<br>ADA Compliance<br>• Replace handrails at stairs to the lower-level mechanical / storage space for code compliance. |

| FIM # | Benefits of Interior Finishes Upgrades |
|---|---|
| AES-INT-1<br>Through<br>AES-INT-4 | • Reduced future maintenance<br>• Improved school aesthetics<br>• Improved school pride<br>• Improved sanitary conditions; sealing cracks in floor in food prep areas<br>• Code compliance for safer use of stairs by staff |

# FOOD SERVICE EQUIPMENT

Abrams Elementary School is a full production kitchen where food is received, prepped and cooked on site for daily meal service. The school provides both breakfast and lunch to students. Meals are served to students in multipurpose room. Deliveries come thru dedicated 36” door to south. Overall kitchen flow is adequate from receiving to bulk storage to prep and cooking. The serving line (Servery) for students is located inside kitchen with dedicated entry and exit for circular flow, however, is not the most desirable having students (public) enter inside the kitchen proper. Ideally the servery space wants to be a separate room or space from a sanitation and safety standpoint. The serving line inside the kitchen also limits proper staging space opposite the cooking line.

**Observations**

- Walk-In Cooler / Freezer had some epoxy coated shelves but some of the uprights we chrome plated and rusting.
- Epoxy floor inside cooler and freezer is failing in certain locations of cooler / freezer especially around door jamb.
- Drop ceiling is showing age with rust on grid and discolored tiles.
- Floor Mixer – Blakeslee - is very old and does not have bowl guard.
- Convection ovens – Hobart – are no longer manufactured and may be difficult to get parts should they become unreliable in future.
- Serving line hot well unit has pans with exposed heating elements that are rusting.

## Recommendations

- Replace ceiling grid and vinyl coated tiles – (see interior finishes recommendations.)
- Repair of epoxy flooring – patching where necessary – (see interior finishes recommendations.)
- Replace rusted shelving in walk in cooler & freezer with epoxy coated units
- Replace Floor Mixer (assuming it is still utilized as part of meal service program)
- Appears cooking line has been adjusted on side with Range and Steam Kettle. Make sure drop for Ansul System on this side are lined up properly for coverage over range (kettle may not require a drop). This can be verified with School Districts local fire suppression company.
- Replace gas double stock convection ovens
- Replace hot food well unit in serving line
- Replace baffle for disposer (was missing in Prep Table)
- Consider replacing Dishwasher with newer energy efficient unit.
- Consider replacing Pre-Rinse Spray unit with new.
- Consider replacing Disposer with new unit that has remote start / stop control in lieu of old drum switch.

| FIM # | Recommended Food Service Improvements |
|---|---|
| AES-INT-5 | **Replace Kitchen Equipment Where Required:**<br>• Replace ceiling grid and vinyl coated tiles – (see interior finishes recommendations.)<br>• Repair epoxy flooring – patching where necessary – (see interior finishes recommendations.)<br>• Replace rusted shelving in walk in cooler & freezer with epoxy coated units.<br>• Replace Floor Mixer (assuming it is still utilized as part of meal service program.)<br>• Verify fire-suppression safety for cooking line.<br>• Replace gas double stock convection ovens.<br>• Replace hot food well unit in serving line.<br>• Replace baffle for disposer (was missing in Prep Table.)<br>• Replace dishwasher with newer energy efficient unit.<br>• Replace Pre-Rinse Spray unit with new.<br>• Replace Disposer with new unit that has remote start / stop control in lieu of old drum switch. |

| FIM # | Benefits of Food Service Improvements |
|---|---|
| AES-INT-5 | • Improved food safety.<br>• Reduced future maintenance on food service equipment.<br>• Increase efficiency of food service staff.<br>• Improved safety for food service staff. |

# SITE DRAWINGS

## PLAN NOTES: ⓧ

1 METAL TOILET PARTITIONS ARE RUSTING.
2 HOLLOW METAL DOORS AND FRAMES ARE RUSTING.
3 HAZARDOUS MATERIAL MAY BE PRESENT IN FLOORING.
4 LOCKERS HAVE RUST SPOTS.
5 NO CODE REQUIRED HANDRAIL EXTENSIONS.
6 DOOR HARDWARE (KNOB) IS NOT ADA COMPLIANT.

FIRST FLOOR PLAN FLOORING REVIEW

NOT TO SCALE

## PRIORITY LEGEND

🟪 0-5 YEARS
🟧 5-10 YEARS
🟦 10-20 YEARS
🟩 SEE REPORT FOR UPGRADE DESCRIPTION
⬜ EXISTING BUILDING - NO WORK

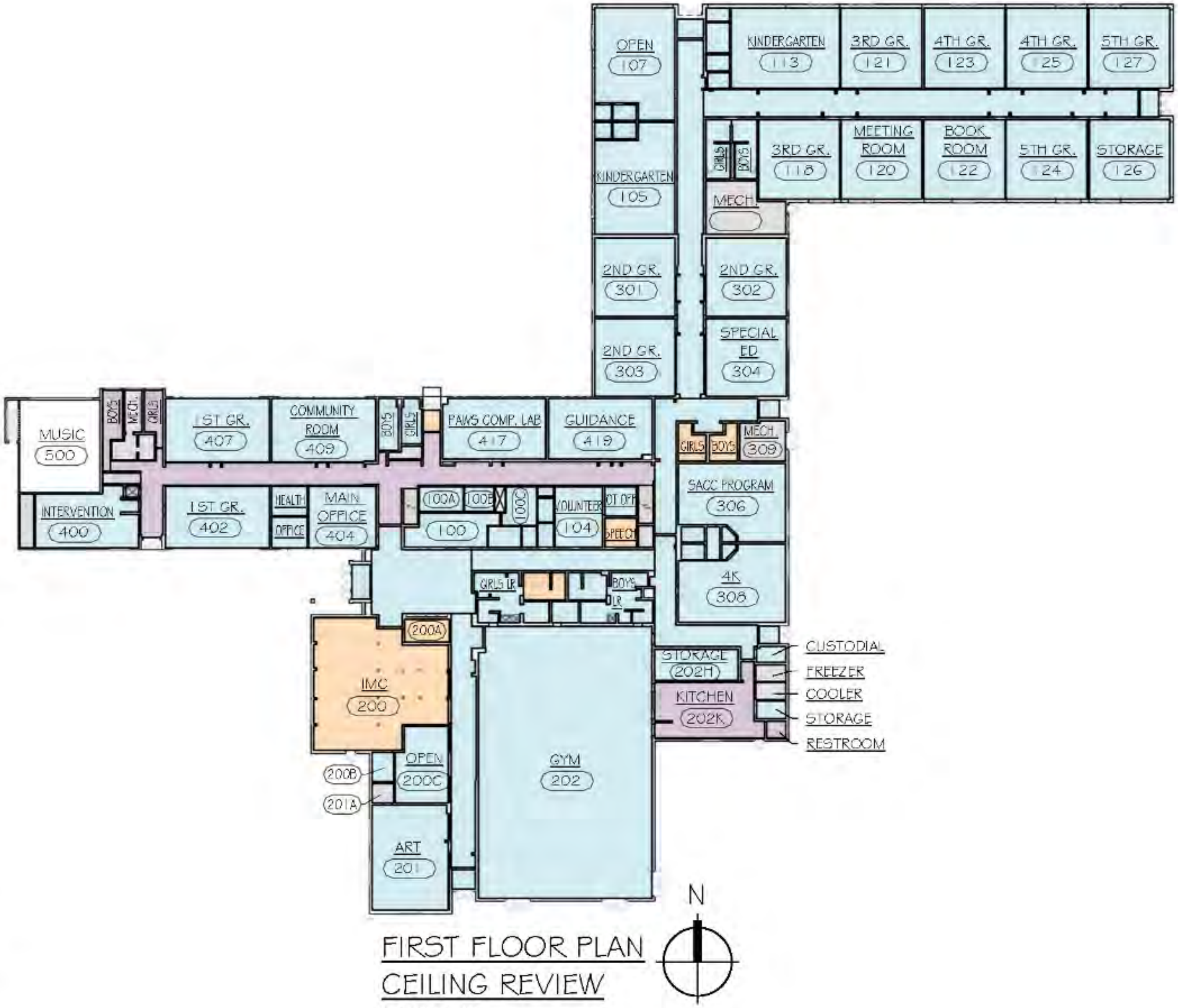
PLAN NOTES: ⬡

7 PAINT PEELING ON WALLS APPEARS TO HAVE WATER DAMAGE.

FIRST FLOOR PLAN
WALL REVIEW
NOT TO SCALE

PRIORITY LEGEND

| | |
|---|---|
| 🟪 | 0-5 YEARS |
| 🟧 | 5-10 YEARS |
| 🟦 | 10-20 YEARS |
| 🟩 | SEE REPORT FOR UPGRADE DESCRIPTION |
| ⬜ | EXISTING BUILDING - NO WORK |



## FIRST FLOOR PLAN
## CEILING REVIEW

NOT TO SCALE

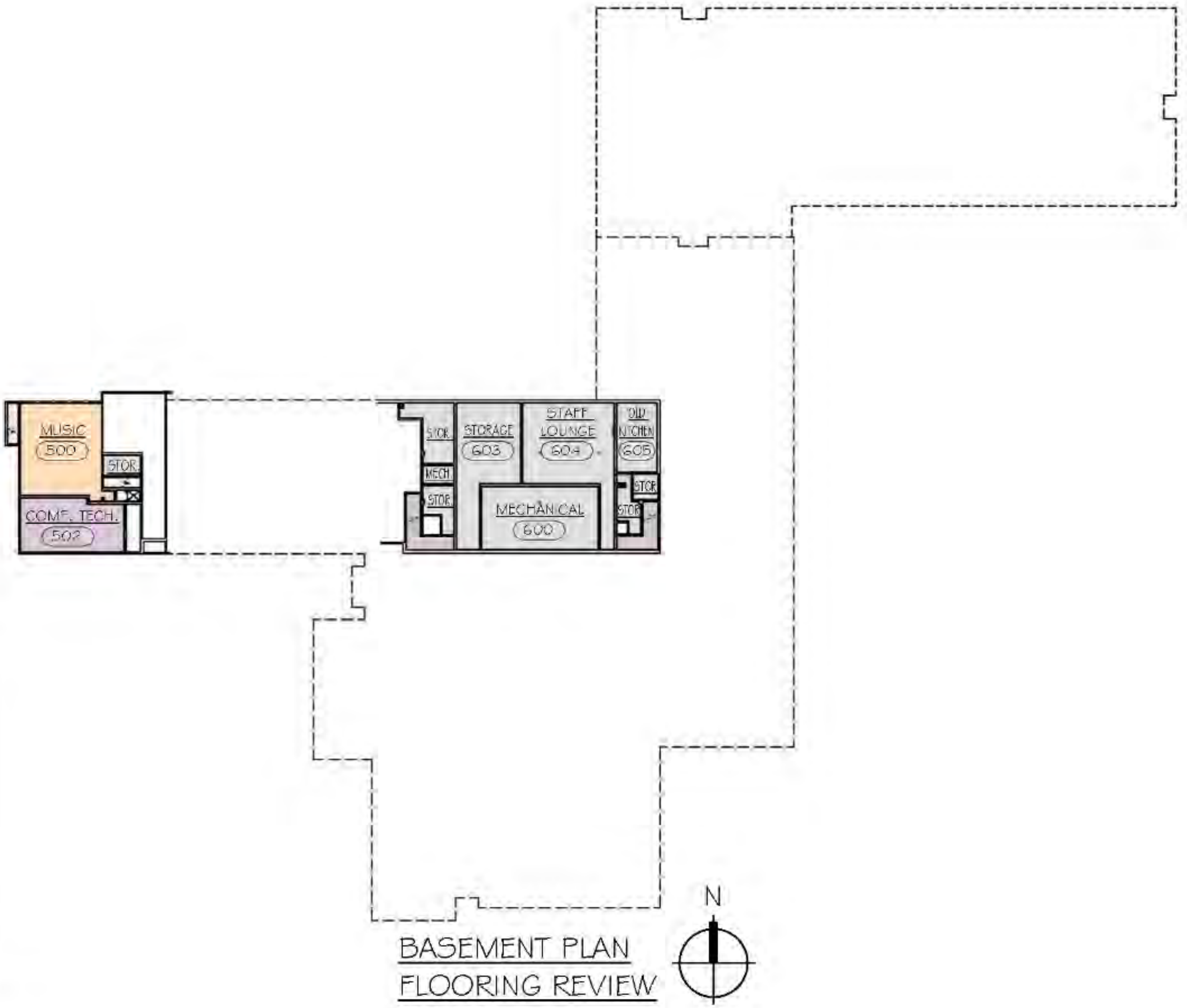
## PRIORITY LEGEND

- 🟪 0-5 YEARS
- 🟧 5-10 YEARS
- 🟦 10-20 YEARS
- 🟩 SEE REPORT FOR UPGRADE DESCRIPTION
- ⬜ EXISTING BUILDING - NO WORK

## PRIORITY LEGEND

- 🟪 0-5 YEARS
- 🟧 5-10 YEARS
- 🟦 10-20 YEARS
- 🟩 SEE REPORT FOR UPGRADE DESCRIPTION
- ⬜ EXISTING BUILDING – NO WORK

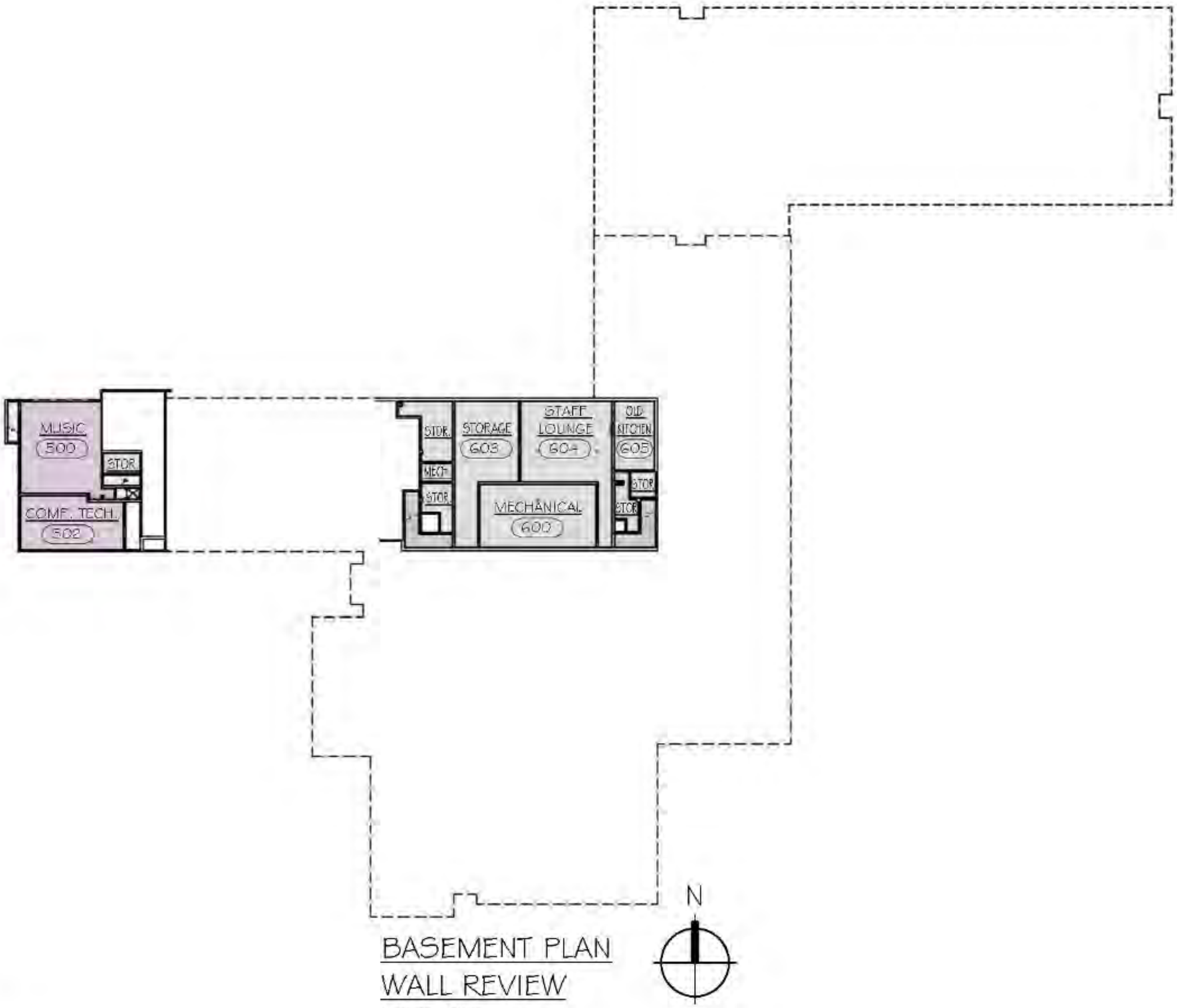
FIRST FLOOR PLAN
CASEWORK REVIEW
NOT TO SCALE



BASEMENT PLAN
FLOORING REVIEW
NOT TO SCALE

## PRIORITY LEGEND

- 🟪 0-5 YEARS
- 🟧 5-10 YEARS
- 🟦 10-20 YEARS
- 🟩 SEE REPORT FOR UPGRADE DESCRIPTION
- ⬜ EXISTING BUILDING - NO WORK

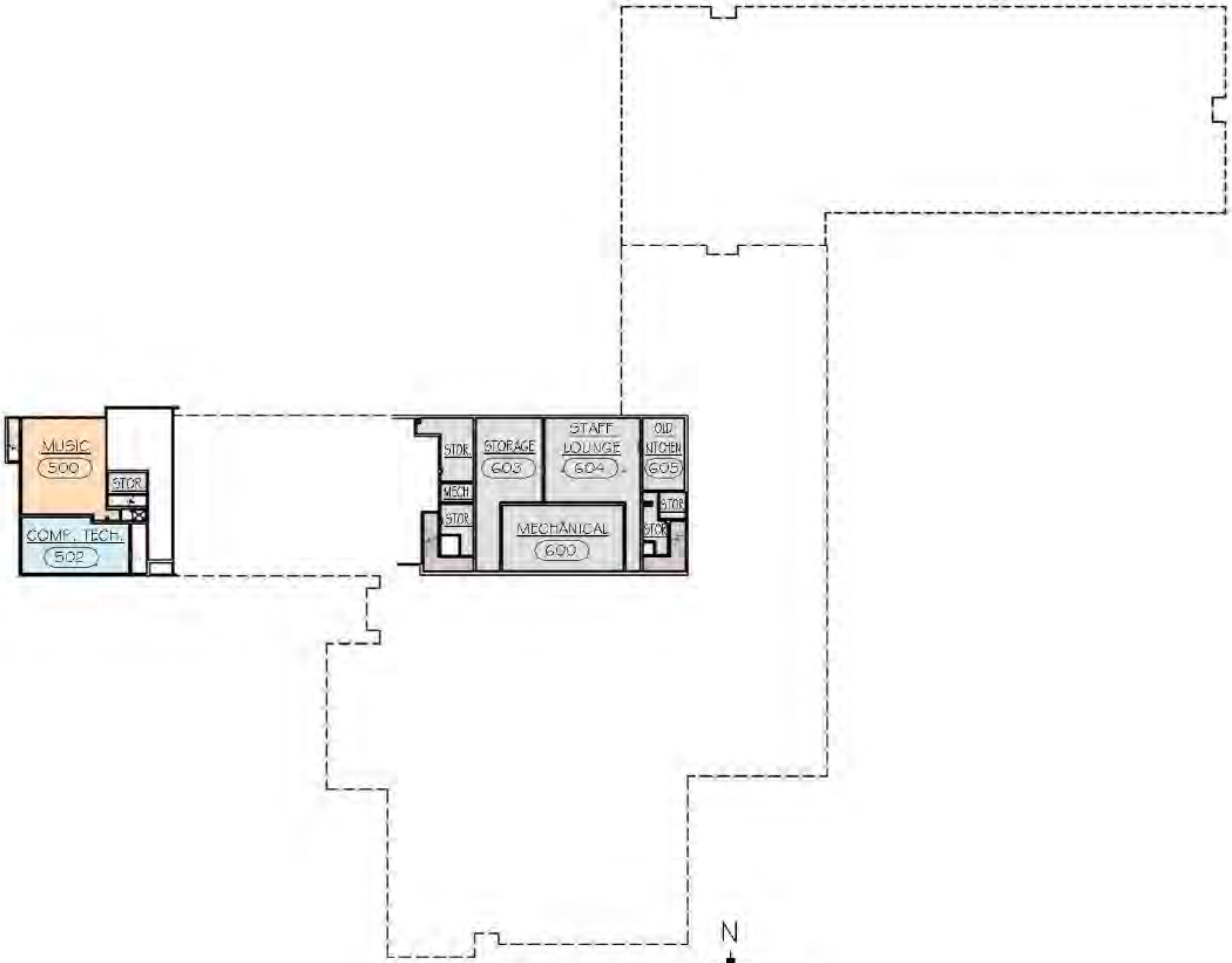


## BASEMENT PLAN
## WALL REVIEW

NOT TO SCALE

## PRIORITY LEGEND

- 🟪 0-5 YEARS
- 🟧 5-10 YEARS
- 🟦 10-20 YEARS
- 🟩 SEE REPORT FOR UPGRADE DESCRIPTION
- ⬜ EXISTING BUILDING - NO WORK



## PRIORITY LEGEND

| | |
|---|---|
| 🟪 | 0-5 YEARS |
| 🟧 | 5-10 YEARS |
| 🟦 | 10-20 YEARS |
| 🟩 | SEE REPORT FOR UPGRADE DESCRIPTION |
| ⬜ | EXISTING BUILDING - NO WORK |

## BASEMENT PLAN
## CEILING REVIEW

NOT TO SCALE

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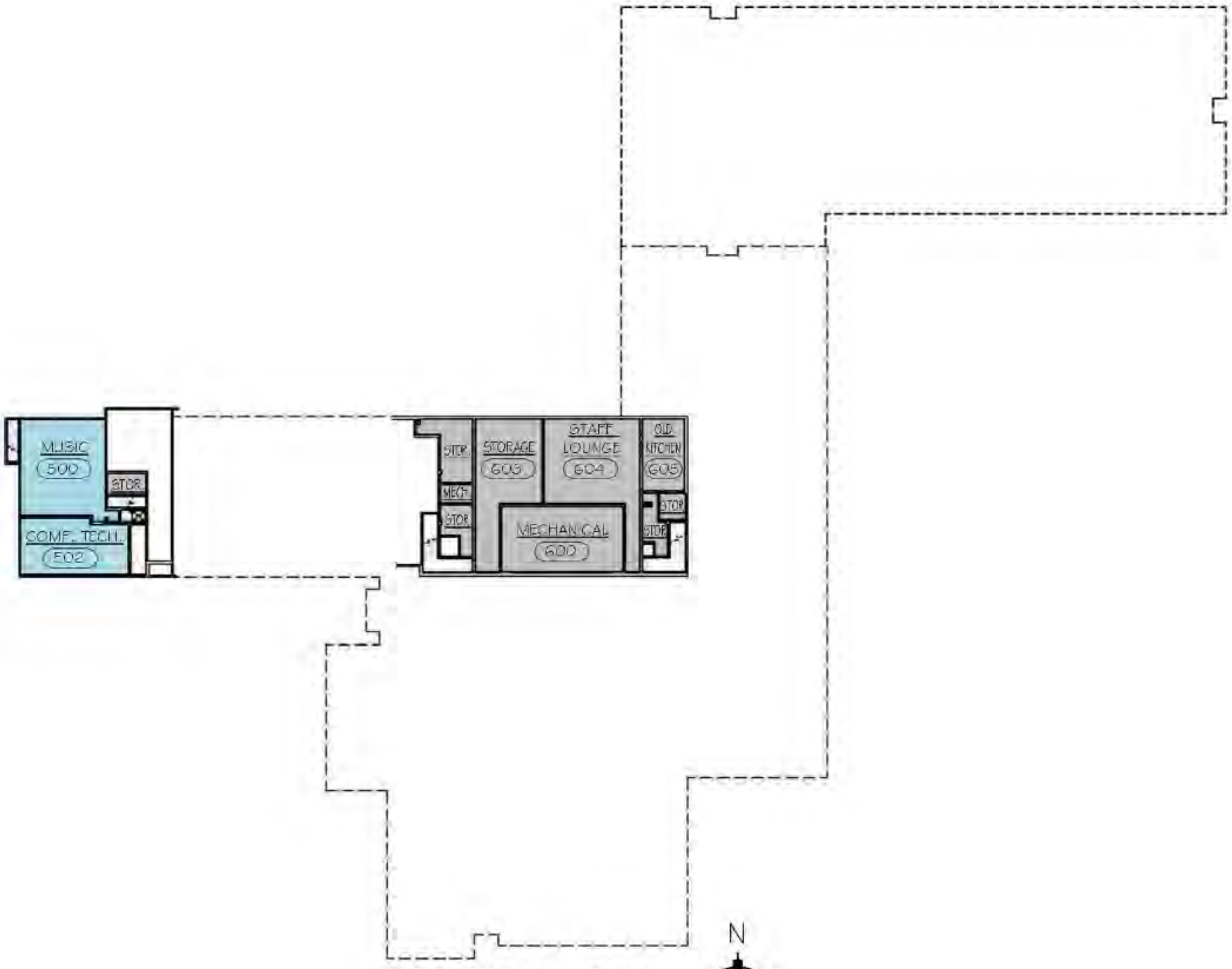


## PRIORITY LEGEND

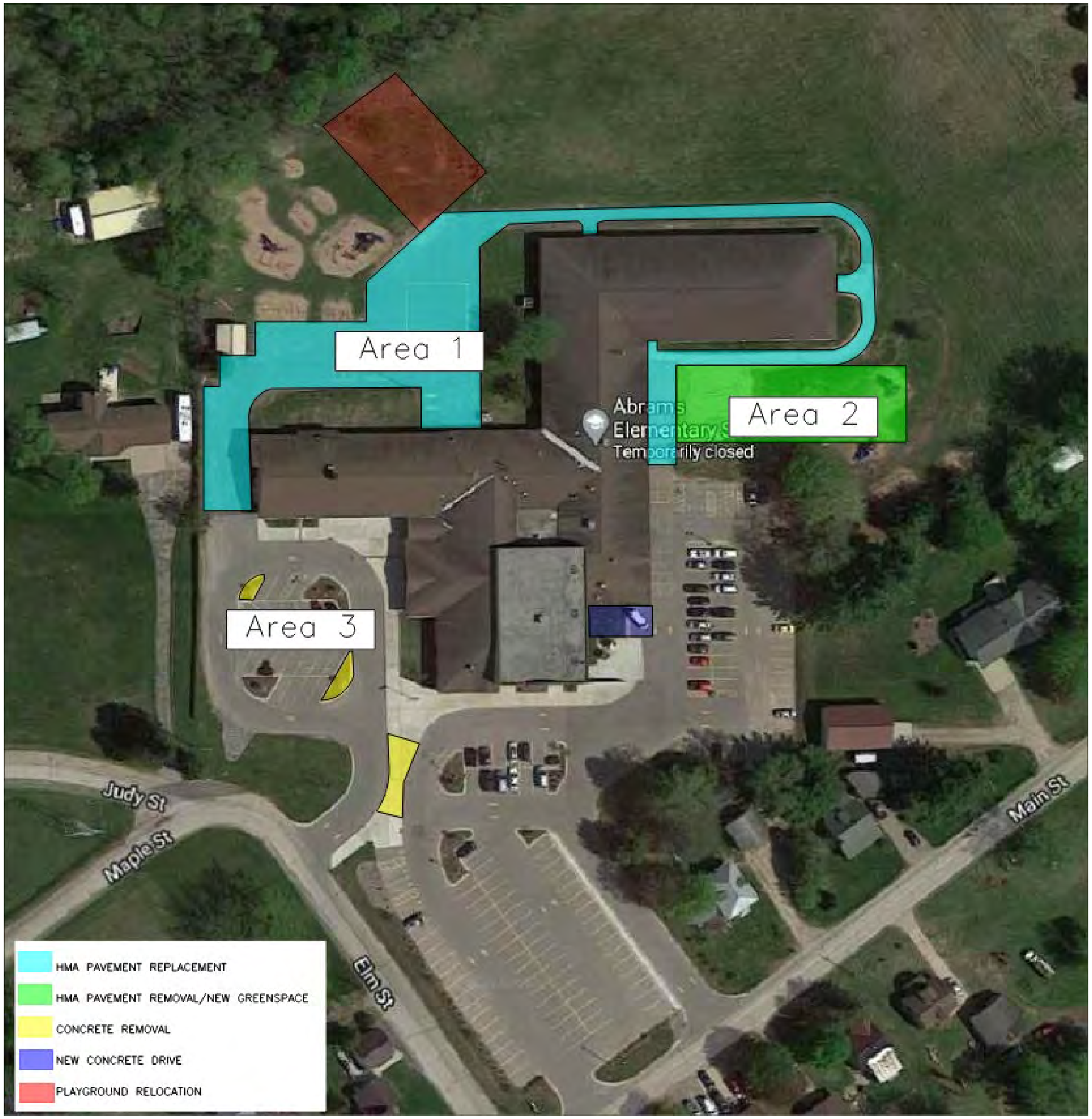
- 🟪 0-5 YEARS
- 🟧 5-10 YEARS
- 🟦 10-20 YEARS
- 🟩 SEE REPORT FOR UPGRADE DESCRIPTION
- ⬜ EXISTING BUILDING - NO WORK

## BASEMENT PLAN
## CASEWORK REVIEW

NOT TO SCALE

## SITE & CIVIL

The map at right shows the areas noted in the following recommendations. Areas not shaded were found to be in good condition, with no improvements being recommended at this time.



### Area 1: Paved Play Area and Road (North Side)

The existing pavement has numerous thermal cracks which have worsened over multiple freeze-thaw cycles. There are some areas of localized base failure, which are evident by the fatigue cracking present. The base failure is a small portion of this area, approximately 11%. Edge failure and surface weathering are also present.

### Area 2: Play Area (East Side)

Due to the condition and use of this area, it is recommended to remove the existing pavement and return it to green space. The playground equipment should be relocated as part of another recommendation (AES-EDA-5).

**Area 3: Site Concrete**

The shape and location of the concrete islands in this area make snow removal extremely time consuming and inefficient. It is recommended that the island be removed.

For ADA compliance, warning panels should be added to sidewalks where pedestrian traffic meets vehicular traffic.

**New Concrete Drive:**

A new concrete drive is desired to connect an overhead door to the paved surfaces.

**Playground Relocation:**

See Educational Adequacy Recommendations.

| FIM # | Recommended Site and Civil Improvements |
|---|---|
| AES-SC-1 | Area 1: Paved Play Area and Road (North Side)<br>• Remove the existing asphalt to expose the base material.<br>• Inspect the base material and repair it with base course patching as needed.<br>• Pave 3 inches of new asphaltic surface, perform drainage corrections, and paint all pavement markings. |
| AES-SC-2 | Area 2: Play Area (East Side)<br>• Remove the existing asphalt to expose the base material.<br>• Remove 3 inches of base material. Add 6 inches of topsoil, then add seed, fertilizer, and mulch.<br>• Addition of Concrete Drive to overhead door. |
| AES-SC-3 | Area 3: Site Concrete<br>• Remove the existing islands and sidewalk.<br>• Add 12 inches of dense graded base, add 3 inches of pavement, and mark the pavement.<br>• Add the detectable waring fields in required location. |

| FIM # | Benefits of Site and Civil Improvements |
|---|---|
| AES-SC-1 through AES-SC-3 | • Improved site safety.<br>• Reduced future maintenance on paved areas and sidewalks.<br>• Replacement of damaged pavement on playground with grass for usability and aesthetics. |

# BUILDING ENVELOPE

## Ballasted EPDM Roofing

The EPDM roofing systems are in poor condition.  The lower interior roof evidence of ponding, poor perimeter flashing transition installation, and is spongy in several areas when walked upon.  The upper gymnasium roof has had reported leaks. Multiple repair attempts were observed at through wall scuppers, drain flashings, and roof top penetration flashings. Coping fasteners are installed through the top plane of the coping and multiple fasteners are backing out.

## Shingle Roofing

The shingle roof system is in fair condition.  Valleys and roof penetrations are improperly installed per industry and manufacturer's written installation instructions. There are two locations on the west elevation at the front entrance where several slopes converge that ice damming regularly occurs.  Heat tape has been installed as a temporary solution to alleviate ice damming, along with EPDM roof membrane. Roof curbs are improper installed and will allow moisture infiltration into the building.

## Gutters and Drainage

Roof Drainage Along East & North Elevation

Roof edge lacks proper gutter and downspout drainage system.

## Reseal Gutter Joints

Gutter joints leak along west elevation of new gymnasium

### Under slab Moisture

There are several classrooms along the north elevation where there are tiles bubbling, buckling, and cracking on the interior of the building. Rooms 123 and 125 show the most significant evidence of this issue. It appears that there is excessive below slab moisture. This is most likely due to the disconnection of the roof drainage from the below grade storm sewer drainage system as categorized by the capped off green PVC drainage pipe inlets on the exterior of the building adjacent to these classrooms. The lack of gutters and downspouts exacerbate this situation.

### Windows, Windowsill Flashings, and Control Joints

Gaskets and seals have shrunk and require replacement. Improper sill flashing sealant installation, with multiple failed sealant joints observed. Exposed wood substrates can be seen from exterior. Control joint sealant is in a failed condition.

### Masonry Control Joints, EIFS Control and Reveal Joints

Sealant has failed adhesively and cohesively. EIFS reveals are cracked.

### A/C Unit, Wall Vent Flashings

Unit and wall vent flashings are not properly installed and require a means for preventing moisture from entering the building such as a hood, through wall flashing, and incorporation of drip edges

### Soffit Panels

Evidence of moisture can be seen coming from the vent holes of the soffit panels most likely due to excessive condensation in the roof system. There is evidence of possible condensation occurring from the roofing above the several entrances observed by efflorescence on the soffit panels.

### CMU Masonry

Paint is peeling due to moisture trying to dry towards the exterior.

### EIFS Cladding

The EIFS cladding system is beginning to crack throughout the field of the cladding system. Additionally, reveals and sealant joints are in a failed condition. Moisture infiltration is most likely occurring resulting lack of functionality.

### EIFS Cladding Transitions

EIFS cladding transitions to roofing and other building components are improperly detailed and allow moisture infiltration resulting in degraded exterior cladding systems and possible moisture infiltration into the interior.

### Structural CMU Step Cracks, Masonry/EIFS Movement

There are several step cracks observed in the CMU on the East elevation on the east wing of the school. There is an area on the southeast corner of the building located on the gymnasium where the rowlock bricks have become displaced due to differential movement between the EIFS cladding and brick veneer (@ Door #8)

| FIM # | Recommended Building Envelope Repairs |
|---|---|
| AES-BE-1 | Replace Ballasted EPDM Roofing on Gym Roof<br>• Replace roof system with new insulation and fully adhered EPDM membrane.<br>• Incorporate a thermal barrier and vapor retarder prior to installation of the roof insulation and membrane.<br>• Incorporate slope into roof system design to improve drainage. Adhere all insulation layers down.<br>• Fully-adhere new EPDM membrane, properly install edge details and gutter. |
| AES-BE-2 | Replace Shingled Roofing<br>• Replace shingle roof system.<br>• Consult a roof design expert to detail the multiple different roof system and exterior wall cladding systems to ensure a watertight building envelope.<br>• Possibly recommend a decorative PVC roof system which mimics a metal roof.<br>• Re-design roofing at front entrance slopes so that heat tape is not required. |
| AES-BE-3 | Repair Roof Drainage Along East & North Elevations, Reseal Gutter Joints, Address Under slab Moisture<br>• Install gutters and downspouts and tie into nearest stormwater drainage system.<br>• Reseal gutter joints with more permanent method.<br>• Install gutters and downspouts and tie into pre-existing drainage system.<br>• Core interior concrete slab to observe for presence of subsurface moisture and investigate source. |
| AES-BE-4 | Replace Window Seals and Gaskets, Remove and Replace Window Flashing Sealant Joints<br>• Remove sealant and install backer rod, prime, and reseal control joints.<br>• Remove and install new window seals and gaskets.<br>• Remove existing sealant from sill flashings, prime, and reseal |
| AES-BE-5 | Remove and Replace Masonry and EIFS Control Joints<br>• Remove sealant and install backer rod, prime, and reseal control joints.<br>• Cut out reveals per industry standards and install sealant joints.<br>• Install breathable elastomeric coating system over entire EIFS surface. |
| AES-BE-6 | Install New Wall Vent and A/C Flashings to Prevent Moisture Infiltration<br>• Install through wall flashings, hoods, and drip edges where necessary to prevent moisture infiltration. |

| | |
|---|---|
| AES-BE-7 | Replace Aging Soffit Panels, Install Adequate Roof Ventilation<br>• Remove asbestos panels, install new higher NFVA soffit panels and review steep slope roof ventilation calculations for appropriate intake and exhaust ventilation.<br>• Review the roof system ventilation for proper intake and exhaust ventilation as mentioned above. Increase ventilation as necessary. |
| AES-BE-8 | Repaint and Reseal Masonry where Peeling. Clean, Repair, and Recoat EIFS Cladding. Repair Cladding Transitions<br>• Sand down to substrate. Remove all sealant joints and backer rods.<br>• Install new back rod, prime, and sealant.<br>• Install elastomeric sealant over CMU surfaces and sealant joints.<br>• Power wash EIFS surface to remove dust and debris, rehabilitate areas where the finish coat and brown coat have delaminated.<br>• Applied new coats of EIFS material to insulation substrate to match existing texture.<br>• Install an elastomeric coating the same as the precast concrete panels to prevent future moisture infiltration.<br>• Consult a design professional to detail the multiple exterior systems so that they are properly integrated to prevent future material deterioration and moisture infiltration |
| AES-BE-9 | Repair Structural CMU Step Cracks. Address Masonry/EIFS Movement<br>• Have structural engineer review cracks to determine if structural integrity has been compromised.<br>• Have a masonry contractor repair per Structural Engineer's recommendations.<br>• Coat with a breathable elastomeric coating system as described and included above.<br>• Remove rowlock bricks, install EIFS termination flashing, trim EIFS and reseal per industry practices.<br>• Reset rowlock bricks, install sealant/expansion joint at base of EIFS to allow for differential movement.<br>• Coat EIFS with elastomeric coating system as described above. |

| **FIM #** | **Benefits of Building Envelope Repairs** |
|---|---|
| AES-BE-1 through AES-BE-9 | Protection from water infiltration and further damage to roofing, interior, and walls.<br>• Reduced future maintenance on roofs and masonry.<br>• Improved exterior aesthetics. |

# ELECTRICAL & SAFETY

## Electrical Service

The original Abrams Elementary School building was constructed in 1957. Two building additions were constructed in 1995 and 2000. During the building addition in 1995, a new 208Y/120V, 3-phase, 4-wire, 1200A service was added to serve the building. The service equipment is a Square D QED-style switchboard in Mechanical Room 309. The BOMA life expectancy for electrical service equipment is 40 years, so it is expected that this equipment is acceptable as installed, provided manufacturer-recommended maintenance has been executed. It is unclear if a coordination study has been completed to determine the appropriate trip settings on the main and distribution switchgear. We recommend performing a coordination study to determine existing breaker trip settings are acceptable to prevent adverse equipment damage if breakers do not trip properly.

The existing building switchboards, panelboards, disconnect switches, and other electrical equipment do not have arc flash labels installed, so it is unclear if an arc flash study has been performed. There is inherently an increased hazard of working on live equipment due to possible buildup of energy being released in an arcing incident. This arcing incident can occur due to failing conductors causing short circuits, or even when tools incidentally touch live bus bars or contacts causing. These arcing incidents can cause severe burns and injuries. Per NFPA 70E section 130, arc flash labels are required to be applied to electrical equipment, meaning an arc flash study is required to be performed. We recommend that a fault current/arc flash study is performed, and appropriate arc flash labels installed to the required electrical equipment. This will bring the existing installation into compliance with current code requirements and provide clear safety guidelines for persons performing maintenance on equipment.

## Backup Generator

The building is not currently served by a backup generator. The Fire Alarm system and life safety lighting are served from integral battery backup units, while IT servers are all served by local uninterruptible power supplies (UPS). There have been multiple power outages in the past. Based on discussions with the school district, an optional standby generator would be desired to serve IT, HVAC, security, and phone systems, as well as other optional standby equipment. We recommend providing a new optional standby generator to serve IT equipment and other optional standby loads requiring back-up power to limit data loss, communications outages, food spoilage, and other negative consequences of prolonged power outages.

## Electrical Infrastructure and Grounding

Multiple locations of panelboards, disconnect switches, and other electrical equipment have obstructions within the code-defined clearances. These pieces of equipment are in violation of National Electric Code (NEC) section 110.26 which requires specific minimum working clearances for electrical equipment. We recommend relocating existing panelboards, disconnect switches, other electrical equipment, or the other equipment that is causing the obstruction to give the NEC 110.26 required working clearances. This work can be performed as existing equipment is modified or replaced in the future.

Multiple instances of general-purpose receptacles near sinks (e.g., kitchens or bathrooms) were noted to be regular duty, non-ground fault circuit interrupting (GFCI) type. See Figure 1, right, for an example with multiple instances in one kitchen area. Per NEC section 210.8, GFCI protection must be installed for all 15- and 20-Amp circuits in these locations. We recommend replacing general duty receptacles within kitchen and bathroom areas with GFCI-protected receptacles to comply with code. Additionally, receptacles near mop or washdown sinks and basins should also be replaced with GFCI receptacles.

The motor starter for the Café door is located near the washdown/mop sink area but is a NEMA 1 enclosure (see Figure 2, right). Per NEC Table 110.28, this enclosure should be type 4X. We recommend replacing the Café door motor starter with a NEMA 4X motor starter to comply with code and limit safety concerns.

Tech Room 200B currently lacks a ground bar. Per discussion with the school district, the current IT closet standard is to have a floor ground bar to connect the data rack(s) to building steel to prevent static electricity issues. We recommend installing a floor ground bar to mitigate static electricity hazards and protect sensitive equipment damage.

*Figure 1: Existing Non-GFCI receptacles installed in proximity of washdown sink*

*Figure 2: NEMA 1-Rated combination motor starter/disconnect switch adjacent to washdown/mop sink*

Existing panelboards throughout the building are missing filler plates in breaker spaces, exposing the live bus. See Figure 3, left, for example of a missing filler plate, as well as a properly installed filler plate. NEC 110.12(A) requires that “unused openings” shall be closed to afford protection substantially equivalent to the wall of the equipment”. We recommend installing filler plates in uncovered breaker spaces to comply with code and limit safety concerns.

The existing panels in the building are of varying ages due to the expansion. However, Electrical Closet 413 and Boiler Room 602 in the original portion of the building contain original electrical equipment including, but not limited to, disconnect switches, panelboards, fused switchboards, etc. (see Figure 4, right). These pieces of electrical distribution and branch equipment are well past their BOMA life expectancy of 30 years. We recommend replacing all aging electrical equipment installed prior to the 1995 expansion, especially equipment original to the building, with new equivalent equipment. This will ensure the ability to source replacement parts and substantially decrease the chance of equipment failure.

Figure 3:

Figure 4:

## Interior and Exterior Building Lighting

Existing lighting throughout the building is either high pressure sodium or fluorescent T8 lamps. Modern lighting is typically dimmable LED which typically has substantially lower wattage fixtures than equivalent fluorescent fixtures. We recommend replacing the existing lighting with equivalent LED fixtures throughout for increased energy savings and reduced maintenance costs. Emergency fixtures replaced with LED equivalents shall be specified to include battery back-up.

Some existing emergency battery packs in emergency fixtures were labeled with replacement dates that exceeded 5 years. This exceeds the BOMA useful expected life of 5 years for egress light batteries, as well as some manufacturer-provided maintenance requirements. We recommend replacing the emergency battery packs in any emergency fixtures not replaced with an LED equivalent (as described above).

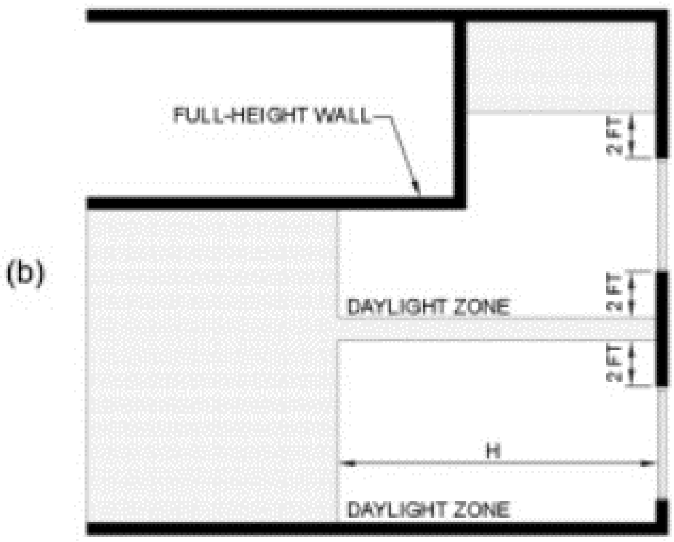
The lighting controls that were installed as part of the 2000 building addition utilize dual-level switching, but classrooms in the original and 1995 areas are controlled by a single switch. Per IECC 2018 Section C405.2.3, spaces with over 150W of lighting must have separate daylight-responsive controls. This means fixtures in the daylighting/sidelit zone (defined in IECC Figure C405.2.3.2, shown below in Figure 5) must dim automatically in response to the amount of light coming in the windows separately from the rest of the room. These responsive controls must be able to be calibrated from within the space. In order to meet these requirements, we recommend providing photocells separately controlled switching to control new, dimmable LED fixtures that are within daylight zones.

In addition to only having single switch controls in classrooms, the original and 1995 building areas have occupancy sensors that are no longer operational. As part of the replacements mentioned above, we would also recommend replacement (or addition of new) dual-technology occupancy sensors in rooms to realize greater energy savings and meet IECC requirements. Dual-technology sensors utilize ultrasonic and infrared detection technologies to eliminate false sensing and provide accurate and efficient lighting control.

In some electrical and mechanical rooms, inadequate lighting for maintenance and inspection of equipment was noted. Typical light levels required per IES (Illumination Engineering Society) are 30-foot candles (fc) for utility rooms and 50 fc for equipment service rooms. However, IECC 2018 table C405.3.2(2) only allows a maximum of 0.46 W/ft2. Because of this, we would recommend replacing existing lighting in electrical and mechanical rooms with high-efficacy LED strip lighting to get as close as possible to the recommended 30 fc.

*Figure 5: IECC Figure C405.2.3.2 showing the calculation method for sidelit daylighting zones*

(a) Section view
(b) Plan view of daylight zone under a rooftop monitor



# TECHNOLOGY & SAFETY

## IT Infrastructure

The existing IT infrastructure has been recently replaced by the Oconto Falls School District over the past two years. The district server is located at Oconto Falls High School and is fed by a dual utility feed with a transfer switch between the two sources. Additionally, it has UPS power available for 400 minutes of run time. Abrams Elementary has multiple IT closets with servers backed up by local, standalone UPSs to provide a minimum 30 minutes of back up. With exception of the Tech Room 200B grounding issue mentioned above, we have no recommended IT work.

## Door Access and Video Surveillance

During a 2019 audit, it was identified that Oconto Falls School District did not have adequate door access control or video surveillance systems. The School District has since upgraded the security systems throughout their buildings. No deficiencies or issues were noted, and as such, we have no recommended security systems work.

## Public Address System

The existing public address (PA) system head end unit is located in Tech Room 200B. The exact make, model, and installation year were unable to be verified. As such, it could not be verified if replacement parts are able to be sourced.  The existing system is standalone and not currently integrated into the IT infrastructure. Based on discussion with the school district, it is safe to assume the existing system is obsolete. We recommend replacement of the existing PA system with a new system that is capable of integration into the IT infrastructure. This will include a new head end unit and new speakers throughout the facility. However, as long as the existing system is fully functional and serviceable, it can remain in service.

## Clocks

The existing clock system is by Franklin Time Systems. Again, the installation date could not be confirmed, and is assumed to be obsolete. The system is standalone and did not appear to be tied into the IT infrastructure. We recommend replacing the existing system with a new system capable of integration into the IT infrastructure at some point in the future. Again, as long as this system is fully operational and parts are readily available, it isn't a high priority replacement.

## Fire Alarms

The existing fire alarm control panel (FACP) is a Simplex 4002 non-addressable system, shown to the left in Figure 6. This is a zoned system that has been discontinued by Simplex for many years. It is over 20 years old and past its expected useful life. The parts internal to the FACP are no longer manufactured and cannot easily be sourced. Due to the necessity of maintaining this system for future years, we strongly recommend a replacement of the head end fire alarm control panel with one that meets the requirements of, and is installed in accordance with, NFPA 72 and International Building Code. The new fire alarm system should be an addressable, emergency voice-alarm communications (EVAC) system with capacity for future building expansions. To allow the school district to monitor the site remotely, it should and be networkable to integrate it into the new IT infrastructure.

The current fire alarm notification devices are also deficient. It was observed that numerous classrooms in the original and 1995 building areas were missing a notification device (horn or strobe), as is required by NFPA 72. Similarly, due to the age of the system, we assume that mass notification/voice evacuation audio capability does not exist, and some notifications are past their expected useful life of 15 years, as defined by BOMA. We recommend replacing existing devices in the original and 1995 building areas to maintain continued functionality. We also recommend adding notification devices in rooms that are currently deficient. Replacement and addition on new notification devices can occur separately from the head-end unit FACP replacement but may be more economical to make all fire alarm changes at once, including removal of original fire alarm equipment that has been abandoned in place.

However, due to the number of devices needing replacement or to be added exceeding 20, the entire system will need to be submitted for state review. This means that the fire alarm system will likely need to be brought up to current code (EVAC) requirements. Because of precedent set with other state-reviewed jobs of a similar nature, we recommend a total fire alarm system replacement, as solely replacing the head end or adding and replacing devices will not meet the requirements to pass state review.

*Figure 6: Existing Simplex 4002 Fire Alarm Control Panel*

*Figure 7: Abandoned-in-place, original fire alarm panel and fire bell*

| FIM # | Recommended Electrical and IT Infrastructure Improvements |
|---|---|
| AES-EE-1 | • Provide new fire alarm control panel for future expansion and voice capability<br>• Provide entirely new addressable fire alarm system |
| AES-EE-2 | • Perform coordination study and adjust circuit breaker trip settings as necessary<br>• Perform fault current/arc flash study and apply arc flash labels to equipment<br>• Install filler plates in panelboards where circuit board spaces are missing covers<br>• Relocate noncompliant existing panelboards to comply NEC clearance requirements<br>• Replace noncompliant general-purpose receptacles with GFCI-type receptacles in kitchens, bathrooms, and near sinks per NEC<br>• Replace electrical equipment in washdown areas with NEMA 4X equivalent<br>• Install floor grounding bar in Tech Room 200B |
| AES-EE-3 | • Provide new fire alarm devices to meet current code requirements and replace original building devices beyond their life expectancy. |
| AES-EE-4 | • Provide new optional standby generator |
| AES-EE-5 | • Replace original electrical equipment past useful life expectancy |
| AES-EE-6 | • Replace fluorescent and HPS fixtures with dimmable LED equivalents<br>• Modify lighting controls and provide photocells in rooms with windows<br>• Add and replace existing occupancy sensors |
| AES-EE-7 | • Provide new PA system<br>• Provide new central clock system |

| FIM # | Benefits of Electrical and IT Infrastructure Improvements |
|---|---|
| AES-EE-1 | • Ensure a vital life safety system is able to be maintained into the future and meet minimum requirements of NFPA 72 and the local authority having jurisdiction, as well as be monitored remotely<br>• Ensures a system in full compliance with all current regulations, corrects device deficiencies and inadequate coverage, and most importantly, pass state review. |
| AES-EE-2 | • Reduce risk of improper breaker function and protect electrical equipment<br>• Verify existing equipment ratings to improve safety of operation and maintenance staff working on electrical equipment and comply with NEC code requirements<br>• Improve safety of operation and maintenance staff working on electrical equipment and comply with NEC code requirements<br>• Mitigate equipment-damaging static discharge and meet OFSD IT standard |
| AES-EE-3 | • Ensure continued operation of existing notification devices, improve coverage to meet current NFPA and ADA code requirements |
| AES-EE-4 | • Limit data loss, communications/security lapses, spoiled food, freezing temperatures, and equipment and building damage during prolonged power outages |
| AES-EE-5 | • Improve safety of operation and maintenance staff working on electrical equipment and reduce the risk of equipment failure |
| AES-EE-6 | • Decrease energy usage related to lighting, limit maintenance effort to replace lamps, and comply with current IECC and ASHRAE 90.1 energy codes |
| AES-EE-7 | • Improve audible clarity of voice announcements for occupants with hearing impairment<br>• Improve ability to maintain the system into the future with readily available new parts |

## Codes and Guidelines Referenced

The following codes and guidelines are referenced within this analysis to ensure the safety and well-being of building occupants and personnel and limit fire or other building hazards:

- Building Owners and Managers Association (BOMA) International has published a preventative maintenance guidebook intended to illustrate “best practices to maintain efficient and sustainable buildings.” In it, Appendix 7 lists the expected useful life for numerous building systems and components. Specifically, we reference Appendix 7, sections E and F.
- National Fire Protection Association (NFPA) is an international organization that publishes numerous codes and standards intended to eliminate death, injury, and property and economic loss due to fire- and electrical-related hazards. For our analysis, we are looking specifically at NFPA codes 70, 70E, 72, and 101. They are the National Electric Code (NEC), Standard for Electrical Safety in the Workplace, National Fire Alarm and Signaling Code, and Life Safety Code, respectively.
- NFPA 70, or as it is commonly referred to as the NEC, is “the benchmark for safe electrical design, installation, and inspection to protect people and property from electrical hazards”. We refer to this often as it is the electrical code all residential and commercial building electrical construction must adhere to.
- NFPA 70E lays out requirements for safe work practices intended to protect personnel from exposure to major electrical hazards. This code was written to help comply with OSHA 1910 Subpart S and OSHA 1926 Subpart K in limiting “workplace injuries or fatalities due to shock, electrocution, arc flash, or arc blast.”
- NFPA 72 defines the latest safety provisions regarding fire detection, signaling, and emergency communications demands. This code is critically focused on fire alarm and mass notification systems to ensure safety of all building occupants in the event of emergencies or threats.
- NFPA 101 is used to protect people based on building construction, protection, and occupancy features to minimize the effects of fire and related hazards, covering both new and existing buildings.
- The International Energy Conservation Code (IECC) is a widely adopted energy code which establishes a “baseline for energy efficiency by setting performance standards for the building envelope (defined as the boundary that separates heated/cooled air from unconditioned, outside air), mechanical systems, lighting systems, and service water heating systems in homes and commercial businesses.” As part of this analysis, we are focused solely on the parts of the code related to lighting systems.
- The Illuminating Engineering Society (IES) is the recognized technical and educational authority on lighting, which publishes lighting standards and recommended practices for lighting design. For this analysis, we are utilizing illuminance recommendations for electrical and mechanical spaces with the intent to recommend ample light for operating and maintenance personnel to make repairs or replacements effectively and safely in often-overlooked spaces.

## MECHANICAL & ENVIRONMENTAL

### Direct Digital Controls (DDC) – Classroom Unit Ventilators (4) and Supervisor

Abrams Elementary School utilizes DDC and stand-alone electric control systems. Most systems in the building are DDC, but four (4) Unit Ventilators utilize stand-alone controls. The stand-alone electric controls are not integrated into a building automation system. This does not allow the maintenance staff to monitor or troubleshoot the building effectively.

Nexus recommends eliminating the stand-alone electric control systems at Abrams Elementary School and replacing them with DDC components and controls systems building-wide. These DDC controls would be integrated into a building automation system platform that would allow for building-wide equipment monitoring and troubleshooting while on site or remotely while using a computer or a hand-held device via the internet. The building would further be integrated into a district control interface where all schools can be monitored.

This would involve converting the re-used HVAC controls components to DDC actuators for valves, dampers, sensors, as well as the addition of DDC controllers and control panels.

Benefits of the DDC controls upgrade include reduced energy consumption, reduced maintenance, improved equipment scheduling and troubleshooting, alarm monitoring, operational tracking, and trending of mechanical equipment parameters.

| FIM # | Recommend DDC Controls Upgrade to Classroom Unit Ventilators (4) and Supervisor Upgrade |
|---|---|
| AES-ME-1 | • Replace stand-alone electric control components with DDC on four Unit Ventilators<br>• Provide DDC controllers and control panels<br>• Provide all programming required for this conversion<br>• Provide building automation system platform with remote access |

| FIM # | Benefits of DDC Controls Upgrade to Classroom Unit Ventilators (4) and Supervisor Upgrade |
|---|---|
| AES-ME-1 | • Easy-to-use, modernized system control<br>• Improved building monitoring and maintenance troubleshooting<br>• Extended system life<br>• Improved occupant comfort<br>• Reduced energy consumption<br>• Reduced maintenance |

## Heating Plant Upgrades - Heating Systems (2) Glycol, Replace 1995 Heating Pumps, Upgrade Air Separators (2)

The existing heating water system does not have adequate freeze protection for the Hot Water Heating Systems. Additionally, existing pumps have operational issues according to staff and are not reliable.

Nexus recommends the installation of propylene glycol to the hydronic heating system. A solution that is 35% propylene glycol and 65% water that would give system protection down to -30°F is recommended. An air and dirt separator would be added to collect any particulate, debris, and rust within the water volume and keep the glycol and piping clean. A glycol fill tank would be installed to allow for ease of refilling the heating piping system when required.

Thorough analysis of existing systems during the design phase will be required to investigate system operation in the Boiler Rooms. There were staff concerns about noise generated and balancing/flow issues. These will be investigated and resolved. Pump replacement will likely be required. This will be studied in the design phase.

| FIM # | Recommend Heating Plant Upgrades - Heating Systems (2) Glycol, Replace 1995 Heating Pumps Upgrade Air Separators (2) |
|---|---|
| AES-ME-2 | • Add propylene glycol to the system<br>• Add a glycol fill tank and pump for ease of refill<br>• Add air and dirt separator to collect entrained air and debris<br>• Replace pumps that are having operational issues |

| FIM # | Benefits of Heating Plant Upgrades - Heating Systems (2) Glycol, Replace 1995 Heating Pumps, Upgrade Air Separators (2) |
|---|---|
| AES-ME-2 | • Optimized boiler plant operation<br>• Reduced future maintenance<br>• Increased energy savings<br>• Extended heating system life |

## Chilled Water Plant and Associated Chilled Water Piping Distribution

Abrams Elementary School is currently only partially cooled. The Gymnasium and most of the older Classrooms do not have cooling. Two large aging condensing units (One installed in 1995, the other 2000) serve the remainder of the building with cooling.

The lack of cooling/dehumidification results in higher humidity levels and occupant discomfort in these areas of the building. The spaces are also unable to meet the American Society of Heating and Refrigeration Engineer's (ASHRAE) Thermal Environmental Conditions for Human Occupancy Standard 55-2017. 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. The indoor environmental requirements include temperature, thermal radiation, humidity, and air speed.

Nexus recommends the installation of an Air-Cooled Chiller to provide chilled water to the building. This chilled water would be sized to cool all spaces throughout the building. Existing Direct Expansion cooling coils would be removed from the air handling units and a cooling coil would be installed in each existing unit along with the piping necessary for cooling/dehumidification of the code required ventilation air.

Glycol is an important compound to have in chilled water systems that are exposed to freezing temperatures. It acts as an antifreeze, preventing the formation of ice in the system which can cause chilled water piping and coils to burst. A solution that is 35% propylene glycol and 65% water that would give system protection down to -30°F is recommended. An air and dirt separator would be added to collect any particulate, debris, and rust within the water volume and keep the glycol and piping clean. A glycol fill tank would be installed to allow for ease of refilling the chilled water piping system when required.

The benefits of this HVAC improvement measure include improved occupant comfort, reduced future maintenance costs, and improved temperature control.

| FIM # | Recommend Chilled Water Plant and Associated Chilled Water Piping Distribution System |
|---|---|
| AES-ME-3 | • Replace DX cooling coils in existing equipment<br>• Provide required piping to the coils<br>• Provide new Air-Cooled Chiller<br>• Provide Propylene Glycol for new Chilled Water System<br>• Provide glycol fill tank and pump for ease of refill<br>• Provide air and dirt separator to collect entrained air, debris, and rust<br>• Provide all required electrical and general construction work associated with this replacement |

| FIM # | Benefits of Chilled Water Plant and Associated Chilled Water Piping Distribution System |
|---|---|
| AES-ME-3 | • Improved occupant comfort<br>• Improved temperature control<br>• Added flexibility to the spaces with dehumidification<br>• Added flexibility for future remodeling and changes in space use<br>• Reduced future maintenance costs |

## 1957 Underground Ventilation System and 1995 Unit Ventilator Conversion to Displacement Ventilation with Cooling

The original 1957 ventilation is still in use in that portion of the building. This system does not have cooling and utilizes underground ductwork to distribute air, which can lead to poor indoor air quality due to water infiltration into the ductwork. Additionally, the 1995 addition utilizes heating only Unit Ventilators to provide ventilation to those classrooms. The Music room does not have proper ventilation. Finally, the front Offices do not have appropriate HVAC Control or Ventilation.

Nexus recommends the installation of a displacement ventilation system to replace the original 1957 Air Handling system as well as the 1995 Unit Ventilators. Cabinet Displacement Ventilation Units with chilled and hot water terminal coils would be provided to each zone using externally insulated overhead ductwork, which would distribute the ventilation air to each space. Energy recovery would be incorporated into these units to reduce the energy required to treat the code required ventilation air. A New Air-Cooled Chiller would be installed to provide Chilled Water for this system. The 1995 VAV system would also be revised slightly to meet the needs of the administrative office spaces.

Benefits of the HVAC system modifications include increased system life expectancy, improved indoor air quality, improved occupant comfort and improved learning/work environment.

| FIM # | 1957 Underground Ventilation System and 1995 Unit Ventilator Conversion to Displacement Ventilation with Cooling |
|---|---|
| AES-ME-4 | • Provide Energy Recovery Units including Heating and Chilled Water Coils, Filters, and Fans with Variable Speed Drives (VSD)<br>• Provide Distribution Ductwork and Heating/Chilled Water Piping<br>• Provide Cabinet Displacement Ventilation Units with chilled water cooling and hot water heating coils<br>• Provide Variable Air Volume Boxes and duct modification required to better condition administrative spaces<br>• Provide the associated electrical and general construction work required |

| FIM # | Benefits of 1957 Underground Ventilation System and 1995 Unit Ventilator Conversion to Displacement Ventilation with Cooling |
|---|---|
| AES-ME-4 | • Extend operational life of the building<br>• Improved indoor air quality<br>• Improve occupancy comfort with cooling<br>• Improved learning/work environment<br>• Reduced maintenance<br>• Energy savings with reduced fan speed |

## Add Cooling to Gymnasium

The air handling unit serving the gymnasium does not contain cooling coils and cannot cool the Gymnasium. The Air Handling Unit that serves this space was installed in 1995 and is still in good condition.

Nexus proposes the installation of a chilled water-cooling coil in the existing air handling unit serving the gymnasium. These spaces would also have remote relief air fans with VSDs installed to maintain neutral air pressure in the space. Demand control, carbon dioxide level driven ventilation controls will be installed on the gymnasium unit to reduce outside airflow during lightly occupied timeframes. As ventilation requirements have increased since the original installation, increased outside air capabilities will be designed into the new unit to not only comply with current codes, but improve the indoor air quality in the space.

Benefits of the HVAC system modifications include increased system life expectancy, improved maintenance access, improved DDC scheduling, increased ventilation, increased energy savings, improved occupant comfort and an improved learning environment.

| **FIM #** | **Add Cooling to Gymnasium** |
|---|---|
| OFHS-ME-5 | • Provide new chilled water-cooling coil in existing Air Handling Unit<br>• Provide variable speed drives for the supply and remote relief fans<br>• Provide carbon dioxide sensors and controls for demand control ventilation<br>• Provide DDC controls, sequencing, and programming<br>• Provide all associated general and electrical construction work required |

| **FIM #** | **Benefits of Add Cooling to Gymnasium** |
|---|---|
| OFHS-ME-5 | • Upgraded HVAC infrastructure<br>• Increased ventilation for improved indoor air quality<br>• Reduced energy costs with the incorporation of demand control ventilation<br>• Improved occupant comfort<br>• Improved learning/work environment |

## Kitchen Make-Up Air Unit Addition - Unit Ventilator Replacement

There is an existing unit ventilator located in a storage room that currently feeds the kitchen. This unit is not adequate to provide adequate makeup air and cooling and is in need of replacement.

Nexus recommends the replacement of this unit with a new double wall air handling unit. The new double-wall air handling unit would include code compliant filters, heating water coil, chilled water-cooling coil, access sections, and supply and relief fans with variable speed drives (VSD).

Benefits of the HVAC modifications include increased system life expectancy, improved DDC scheduling, improved ventilation, increased energy savings, improved occupant comfort, and an improved working environment.

| FIM # | Kitchen Make-Up Air Unit Addition |
|---|---|
| AES-ME-6 | • Remove existing unit ventilator, piping, and controls<br>• Provide new air handling unit with hot water heating and chilled water-cooling coils<br>• Provide variable speed drives for fans<br>• Provide DDC controls, sequencing, and programming<br>• Provide all associated genera/electrical construction work required |

| FIM # | Benefits of Kitchen Make-Up Air Unit Addition |
|---|---|
| AES-ME-6 | • Increased ventilation for improved indoor air quality and occupant comfort<br>• Improved working environment |

## Exhaust Fan (5) Replacements

Some exhaust fans serving the school have exceeded their recommended service life and are in need of replacement. Non-functioning exhaust fans will not remove odors or provide ventilation in toilet rooms, janitor closets, and break rooms.

The district may want to consider replacement of these fans when major work is taking place so the best pricing can be obtained from contractors.

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. Direct drive fans will be utilized where possible to eliminate fan belt maintenance.

| FIM # | Exhaust Fan Replacements |
|---|---|
| AES-ME-7 | • Replacement of five existing exhaust fans<br>• Provide the associated general and electrical construction work |

| FIM # | Benefits of Exhaust Fan Replacements |
|---|---|
| AES-ME-7 | • Increased energy savings from ECM motors<br>• Improved flow and reduced maintenance for exhaust fans |

### Domestic Water Heating Plant Replacement - 1995 Addition and Kitchen

The existing kitchen and 1995 addition are served by domestic water heaters that are older high efficiency natural gas fired units. The water heaters are nearing the end of their useful lives.

Nexus proposes the removal of the 1995 addition and kitchen water heaters and installation of new ultra-high efficiency, condensing-style, sealed combustion water heaters.

Replacing the water heaters would provide energy savings, reduced maintenance, and extend the life expectancy of the system.

| FIM # | Domestic Water Heating Plant Replacement - 1995 Addition and Kitchen |
|---|---|
| AES-ME-8 | • Replace existing water heaters<br>• Provide associated construction including electrical and controls |

| FIM # | Benefits of Domestic Water Heating Plant Replacement - 1995 Addition and Kitchen |
|---|---|
| AES-ME-8 | • Increased energy savings<br>• Reduced maintenance |

### 1957 Galvanized Domestic Water Piping Replacement

The 1957 building areas have galvanized steel domestic water piping remaining. There is a potential for entrainment of iron and lead into the potable water as the soldered fittings, and piping break down over time.

Nexus recommends 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.

Benefits would include piping that does not leech or flake off galvanized piping and extend the system life from replacing piping that will eventually rust through.

| FIM # | 1957 Galvanized Domestic Water Piping Replacement |
|---|---|
| AES-ME-9 | • Replace existing galvanized steel domestic water piping and components in the 1957 building areas with insulated copper piping. |

| FIM # | Benefits of 1957 Galvanized Domestic Water Piping Replacement |
|---|---|
| AES-ME-9 | • Improved drinking water quality<br>• Reduce pipe leaks and possible property damage |

## Add Domestic Hot Water and Recirculation to 1957 Sinks, Sump Pump Replacement, Iron Removal System

Some existing handwashing sinks, specifically in the 1957 portions of the building do not have domestic hot water. Additionally, some fixtures do not utilize a hot water recirculation system which requires users to waste water to receive hot water. There is currently a sump pump located in the 1957 mechanical room that is used to prevent flooding in the building. This sump pumps are at the end of its useful service life and is in need of replacement. Finally, there is significant iron in the domestic water and the high iron levels stain fixtures over time.

Nexus recommends the domestic hot water system be extended to serve rooms without hot water and the hot water recirculation system be extended to all areas of the building to meet code requirements and basic hot water system operation expectations. Nexus also recommends replacement of the sump pump including all general construction work. Finally, Nexus recommends an iron removal system be installed in the domestic water system.

Benefits of the hot water recirculation include increased reduced water consumption and increased hygiene. Replacing these sump pumps would ensure proper protection against flooding and reduce maintenance. The iron removal system will decrease maintenance and cleaning requirements.

| FIM # | Add Domestic Hot Water and Recirculation to 1957 Sinks, Sump Pump Replacement, Iron Removal System |
|---|---|
| AES-ME-10 | • Extend existing Domestic Hot Water systems to Sinks without Hot Water<br>• Connect Domestic Hot Water recirculation systems to all areas of the building<br>• Replace existing sump pump<br>• Provide new iron removal system<br>• Provide associated construction including electrical and controls |

| FIM # | Benefits of Add Domestic Hot Water and Recirculation to 1957 Sinks, Sump Pump Replacement, Iron Removal System |
|---|---|
| AES-ME-10 | • Improved flooding protection<br>• Reduced maintenance<br>• Reduced Water Consumption<br>• Increased hygiene |

## Wash Fountain and Sink Replacement with Sensor Operated

Some existing handwashing sinks throughout the building utilize manual metering faucets which require several pushes to use and may be frustrating for users. Many of these valves use higher flow volumes than modernized valves and some can be left on without automatic shutoff.

Nexus recommends replacement of the faucets with modern, battery powered sensor operated units that are more water efficient and automatically turn off after use.

Benefits would include decreased water consumption and increased hygiene.

| FIM # | Wash Fountain and Sink Replacement with Sensor Operated |
|---|---|
| AES-ME-11 | • Replace existing manual lavatory faucets with sensor operated faucets |

| FIM # | Benefits of Wash Fountain and Sink Replacement with Sensor Operated |
|---|---|
| AES-ME-11 | • Reduced Water Consumption<br>• Increased hygiene |

## Fire Protection (Sprinkler System) - Entire Building System Addition

The building does not have a fire protection system installed and is not protected from property loss or life safety during a fire event.

Nexus proposes installing a wet-pipe fire protection system to the entire building while the ceiling is being replaced.

Benefits of fire protection addition include increased occupant safety and reduced damage during a fire event.

| FIM # | Fire Protection (Sprinkler System) - Entire Building System Addition |
|---|---|
| AES-ME-12 | • Install a wet-pipe fire protection system to fully protect the building<br>• Provide general and electrical construction as required |

| FIM # | Benefits of Fire Protection (Sprinkler System) - Entire Building System Addition |
|---|---|
| AES-ME-12 | • Reduced damage during fire event<br>• Increased occupant safety |

## IT Room Cooling Upgrade - New Split Cooling Unit

There is currently an IT room that contains Heat Producing IT equipment that is not being cooled.

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

The benefits are improved system and room temperature control and reduced risk of system outages.

| FIM # | IT Room Cooling Upgrade - New Split Cooling Unit |
|---|---|
| AES-ME-14 | • Provide a new split-system cooling unit appropriately sized to cool the server room during all times of the year<br>• Provide all required electrical and general construction work |

| FIM # | Benefits of IT Room Cooling Upgrade - New Split Cooling Unit |
|---|---|
| AES-ME-14 | • Reduced risk of system outages and increased IT maintenance costs<br>• IT infrastructure protection |

## RECOMMISSIONING ACTIVITIES

### HVAC Systems Optimization (RCx & Sequence Review)

Building Recommissioning is a systematic process that ensures all building systems 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.

The Nexus Recommissioning Team will identify any HVAC equipment operational issues and will provide adjustments to the sequences and outdoor air settings to improve occupant comfort while reducing energy consumption where possible. The recommissioning process will also identify components that require adjustment or replacement.

**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 unit ventilator (UV) 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 UV 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 valves 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.

**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 recommissioning process.*

| FIM # | HVAC Systems Optimization (RCx & Sequences & Sensors) |
|---|---|
| AES-ME-13a | Systems Optimization for 2000 Addition (Only if ME-4 is Selected)<br>• Provide recommissioning of all existing HVAC systems in 2000 addition<br>• Provide adjustments to existing sequences to improve HVAC system operation<br>• Verify operation of all dampers, actuators, valves, and terminal HVAC devices |
| AES-ME-13b | Systems Optimization for Entire Building<br>• Provide recommissioning of all existing HVAC systems<br>• Provide adjustments to existing sequences to improve HVAC system operation<br>• Verify operation of all dampers, actuators, valves, and terminal HVAC devices |

| FIM # | Benefits of HVAC Systems Optimization (RCx & Sequences & Sensors) |
|---|---|
| AES-ME-13a through AES-ME-13b | • Improved temperature control and occupant comfort<br>• Reduced energy consumption<br>• Reduced maintenance<br>• Extended HVAC equipment life |

## ABRAMS ELEMENTARY | EDUCATIONAL ADEQUACY SCORECARD

Educational Adequacy (EA) is an analysis of how well the design of educational spaces in each building support instruction as defined by the District's strategic plan, personalized learning framework, technology plan, demographic trends, student enrollment and building utilization and capacities. Our analysis includes staff interviews/surveys and school space/capacity studies, as well as school utilization based on enrollment projections and boundaries to determine if they can adequately support modern learning needs. At the end of the process, each school receives a scorecard that evaluates 22 different components and ranks each as Green=Adequate, Yellow=Questionable or Red=Inadequate. These final scores guide recommendations for the most cost-effective and sustainable improvements to best address the deficiencies identified.

| Key Program Area | | Rating | Summary |
|---|---|---|---|
| **Site** | 1. Site Size, Outdoor Fields & Greenspace Areas | Y | Two playgrounds, east side gets muddy from water runoff after most recent parking project. The separate playgrounds cause a supervision challenge. |
| | 2. Site Traffic, Safe Routes, Parking | G | Traffic is divided and works well with multiple parking areas. Overcrowded of the parking areas occurs two days a year. Currently there are 4 buses and 30 staff cars. Parents parking can overflow during heavy use. |
| **General** | 3. Security/Supervision | G | The current office is not part of a secured entry sequence. Cameras in back playground and both front entrances. |
| | 4. ADA Accessibility | Y | No lower-level access to one area and do have lift to Music/ Special Education area. |
| | 5. Administrative/Nurse/Student Support | R | The Office seems slightly undersized and is not part of secure entry sequence. Psychologist, here two days a week. IEP meetings are in SPED office. |
| | 6. Staff Planning/Collaboration | R | No staff planning areas, planning meetings happen within classrooms. |
| | 7. Community Integration (Community/Parent Room) | Y | Room 409 (north of office) is used a variety of community functions (Scouts, meeting room, etc.) This room is also used for breakfast as students are entering the building. |
| | 8. Cafeteria/Serving/Kitchen | Y | Lunch occurs in the gym, 9-12 tables stored in 202H. 10:45 setup starts for 11:05 lunch, 12:00 last out. 12:45 Gym is used for PE only two afternoons a week. 2 periods. K-2 eat first. Go to lockers first then playground. No dedicated handwashing stations. Sanitizing Stations, looking at sustainability, is it realistic? |
| | 9. Restrooms-Student/Staff | Y | Current restrooms are adequate but could benefit from handwashing stations just outside the toilet rooms. |
| | 10. Support Spaces (Lockers, Storage, Receiving, etc.) | Y | Deliveries occur in and through the gym and all are made before school. Lockers are good, 4K and K have cubbies in room, rest have lockers, don't lock them, wet boots are an issue and create deterioration. There are currently a number of empty lockers. |
| | 11. Adaptability | R | Most of the interior walls in the building are CMU and provide little opportunity for short-term and/or long-term adaptability and flexibility. |
| | 11. Furniture and Equipment | Y | There has been some furniture recently purchased that is less traditional, have been moving away desks. |
| | 12. Building Aesthetics (Interior & Exterior) | G | |
| **Instructional** | 13. Classroom Quantity, Size & Suitability | G | Core classrooms are big enough, have ample room and well grouped. Many programs are using core classroom spaces because they are available due to reduced overall enrollment in the building. |
| | 14. Science/STEM/STEAM Labs | Y | All science is done within the core classrooms which is acceptable for elementary since the rooms have sinks. |
| | 15. Music, Art, Performance Spaces | G | Do have separate Art and Music spaces. Access to Music is located on lower level and concerts/events are done in the gym. |
| | 16. Flexible Learning Spaces, Student Project/Breakout Spaces | Y | Do have dedicated Computer Labs, are using because they have space. |
| | 17. Applied Learning Spaces (Makers Space) | R | This type of space does not exist in the building currently and would be beneficial |
| | 18. Phy. Ed. & Athletics Spaces | G | Works well for PE, large enough to meet needs. Concerts and other large events in Gym, uses risers. |
| | 19. Library/Media Center/Learning Commons | Y | Would like to do some different things but are not sure how to go about implementing potential change. One librarian shared across the district with one paraprofessional in space consistently. |
| | 20. Special Education Spaces | G | Spaces located throughout building, are suitable for current enrollment. |
| **Reuse** | 21. Deferred Maintenance/Facility Condition Index (FCI) | | |
| | 22. Suitability for Expansion/Repurposing | G | |

G Adequate - Conforms with design best practices and meets District needs for foreseeable future
Y Questionable - Doesn't meet design best practice but may be considered acceptable based on current usage, enrollment, or programs
R Inadequate - Fails to meet District needs and should be considered highest priority for correction

## Relocate Front Office into IMC, Create Secure Entry, Renovate Library to Learning Commons, Remodel Student Services Area

The existing main office at Abrams Elementary School is located near the front entrance. However, there is not direct access into the office from the main entrance vestibule to create a safe, secure entrance sequence for visitors during the school day. Visitors enter through the vestibule into the main 'unsecure' lobby before turning left and entering the office through another door. Once in the main 'unsecure' lobby, visitors have uncontrolled access to the entire school. The District's desire to create a safe, secure entrance to the school would require remodeling of the existing vestibule and main office. The building code does require a vestibule at all entrances to the building; a door cannot be added to enter directly into the building from the exterior.

One option to create a safe secure entry would be to relocate the main office into a portion of the library and create a secure entry. This would allow for an opportunity to create flexible learning space in the space currently occupied by the main office. This area is adjacent to classrooms, providing for improved learning options.

The library is currently furnished as a traditional library environment with book stacks and traditional tables and chairs. Modern elementary school libraries are flexible, dynamic spaces that allow for a variety of activities to take place. Remodeling of the library would transform the library into an active learning commons where staff and students could learn, collaborate, and create together. The recommendation is to reimagine the space with flexible furniture, technology and a project-based maker space.

Examples of Modern Elementary Learning Commons

The current area in the core of the building should be remodeled to provide more efficient use of the space for student services. The central location of the student services allows for multiple access points and ease of wayfinding for staff, students and parents/visitors.

| FIM # | Relocate Front Office into IMC, Create Secure Entry, Renovate Library to Learning Commons, Remodel Student Services Area |
|---|---|
| AES-EDA-1 | • Create a safe and secure entry sequence by remodeling the vestibule and main office. This may require moving the office.<br>• Renovate library into learning commons with flexible furniture, technology, and Maker Space as a separate space<br>• Remodel student services area for more efficient layout, with offices and conference room |

| FIM # | Benefits of Relocate Front Office into IMC, Create Secure Entry, Renovate Library to Learning Commons, Remodel Student Services Area |
|---|---|
| AES-EDA-1 | • Improved security for all occupants with proper safe, secure entrance sequence and control of visitors<br>• Modern, active learning commons allows for creative, collaborative learning<br>• Create a more efficient use of space that is user friendly for staff, students and parents to better serve the students |

## Create Separate Cafeteria, Reconfigure Kitchen/Servery Add Receiving, Remodel Restrooms and Create Gym Storage

The current gym serves as the gym and cafeteria. This limits the scheduling opportunities for the gym when being used for lunch. Furthermore, using the gym as a cafeteria puts additional wear and abuse on the expensive sports floor in the gym. Creating a separate cafeteria will allow for better scheduling and use of the gym, it will also create a large multi-purpose space that can be used for student, staff and community gatherings and activities. The cafeteria, multi-purpose space, could be used for before and after school programming beyond a space for breakfast and lunch.

Relocating the cafeteria would require the kitchen to be remodeled to move the food serving line out of the gym. Remodeling the kitchen would allow for a receiving area to be added to the building. A dedicated receiving area helps to manage the traffic onsite and in the building regarding deliveries to the school. A receiving area would allow for a dedicated space for deliveries, which would result in a safer building and site.

The current locker and restroom facilities adjacent to the gym are underutilized. Remodeling the existing locker room and restroom facilities to create new, centrally located restroom facilities for students, and visitor during after school activities, would be more efficient use of that space. A community room near the main, secure entrance would be an optimal location to host volunteers or alternate before, after, and during school programs. Storage for the gym, commons, and after school program materials could be added in the area adjacent to the new cafeteria.

*Existing Gymnasium-Cafeteria*

*Existing Kitchen*

| FIM # | Create Separate Cafeteria, Reconfigure Kitchen / Servery and Add Receiving, Remodel Restrooms and Create Gym Storage |
|---|---|
| AES-EDA-2 | • Create a separate cafeteria<br>• Reconfigure the existing kitchen and create a dedicated receiving area<br>• Remodel the existing locker and restroom area to create new restrooms and planned storage for the gym, cafeteria and after school activities<br>• Create a community room for volunteer and alternative activities before, after, and during school. |

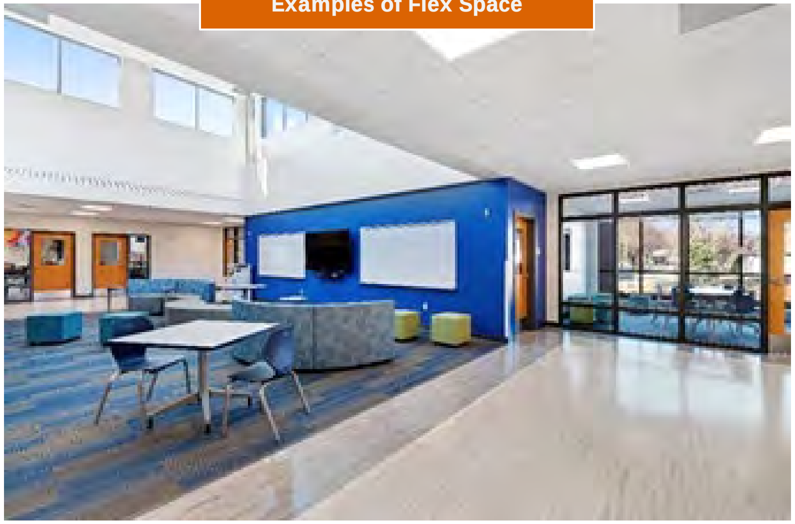
| FIM # | Benefits of Create Separate Cafeteria, Reconfigure Kitchen / Servery and Add Receiving, Remodel Restrooms and Create Gym Storage |
|---|---|
| AES-EDA-2 | • Open up scheduling opportunities in the gym and a multi-purpose cafeteria space<br>• Preserve the gym flooring and finishes by keeping the cafeteria tables and food out of the gym<br>• Provide better kitchen serving line outside of the gym<br>• Provide for a safer building and site with a dedicated receiving area to manage deliveries<br>• Create centralized restrooms for the students during the school day and visitor during after school activities<br>• Create easily accessible community room near the main, secure entrance |

## Create Three Flex Spaces, Provide Operable Connection Between Classrooms, Add Visual Supervision Windows

The layout of the school is a traditional, double-loaded corridor, 20th century classroom model. The corridors are lined with lockers with classrooms on both sides of the corridors. The classrooms are isolated from each other, they do not have physical or visual connection.

Today's classrooms look to encourage collaboration, of students and teachers, in the learning environment. The recommendation is to create (3) flex spaces out of existing classrooms to provide collaborative learning environments within grade level pods. Along with the flex areas, the addition of operable partitions between classrooms would allow for team teaching and further student and staff teaching collaboration. A collaborative environment would be expanded through the use of windows for visual supervision into the flex spaces.

Examples of Flex Space



| FIM # | Create Three Flex Spaces out of Classrooms, Provide Operable Connection between Classrooms, Add Visual Supervision Windows at Classrooms |
|---|---|
| AES-EDA-3 | • Create (3) flex spaces throughout the building, aligning with grade level classroom pods<br>• Create operable partitions between classrooms<br>• Add visual supervision at the classrooms to corridors and Flex Spaces |

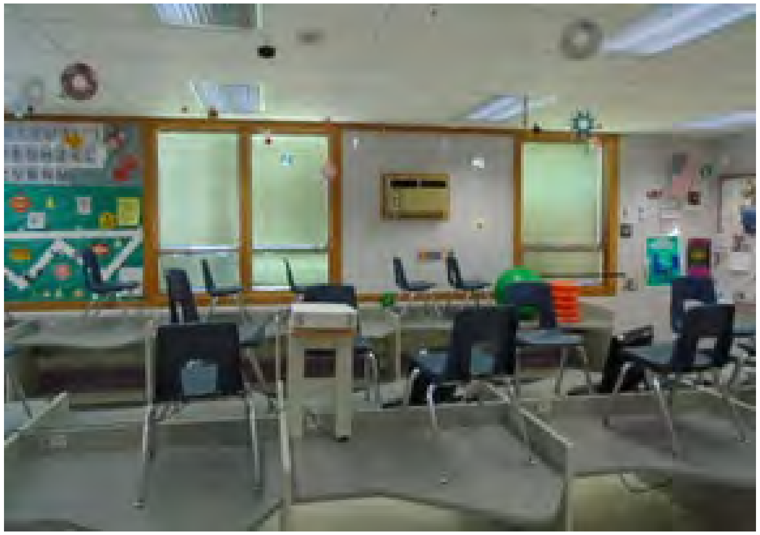
| FIM # | Benefits of Create Three Flex Spaces out of Classrooms, Provide Operable Connection between Classrooms, Add Visual Supervision Windows at Classrooms |
|---|---|
| AES-EDA-3 | • Create collaborative, modern learning environments and promote team teaching<br>• Provide visual supervision while allowing for student collaboration |

## Renovate Computer Lab and Old Office into Special Education Spaces

Renovate existing spaces, including the existing office and the computer lab, into special education classrooms allows for special educations to be central to the overall classroom layout.

There is a growing need for more Special Education spaces and different types of spaces for small and large groups as well as more space for specialized and larger equipment.

It is recommended to remodel and centralize several Special Education spaces that are properly sized for certain groups of students and provide amenities and adjacencies for staff.



*Existing Computer Lab*

| FIM # | Renovate Computer Lab and Old Office into Special Education spaces |
|---|---|
| AES-EDA-4 | • Create more Special Education spaces |

| FIM # | Benefits of Renovate Computer Lab and Old Office into Special Education spaces |
|---|---|
| AES-EDA-4 | • Create appropriate and specialized special education spaces for more opportunities |

## Relocate Playground Equipment – Drainage Improvements

There are two sets of playground equipment installed on the property. The playground installed to the east of the building is a supervision issue during recess since it is separated from the main playground.

The playground equipment installed on the east side of the building also does not drain well due to a low spot in the grass/dirt, so it accumulates rainwater there and is muddy for student recess.

The recommendation is to relocate the playground equipment to the north of the building near the other playground equipment, so supervision is easier for a single staff member.  Also, the area of poor drainage should be leveled and graded so that water does not pond and grass will grow in the area.

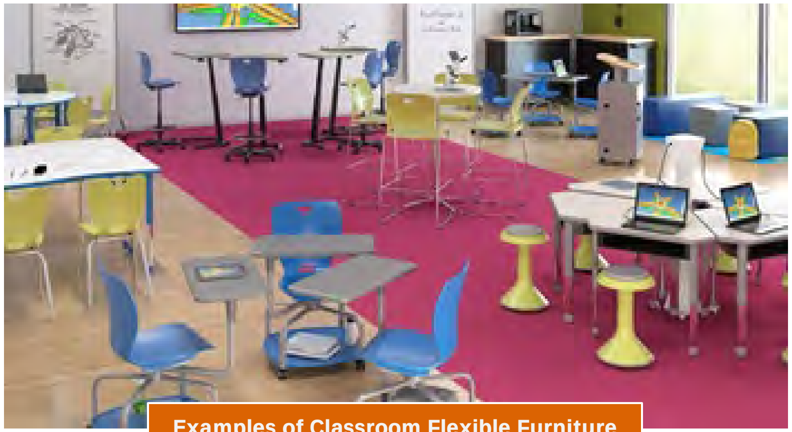
| FIM # | Relocate Playground Equipment – Drainage Improvements |
|---|---|
| AES-EDA-5 | • Relocate playground equipment<br>• Provide positive drainage in existing |

| FIM # | Benefits of Relocate Playground Equipment – Drainage Improvements |
|---|---|
| AES-EDA-5 | • Provide improved supervision of playground<br>• Provide improved landscaping |

## Flexible Furniture for Existing Areas

All remodeled areas would include new flexible furniture to assist in promoting collaboration, flexibility and project-based learning. The existing furniture in the majority of the spaces is traditional, standard classroom furniture.

Budgeting for new furniture in the remodeled areas, of at least 50%, allows for those existing spaces to move toward a modern learning environment with flexible furniture.

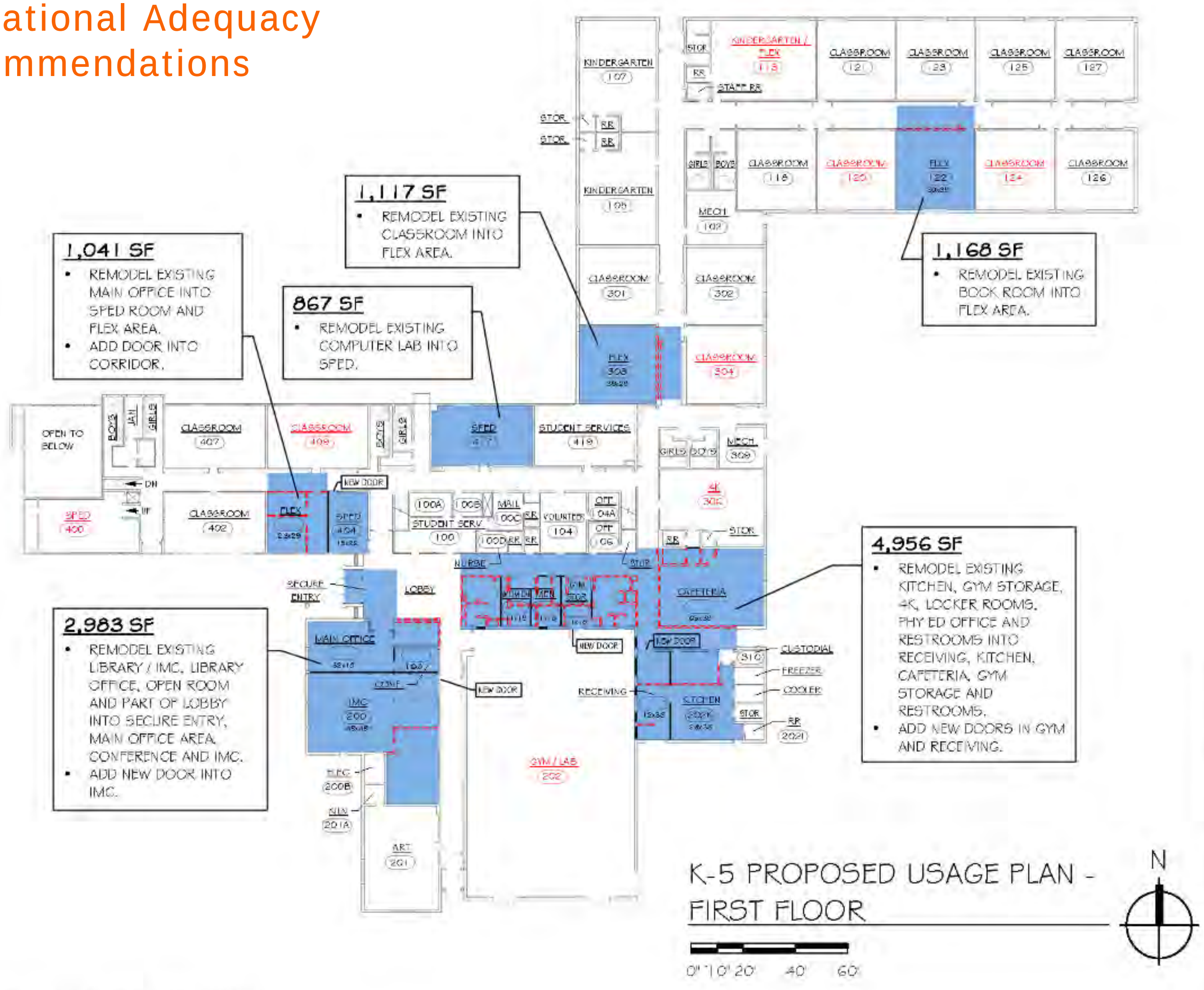


Examples of Classroom Flexible Furniture

| FIM # | Flexible Furniture for Unremodeled Areas |
|---|---|
| AES-EDA-6 | • Budget for 50% new furniture in unremodeled areas |

| FIM # | Benefits of Flexible Furniture for Unremodeled Areas |
|---|---|
| AES-EDA-6 | • Moves learning toward a more collaborative, flexible, and project-based learning environment |

# Educational Adequacy Recommendations



**1,041 SF**
- REMODEL EXISTING MAIN OFFICE INTO SPED ROOM AND FLEX AREA.
- ADD DOOR INTO CORRIDOR.

**1,117 SF**
- REMODEL EXISTING CLASSROOM INTO FLEX AREA.

**867 SF**
- REMODEL EXISTING COMPUTER LAB INTO SPED.

**1,168 SF**
- REMODEL EXISTING BOOK ROOM INTO FLEX AREA.

**2,983 SF**
- REMODEL EXISTING LIBRARY / IMC, LIBRARY OFFICE, OPEN ROOM AND PART OF LOBBY INTO SECURE ENTRY, MAIN OFFICE AREA, CONFERENCE AND IMC.
- ADD NEW DOOR INTO IMC.

**4,956 SF**
- REMODEL EXISTING KITCHEN, GYM STORAGE, 4K, LOCKER ROOMS, PHY ED OFFICE AND RESTROOMS INTO RECEIVING, KITCHEN, CAFETERIA, GYM STORAGE AND RESTROOMS.
- ADD NEW DOORS IN GYM AND RECEIVING.

## K-5 PROPOSED USAGE PLAN - FIRST FLOOR

## REMODEL TYPE:

🟦 REMODELING

🟩 NEW CONSTRUCTION

- - - NEW FIRE WALL

ROOM LABELS IN RED REPRESENT A CHANGE IN ROOM USE WITH NO REMODEL.

## SCHOOL CAPACITY INFORMATION:

| | |
|---|---|
| TOTAL EXIS. BUILDING AREA: | 64,168 SF |
| TOTAL ADDITION AREA: | 0 SF |
| TOTAL BUILDING AREA: | 64,168 SF |

2019 THIRD FRIDAY ENROLLMENT: 249
+ XX 4K

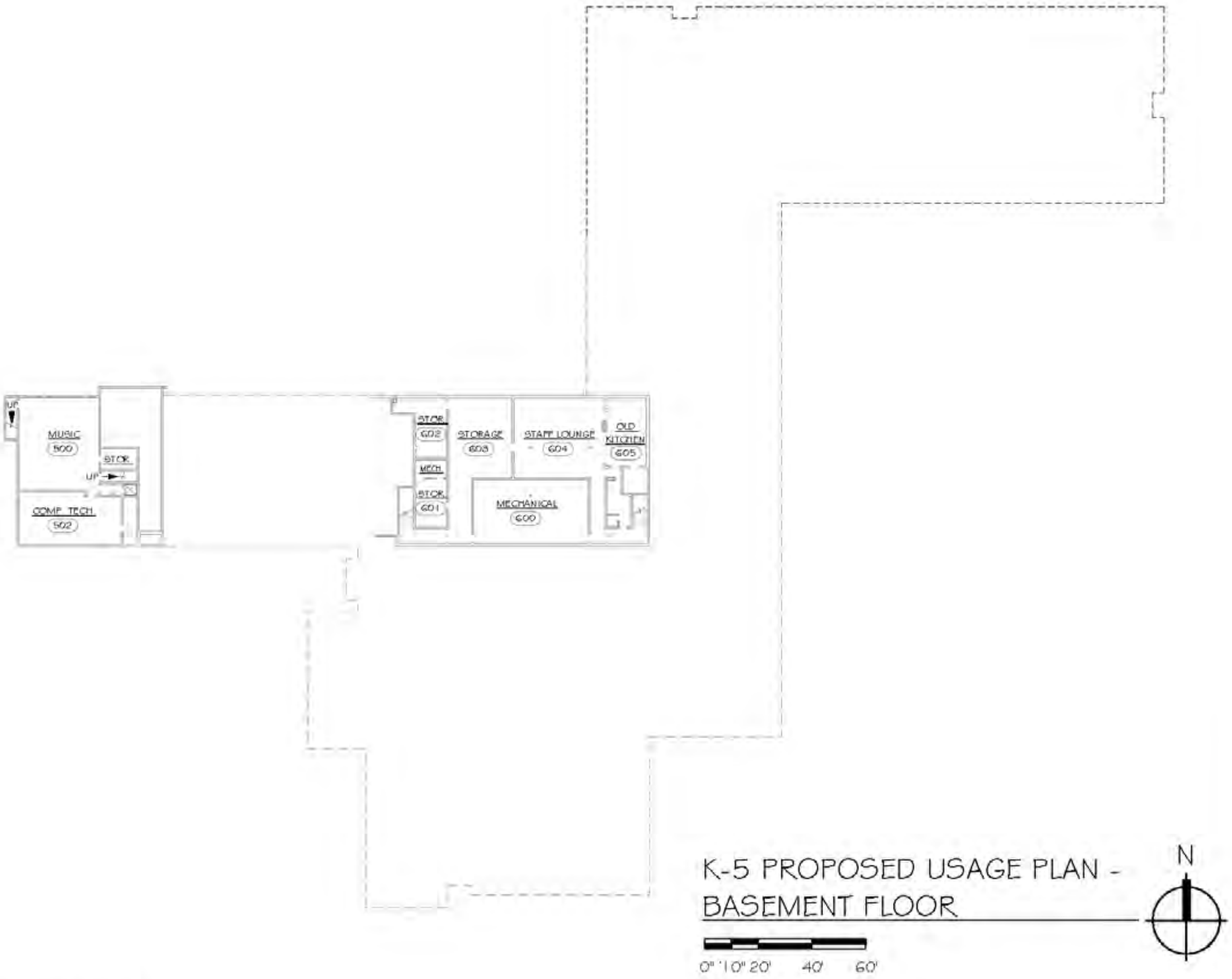
(1) 4K CLASSROOM x 19 MAX. STUDENTS / ROOM = 19 STUDENTS

(10) K - 3 CLASSROOMS x 19 MAX. STUDENTS / ROOM = 190 STUDENTS

(6) 4 - 5 CLASSROOMS x 22 MAX. STUDENTS / ROOM = 132 STUDENTS

TOTAL CAPACITY: 322 STUDENTS + 19 4K

OCONTO FALLS SCHOOL DISTRICT
ABRAMS ELEMENTARY SCHOOL
75201 7/28/20 YEAR BUILT: 1957



## K-5 PROPOSED USAGE PLAN - BASEMENT FLOOR

### REMODEL TYPE:

🟦 REMODELING

🟩 NEW CONSTRUCTION

- - - NEW FIRE WALL

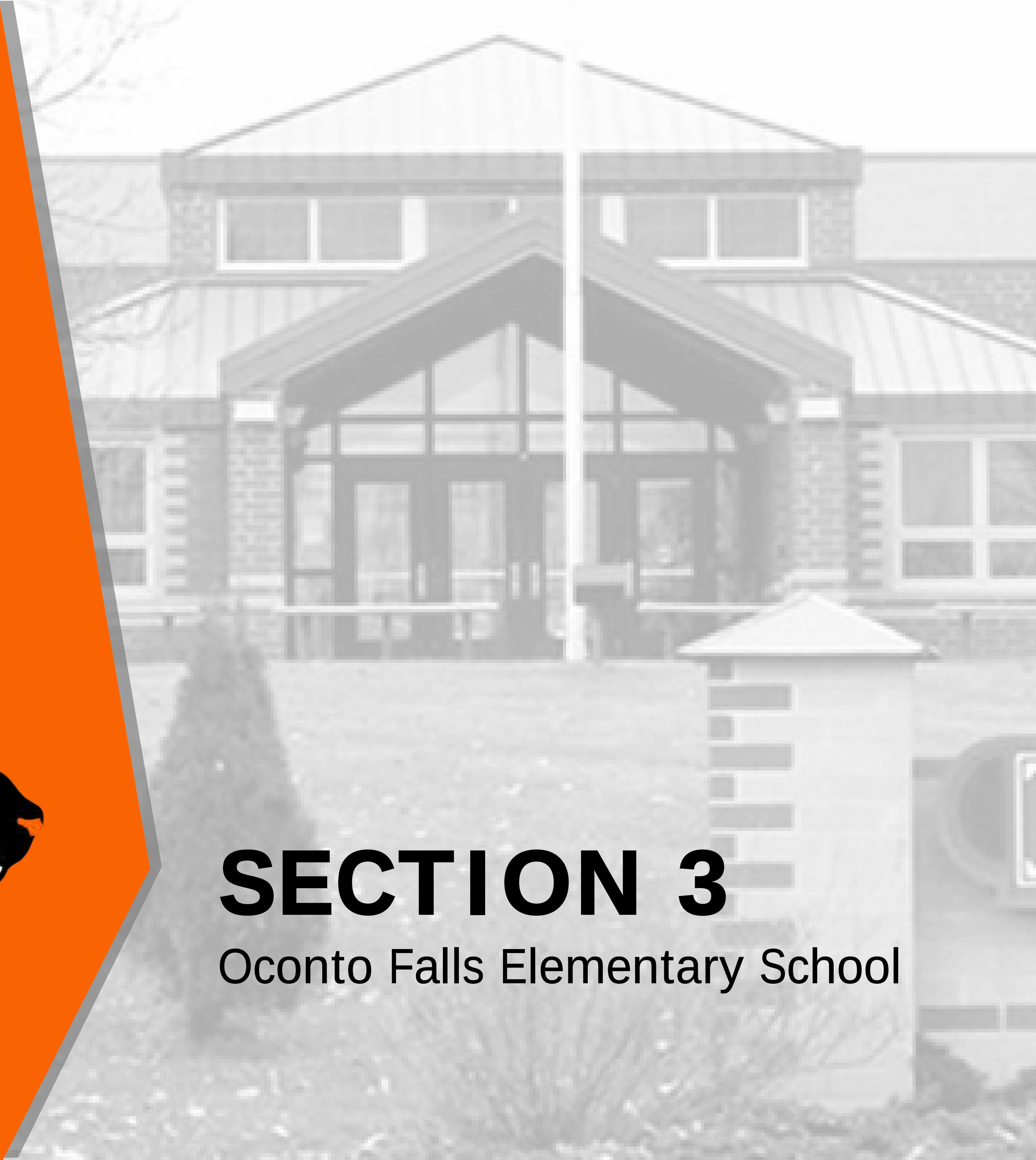
ROOM LABELS IN RED REPRESENT A CHANGE IN ROOM USE WITH NO REMODEL.

OCONTO FALLS SCHOOL DISTRICT
ABRAMS ELEMENTARY SCHOOL
7510 | 7/28/20

SOLUTIONS®

Oconto Falls School District

**FACILITY ASSESSMENT**



# SECTION 3

## Oconto Falls Elementary School

## INTERIOR FINISHES

### Doors

Throughout the school the interior wood doors and frames are in good shape, there are a few door grilles that need painting or replacing due to chipped paint.

All the exterior doors and frames are a mix of aluminum hollow metal. The hollow metal doors and frames are showing wear and rust. The recommendation is to replace the hollow metal doors and frames with aluminum and FRP doors and frames for durability, maintenance and longevity.

### Floors

Throughout the school the area of greatest concern is the flooring. The majority of the flooring is VCT (Vinyl Composition Tile). This floor product requires regular stripping and waxing. If the product is not stripped on a regular basis prior to applying the new wax, the dirt will get trapped in the flooring. VCT flooring throughout the school is discolored and appears ‘dirty’.

There are multiple locations where the VCT has cracks in it. VCT is a hard and brittle product. If there are cracks in the concrete below the VCT, it is likely to transfer through the VCT; if the cracking below the VCT is not addressed (filled or stopped) replacing the existing VCT with new VCT will likely result in the same type of cracking. A more flexible, resilient flooring product (like a solid vinyl or rubber) or polishing the concrete, is recommended.

There are areas of the VCT floor that are stained with rust spots. It appears there was metal furniture sitting on the floor, the furniture rusted and stained the flooring.

There are cracks in the epoxy floor base in the kitchen that should be filled for sanitary reasons.

The gym floor is similar to the Abrams Elementary gym floor; however, the Oconto Falls Elementary School gym floor has significant scuff marks from chairs. The floor is not in immediate need of repair, but care should be taken to prevent further damage.

There is carpet throughout the building; there are areas where the carpet is worn and the transition strip between the carpet and VCT flooring is missing.

Ceramic tile flooring and base in the restrooms is in good condition.

### Ceilings

Are generally in good condition. The ceiling in the kitchen will likely require replacing prior to the other ceilings.

### Walls

One pair of restrooms has wall damage where there appears to have been water infiltration. The plaster finish should be repaired and the walls repainted.

### Toilet Partitions

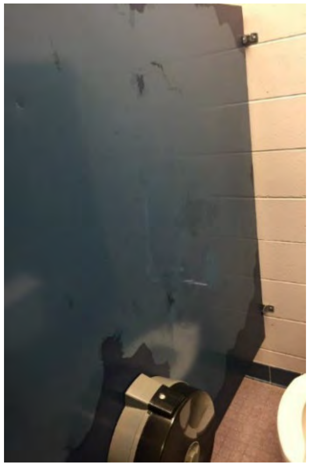
The multiple stall restrooms have metal toilet partitions. One of the partitions was showing significant wear. Replacing the metal partitions with solid plastic partitions should be considered.

### Lockers

One hallway of metal lockers has visible rust spots on the lockers. These lockers may be able to be repaired and repainted or replaced.

### ADA Accessibility

The building is accessible. The ADA violations are often identified in non-accessible restroom facilities, door hardware and lack of elevator. This building does not have these, or any other, accessibility concerns.



| FIM # | Interior Finishes Upgrades |
|---|---|
| OFES-INT-1<br>through<br>OFES-INT-4 | Door Hardware<br>• Replace or paint grilles on doors with damaged grilles (approximately 6)<br>• Replace exterior hollow metal doors and frames (approximately 4 pair)<br>Flooring Upgrade<br>• Replace cracked and discolored ‘dirty’ VCT<br>• Fill cracks in Epoxy Floor<br>• Replace worn carpet and transition strips (approximately 8 rooms)<br>Walls Upgrade<br>• Repair cracks in walls and repaint (approximately 4 locations)<br>Toilet Partition Upgrade<br>• Replace rusting metal toilet partitions<br>Locker Upgrade<br>• Replace or repair rusting metal lockers |

| FIM # | Benefits of Interior Finishes Upgrades |
|---|---|
| OFES-INT-1<br>through<br>OFES-INT-4 | • Reduced future maintenance<br>• Improved school aesthetics<br>• Improved school pride<br>• Improved sanitary conditions, sealing cracks in floor in food prep areas |

# FOOD SERVICE EQUIPMENT

Oconto Falls Elementary School is a full production kitchen where food is received, prepped and cooked on site for daily meal service. The school provides breakfast and lunch to students. Meals are served in gymnasium. Deliveries come thru public entry vestibule, no receiving room with direct or close access to kitchen. Overall kitchen flow between bulk storage (walk in refrigeration) and prep tables is tight. This includes positioning of walk-in cooler door with prep table. There are two serving lines; one where students circulate in gym and access line at pass thru window. The second line is entirely inside kitchen where students must enter kitchen proper. Ideally the server space wants to be in a separate room or space from a safety and sanitation standpoint. Oconto Falls Elementary School also has a walk in cooler remote of kitchen (newer unit) for additional storage.

### Observations

- The drop ceiling is showing age with discolored tiles & grid.
- Walk in Cooler / Freezer floor is showing signs of heaving at floor. This could be due to a combination of age of box and a faulty thermal break.
- Shifting of panels is causing the epoxy flooring to crack and fail.
- Cooler and freezer doors also do not line up properly which prevent proper seal. This is likely caused by panels shifting.
- Cooler / Freezer shelving has a combination of both chrome plated and epoxy coated shelving.
- Some chrome shelving is rusting.
- Disposer has older drum switches that are not recessed inside of table edge which will cause workers to bump into.
- Top oven on double stack convection oven is not working.
- Dish washer is leaking which could be seals failing due to age. Pre rinse spray at dishwashing is showing was problematic.

### Recommendations

- Replace ceiling grid and vinyl coated tiles – (see interior finishes recommendations.)
- Repair of epoxy flooring – patching where necessary – (see interior finishes recommendations.)
- Consider replacing walk in cooler/freezer with new box and insulated floor.
- Replace stacked convection ovens.
- Replace dish washer with new energy efficient unit.
- Consider replacing Pre-Rinse Spray unit with new.
- Consider replacing Disposer with new unit that has remote start / stop control in lieu of old drum switch.
- Consider replacing chrome posts for shelving in walk in units with epoxy coated to prevent rusting.

| FIM # | Recommended Food Service Improvements |
|---|---|
| OFES-INT-5 | Replace Kitchen Equipment Where Required:<br>• Replace ceiling grid and vinyl coated tiles – (see interior finishes recommendations.)<br>• Repair epoxy flooring – patching where necessary – (see interior finishes recommendations.)<br>• Replace walk in cooler/freezer with new box and insulated floor.<br>• Replace stacked convection ovens.<br>• Replace dish washer with new energy efficient unit.<br>• Replace Pre-Rinse Spray unit with new.<br>• Replace Disposer with new unit that has remote start / stop control in lieu of old drum switch.<br>• Replace chrome posts for shelving in walk in units with epoxy coated to prevent rusting. |
| **OFES-INT-6** | Replace Walk-In Cooler/Freezer:<br>• Replace Walk-in Cooler and Freezer<br>• Replace Condenser, Evaporator, and Controls |

| FIM # | Benefits of Food Service Improvements |
|---|---|
| OFES-INT-5 | • Improved food safety.<br>• Reduced future maintenance on food service equipment.<br>• Increase efficiency of food service staff.<br>• Improved safety for food service staff. |
| OFES-INT-6 | • Improved food safety.<br>• Reduce chance of losing product due to cooling failures. |

## SITE DRAWINGS

### PLAN NOTES: ⟨x⟩

1 PORTION OF ROOM HAS CARPET THAT SHOULD BE REPLACED IN 0-5 YEARS.

FIRST FLOOR PLAN
FLOORING REVIEW
NOT TO SCALE

### PRIORITY LEGEND

- 🟪 0-5 YEARS
- 🟧 5-10 YEARS
- 🟦 10-20 YEARS
- 🟩 SEE REPORT FOR UPGRADE DESCRIPTION
- ⬜ EXISTING BUILDING - NO WORK

FIRST FLOOR PLAN
WALL REVIEW
NOT TO SCALE

## PRIORITY LEGEND

- 🟪 0-5 YEARS
- 🟧 5-10 YEARS
- 🟦 10-20 YEARS
- 🟩 SEE REPORT FOR UPGRADE DESCRIPTION
- ⬜ EXISTING BUILDING - NO WORK

## FIRST FLOOR PLAN
## CEILING REVIEW

NOT TO SCALE

### PRIORITY LEGEND

- 🟪 0-5 YEARS
- 🟧 5-10 YEARS
- 🟦 10-20 YEARS
- 🟩 SEE REPORT FOR UPGRADE DESCRIPTION
- ⬜ EXISTING BUILDING - NO WORK

## PRIORITY LEGEND

- 🟪 0-5 YEARS
- 🟧 5-10 YEARS
- 🟦 10-20 YEARS
- 🟩 SEE REPORT FOR UPGRADE DESCRIPTION
- ⬜ EXISTING BUILDING - NO WORK

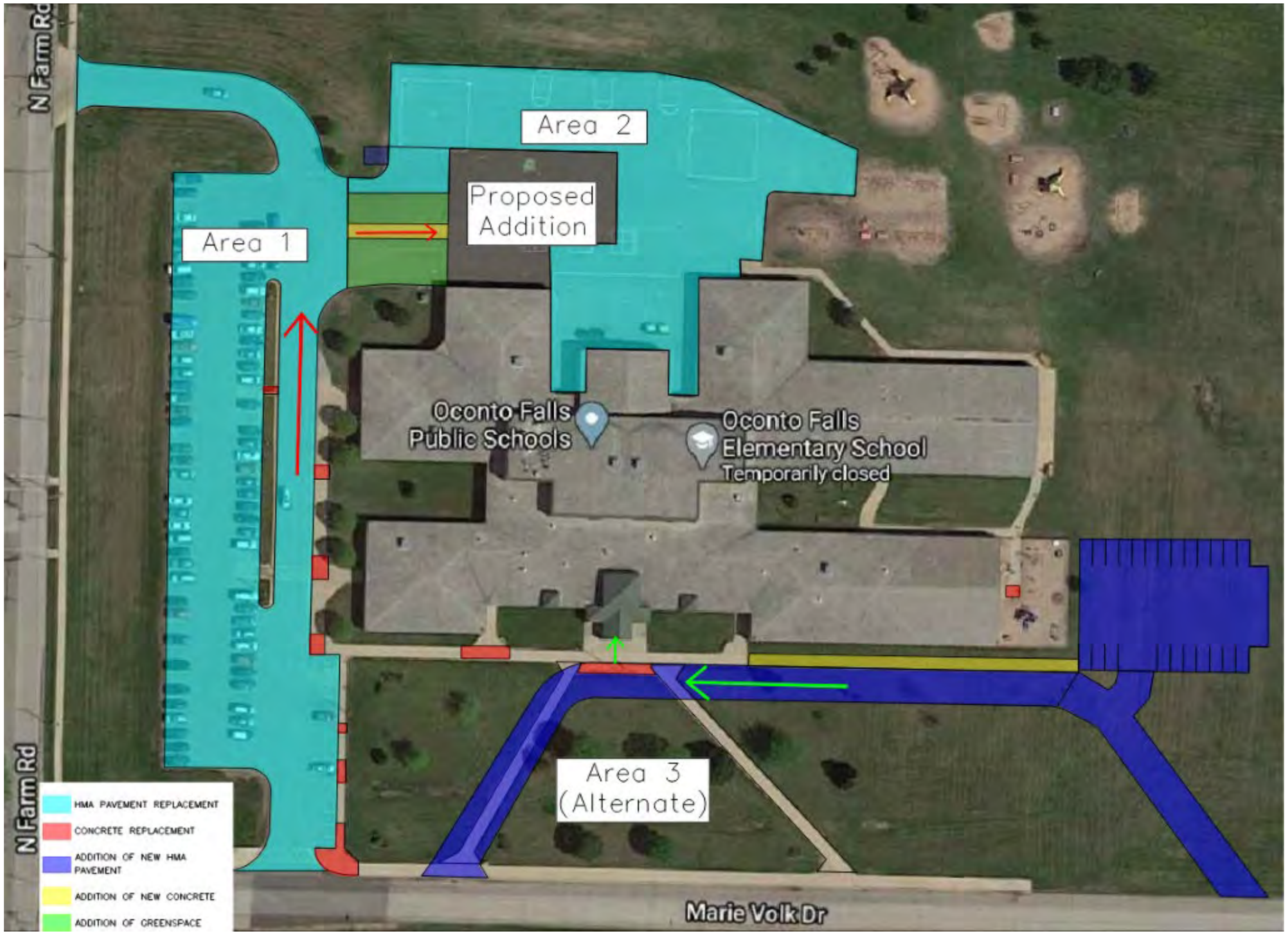
## FIRST FLOOR PLAN
## CASEWORK REVIEW

NOT TO SCALE

## SITE & CIVIL

The map pictured on right shows the areas listed in the following recommendations for Oconto Falls Elementary School.

Areas not shaded were found to be in good condition, with no improvements being recommended at this time.



### Area 1: Parking lot on west side of school

The existing pavement has numerous thermal cracks which have worsened over multiple freeze-thaw cycles. There are some areas of localized base failure, which are evident by the fatigue cracking present. The base failure is a small portion of this area, approximately 5%. Edge failure and surface weathering are also present.

### Area 2: Play area on north side of the school

The existing pavement has numerous thermal cracks which have worsened over multiple freeze-thaw cycles. There are some areas of localized base failure, which are evident by the fatigue cracking present. The base failure is a small portion of this area, approximately 10%. Edge failure and surface weathering are also present.

### Site Concrete

Throughout the site there are sections of sidewalk that have spalled along the edges and it will continue to worsen as the sidewalk ages. There are multiple areas of curb and gutter that have also spalled along the edges and have broken into smaller sections of curb. These become a tripping hazard when stepping down from the sidewalk.

ADA panels (detectable warning fields) need to be added where pedestrian traffic meets vehicular traffic.

### Addition of Bus Loop and 4K/EC Parking

See Educational Adequacy Recommendations.

| FIM # | Site and Civil Improvements |
|---|---|
| OFES-SC-1 | Area 1: West Parking Lot<br>• Remove existing pavement, inspect the base material and patch as necessary.<br>• Add 3 inches of asphalt and mark the new pavement.<br>• Add concrete flume. |
| OFES-SC-2 | Area 2: North Playground<br>• Remove the existing asphalt to expose the base material.<br>• Inspect the base material and repair it with base course patching as needed.<br>• Pave 3 inches of new asphaltic surface and paint all pavement markings. |
| OFES-SC-3 | Site Concrete:<br>• Remove and replace all areas of damaged or spalling concrete.<br>• Add the detectable warning fields in required location. |
| OFES-SC-4 | Stormwater Management:<br>• If more than one acre is disturbed for reconstruction. stormwater management will need to be performed. |
| **FIM #** | **Benefits of Site and Civil Improvements** |
| OFES-SC-1 through OFES-SC-4 | • Improved site safety.<br>• Reduced future maintenance on paved areas and sidewalks.<br>• Improved aesthetics. |

# BUILDING ENVELOPE

### Ballasted EPDM Roofing

The roof system is beginning to show signs of failure by holes at penetrations. Ballasted system is not appropriate for sloped roof design. No gutters exist at roof perimeter edges which allow excessive moisture to shed off roof and saturate the ground around the perimeter. Stone ballast is in a deteriorated condition.

### Roof to Wall Transition Flashing

There is a leak that is occurring along the upper roof to wall transition where some pre-existing through wall flashing appears to have been removed during a past roof replacement.

### Masonry Moisture Issues

Efflorescence is exhibited on primarily the south elevation coming from the brick veneer. Excessive moisture is entering the masonry cladding and leeching out fine minerals from the mortar and brick. This is due to most likely to the lack of gutters to divert roof stormwater runoff. Organic growth is also visible on a number of mortar joints which is due to excessive moisture within the wall system.

### No Gutters

No gutters exist at roof perimeter edges which allow excessive moisture to shed off roof and saturate the ground around the perimeter. Stone ballast is in a deteriorated condition.

### Window Seals and Gaskets

Window gaskets are in a failed or deteriorated state on the roof level at the south entrance cupola. Window seals were observed extruding from exterior in other areas. The windowsill flashings at alcove on east elevation lack proper sealant at lower outside corners. Window perimeter sealant is in a failed condition or deteriorated condition in multiple areas.

### Masonry Control Joints & Lintels

Control joints are sized too small which has caused the sealant to extrude from the joint and has cohesively failed.  Lintels are exhibiting rust due to excess moisture contact and lack of properly installed drip edge flashings.

### Spalling Brick

Bricks were observed with face delamination at several locations about the building. This is due in part to too hard of mortar. Mortar that is harder than the brick will not allow the brick to expand when it warms up or absorbs moisture therefore cause shear stress at the outer face of the brick which results in the face delaminating.

### Cracked Masonry

Cracked masonry was noted at the north east corner of the building. Step cracks were observed at the two south entrance locations with brick veneer parapets above.

| FIM # | Building Envelope Repairs |
|---|---|
| OFES-BE-1 | Replace Ballasted EPDM Roof System with TPO Roofing System (Entire Building)<br>• Roof system should be replaced with a decorative PVC roof system. |
| OFES-BE-2 | Replace Deteriorated Windows at South Entrance Cupola<br>• Remove and replace window seals and gaskets or replace windows. |
| OFES-BE-3 | Remove and Replace Masonry Control Joints, Install Gutters and Drainage to Prevent Further Masonry Damage<br>• Gutters should be installed around the roof edge perimeter to collect stormwater runoff and a drainage system installed to move water to a retention location/storm sewer nearby.<br>• Wash brick veneer with a low-pressure washer to remove efflorescence and organic growth.<br>• Remove existing masonry control joint sealant, rout open joint to properly calculated width, install backer rod, prime, and re-seal |
| OFES-BE-4 | Remove, Repair, Coat, and Reinstall Rusting Masonry Lintels<br>• Remove lintels, remove rust and corrosion, epoxy coat, and re-install. |
| OFES-BE-5 | Replace Roof Flashing at Wall Transitions, Replace Through-Wall Flashing<br>• Remove roof flashing in order to tie in new roof-to-wall flashing. Reuse or remove brick and replace through wall flashing membrane to rehabilitate original through wall flashing. |
| OFES-BE-6 | Replace Spalling Brick where Damaged, Repair Crack at N.E. Corner, Repair Cracks and Tuckpoint at South Entrance<br>• Remove and replace bricks as necessary.<br>• Around north east crack, remove and replace brick and mortar.<br>Rout out existing mortar joints and tuckpoint at area showing step cracks. |
| OFES-BE-7 | Replace Failed Window Seals and Gaskets, Remove and Replace Window Perimeter Sealant where Deteriorated<br>• Remove and replace window seals/gasket<br>• sRemove existing sealant, install backer rod, prime, and re-seal |

| FIM # | Benefits of Building Envelope Repairs |
|---|---|
| OFES-BE-1 through OFES-BE-7 | • Protection from water infiltration and further damage to roofing, interior, and walls.<br>• Reduced future maintenance on roofs and masonry.<br>• Improved exterior aesthetics. |

# ELECTRICAL & SAFETY

## Electrical Service

The Oconto Falls Elementary School building was constructed in 1995 with further building updates occurring in 2005. The electrical service is 208Y/120V, 3-phase, 4-wire, 2000A and is unchanged since the original construction. The service equipment is a Square D QED-style switchboard in the Receiving/Electrical Room. The BOMA life expectancy for electrical service equipment is 40 years, so it is expected that this equipment is acceptable as installed, provided manufacturer-recommended maintenance has been executed.

It is unclear if a coordination study has been completed to determine the appropriate trip settings on the main and distribution switchgear circuit breakers. We recommend performing a coordination study to determine if existing breaker trip settings are acceptable to prevent adverse equipment damage if breakers do not trip properly. If breakers are not properly coordinated, a simple fault at the branch circuit or receptacle level could potentially cause an outage for the entire building.

The existing building switchboards, panelboards, disconnect switches, and other electrical equipment do not have arc flash labels installed, so it is unclear if an arc flash study has been performed. There is inherently an increased hazard of working on live equipment due to possible buildup of energy being released in an arcing incident. This arcing incident can occur due to failing conductors or even tools incidentally touch live bus bars or contacts causing short circuits. These arcing incidents can cause severe burns and injuries. Per NFPA 70E section 130, arc flash labels are required to be applied to electrical equipment, meaning an arc flash study is required to be performed. We recommend that a fault current/arc flash study is performed and appropriate arc flash labels installed to the required electrical equipment. This will bring the existing installation into compliance with current code requirements and provide clear safety guidelines for persons performing maintenance on equipment.

## Backup Generator Addition

The building is not currently served by a backup generator. The Fire Alarm system and life safety lighting are served from integral battery backup units, while IT servers are all served by local uninterruptible power supplies (UPS). There have been multiple power outages in the past. Based on discussions with the school district, an optional standby generator would be desired to serve IT, HVAC, security, and phone systems, as well as other optional standby equipment. We recommend providing a new optional standby generator to serve IT equipment and other optional standby loads requiring back-up power to limit data loss, communications outages, food spoilage, and other negative consequences of prolonged power outages.

## Electrical Infrastructure and Grounding

Multiple instances of general-purpose receptacles near sinks (e.g. kitchens or bathrooms) were noted to be regular duty, non-ground fault circuit interrupting (GFCI) type. Per NEC section 210.8, GFCI protection must be installed for all 15 and 20 Amp circuits in these locations. We recommend replacing general duty receptacles within kitchen and bathroom areas with GFCI-protected receptacles to comply with code. Additionally, receptacles near mop or washdown sinks and basins should also be replaced with GFCI receptacles.

Existing panelboard 'B' is located near the washdown/mop sink area but is a NEMA 1 enclosure (see Figure 1, right). Per NEC Table 110.28, this enclosure should be type 4X for this installation. Since an immediate replacement of the panelboards with NEMA 4X enclosures or relocating will be difficult and/or costly, we would recommend installing a solid partition from the floor to a height greater than the panelboards to reduce the chance of splashes. Additionally, the BOMA useful life expectancy of this panelboard is about 30 years. Since these panelboards are assumed to have been installed as part of the original construction, we would strongly recommend replacement within 5 years with a NEMA 4X enclosure, a single 60-pole panel, or entirely relocated away from the potential splash area.

Audio/Visual Room 153B currently has a metal sleeve installed around the bare copper ground lead as shown in Figure 2 to the right. We recommend replacing this metal sleeve with a non-metallic sleeve or other NEC-approved stress relief solution to prevent the potential of unwanted current on the ground sleeve.

FIG 1: Existing Panelboard adjacent to washdown/mop sink

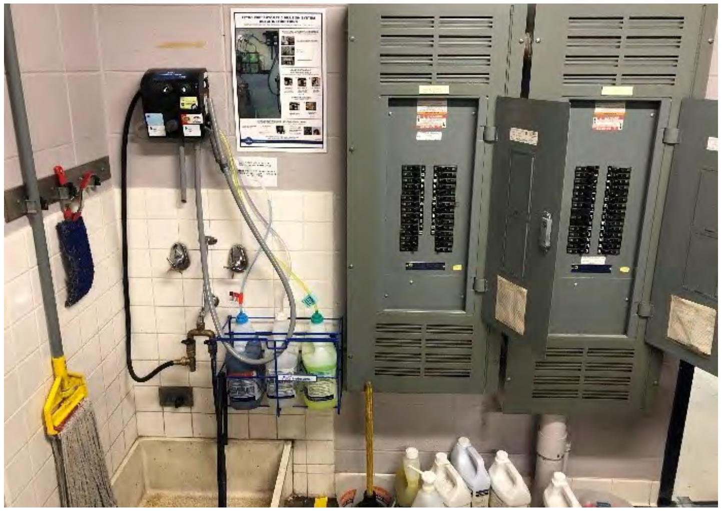


FIG 2: Bare copper ground lead in metal sleeve

The existing equipment disconnect switches on the roof are showing signs of degradation, shown to the left in Figure 3. This is due in part to the equipment being in NEMA 1 rated enclosures. Per NEC Table 110.28, this enclosure should be type 3R for this installation. We recommend replacing the disconnect switches with new, NEMA 3R rated devices. Additionally, we would recommend a thorough inspection of all rooftop equipment connections and terminations for corrosion. All instances of corrosion should be removed and replaced with new equipment connections in liquidtight flexible metal conduit (LFMC).

Most existing distribution and branch electrical equipment is original to the building. This electrical equipment includes, but is not limited to, disconnect switches, branch panelboards, and distribution panelboards. These pieces of equipment are approaching their BOMA life expectancy of 30 years. Assuming equipment has been properly maintained, we do not necessarily recommend full equipment replacement throughout the building. However, we recommend a thorough inspection and evaluation of all electrical equipment installed in the original 1995 building construction. This will limit the chance of failure by identifying equipment or parts that may need cleaning, re-torqueing, or replacement. Additionally, this offers an opportunity to re-evaluate the availability of replacement parts for continued maintenance. Repair or maintain deficient equipment. If equipment is defective or cannot properly be maintained because of the inability to source parts, replace immediately.

FIG 3: Disconnect switch on rooftop showing signs of major degradation

## Interior Building Lighting

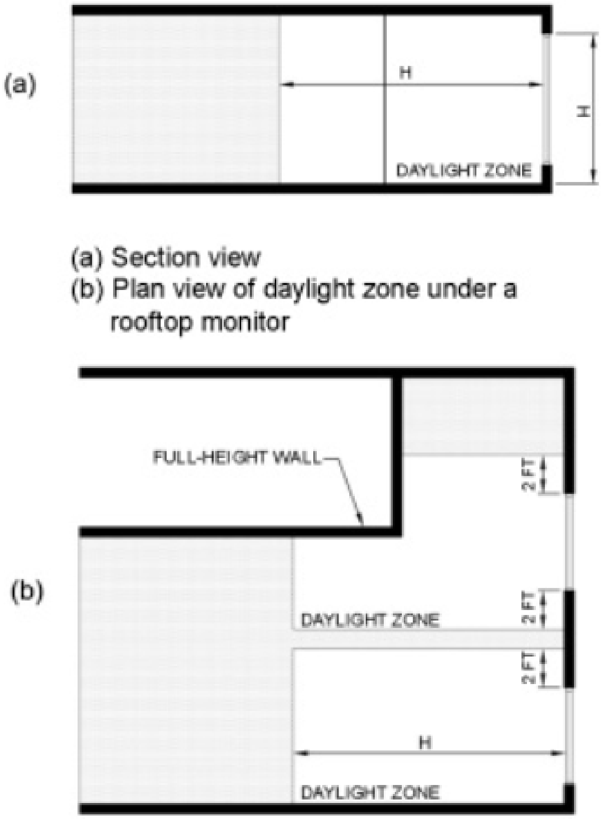
Existing lighting throughout the building consists primarily of fixtures with fluorescent T8 lamps. Modern lighting is typically dimmable LED which has substantially lower wattage consumption than equivalent fluorescent fixtures. Because of this, energy savings can often offset installation costs. We recommend replacing the existing lighting with equivalent LED fixtures throughout for increased energy savings and reduced maintenance costs. Emergency fixtures replaced with LED equivalents shall be specified to include battery back-up.

Some existing emergency battery packs in emergency fixtures were labeled with replacement dates that exceeded 5 years. This exceeds the BOMA useful expected life of 5 years for egress light batteries, as well as some manufacturer-provided maintenance requirements. One emergency fixture in the gymnasium was labeled “No Battery” (shown in Figure 4 , right) which warrants immediate replacement. We recommend replacing the emergency battery packs in any emergency fixtures not replaced with an LED equivalent (as described above), as well as replacing the gymnasium fixture.

Classrooms throughout the building are controlled by a single switch. Per IECC 2018 Section C405.2.3, spaces with over 150W of lighting must have separate daylight-responsive controls. This means fixtures in the daylighting/sidelit zone (defined in IECC Figure C405.2.3.2, shown at right in Figure 5) must dim automatically in response to the amount of light coming in the windows separately from the rest of the room. These responsive controls must be able to be calibrated from within the space. In order to meet these requirements, we recommend providing photocells separately controlled switching to control new, dimmable LED fixtures that are within daylight zones. Not only would this installation comply with the latest energy code requirements, it will offer increased energy savings over the existing installation.

**FIG 4:**

**FIG 5:**



(a) Section view
(b) Plan view of daylight zone under a rooftop monitor

In addition to only having single switch controls in classrooms, some building areas have occupancy sensors that are installed but disabled. Other parts of the building do not have any occupancy sensors installed. Per IECC section C405.2.1, these are required in common school spaces that include, but are not limited to, classrooms, offices, restrooms, and locker rooms. As part of the replacements mentioned above, we would also recommend replacement (or addition of new) dual-technology occupancy sensors in rooms to realize greater energy savings and meet IECC requirements. Dual-technology sensors utilize ultrasonic and infrared detection technologies to eliminate false sensing and provide accurate and efficient lighting control.

Hallway ceiling emergency lights like the one shown in Figure 6 to the right are installed with spacing exceeding 70 feet in some cases. We expect that the minimum lighting requirements as defined by NFPA 101 section 7.9.2.1.1 would not be met. We recommend performing a detailed walkthrough with a light meter to assess the existing emergency lighting installation and installing new emergency fixtures as required.

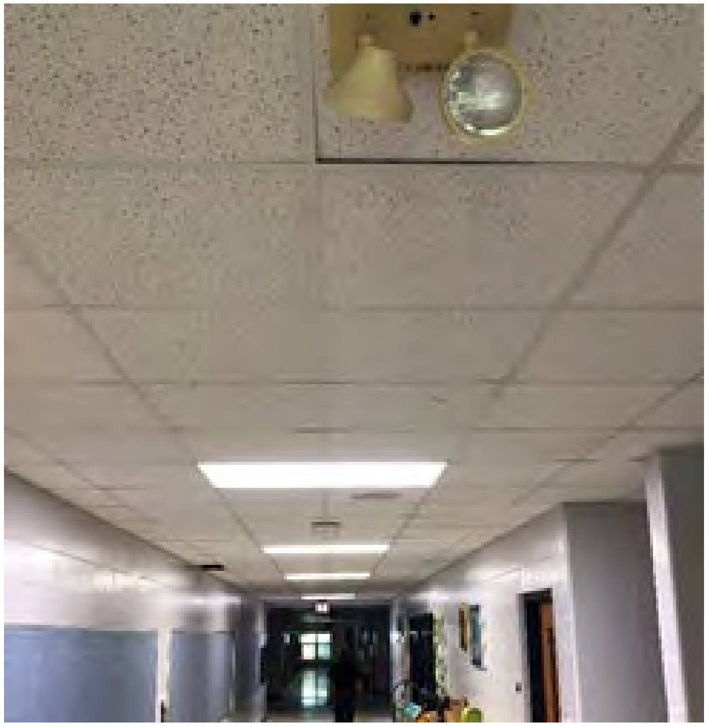


FIG 6: Typical hallway ceiling emergency light

# TECHNOLOGY & SAFETY

## IT Infrastructure

The existing IT infrastructure has been recently replaced by the Oconto Falls School District over the past two years. The district server is located at Oconto Falls High School and is fed by a dual utility feed with a transfer switch between the two sources. Additionally, it has UPS power available for 400 minutes of run time. Oconto Falls Elementary has multiple IT closets with servers backed up by local, standalone UPSs to provide a minimum 30 minutes of back up. We have no new recommended IT work.

## Door Access and Video Surveillance Systems

During a 2019 audit, it was identified that Oconto Falls School District did not have adequate door access control or video surveillance systems. The School District has since upgraded the security systems throughout their buildings. No deficiencies or issues were noted, and as such, we have no recommended security systems work.

## Public Address System

The existing public address (PA) system head end unit make, model, and installation year were unable to be verified, but assumed to be original to the building. As such, it could not be verified if replacement parts are able to be sourced. The existing system is standalone and not currently integrated into the IT infrastructure. Based on discussion with the school district, it is safe to assume the existing system is obsolete. We recommend replacement of the existing PA system with a new system that is capable of integration into the IT infrastructure. This will include a new head end unit and new speakers throughout the facility. However, if the existing system is fully functional and serviceable, it can remain in service as the system replacement is not high priority.

## Clock System

The existing clock system was manufactured by Franklin Time Systems. The installation date could not be confirmed but is assumed to be original to the building and likely an obsolete system. The system is standalone and did not appear to be tied into the IT infrastructure. We recommend replacing the existing system with a new system capable of integration into the IT infrastructure at some point in the future. If this system is fully operational and parts are readily available, it is not a high priority replacement.

## Fire Alarm System

The existing fire alarm control panel (FACP) is a Simplex 4002 non-addressable system, shown at the left. This is a zoned system that has been discontinued by Simplex for many years. It is over 20 years old and past its expected useful life. The parts internal to the FACP are no longer manufactured and cannot easily be sourced. Due to the necessity of maintaining this system for future years, we strongly recommend a replacement of the head end fire alarm control panel with one that meets the requirements of, and is installed in accordance with, NFPA 72 and International Building Code. The new fire alarm system should be an addressable, emergency voice-alarm communications (EVAC) system with capacity for future building expansions. To allow the school district to monitor the site remotely, it should and be networkable to integrate it into the new IT infrastructure.

The current fire alarm notification device age and quantity are also deficient. It was observed that numerous classrooms were missing a strobe notification device, as is required by NFPA 72. Similarly, due to the age of the system, we assume that mass notification/voice evacuation audio capability does not exist, and some notification devices are past their expected useful life of 15 years, as defined by BOMA. We recommend replacing existing devices in the original and 1995 building areas to maintain continued functionality. We also recommend adding strobe notification devices in rooms that are currently deficient. Replacement and addition of new notification devices can occur separately from the head-end unit FACP replacement but may be more economical to make all fire alarm changes at once, including removal of any original fire alarm equipment that has been abandoned in place.

Fire alarm coverage in Cafeteria Kitchen C109 did not appear acceptable. We recommend an additional speaker/strobe notification device be installed to ensure the entire area is covered.

However, due to the number of devices needing replacement or to be added exceeding 20, the entire system will need to be submitted for state review. This means that the fire alarm system will likely need to be brought up to current code (EVAC) requirements. Because of precedent set with other state-reviewed jobs of a similar nature, we recommend a total fire alarm system replacement, as solely replacing the head end or adding and replacing devices will not meet the requirements to pass state review.

| FIM # | Electrical and IT Infrastructure Improvements |
|---|---|
| OFES-EE-1 | Replace Fire Alarm System with New Addressable System<br>• Provide new fire alarm control panel for future expansion and voice capability<br>• Provide entirely new addressable fire alarm system |
| OFES-EE-2 | Coordination, Arc Flash, and Panel Safety Improvements<br>• Perform coordination study and adjust circuit breaker trip settings as necessary<br>• Perform fault current/arc flash study and apply arc flash labels to equipment<br>• Provide new partition between washdown/mop sink until it is viable to replace or relocate panel<br>• Replace rooftop disconnect switches with NEMA 3R rated equipment, and inspect and replace equipment connections<br>• Replace noncompliant general-purpose receptacles with GFCI-type receptacles in kitchens, bathrooms, and near sinks per NEC<br>• Replace sleeve for grounding lead with a non-metallic sleeve or other approved stress relief |
| OFES-EE-3 | Add Notification Strobes to Classrooms and Kitchen<br>• Assess egress lighting coverage in hallways and add ceiling emergency fixtures as required<br>• Replace emergency light fixture battery packs and replace gymnasium emergency fixture noted to be without battery. |
| OFES-EE-4 | Provide New Backup Generator, Transfer Switches and Distribution Panel<br>• Provide new optional standby generator |
| OFES-EE-5 | Replace Existing Lighting with LED Lighting and Controls<br>• Replace fluorescent and HPS fixtures with dimmable LED equivalents<br>• Modify lighting controls and provide photocells in rooms with windows<br>• Add and replace existing occupancy sensors |
| OFES-EE-6 | Provide New Integrated Systems<br>• Provide new PA system<br>• Provide new central clock system |

| FIM # | Benefits of Electrical and IT Infrastructure Improvements |
|---|---|
| OFES-EE-1 | • Ensure a vital life safety system is able to be maintained into the future and meet minimum requirements of NFPA 72 and the local authority having jurisdiction, as well as be monitored remotely<br>• Ensures a system in full compliance with all current regulations, corrects device deficiencies and inadequate coverage, and most importantly, pass state review. |
| OFES-EE-2 | • Reduce risk of improper breaker function and protect electrical equipment<br>• Verify existing equipment ratings to improve safety of operation and maintenance staff working on electrical equipment and comply with NEC code requirements<br>• Improve safety of operation and maintenance staff working on electrical equipment and comply with NEC code requirements |
| OFES-EE-3 | • Ensure continued operation of existing notification devices, improve coverage to meet current NFPA and ADA code requirements |
| OFES-EE-4 | • Limit data loss, communications/security lapses, spoiled food, freezing temperatures, and equipment and building damage during prolonged power outages |
| OFES-EE-5 | • Decrease energy usage related to lighting, limit maintenance effort to replace lamps, and comply with current IECC and ASHRAE 90.1 energy codes |
| OFES-EE-6 | • Improve audible clarity of voice announcements for occupants with hearing impairment<br>• Improve ability to maintain the system into the future with readily available new parts |

## Codes and Guidelines Referenced

The following codes and guidelines are referenced within this analysis to ensure the safety and well-being of building occupants and personnel and limit fire or other building hazards:

- Building Owners and Managers Association (BOMA) International has published a preventative maintenance guidebook intended to illustrate “best practices to maintain efficient and sustainable buildings.” In it, Appendix 7 lists the expected useful life for numerous building systems and components. Specifically, we reference Appendix 7, sections E and F.
- National Fire Protection Association (NFPA) is an international organization that publishes numerous codes and standards intended to eliminate death, injury, and property and economic loss due to fire- and electrical-related hazards. For our analysis, we are looking specifically at NFPA codes 70, 70E, 72, and 101. They are the National Electric Code (NEC), Standard for Electrical Safety in the Workplace, National Fire Alarm and Signaling Code, and Life Safety Code, respectively.
- NFPA 70, or as it is commonly referred to as the NEC, is “the benchmark for safe electrical design, installation, and inspection to protect people and property from electrical hazards”. We refer to this often as it is the electrical code all residential and commercial building electrical construction must adhere to.
- NFPA 70E lays out requirements for safe work practices intended to protect personnel from exposure to major electrical hazards. This code was written to help comply with OSHA 1910 Subpart S and OSHA 1926 Subpart K in limiting “workplace injuries or fatalities due to shock, electrocution, arc flash, or arc blast.”
- NFPA 72 defines the latest safety provisions regarding fire detection, signaling, and emergency communications demands. This code is critically focused on fire alarm and mass notification systems to ensure safety of all building occupants in the event of emergencies or threats.
- NFPA 101 is used to protect people based on building construction, protection, and occupancy features to minimize the effects of fire and related hazards, covering both new and existing buildings.
- The International Energy Conservation Code (IECC) is a widely adopted energy code which establishes a “baseline for energy efficiency by setting performance standards for the building envelope (defined as the boundary that separates heated/cooled air from unconditioned, outside air), mechanical systems, lighting systems, and service water heating systems in homes and commercial businesses.” As part of this analysis we are focused solely on the parts of the code related to lighting systems.
- The Illuminating Engineering Society (IES) is the recognized technical and educational authority on lighting, which publishes lighting standards and recommended practices for lighting design. For this analysis, we are utilizing illuminance recommendations for electrical and mechanical spaces with the intent to recommend ample light for operating and maintenance personnel to make repairs or replacements effectively and safely in often-overlooked spaces.

## MECHANICAL & ENVIRONMENTAL

### Direct Digital Controls (DDC) Upgrade to Air Handling Unit (AHU), Supervisor Upgrade

Oconto Falls Elementary School utilizes DDC control systems. Most systems in the building are up to date with the latest technology, but one Air Handling Unit (AHU) utilizes an outdated version of DDC. This does not allow for as much flexibility in system operation and will lead to increased future maintenance costs.

Nexus recommends eliminating the outdated DDC on an AHU at Oconto Falls Elementary School, and replacing them with the latest DDC components and controls systems. These DDC controls would be integrated into a building automation system platform that would allow for building-wide equipment monitoring and troubleshooting while on site or remotely while using a computer or a hand-held device via the internet. The building would further be integrated into a district control interface where all schools can be monitored.

Benefits of the DDC controls upgrade include reduced maintenance, improved equipment scheduling and troubleshooting, operational tracking, and trending of mechanical equipment parameters.

| FIM # | Direct Digital Controls Upgrade to Air Handling Unit (1) and Supervisor Upgrade |
|---|---|
| OFES-ME-1 | • Replace outdated DDC components on one Air Handling Unit<br>• Provide DDC controllers and control panels<br>• Provide all programming required for this conversion<br>• Provide building automation system platform with remote access |

| FIM # | Benefits of Direct Digital Controls Upgrade to Air Handling Unit (1) and Supervisor Upgrade |
|---|---|
| OFES-ME-1 | • Easy-to-use, modernized system control<br>• Improved building monitoring and maintenance troubleshooting<br>• Extended system life<br>• Improved occupant comfort<br>• Reduced energy consumption<br>• Reduced maintenance |

## Heating Plant Improvements - Boiler & Pump Replacement, Glycol Addition, Air Separator Improvements

Two existing heating water boilers are 24 years old.  A third boiler has recently been replaced (2013).  The boiler plant does not have adequate capacity to heat the building during the winter months if the new boiler in not operating at peak capacity.  The 1996 boilers have exceeded their recommended service life.

Nexus recommends replacing the two old unreliable original boilers with two (2) new  high-efficiency condensing boilers. The installation of two (2) boilers will provide the required redundancy should one of the boilers require service during the heating season.  The system pumps will also be replaced and increased in size to match the capacity of the new heating system.

Condensing, high-efficiency boilers will be specified and sequenced to take advantage of lower water temperatures and provide an aggressive hot water reset schedule resulting in lower operating costs.

The existing heating water system does not contain glycol. Glycol is an important compound to have in hydronic heating systems that are exposed to freezing temperatures. It acts as an antifreeze, preventing the build up of ice in the system which can cause heating piping and coils to burst.

We recommend adding propylene glycol to the hydronic heating system in a solution that is 35% propylene glycol and 65% water.  An air and dirt separator would be added to collect any particulate, debris, and rust within the water volume and keep the glycol and piping clean. A glycol fill tank would be installed to allow for ease of refilling the heating piping system when required.

| FIM # | Heating Plant Improvements - Boiler & Pump Replacement, Glycol Addition, Air Separator Improvements |
|---|---|
| OFES-ME-2 | • Remove two existing original boilers and boiler pumps<br>• Install two (2) new fully modulating condensing boilers with integral primary boiler pumps<br>• Install two (2) new system pumps<br>• Add propylene glycol to the heating water system<br>• Add a glycol fill tank and pump for ease of refill<br>• Add air and dirt separator to collect entrained air and debris |

| FIM # | Benefits of Heating Plant Improvements - Boiler & Pump Replacement, Glycol Addition, Air Separator Improvements |
|---|---|
| OFES-ME-2 | • Optimized boiler plant operation<br>• Reduced future maintenance<br>• Increased energy savings<br>• Extended heating system life |

## Chilled Water Plant and Associated Chilled Water Piping Distribution System and AHU Cooling Coil Additions (7)

Currently, only the IMC and some Offices and Work Rooms are cooled. The lack of cooling/dehumidification results in higher humidity levels and occupant discomfort in these areas of the building. The spaces are also unable to meet the American Society of Heating and Refrigeration Engineer's (ASHRAE) Thermal Environmental Conditions for Human Occupancy Standard 55-2017. 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. The indoor environmental requirements include temperature, thermal radiation, humidity, and air speed.

Nexus recommends the installation of a new Chiller and AHU Cooling Coils. A cooling coil would be installed in each existing unit (quantity 7) along with the piping necessary for cooling/ dehumidification of the code required ventilation air. The Office/IMC condensing unit would be removed and the AHU coil would be converted to chilled water. A new Air-Cooled Chiller would be installed to supply the building with Chilled Water for cooling. The chiller would be sized to cool the entire building. Existing supply ductwork that can be reused will be insulated to reduce noise and prevent condensation.

The benefits of this HVAC improvement measure include improved occupant comfort, reduced future maintenance costs, and improved temperature control.

| FIM # | Chilled Water Plant and Associated Chilled Water Piping Distribution System and AHU Cooling Coil Additions (7) |
|---|---|
| OFES-ME-3 | • Provide new air-cooled chiller, pumps, and distribution piping<br>• Provide propylene glycol to the system<br>• Insulate existing ductwork<br>• Provide associated construction including general, electrical, and controls work required |

| FIM # | Benefits of Chilled Water Plant and Associated Chilled Water Piping Distribution System and AHU Cooling Coil Additions (7) |
|---|---|
| OFES-ME-3 | • Improved thermal comfort<br>• Reduced future maintenance<br>• Extended operational life of the system |

## Addition of Variable Air Volume (VAV) Boxes to Classroom Systems

The majority of the building is served by a constant volume air handling system that utilizes reheat coils for each space. This system is inefficient because of the simultaneous heating and cooling that can occur and operates the fans at full power which result in unnecessary electricity usage.

Nexus recommends that if cooling is added to the classrooms, the existing duct heating coils be replaced with variable air volume (VAV) boxes.

Variable air volume (VAV) boxes with hot water terminal coils would be provided to each zone using the existing overhead ductwork, which would distribute the ventilation air to each space. The existing supply diffusers located in the ceiling would also be reused. Existing heating coils would be removed and replaced with heating coils that can maximize lower return water temperatures back to the boilers.

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

| FIM # | Addition of Variable Air Volume (VAV) Boxes to Classroom Systems |
|---|---|
| OFES-ME-4 | • Removal of existing duct heating coils<br>• Provide variable air volume (VAV) boxes with hot water heating coils<br>• Insulate and reuse existing heating piping and ductwork as possible<br>• Provide the associated general and electrical construction work |

| FIM # | Benefits of the Addition of Variable Air Volume (VAV) Boxes to Classroom Systems |
|---|---|
| OFES-ME-4 | • Extended operational life of the building<br>• Improved indoor air quality<br>• Improved occupant comfort<br>• Reduced maintenance<br>• Energy savings with reduced fan speed and reduced reheat |

## Exhaust Fan (5) Replacements

Some exhaust fans serving the school have aged or failed prematurely and are in need of replacement.

The district may want to consider replacement of these fans when major work is taking place so the best pricing can be obtained from contractors. We have budgeted replacement of 5 existing exhaust fans.

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. Direct drive fans will be utilized where possible to reduce fan belt maintenance.

| **FIM #** | **Exhaust Fan (5) Replacements** |
|---|---|
| OFES-ME-5 | • Replacement of existing exhaust fans<br>• Provide the associated general and electrical construction work |

| **FIM #** | **Benefits of Exhaust Fan (5) Replacements** |
|---|---|
| OFES-ME-5 | • Increased energy savings from ECM motors<br>• Improved flow and reduced maintenance for exhaust fans |

### Miscellaneous HVAC Upgrades - Gym Office Air Noise, Additional Diffusers to Classrooms, Music Room Zoning Improvements and Rebalance HVAC System

The Gymnasium Office staff complains of a vibration from the HVAC ductwork that makes it difficult to occupy the space. Most classrooms were originally designed with two corner diffusers and this configuration does not distribute air to the classrooms as well as it should, leading to hot and cold complaints. Also, the Music room was converted from one room to two but the HVAC was never upgraded for the space. In addition, the exterior building doors stand open during the spring and fall when the air handling units bring in cool outside air to cool the building and cause positive pressurization in relation to outside.

Nexus recommends the addition of vibration isolation to the ductwork in the Gym Office. Insulation may be added and the ductwork reinforced to prevent the sound and pressure issues from occurring and making this space usable again. Additional diffusers will be installed in each classroom where the air distribution is not adequate. In Addition, a VAV box and reheat coil will be added along with thermostatic control so that the remodeled music rooms will have thermostatic control. Lastly, the rebalancing of the HVAC air-side systems are recommended to establish a neutral building pressure to keep doors closed.

| FIM # | Miscellaneous HVAC Upgrades - Gym Office Air Noise, Additional Diffusers to Classrooms, Music Room Zoning Improvements and Rebalance HVAC System |
|---|---|
| OFES-ME-6 | • Provide vibration isolation to ductwork and air balancing for Gym Office<br>• Provide new ductwork and diffusers to classrooms<br>• Provide new VAV box and reheat coil to Music room<br>• Provide the associated general and electrical construction work |

| FIM # | Benefits of Miscellaneous HVAC Upgrades - Gym Office Air Noise, Additional Diffusers to Classrooms, Music Room Zoning Improvements and Rebalance HVAC System |
|---|---|
| OFES-ME-6 | • Improved occupant comfort<br>• Improved air distribution<br>• Space use flexibility |

## Sink Replacement with Sensor Battery Operated & Wash Fountain Additions to Main Bathrooms

Some existing handwashing sinks throughout the building utilize manual faucets. Many of these valves use higher flow volumes than modernized valves and can be left on without automatic shutoff. Additionally in the main toilet rooms the number of sinks is not adequate to acommodate the number of students using them.

Nexus recommends replacement of the faucets with modern, battery powered sensor operated units that are more water efficient and automatically turn off after use and the replacement of sinks in the large bathroom groups with a Lavatory Washfountain that includes four stations for handwashing to increase the capacity of the toilet rooms.

Benefits would include decreased water consumption, increased hygiene, and increased toilet room capacity.

| FIM # | Sink Replacement with Sensor Battery Operated & Washfountain Additions to Main Bathrooms |
|---|---|
| OFES-ME-7 | • Replace existing manual lavatory faucets with sensor operated faucets<br>• Replace sinks in main toilet rooms with 4 station Washfountains.<br>• Provide the associated general and electrical construction work |

| FIM # | Benefits of Sink Replacement with Sensor Battery Operated & Wash Fountain Additions to Main Bathrooms |
|---|---|
| OFES-ME-7 | • Reduced Water Consumption<br>• Increased hygiene<br>• Increased capacity in main toilet rooms |

### Domestic Hot Water Recirculation Upgrades - Upsize Pump and Recirculation Line

Some existing handwashing sinks throughout the building do not meet current code for Hot Water recirculation. This makes for a significant delay in hot water reaching the sink and wastes water and user's time in waiting for hot water.

Nexus recommends the hot water recirculation system be extended to all areas of the building to meet code requirements and basic hot water system operation expectations. Some piping will need to be replaced with larger piping to accommodate this change.

Benefits would include decreased water consumption and increased hygiene.

| FIM # | Domestic Hot Water Recirculation Upgrades - Upsize Pump and Recirculation Line |
|---|---|
| OFES-ME-8 | • Extend existing Domestic Hot Water systems to Sinks without Hot Water<br>• Connect Domestic Hot Water recirculation systems to all areas of the building and upsize as required |

| FIM # | Benefits of Domestic Hot Water Recirculation Upgrades - Upsize Pump and Recirculation Line |
|---|---|
| OFES-ME-8 | • Reduced Water Consumption<br>• Increased hygiene |

### Fire Protection (Sprinkler System) - Entire Building System Addition

The building does not have a fire protection system installed and is not protected from property loss or life safety during a fire event.

Nexus proposes installing a wet-pipe fire protection system to the entire building while the ceiling is being replaced.

Benefits of fire protection addition include increased occupant safety and reduced damage during a fire event.

| FIM # | Fire Protection (Sprinkler System) - Entire Building System Addition |
|---|---|
| OFES-ME-9 | • Install a wet-pipe fire protection system to fully protect the building<br>• Provide general and electrical construction as required |

| FIM # | Benefits of Fire Protection (Sprinkler System) - Entire Building System Addition |
|---|---|
| OFES-ME-9 | • Reduced damage during fire event<br>• Increased occupant safety |

### IT Room Cooling Upgrade - New Split Cooling Unit

There is currently an IT room that contains Heat Producing IT equipment that is not being cooled.

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

The benefits are improved system and room temperature control and reduced risk of system outages.

| FIM # | IT Room Cooling Upgrade - New Split Cooling Unit |
|---|---|
| OFES-ME-11 | • Provide a new split-system cooling unit appropriately sized to cool the server room during all times of the year<br>• Provide all required electrical and general construction work |

| FIM # | Benefits of IT Room Cooling Upgrade - New Split Cooling Unit |
|---|---|
| OFES-ME-11 | • Reduced risk of system outages and increased IT maintenance costs<br>• IT infrastructure protection |

# RETRO-COMMISSIONING ACTIVITIES

## HVAC Systems Optimization

Building retro-commissioning is a systematic process that ensures all building systems 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 Nexus Retro-Commissioning Team will identify the root cause of HVAC equipment operational issues and will provide adjustments to the sequences and outdoor air settings to improve occupant comfort while reducing energy consumption where possible. The retro-commissioning process will also identify components that require adjustment or replacement. This process will find the root cause of the heating and building pressurization issues so that they can be resolved.

This work will apply to all HVAC equipment that will remain in use.

Retro-commissioning activities are defined on the following page.

**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 unit ventilator (UV) 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 UV 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 valves 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.

**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.*

| FIM # | HVAC Systems Optimization (RCx & Sequence Review) |
|---|---|
| OFES-ME-10 | • Provide retro-commissioning of all existing and re-used HVAC systems<br>• Provide adjustments to existing sequences to improve HVAC system operation<br>• Verify operation of all dampers, actuators, valves, and terminal HVAC devices |

| FIM # | Benefits of HVAC Systems Optimization (RCx & Sequence Review) |
|---|---|
| OFES-ME-10 | • Improved temperature control and occupant comfort<br>• Reduced energy consumption<br>• Reduced maintenance<br>• Extended HVAC equipment life |

# OCONTO FALLS ELEMENTARY | EDUCATIONAL ADEQUACY SCORECARD

Educational Adequacy (EA) is an analysis of how well the design of educational spaces in each building support instruction as defined by the District's strategic plan, personalized learning framework, technology plan, demographic trends, student enrollment and building utilization and capacities. Our analysis includes staff interviews/surveys and school space/capacity studies, as well as school utilization based on enrollment projections and boundaries to determine if they can adequately support modern learning needs. At the end of the process, each school receives a scorecard that evaluates 22 different components and ranks each as Green=Adequate, Yellow=Questionable or Red=Inadequate. These final scores guide recommendations for the most cost-effective and sustainable improvements to best address the deficiencies identified.

| Key Program Area | | Rating | Summary |
|---|---|---|---|
| **Site** | 1. Site Size, Outdoor Fields & Greenspace Areas | Y | 540 last year enrollment. 100 staff. Matt assistant - 11 months, Neil - 10 months. Recess uses blacktop in the back. Drainage is big issue, stays wet for a while. Icy on pavement - Biggest workman's comp site. Need better loading dock, it occurs on the playground, also trash. |
| | 2. Site Traffic, Safe Routes, Parking | Y | Vehicle circulation works fairly well on the site. More parking is needed on the east. All buses on Marie Volk, 12-13 total. Parent pickup works well and occurs at back of building. Few walkers, 10 at most. 50-70 cars. |
| **General** | 3. Security/Supervision | G | Camera coverage good outside. Inside locations aren't good. Would like fencing all around playground. Are putting up a 4K fence. Would like to add one door FOB by 4K. No secure entry. |
| | 4. ADA Accessibility | G | Tightly packed corridors are a challenge. |
| | 5. Administrative/Nurse/Student Support | R | Office space is too small for current staffing levels. Office quantities, work flow and adjacencies within office need improvement. Conference room is undersized. Want/need more sound reduction within office suite. Also, staff uses as workroom and is not conveniently located for most of teaching staff. Need secondary exit, entrance. Want more centrally located Teacher's Lounge - 40 teachers, 20 paras. |
| | 6. Staff Planning/Collaboration | R | Very few staff planning areas within the building. |
| | 7. Community Integration (Community/Parent Room) | R | Uses IMC and Cafeteria for a larger community space. |
| | 8. Cafeteria/Serving/Kitchen | R | Undersized now, 196 capacity with rolling sequence, 150 most of the time. 10:50-12:40 period. Kitchen to cafeteria connection is troublesome. No toilet rooms nearby. 5-6 staff supervising. Want to keep coats at lockers. |
| | 9. Restrooms-Student/Staff | G | Have enough bathrooms, just in poor spots or not enough handwashing stations or drinking stations. |
| | 10. Support Spaces (Lockers, Storage, Receiving, etc.) | G | Lack of storage, receiving in poor area. Lockers are fine per Principals, kids like them but location causes major congestion in narrow classroom corridors. Theft problem without lockers. Neil would put back lockers, Matt would like cubbies. Trying to make a Book Room. Would also like a Professional Planning Area, common planning time twice per week. There is either a lack of storage within classrooms or some rooms have too much equipment/supplies. |
| | 11. Adaptability | R | Most of the interior walls within the building are CMU making flexibility and adaptability difficult. |
| | 11. Furniture and Equipment | Y | Multitude of furniture, waiting to find out how to proceed with COVID now. There are many traditional desks and very little flexibility. |
| | 12. Building Aesthetics (Interior & Exterior) | Y | |
| **Instructional** | 13. Classroom Quantity, Size & Suitability | Y | General purpose classrooms are undersized and there are not enough of them. Declining slightly 100 kids in 4 years. |
| | 14. Science/STEM/STEAM Labs | Y | All science is done within the core classrooms which is acceptable for elementary since the rooms have sinks. |
| | 15. Music, Art, Performance Spaces | Y | Art & Music are spread out, not central. Music is in a former general purpose classroom. |
| | 16. Flexible Learning Spaces, Student Project/Breakout Spaces | R | Almost all spaces are used throughout the day and provide very little opportunity for other functions. |
| | 17. Applied Learning Spaces (Makers Spaces) | R | This type of space does not exist in the building currently and would be beneficial |
| | 18. Phy. Ed. & Athletics Spaces | G | Lunch time interrupts possible gym for PE usage. Other schools use the gym for varying activities after school hours. |
| | 19. Library/Media Center/Learning Commons | Y | 1 Librarian shared across district. Neil looks as no change in Library. Matt could reimagine the space for STEM. |
| | 20. Special Education Spaces | Y | Spaces located throughout the building, there seems to be quite a bit of space dedicated to SPED. |
| **Reuse** | 21. Deferred Maintenance/Facility Condition Index (FCI) | | |
| | 22. Suitability for Expansion/Repurposing | G | |

| | |
|---|---|
| G | Adequate - Conforms with design best practices and meets District needs for foreseeable future |
| Y | Questionable - Doesn't meet design best practice but may be considered acceptable based on current usage, enrollment, or programs |
| R | Inadequate - Fails to meet District needs and should be considered highest priority for correction |

## Commons, Kitchen, Receiving, Restrooms and Flexible Space Addition

The existing building has a separate gym and cafeteria space, however, the existing kitchen and serving line require the students to queue in and through the gym to access the serving line. This causes disruption and scheduling issues with use of the gym. The cafeteria size is also too small for the number of students without creating too many lunch periods each day.

In addition, the building does not have a proper Receiving area, so vestibule double doors are used to bring food, paper and other deliveries into the building.

The recommendation is to add an addition to the school to include a new cafeteria, kitchen, and receiving area. The addition would also include restrooms, vestibules to parking and playground and flexible learning space. The flexible learning space adjacent to the commons for a variety of uses. The space could be used for before, after school and community activities. The flexible learning space could open directly to the commons to create a large project-based learning lab.

The location of the addition would allow it to be secured from the remainder of the school building. The inclusion of the separate entrance and restrooms, along with separating it from the rest of the school, makes it a great space for community activities.

| FIM # | Commons, Kitchen, Receiving, Restrooms and Flexible Space in Addition |
|---|---|
| OFES–EDA-1 | • Create a separate commons and kitchen<br>• Create flexible learning space<br>• Create separate building receiving area adjacent to the kitchen<br>• Provide restrooms near the Commons |

| FIM # | Benefits of Commons, Kitchen, Receiving, Restrooms and Flexible Space in Addition |
|---|---|
| OFES–EDA-1 | • Offers increased scheduling and space flexibility<br>• Creates modern, flexible learning lab space<br>• Separate area of school that can be secured from the remainder of the school to provide community activity areas |

## Remodel Main Office, Art room, Create Secure Main Office and Entry, Community room and Special Education room

The existing main office at Oconto Falls Elementary School is located adjacent to the front entrance. However, there is not direct access into the office from the main entrance vestibule to create a safe, secure entrance sequence for visitors during the school day. Visitors enter through the vestibule into the main 'unsecure' lobby before turning left and entering the office through another door. Once in the main 'unsecure' lobby, visitors have uncontrolled access to the entire school.

The District's desire to create a safe, secure entrance to the school would require remodeling to the existing vestibule to add a door into the office area. The office area would require remodeling to relocate the reception desk and private offices to accommodate a new door into the area.

The existing main office space is undersized, additional office and meeting space is required. The building does not have a community room near the main entrance for volunteer, parent use, etc. Expanding the existing main office area into the art room, relocating the art room, and creating a new special education space the near fifth grade classroom wing provides for added staff and student benefits.

Existing Entrance/Lobby

| FIM # | Remodel Main Office, Art room, Create Secure Main Office and Entry, Community room and Special Education room |
|---|---|
| OFES-EDA-2 | • Create a safe and secure entry sequence by remodeling the vestibule and main office<br>• Expand existing office space to accommodate office needs<br>• Provide a community room for extracurricular and community events<br>• Remodel existing art room to create new special education programming space |

| FIM # | Benefits of Remodel Main Office, Art room, Create Secure Main Office and Entry, Community room and Special Education room |
|---|---|
| OFES-EDA-2 | • Improved security for all occupants with proper safe, secure entrance sequence and control of visitors<br>• Create office and meeting space that is currently lacking in the building<br>• Create space for the community to use during the school day, for volunteers, etc<br>• Provide adequate special education space |

### Remodel Computer Lab and IMC into Maker Space

The library is currently furnished as a traditional library environment with book stacks and traditional tables and chairs.  Modern elementary school libraries are flexible, dynamic spaces that allow for a variety of activities to take place. Remodeling of the library would transform the library into an active learning commons where staff and students could learn, collaborate, and create together.

The recommendation is to reimage the space with flexible furniture, technology and a project-based maker space.

Examples of Learning Commons / Maker Spaces

| FIM # | Remodel Computer Lab and IMC into Maker Space |
|---|---|
| OFES-EDA-3 | • Renovate Computer Lab and Learning Stairs into Maker Space |

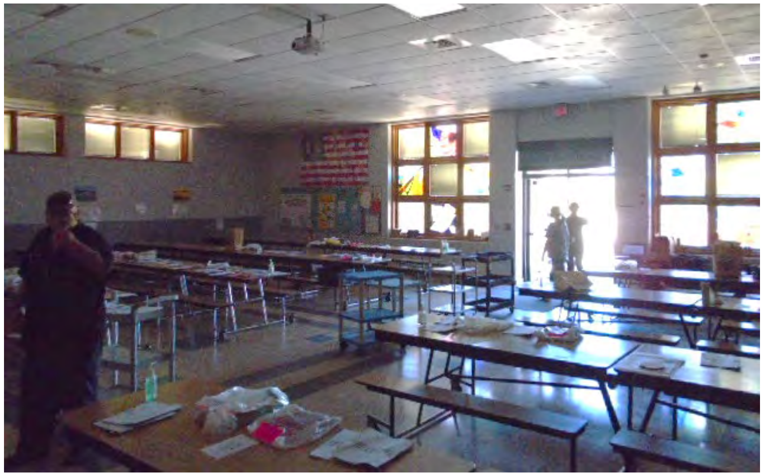
| FIM # | Benefits of Remodel Computer Lab and IMC into Maker Space |
|---|---|
| OFES-EDA-3 | • Modern, active learning commons allows for creative, collaborative learning |

## Repurpose Cafeteria into Music/Lab and Classrooms into Art/Kiln room

Previous scopes have involved expansion of the front office and moving the cafeteria and kitchen to the addition.  For a large school, the ‘specials’ are not collocated, and Music is near other Special Education in a room that is too small.

The recommendation is to move the Art room to existing classroom spaces and move the undersized Music room to the existing high ceiling Cafeteria area.  The final location of the art and music spaces are in proximity to one another.  This is a preferred layout to keep the ‘specials’ near one another in the overall layout of the school.  Music and art will also be located near the existing gym; another special in the school.

Closing off the existing Cafeteria and remodeling it for Music is a logical move. The existing commons has a high ceiling and ample space for storage and movement in the music class.



Existing Cafeteria

| FIM # | Repurpose Cafeteria into Music/Lab and Classrooms into Art/Kiln room |
|---|---|
| OFES-EDA-4 | • Remodel existing classrooms for the Art and kiln room<br>• Remodel the existing commons for the Music/lab |

| FIM # | Benefits of Repurpose Cafeteria into Music/Lab and Classrooms into Art/Kiln room |
|---|---|
| OFES-EDA-4 | • The Art room is relocated in the core of the building near the other ‘specials’ areas<br>• The undersized Music room is moved to a better sized space with better acoustic opportunities |

## Remodel Classrooms into Flex Rooms, Staff Lounge, Kids Station, SPED, etc., Provide Operable Connection between Classrooms, Add Visual Supervision Windows at Classrooms

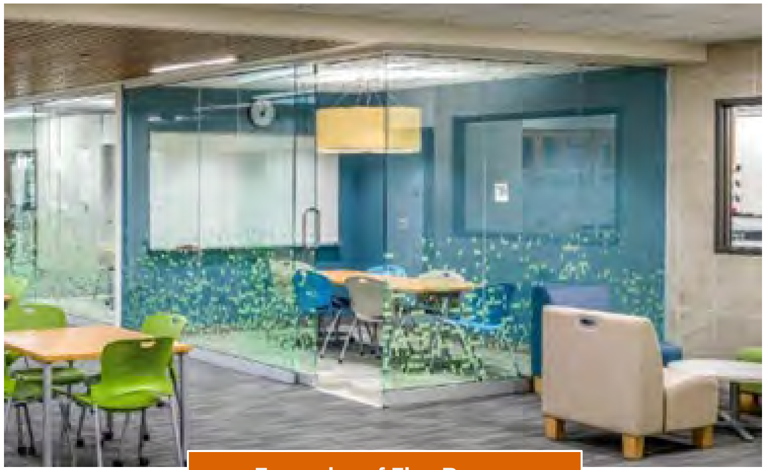
The layout of the school is a traditional, double-loaded corridor, 20th century classroom model. The corridors are lined with lockers with classrooms on both sides of the corridors. The classrooms are isolated from each other, they do not have physical or visual connection.

Today's classrooms look to encourage collaboration, of students and teachers, in the learning environment. The recommendation is to create (4) flex spaces out of existing classrooms to provide collaborative learning environments within grade level pods. Along with the flex areas, the addition of operable partitions between classrooms would allow for team teaching and further student and staff teaching collaboration. A collaborative environment would be expanded through the use of windows for visual supervision into the flex spaces.

The grade level pods include classrooms, flex space and a special education space. It is ideal to allow for a space within each grade level pod to be dedicated for special education. This allows for the special education resources to be integrated throughout the building.

The size and layout of the school lends itself to (2) staff workroom/lounge spaces due to the number of staff in the building.

The need for a dedicated Kids Station area at the school resulted in the remodeling of the existing space to accommodate this need. The Kids Station is located near the new addition entrance, commons and flex space to provide addition space for this program if needed.



Examples of Flex Rooms

| FIM # | Remodel Classrooms into Flex Rooms, Staff Lounge, Kids Station, SPED, etc., Provide Operable Connection between Classrooms, Add Visual Supervision Windows at Classrooms |
|---|---|
| OFES-EDA-5 | • Create (4) flex areas throughout the building, aligning with grade level classroom pods<br>• Create operable partitions/doors between classrooms<br>• Add visual supervision glass at the classrooms<br>• Create additional staff workroom/lounge<br>• Create dedicated Kids Station area<br>• Create special education spaces in each grade level |

| FIM # | Benefits of Remodel Classrooms into Flex Rooms, Staff Lounge, Kids Station, SPED, etc., Provide Operable Connection between Classrooms, Add Visual Supervision Windows at Classrooms |
|---|---|
| OFES-EDA-5 | • Create collaborative, modern learning environments<br>• Promote team teaching<br>• Provide visual supervision while allowing for student collaboration<br>• Provide staff workroom and lounge space in more than one area in the building to allow the services be available to all staff<br>• Locate Kids Station located near a separate entrance for ease of parent access<br>• Distribute the special education services throughout the building |

### Flexible Furniture of Unremodeled Areas

All remodeled areas would include new flexible furniture to assist in promoting collaboration, flexibility and project-based learning. The existing furniture in the majority of the spaces is traditional, standard classroom furniture. Budgeting for new furniture in the remodeled areas, of at least 50%, allows for those existing spaces to move toward a modern learning environment with flexible furniture.

Examples of Classroom Flexible Furniture

| FIM # | Flexible Furniture for Unremodeled Areas |
|---|---|
| OFES-EDA-7 | • Budget for 50% new furniture in unremodeled areas. |

| FIM # | Benefits of Flexible Furniture for Unremodeled Areas |
|---|---|
| OFES-EDA-7 | • Moves learning toward a more collaborative, flexible, and project-based learning environment. |

## Add Bus Loop and 4-K/EC Parking

The existing bus dropoff for students occurs along Marie Volk and students walk up the sidewalk to the main entrance. The sidewalk becomes icy and snowy in the winter and is difficult and dangerous for pedestrians to use it due to the slope of the sidewalk.

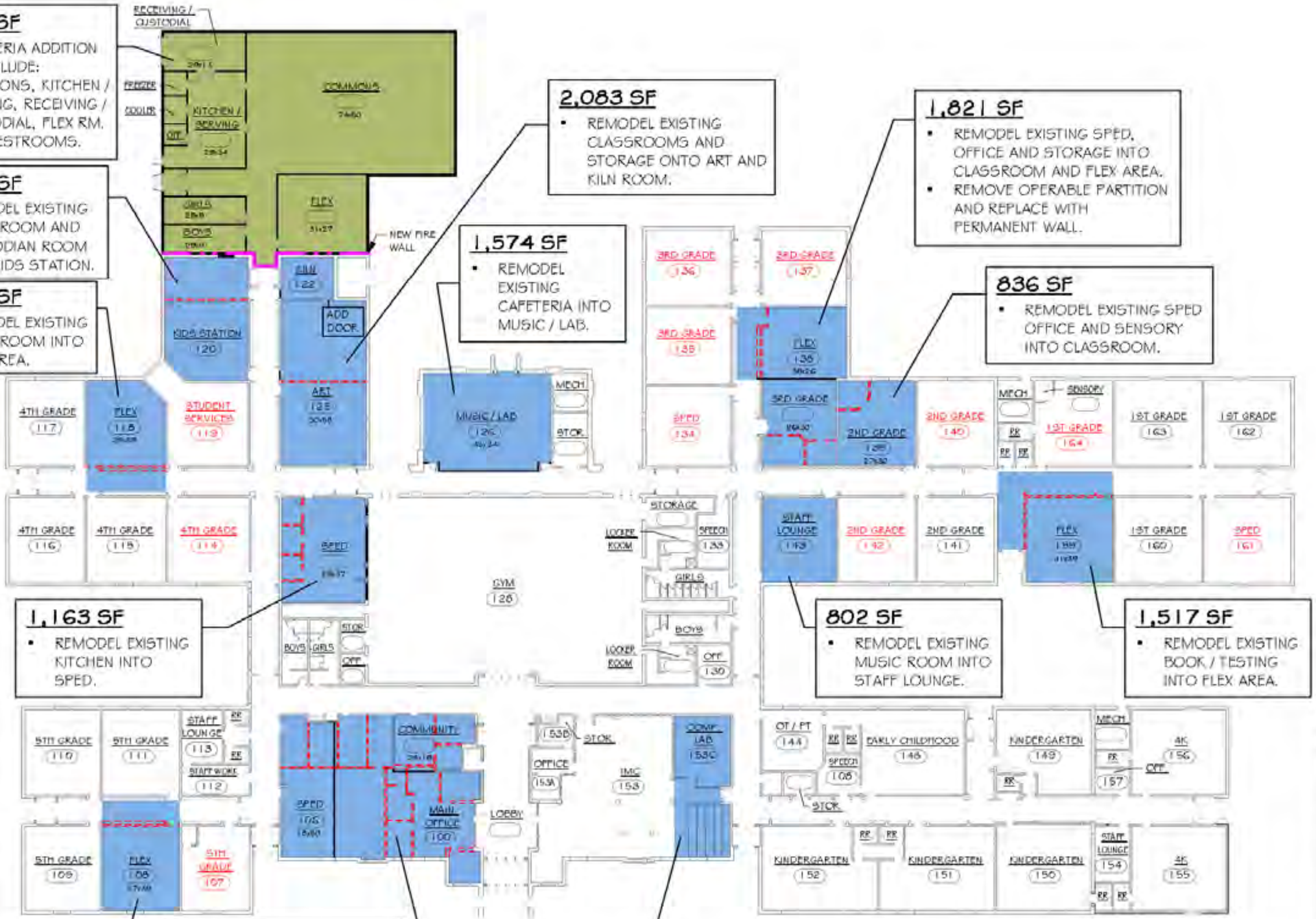
Also, during the school day the parking lot becomes full and additional parking is needed.

It is recommended to bring a drive up closer to the main entrance to limit the amount of travel from the buses to building, allow for safe exterior walking surfaces and to integrate more parking. The graphic above indicates a possible solution but this would be refined during design.

| FIM # | Add Bus Loop and 4K/EC Parking |
|---|---|
| OFES-EDA-6 | • Provide new bus drop off/pick up loop closer to the building, along with sidewalk<br>• Provide new parking on the site for school days and events |

| FIM # | Benefits of Adding Bus Loop and 4K/EC Parking |
|---|---|
| OFES-EDA-6 | • Provide safe traffic and pedestrian travel and routes |

# Educational Adequacy Recommendations



**7,617 SF**
- CAFETERIA ADDITION TO INCLUDE: COMMONS, KITCHEN / SERVING, RECEIVING / CUSTODIAL, FLEX RM. AND RESTROOMS.

**1,289 SF**
- REMODEL EXISTING CLASSROOM AND CUSTODIAN ROOM INTO KIDS STATION.

**1,092 SF**
- REMODEL EXISTING CLASSROOM INTO FLEX AREA.

**2,083 SF**
- REMODEL EXISTING CLASSROOMS AND STORAGE ONTO ART AND KILN ROOM.

**1,574 SF**
- REMODEL EXISTING CAFETERIA INTO MUSIC / LAB.

**1,821 SF**
- REMODEL EXISTING SPED, OFFICE AND STORAGE INTO CLASSROOM AND FLEX AREA.
- REMOVE OPERABLE PARTITION AND REPLACE WITH PERMANENT WALL.

**836 SF**
- REMODEL EXISTING SPED OFFICE AND SENSORY INTO CLASSROOM.

**1,163 SF**
- REMODEL EXISTING KITCHEN INTO SPED.

**802 SF**
- REMODEL EXISTING MUSIC ROOM INTO STAFF LOUNGE.

**1,517 SF**
- REMODEL EXISTING BOOK / TESTING INTO FLEX AREA.

**1,099 SF**
- REMODEL EXISTING CLASSROOM INTO FLEX AREA.

**3,560 SF**
- REMODEL EXISTING MAIN OFFICE AREA AND ART ROOM INTO LARGER MAIN OFFICE, COMMUNITY ROOM AND A SPED AREA.

**986 SF**
- OPPORTUNITY TO RE-IMAGINE IMC SPACE.

## REMODEL TYPE:

🟦 REMODELING
🟩 NEW CONSTRUCTION
-·-·- NEW FIRE WALL

ROOM LABELS IN RED REPRESENT A CHANGE IN ROOM USE WITH NO REMODEL.

## K-5 PROPOSED USAGE PLAN - FIRST FLOOR

0' 10' 20' 40' 60'

## SCHOOL CAPACITY INFORMATION:

| | |
|---|---|
| TOTAL EXIS. BUILDING AREA: | 84,707 SF |
| TOTAL ADDITION AREA: | 7,617 SF |
| TOTAL BUILDING AREA: | 92,324 SF |

2019 THIRD FRIDAY ENROLLMENT: 540
+ XX 4K

(2) 4K CLASSROOMS x 19 MAX. STUDENTS / ROOM = 38 STUDENTS

(16) K - 3 CLASSROOMS x 19 MAX. STUDENTS / ROOM = 304 STUDENTS

(8) 4 - 5 CLASSROOMS x 22 MAX. STUDENTS / ROOM = 176 STUDENTS

TOTAL CAPACITY: 480 STUDENTS + 38 4K + EC

OCONTO FALLS SCHOOL DISTRICT

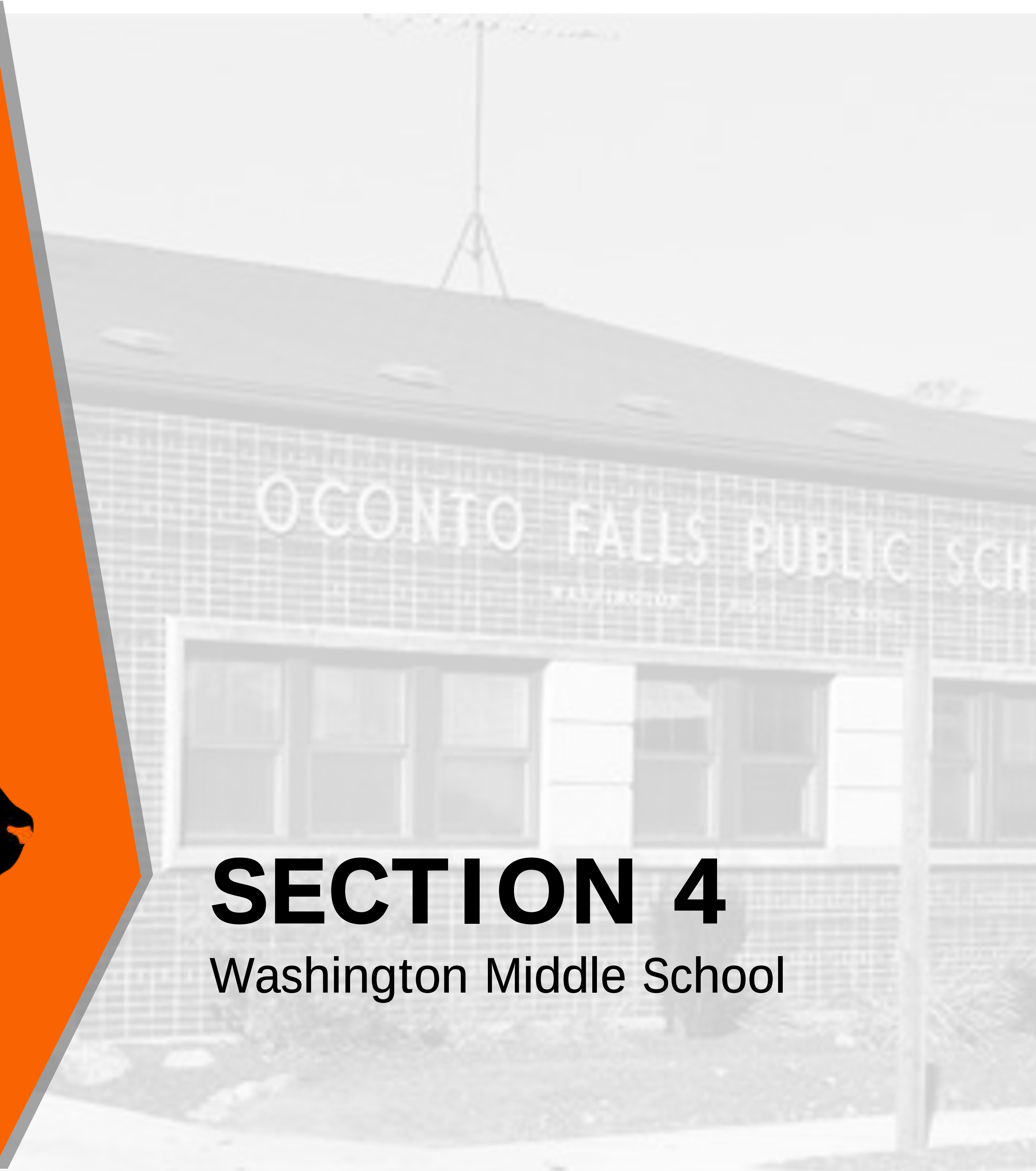
OCONTO FALLS ELEMENTARY SCHOOL

7/28/20

YEAR BUILT: 1995

Oconto Falls School District

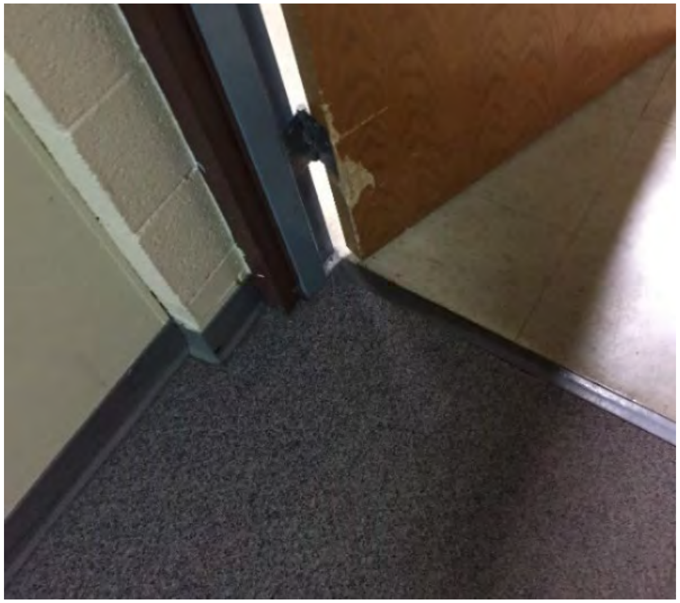
**FACILITY ASSESSMENT**



# SECTION 4

## Washington Middle School

# INTERIOR FINISHES



### Door Upgrades

Throughout the school the interior wood doors and frames are in poor shape. The existing glass in the doors is not code compliant tempered (strengthened) glass.

A significant number of doors have non-ADA compliant knob door hardware. Knob hardware should be replaced with compliant leveler style hardware.

## Floor Upgrades

Throughout the school the area of greatest concern is the flooring. Much of the flooring is 9” x 9” flooring tile. This size tile typically tests positive for containing hazardous material (asbestos) This would need to be verified by an environmental testing adjacency. Abating this tile and replace with a new flooring product is recommended.

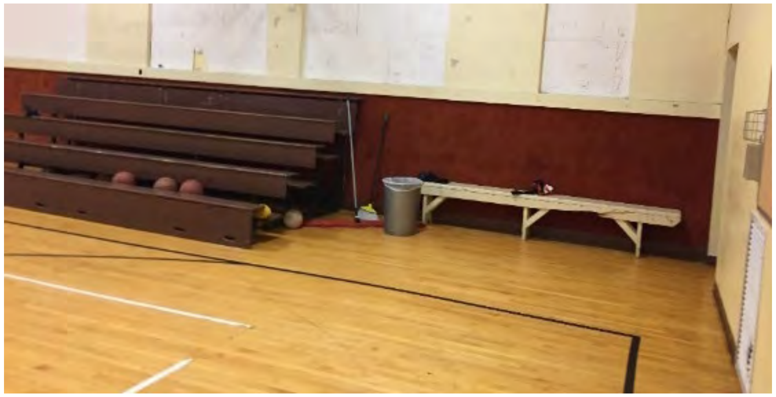
The remainder of the flooring is primarily VCT (vinyl composition flooring). This floor product requires regular stripping and waxing. If the product is not stripped on a regular basis prior to applying the new wax, the dirt will get trapped in the flooring. The majority of the VCT flooring in the school is discolored and appears ‘dirty’.

There are multiple locations where the VCT has cracks in it. VCT is a hard and brittle product. If there are cracks in the concrete below the VCT, it is likely to transfer through the VCT; if the cracking below the VCT is not addressed (filled or stopped) replacing the existing VCT with new VCT will likely result in the same type of cracking. A more flexible, resilient flooring product (like a solid vinyl or rubber) or polishing the concrete, is recommended.

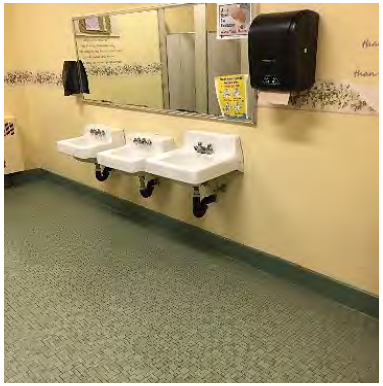
There are areas of the VCT floor that are stained with rust spots. It appears there was metal furniture sitting on the floor, the furniture rusted and stained the flooring.

There are two separate gyms in the school. The older gym has a wood floor. The wood floor is in good condition. The recommendation would be to refinish the floor to maintain the quality and improve the longevity of the floor.

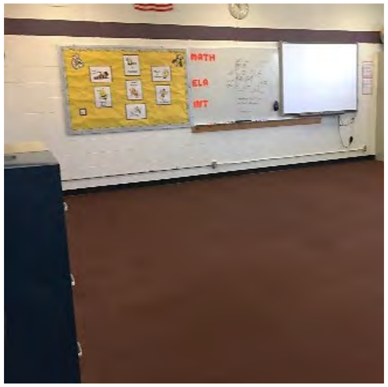
The newer gym floor is a rubber floor that is showing signs of wear and separation at the seams. The recommendation is to replace this floor with a more suitable wood floor to handle the activity and use of the space.



Ceramic tile flooring and base in the restrooms is in good condition for its age. It's style, pattern and color are, however, old, but would not requiring replacing. Modifying the wall color or adding modern wall tile may improve the appearance.



There is carpet throughout the building; there are areas where the carpet is worn and should be replaced. It should be verified if hazardous flooring material remains under the carpet.



## Ceiling Upgrades

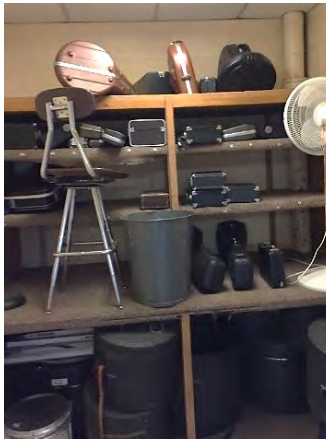
The majority of the ceilings are 2 x 4 ceiling tiles which are sagging and worn. They should be replaced with 2 x 2 ceiling tile and grid.

## Casework Upgrades

The classroom is old and worn. The sliding doors are difficult to use. The plastic laminate casework is chipping. The band storage is hand built wooden shelves covered in carpeting which is in disrepair. The casework should be replaced.

## Locker Room Upgrades

The existing boys' and girls' locker rooms consist of concrete floors and painted block walls. The lockers are small wire baskets. The recommendation would be to improve the flooring finish with an epoxy floor or similar product and upgrade the wire baskets to a more secure option.

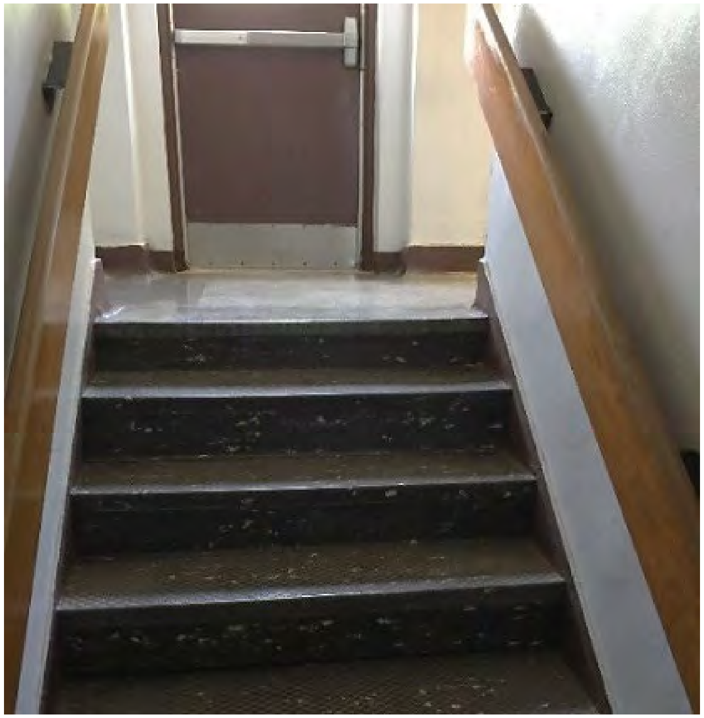


## ADA ACCESSIBILITY

As previously noted, the building is not accessible. The main entrance requires an ADA-compliant ramp or significant remodel to provide the main entrance at an accessible location in the building.

The two-story portion of the building, with the ‘old’ gym, is not ADA compliant. There are stairs from the exterior to enter the building at the location and stairs to access both levels of that building. Addressing the exterior entrance with a ramp should be considered and the addition of an elevator would be required to continuing using these spaces for staff, students and public use.

The stairs in this two-story portion of the building are not code compliant. The main stairs do not meet the code required riser/run dimensions and the handrails do not have the proper code complaint extensions. The stairs and handrails should be reworked to meet code compliance.



| FIM # | Interior Finishes Upgrades |
|---|---|
| WMS-INT-1<br>Through<br>WMS-INT-5 | High Priority Interior Finishes Upgrades – High Priority Areas<br>• Replace worn wood doors with new doors incorporating glass lites<br>• Replace all knob door hardware with ADA compliant lever style hardware<br>• Replace cracked and discolored 'dirty' VCT<br>• Replace 9" x 9" tile flooring<br>• Replace worn carpet<br>• Repair damaged wall plaster and restroom wall finishes<br>• Replace 2 x 4 ceiling tile and grid with 2 x 2 ceiling tile and grid<br>• Rework stairs and handrails for ADA code compliance<br>Medium Priority Interior Finishes Upgrades<br>• Replace walls, flooring, and ceilings in medium priority areas<br>Low Priority Interior Finishes Upgrades<br>• Replace walls, flooring, and ceilings in low priority areas<br>High Priority Casework Replacement<br>• Replace high priority classroom casework where damaged or not functional<br>Low Priority Casework Replacement<br>• Replace low priority classroom casework in areas shown on attached drawings |

| FIM # | Benefits of Interior Finishes Upgrades |
|---|---|
| WMS-INT-1<br>Through<br>WMS-INT-5 | • Reduced future maintenance<br>• Improved school aesthetics<br>• Improved school pride<br>• Increased ADA compliance and accessibility for students, visitors, and staff |

## FOOD SERVICE EQUIPMENT

Washington Middle School is a full production kitchen where food is received, prepped and cooked on site for daily meal service. The school provides breakfast and lunch to students. Meals are served in dedicated cafeteria. There is no direct delivery path from receiving to kitchen. Deliveries are transported down public corridor to kitchen.

Overall kitchen flow is disjointed and tight in both kitchen and servery for the Middle School. Bulk storage spaces including dry storage, walk in cooler and freezer are undersized compared to other schools in district. A half wall separates ware washing from kitchen prep and cooking which creates poor operational flow. The servery space is undersized with two serving lines and a passageway for students that bring their own lunches (brown bag). Staff indicated traffic and lines are a problem with meal service as students back up into corridor to north of kitchen / servery.

**Observations**

- Drop ceiling is showing signs of age with discolored tiles & grid.
- Walk-In Cooler epoxy floor is showing signs of cracking due to age.
- Walk-In Freezer door has been icing up (when in operation). This could be due to fault door heater, door gasketing, door sweep. Could also be a problem with heated air vent and / or defrost cycles for evaporator on unit.
- Existing two burner range has trouble keeping burners running.
- Larger island prep table and wood top (laminate) both have galvanized legs which are rusting due to age.
- Steam tables on main serving line do not hold water in pans (leaking).

- Heated holding cabinet in kitchen is peeling on interior cavity and does not have proper seal to maintain temperatures.
- Existing dishwasher has gas booster heater and is vented to condensate hood above. The dishwasher also has duct risers that extend into hood which is not common (usually heat & steam are either exhausted through duct risers or a hood but not both).

### Recommendations

- Replace ceiling grid and vinyl coated tiles – (see interior finishes recommendations.)
- Repair of epoxy flooring – patching where necessary – (see interior finishes recommendations.)
- Recommend having authorized refrigeration service company inspect existing walk-in doors and icing issues (see notes above addressing possible failures of existing box)
- Recommend having plumber check drop-in hot well unit (APW) in kitchen to see if drain value is not working properly. If leaking is integral with hot well equipment recommend replacing with new unit.
- Recommend replacing existing heated holding cabinet with new unit (in kitchen).
- Recommend replacing two burner cooktop unit.
- Consider replacing dishwasher with new electric unit with integral booster heater (more energy efficient unit).
- Consider reconditioning galvanized legs on existing tables that are showing signs of rust (can be sanded and painted). They can be replaced if budget allows.

| FIM # | Recommended Food Service Improvements |
|---|---|
| WMS-INT-6 | Replace Kitchen Equipment Where Required:<br>• Replace ceiling grid and vinyl coated tiles – (see interior finishes recommendations.)<br>• Repair epoxy flooring – patching where necessary – (see interior finishes recommendations.)<br>• Have authorized refrigeration service company inspect existing walk-in doors and icing issues (see notes above addressing possible failures of existing box.)<br>• Review operation of drain valve on hot well unit or replace with new.<br>• Replace existing heated holding cabinet with new unit (in kitchen).<br>• Replace two burner cooktop unit.<br>• Replace dishwasher with new electric unit with integral booster heater (more energy efficient unit).<br>• Recondition galvanized legs on existing tables that are showing signs of rust (can be sanded and painted). Or replace if budget allows. |

| FIM # | Benefits of Food Service Improvements |
|---|---|
| WMS-INT-6 | • Improved food safety.<br>• Reduced future maintenance on food service equipment.<br>• Increase efficiency of food service staff.<br>• Improved safety for food service staff. |

## SITE DRAWINGS

PLAN NOTES: (X)

1 REPLACE NON-ADA COMPLIANT DOOR HARDWARE.
2 NON-ADA COMPLIANT ENTRANCE AND HANDRAILS AT STAIR DO NOT EXTEND TO MEET CODE.
3 HAZARDOUS MATERIAL MAY BE PRESENT IN FLOOR TILE.
4 MAY CONTAIN HAZARDOUS MATERIAL FLOORING REQUIRING ABATING UNDER THE CARPET.
5 STAIRS ARE NOT CODE COMPLIANT - RISER / RUN DIMENSIONS AND HANDRAILS DO NOT HAVE EXTENSIONS.

PRIORITY LEGEND

🟪 0-5 YEARS
🟧 5-10 YEARS
🟦 10-20 YEARS
🟩 SEE REPORT FOR UPGRADE DESCRIPTION
⬜ EXISTING BUILDING - NO WORK

FIRST FLOOR PLAN
FLOORING REVIEW
NOT TO SCALE

## PRIORITY LEGEND

- 🟪 0-5 YEARS
- 🟧 5-10 YEARS
- 🟦 10-20 YEARS
- 🟩 SEE REPORT FOR UPGRADE DESCRIPTION
- ⬜ EXISTING BUILDING - NO WORK

FIRST FLOOR PLAN
WALL REVIEW
NOT TO SCALE

## PRIORITY LEGEND

🟪 0-5 YEARS
🟧 5-10 YEARS
🟦 10-20 YEARS
🟩 SEE REPORT FOR UPGRADE DESCRIPTION
⬜ EXISTING BUILDING - NO WORK

FIRST FLOOR PLAN
CEILING REVIEW
NOT TO SCALE

N

N

# FIRST FLOOR PLAN
# CASEWORK REVIEW

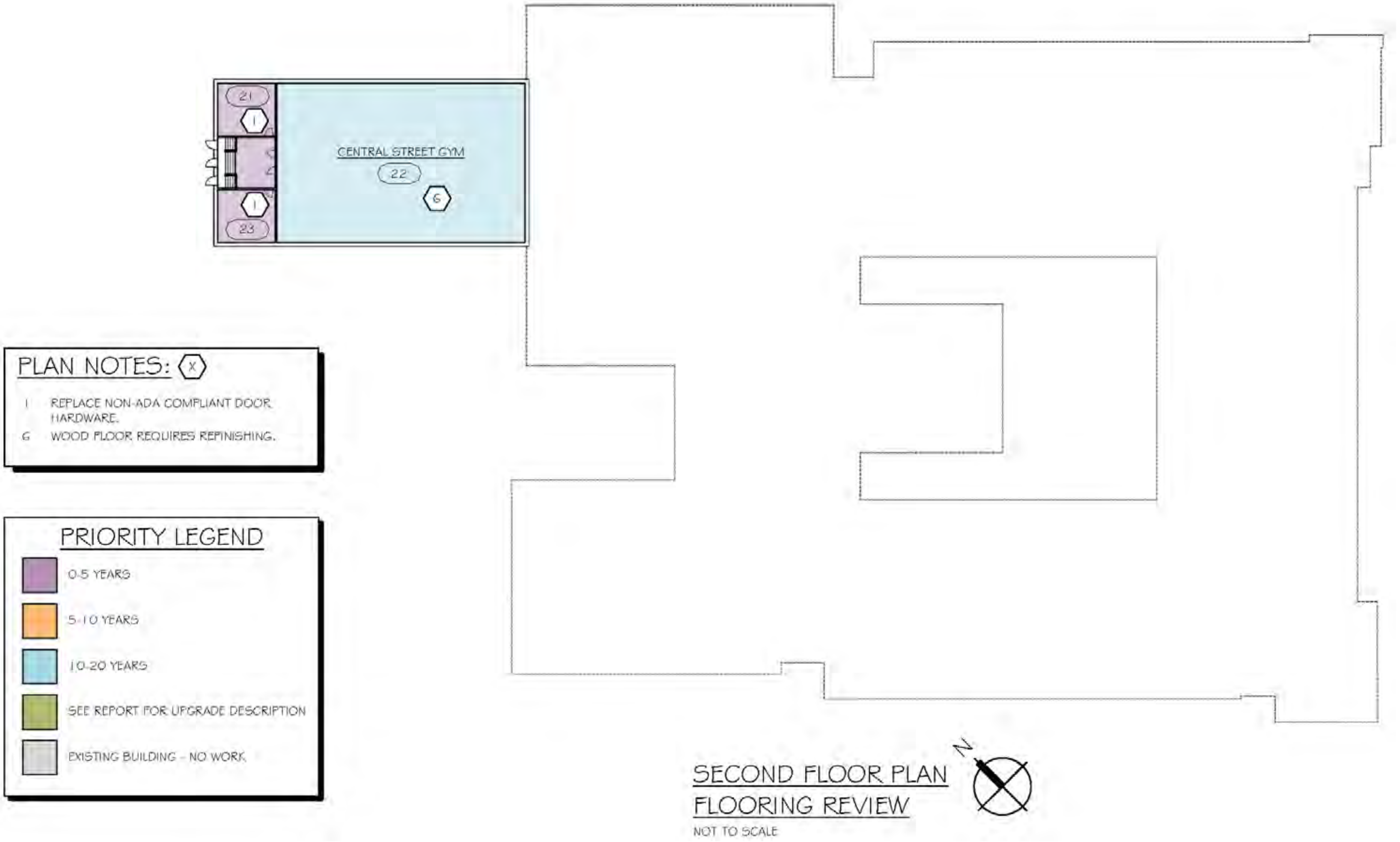
NOT TO SCALE

## PLAN NOTES: (x)

7 LOCKERS ARE SMALL WIRE BASKETS.
8 WOOD BLEACHERS DO NOT APPEAR TO MEET ADA REQUIREMENTS.

## PRIORITY LEGEND

| | |
|---|---|
| 🟪 | 0-5 YEARS |
| 🟧 | 5-10 YEARS |
| 🟦 | 10-20 YEARS |
| 🟩 | SEE REPORT FOR UPGRADE DESCRIPTION |
| ⬜ | EXISTING BUILDING - NO WORK |



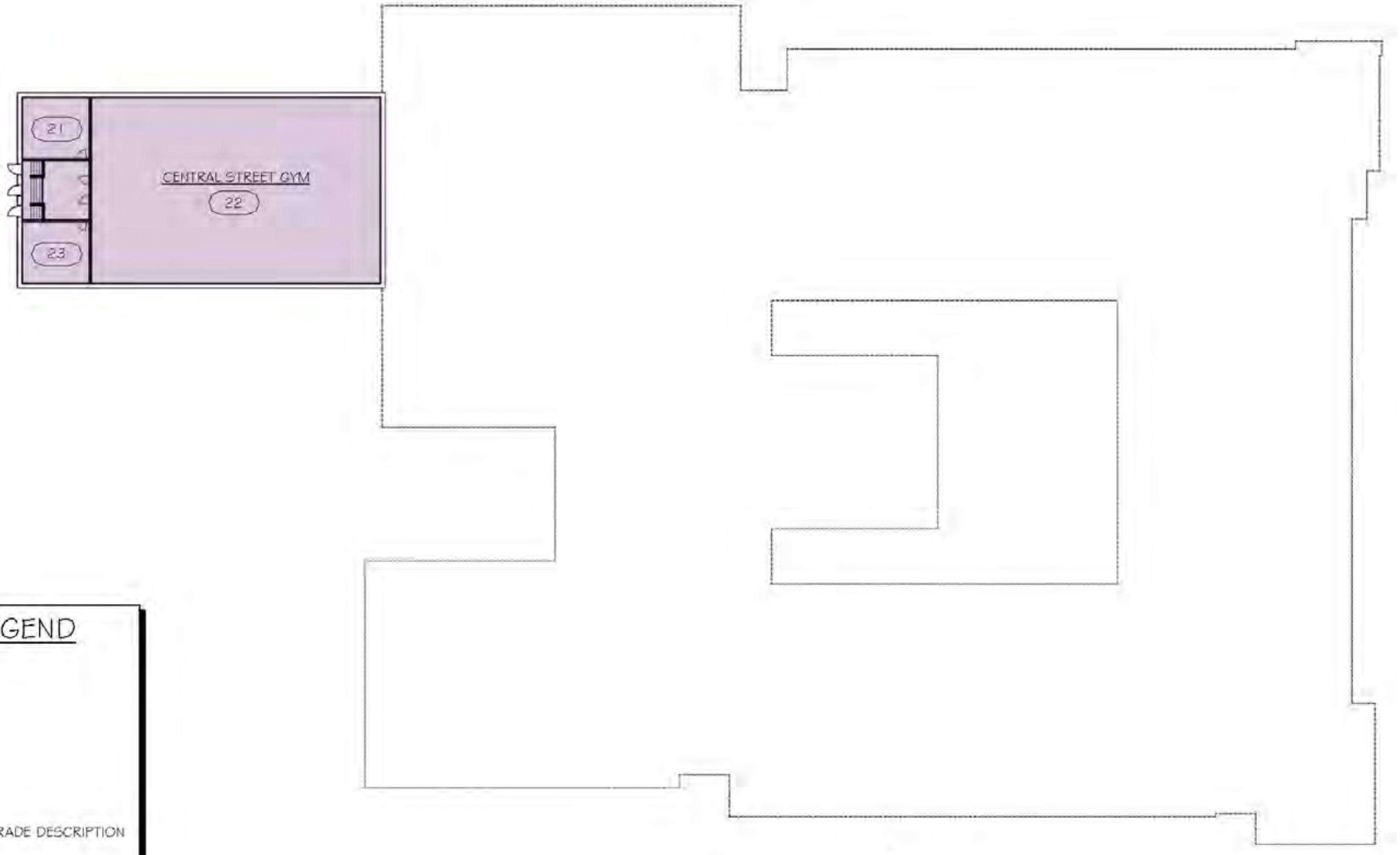
PLAN NOTES: (X)

1 REPLACE NON-ADA COMPLIANT DOOR HARDWARE.
6 WOOD FLOOR REQUIRES REFINISHING.

PRIORITY LEGEND

| | |
|---|---|
| 🟪 | 0-5 YEARS |
| 🟧 | 5-10 YEARS |
| 🟦 | 10-20 YEARS |
| 🟩 | SEE REPORT FOR UPGRADE DESCRIPTION |
| ⬜ | EXISTING BUILDING - NO WORK |

SECOND FLOOR PLAN
FLOORING REVIEW
NOT TO SCALE

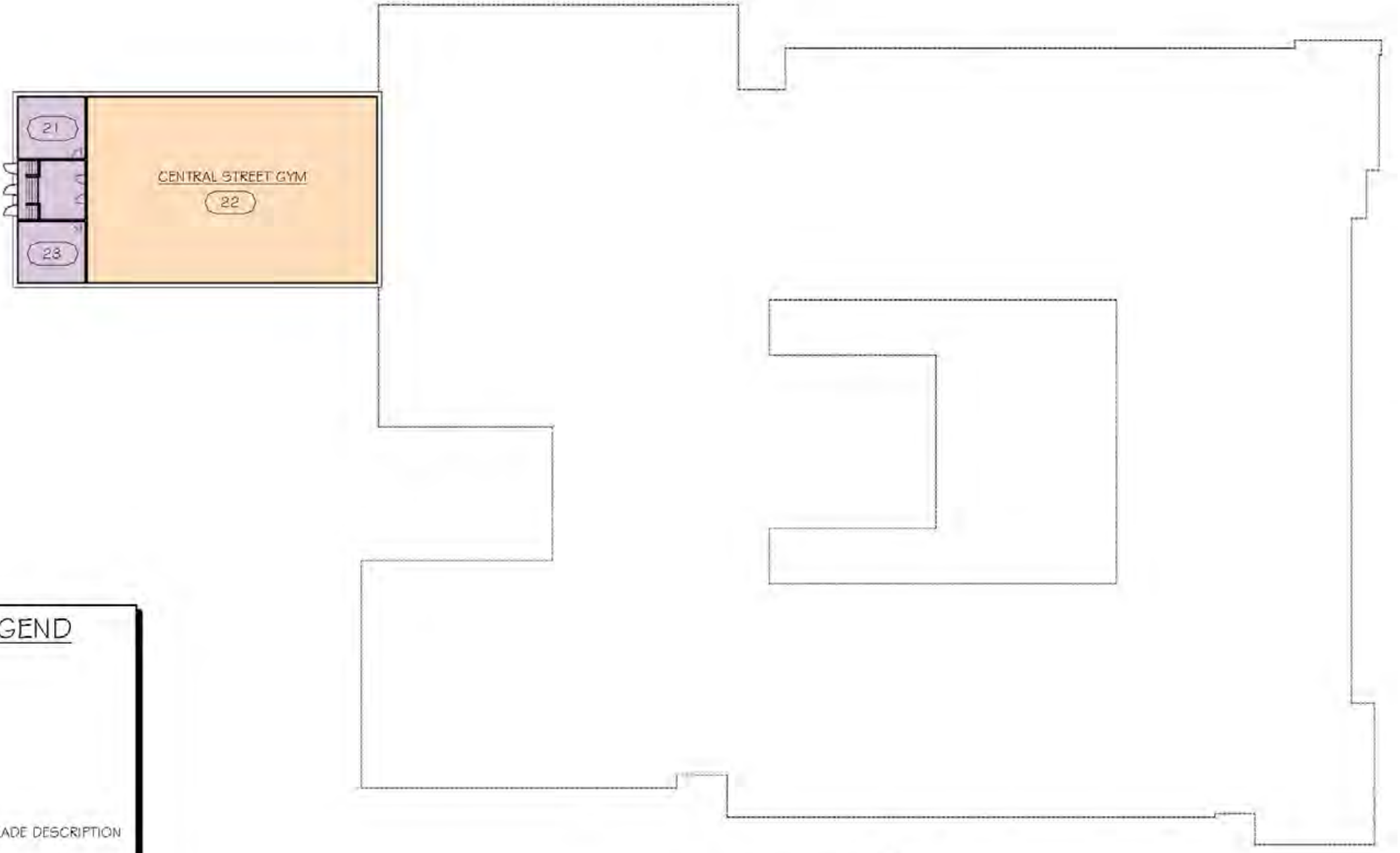


## SECOND FLOOR PLAN WALL REVIEW

NOT TO SCALE

### PRIORITY LEGEND

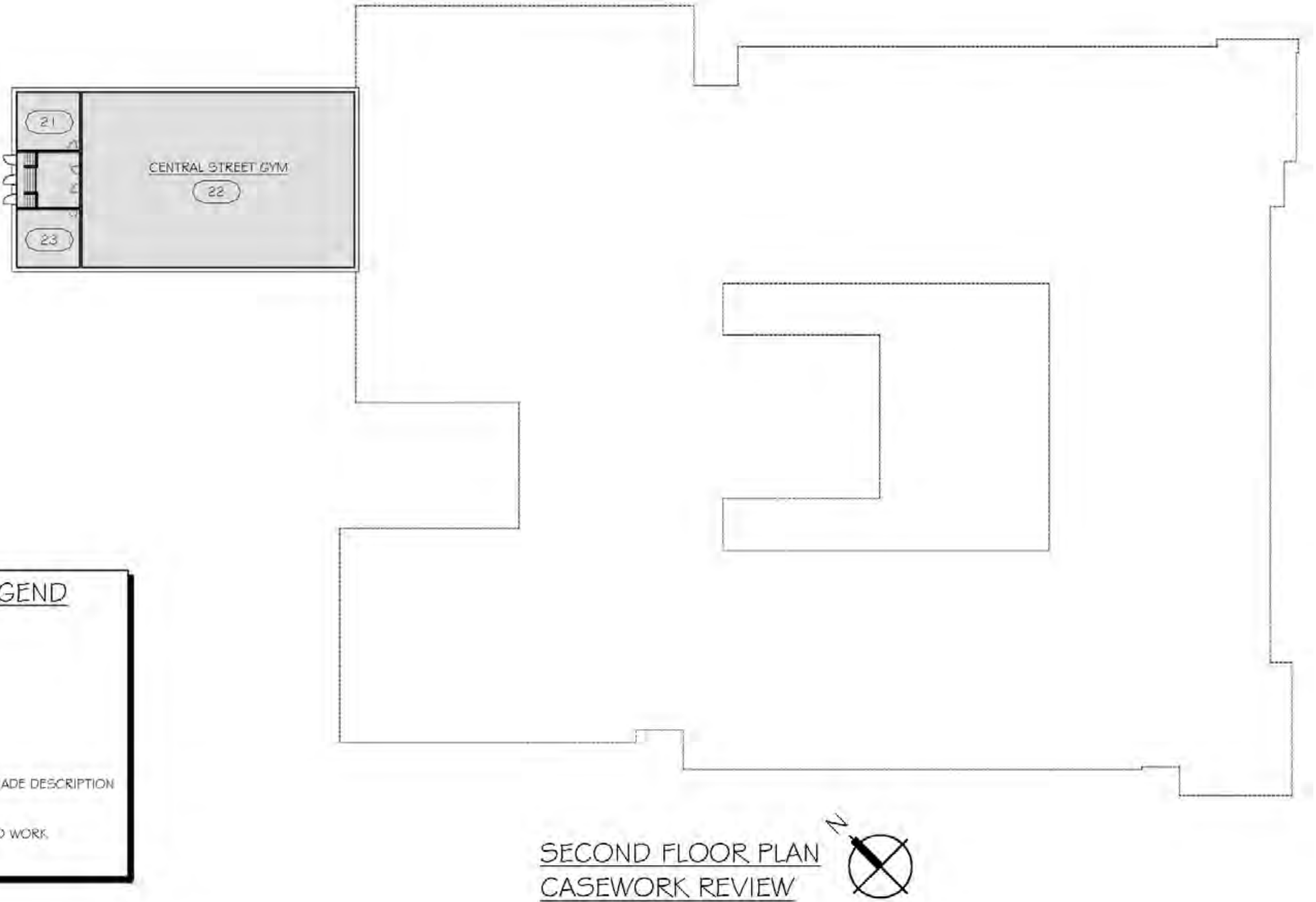
- 🟪 0-5 YEARS
- 🟧 5-10 YEARS
- 🟦 10-20 YEARS
- 🟩 SEE REPORT FOR UPGRADE DESCRIPTION
- ⬜ EXISTING BUILDING - NO WORK



## PRIORITY LEGEND

- 🟪 0-5 YEARS
- 🟧 5-10 YEARS
- 🟦 10-20 YEARS
- 🟩 SEE REPORT FOR UPGRADE DESCRIPTION
- ⬜ EXISTING BUILDING - NO WORK

SECOND FLOOR PLAN
CEILING REVIEW
NOT TO SCALE



## PRIORITY LEGEND

- 🟪 0-5 YEARS
- 🟧 5-10 YEARS
- 🟦 10-20 YEARS
- 🟩 SEE REPORT FOR UPGRADE DESCRIPTION
- ▨ EXISTING BUILDING - NO WORK

SECOND FLOOR PLAN
CASEWORK REVIEW
NOT TO SCALE

## SITE & CIVIL

### Site and Civil Improvements

The map below shows the areas listed in the following recommendations for Washington Middle School. Areas not shaded were found to be in good condition, with no improvements being recommended at this time.

**Area 1: Paved play area on west side of school.**

The existing pavement has numerous thermal cracks which have worsened over multiple freeze-thaw cycles. There are some areas of localized base failure, which are evident by the fatigue cracking present. The base failure is a small portion of this area, approximately 13%. Edge failure and surface weathering are also present.

*Area 1*

**Site Concrete:**

Throughout the site there are sections of sidewalk that have spalled along the edges and it will continue to worsen as the sidewalk ages. These become a tripping hazard when using the sidewalk.

ADA detectable warning panels need to be added to the exit of the site at the stop sign.

*Site Concrete*

| FIM # | Site and Civil Improvements |
|---|---|
| WMS-SC-1 | Area 1:<br>• Remove the existing pavement and 12 inches of base and subgrade.<br>• Add 12 inches of dense base aggregate, stormwater management, and 3.5 inches of asphalt.<br>• Add 6-foot or 16-foot black vinyl chain-link fence as needed. |
| WMS-SC-2 | Site Concrete:<br>• Remove and replace all areas of damaged or spalling concrete.<br>• Add the detectable warning fields in required location. |

| FIM # | Benefits of Site and Civil Improvements |
|---|---|
| WMS-SC-1 through WMS-SC-2 | • Improved site safety.<br>• Reduced future maintenance on paved areas and sidewalks.<br>• Improved aesthetics. |

## BUILDING ENVELOPE

### Ballasted EPDM Roofing

The roof system is in poor condition. There are several on-going reported leaks, as well as displaced stone ballast where patches and seam covers are observed. Tenting of membrane was observed on east side of roof area. Multiple patches and seam sealant observed at EPDM to shingle roof transition. Attempted counter flashing repairs observed at brick masonry which consists of uncured membrane flashing. Repair patches of different material observed at several locations. Deteriorated stone ballast observed.

### Shingled Roofing

Shingle roof to wall flashings are not installed properly. No step flashings are installed. Attempted repair patches exist over roof to wall transitions. Roof penetrations are not properly flashed into shingles. Numerous shingle repairs exist. Ice damming was reported to occur around much of the roof eave edge perimeter.

### Fully Adhered EPDM Roofing

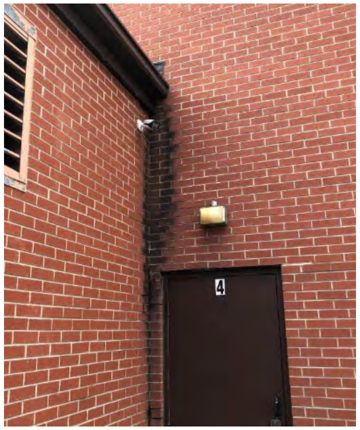
There is evidence of ice damming and ponding along the east roof edge. Also, the gutter roof edge detail is not installed per industry standard details and in the event the gutter backs up water can enter into the building. There is evidence of this by soft insulation substrate observed along the east roof edge. Gutter flashing and laps have been previously repaired.

### Upper PVC Roofing

The roof system is in good condition. Interior moisture staining was observed; however, this is probably pre-existing. The wall flashing membrane is loose along the parapet wall perimeter.

### Gutter Overflow and Soffit Condensation

Gutter joints leak along west elevation of new gymnasium. Gutter overflows at north elevation at new gymnasium. It appears that there is evidence of condensation coming from the soffit of the steep slope roof area. Review roof ventilation.



### Masonite Window Panel Coverings

Windows on the northeast building (old gymnasium) are covered with stone textured masonite panels. The panels are in a deteriorated condition, lack perimeter edge sealant, and sealant at panel joints is in a failed condition.

### Window Seals

Window seals/gaskets are visible extruding from windows.

### Precast Stone Masonry

There are multiple cracks in the stone masonry at the base of the old gymnasium building.

### Lintels

No weep holes exist. Lintels on the east elevation are exhibiting rust due to excess moisture contact.

### Splash Blocks

No splash blocks are installed at grade at downspouts along east elevation on north side of building at new gymnasium. Moisture has been known to leak into building along grade.

### Sealant Joints

Sealant joints on south (front) elevation are in a failed condition.

### EIFS to Window Transitions (East Elevation)

EIFS is cracked and pulling away from trim.

### Insulated Metal Panels on North Elevation of east side of building

No through wall/sill flashing exists. Moisture can enter into the building at base of panel cladding system.

### Tuckpointing

Tuckpointing required along south (front) elevation, as well as along the entire east and north elevation of old gymnasium

| FIM # | Building Envelope Repairs |
|---|---|
| WMS-BE-1 | Replace Ballasted EPDM Roofing Area in Poor Condition with New Insulation and EPDM Membrane<br>• Replace roof system with new insulation and fully adhered EPDM membrane. Incorporate a thermal barrier and vapor retarder prior to installation of the roof insulation and membrane. Incorporate slope into roof system design to improve drainage. Adhere all insulation layers down. Fully-adhere new EPDM membrane, properly install edge details and gutter. |

| | |
|---|---|
| WMS-BE-2 | Replace Shingled Roof, Repair Flashings, Install Step Flashing, Flash Roof Penetrations, Review Roof Ventilation<br>• Replace roof system with new shingles. Properly detail all penetrations. Review interior attic space ventilation requirements to prevent future ice damming. Replace all deteriorated decking. Consider removing steep slope roof system and replacing underlying flat roof system. |
| WMS-BE-3 | Replace Adhered EPDM Roofing Area, Repair Edge Detail, Thermal Barrier, Insulation<br>• Replace roof system with new insulation and fully adhered EPDM membrane. Incorporate a thermal barrier and vapor retarder prior to installation of the roof insulation and membrane. Incorporate slope into roof system design to improve drainage. Adhere all insulation layers down. Fully-adhere new EPDM membrane, properly install edge details and gutter. |
| WMS-BE-4 | Repair Loose Wall Flashing at Upper PVC Roofing Area<br>• Repair loose wall flashing membrane. |
| WMS-BE-5 | Replace Deteriorated Panels Covering Windows in Old Gym<br>• Install new aluminum composite metal panel system. Incorporate an appropriate substrate with an AWB and install ACM panels with proper perimeter flashing and sealant system. |
| WMS-BE-6 | Repair Cracked Masonry, Replace Window Seals & Gaskets where Deteriorated, Splash Blocks and Gutter Repairs<br>• Remove sealant, rout out cracks, seal, and apply elastomeric coating system.<br>• Replace window seals.<br>• Install splash blocks or connect downspouts to storm sewer system |
| WMS-BE-7 | Install Weep Holes in Lintels where None Exist<br>• Recommend installing weep holes and check for through wall flashing membrane |

| | |
|---|---|
| WMS-BE-8 | Remove and Replace Masonry Sealant Joints on Front Elevation, Tuckpointing, Repair Lintels on East Elevation<br>• Remove sealant, install backer rod, prime, and reseal.<br>• Rout out and tuck point with new mortar.<br>• Remove lintels, remove rust and corrosion, epoxy coat, and re-install. |
| WMS-BE-9 | Repair Sealants at East EIFS and North Metal Panels, Install Flashing for Metal Panels<br>• Rout out EIFS and install backer rod, prime, and new sealant.<br>• Install through wall flashing at base of insulated metal panels. Seal perimeter edge at brick wall |
| WMS-BE-10 | Tuckpointing along East and North Sides of Old Gymnasium<br>• Brick and mortar are in a deteriorated condition and requires repointing to restore and preserve exterior integrity. |
| WMS-BE-11 | Repair Corroded Door Frames along Stair Platform<br>• Clean, sand, and coat metal doors where deteriorating. |

| **FIM #** | **Benefits of Building Envelope Repairs** |
|---|---|
| WMS-BE-1<br>through<br>WMS-BE-11 | • Protection from water infiltration and further damage to roofing, interior, and walls.<br>• Reduced future maintenance on roofs and masonry.<br>• Improved exterior aesthetics. |

## ELECTRICAL & SAFETY

### Electrical Service

Washington Middle School was originally constructed in 1917 with building updates occurring in 1955, 1983 and 1986. The building's electrical service was upgraded as part of the 1983 addition to a 208Y/120V, 3-phase, 4-wire, 1600A service. The service equipment is a Cutler Hammer MP200 switchboard in the Custodial Room, shown to the right in Figure 1. The BOMA life expectancy for electrical service equipment is 40 years. We recommend that this equipment be evaluated soon for replacement in the very near future.

It is unclear if a coordination study has been completed to determine the appropriate trip settings on the main and distribution switchgear circuit breakers. We recommend performing a coordination study to determine if existing breaker trip settings are acceptable to prevent adverse equipment damage if breakers do not trip properly. If breakers are not properly coordinated, a simple fault at the branch circuit or receptacle level could potentially cause an outage for the entire building.

The existing building switchboards, panelboards, disconnect switches, and other electrical equipment do not have arc flash labels installed, so it is unclear if an arc flash study has been performed. There is inherently an increased hazard of working on live equipment due to possible buildup of energy being released in an arcing incident. This arcing incident can occur due to failing conductors or even tools incidentally touch live bus bars or contacts causing short circuits. These arcing incidents can cause severe burns and injuries. Per NFPA 70E section 130, arc flash labels are required to be applied to electrical equipment, meaning an arc flash study is required to be performed.

*FIGURE 1:*
*Main Electrical Service Equipment*

We recommend that a fault current/arc flash study be performed, and appropriate arc flash labels installed to the required electrical equipment. This will bring the existing installation into compliance with current code requirements and provide clear safety guidelines for persons performing maintenance on equipment.

## Backup Generator Addition

The building is not currently served by a backup generator. The Fire Alarm system and life safety lighting are served from integral battery backup units, while IT servers are all served by local uninterruptible power supplies (UPS). There have been multiple power outages in the recent past. Based on discussions with the school district, an optional standby generator would be desired to serve IT, HVAC, security, and phone systems, as well as other optional standby equipment. We recommend providing a new optional standby generator to serve IT equipment and other optional standby loads requiring back-up power to limit data loss, communications outages, food spoilage, and other negative consequences of prolonged power outages.

## Electrical Infrastructure and Grounding

Multiple instances of general-purpose receptacles near sinks (e.g., kitchens or bathrooms) were noted to be regular duty, non-ground fault circuit interrupting (GFCI) type. See Figure 2, right, for one example of this. Per NEC section 210.8, GFCI protection must be installed for all 15- and 20-Amp circuits in these locations. We recommend replacing general duty receptacles within kitchen and bathroom areas with GFCI-protected receptacles to comply with code. Additionally, receptacles near mop or washdown sinks and basins should also be replaced with GFCI receptacles to reduce chance of fault.

Cafeteria mixer disconnect switches are located near the washdown/mop sink area but in a NEMA 1 enclosure (see Figure 3, right). Per NEC Table 110.28, this enclosure should be type 4X for this installation. We recommend replacement with equivalent devices in NEMA 4X enclosures or relocating further away in an area safe from splashing.

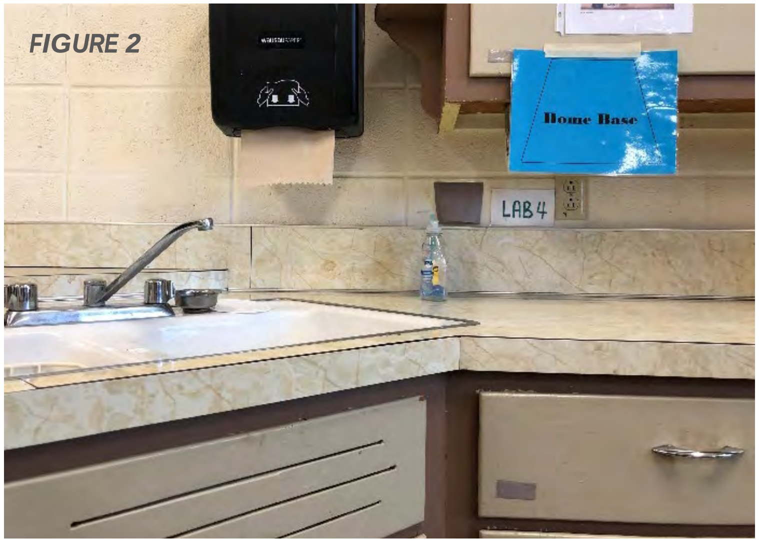


FIGURE 2


FIGURE 3

Kiln disconnect switches in Art Room 12 do not have the appropriate working clearances as defined by NEC section 110.26. We recommend relocating these devices or obstructing equipment to meet NEC-required clearances.

Existing electrical equipment in the Custodial Room is located near the washdown/mop sink area and spigot but is a NEMA 1 enclosure, shown in Figure 4. Per NEC Table 110.28, these enclosures should be type 4X for this installation. In this instance, since installation can be difficult and/or costly, we would recommend installing a solid partition from the floor to a height greater than the equipment to reduce the chance of splashes. Additionally, the BOMA useful life expectancy of this equipment has likely been exceeded. If the equipment needs replacement based on the electrical inspection, we recommend relocating or replacing with NEMA 4X enclosures to reduce chance of fault by water infiltration

One unlabeled panelboard in Corridor 104 is held closed by a screw. By code, this panelboard must be readily accessible, which this would not be considered. We recommend replacing the panelboard cover with a functional, locking cover.

Panelboard “K” in the custodial room has a note on it indicating that a breaker attach screws are hot. This presents a potential electrical hazard to anyone operating or maintaining this panelboard. Because of this and the age/condition of the panelboard, we recommend replacing this panelboard.

In the first-floor mechanical room, existing junction boxes/raceways are not properly supported per NEC section 300.11, shown right in Figure 5. We recommend providing raceway and junction box supports per code to prevent damage to the conductors or raceway.

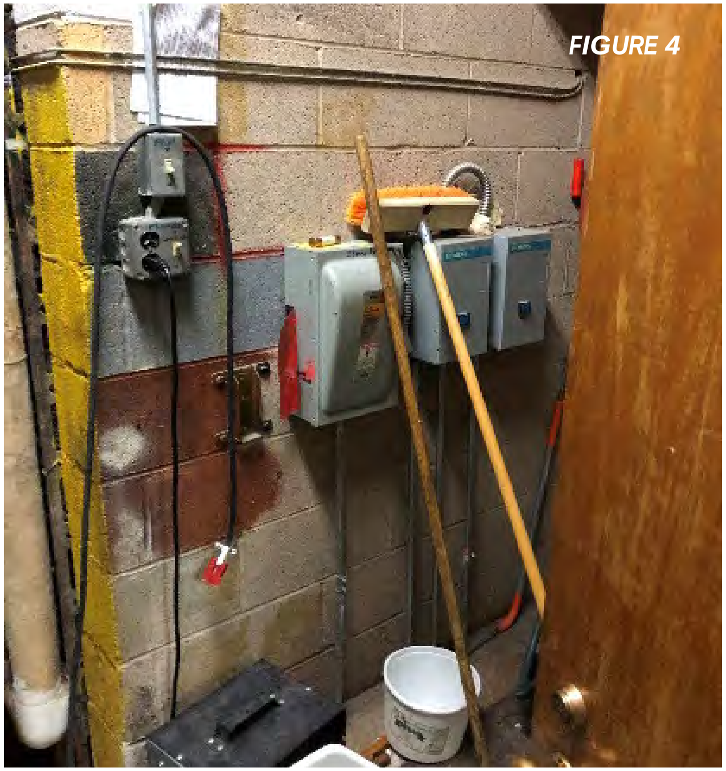


FIGURE 4

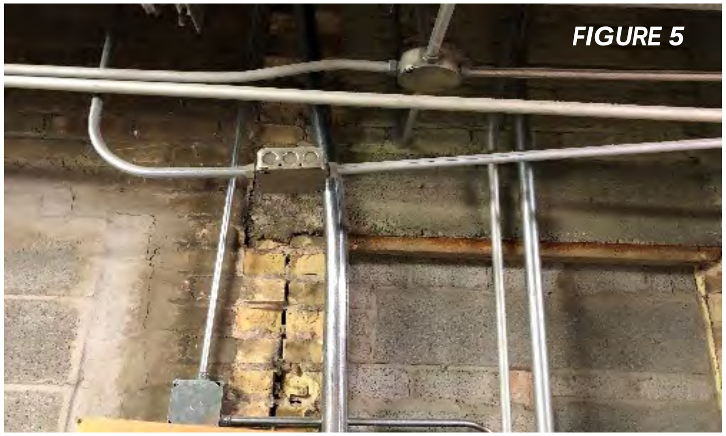


FIGURE 5

Panelboard “E” in the Choir Room is mounted such that the top breakers are above the maximum allowable height of 6’7” defined in NEC section 404.8. Because of this, we recommend replacing the panelboard in a new code-compliant location to ensure safe, accessible operation of this electrical equipment.

Existing panelboards throughout the building are missing filler plates in breaker spaces, exposing the live bus. NEC 110.12(A) requires that “unused openings... shall be closed to afford protection substantially equivalent to the wall of the equipment”. We recommend installing filler plates in uncovered breaker spaces to comply with code and limit potential safety hazards.

Most existing distribution and branch electrical equipment is original to the building. This electrical equipment includes, but is not limited to, disconnect switches, branch panelboards, and distribution panelboards. Examples are shown in Figure 6 and Figure 7 at right. These pieces of equipment are approaching or exceeding their BOMA life expectancy of 30 years. Note that during the survey it was noted that the existing boiler room in the basement has much of this obsolete equipment.

Assuming equipment has been properly maintained, we do not necessarily recommend full equipment replacement throughout the building. However, we recommend a thorough inspection and evaluation of all electrical equipment. This will limit the chance of failure by identifying equipment or parts that may need cleaning, re-torqueing, or replacement. Additionally, this offers an opportunity to re-evaluate the availability of replacement parts for continued maintenance. Repair or maintain deficient equipment if not obsolete. If equipment is defective or cannot properly be maintained because of the inability to source parts, replace immediately.


FIGURE 6


FIGURE 7

## Interior Building Lighting

Existing lighting throughout the building consists primarily of fixtures with fluorescent T8 lamps. Modern lighting is typically dimmable LED which has substantially lower wattage consumption than equivalent fluorescent fixtures. Because of this, energy savings can often offset installation costs. We recommend replacing the existing lighting with equivalent LED fixtures throughout for increased energy savings and reduced maintenance costs. Emergency fixtures replaced with LED equivalents shall be specified to include battery back-up.

Some existing emergency battery packs in emergency fixtures were labeled with replacement dates that exceeded 5 years. This exceeds the BOMA useful expected life of 5 years for egress light batteries, as well as some manufacturer-provided maintenance requirements. Some fixtures were unlabeled with the service dates, and some fixtures were obsolete Lithonia models, as seen to the right in Figure 8. We recommend replacing the emergency battery packs in emergency fixtures not replaced with an LED equivalent (as described above) and replace all discontinued fixtures with modern LED models.

Locations throughout the school were noted to be missing emergency fixtures. The gymnasium is lacking a fixture over the egress door and the building entrance vestibule has no emergency light. We recommend adding new emergency fixtures over the gymnasium door and in the vestibule as defined by NFPA 101 section 7.9.2.1.1.

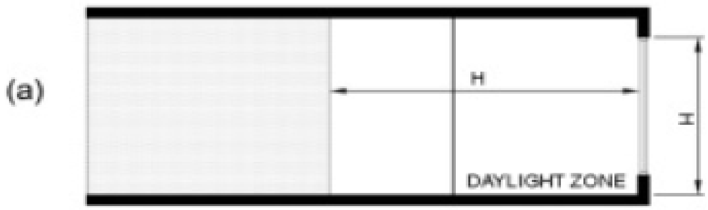
*FIGURE 8*

Classrooms throughout the building are controlled by a single switch. Per IECC 2018 Section C405.2.3, spaces with over 150W of lighting must have separate daylight-responsive controls. This means fixtures in the daylighting/side-lit zone (defined in IECC Figure C405.2.3.2, shown in Figure 9) must dim automatically in response to the amount of light coming in the windows separately from the rest of the room.

These responsive controls must be able to be calibrated from within the space. In order to meet these requirements, we recommend providing photocells separately controlled switching to control new, dimmable LED fixtures that are within daylight zones. Not only would this installation comply with the latest energy code requirements, but it will also offer increased energy savings over the existing installation.

In addition to only having single switch controls in classrooms, the building does not have occupancy sensors installed or they have been disabled if they have been. Per IECC section C405.2.1, these are required in many common school spaces that include, but are not limited to, classrooms, offices, restrooms, and locker rooms. As part of the replacements mentioned above, we would also recommend addition of new dual-technology occupancy sensors in rooms to realize greater energy savings and meet IECC requirements. Dual-technology sensors utilize ultrasonic and infrared detection technologies to eliminate false sensing and provide accurate and efficient lighting control.

Hallway emergency wall packs were noted to be installed with spacing exceeding 100 feet in some cases. We expect that the minimum lighting requirements as defined by NFPA 101 section 7.9.2.1.1 would not be met. We recommend performing a detailed walkthrough with a light meter to assess the existing emergency lighting installation and installing new emergency fixtures as required.



(a) Section view
(b) Plan view of daylight zone under a
rooftop monitor

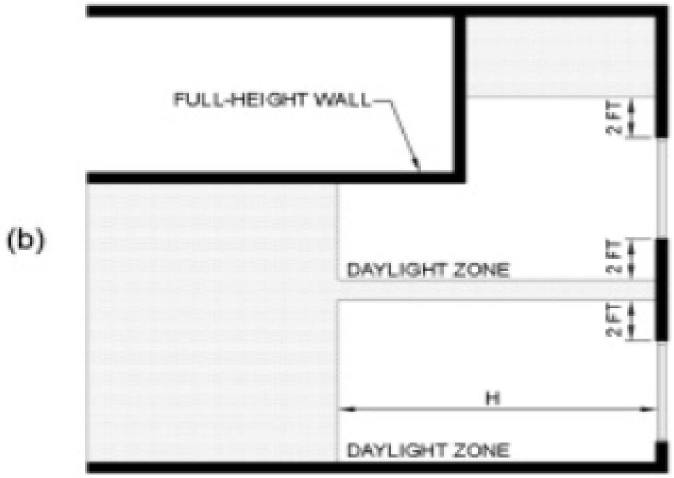


*FIGURE 9*

# TECHNOLOGY & SAFETY

## IT Infrastructure

The existing IT infrastructure has been recently replaced by the Oconto Falls School District over the past two years. The district server is located at Oconto Falls High School and is fed by a dual utility feed with a transfer switch between the two sources. Additionally, it has UPS power available for 400 minutes of run time. Washington Middle School has multiple IT closets with servers backed up by local, standalone UPSs to provide a minimum 30 minutes of back up. We have no new recommended IT work.

## Door Access and Video Surveillance Systems

During a 2019 audit, it was identified that Oconto Falls School District did not have adequate door access control or video surveillance systems. The School District has since upgraded the security systems throughout their buildings. No deficiencies or issues were noted, and as such, we have no recommended security systems work.

## Public Address System

The existing public address (PA) system head end unit make, model, and installation year were unable to be verified. As such, it could not be verified if replacement parts are able to be sourced. The existing system is standalone and not currently integrated into the IT infrastructure. Based on discussion with the school district, it is safe to assume the existing system is obsolete. We recommend replacement of the existing PA system with a new system that is capable of integration into the IT infrastructure. This will include a new head end unit and new speakers throughout the facility. However, if the existing system is fully functional and serviceable, it can remain in service as the system replacement is not high priority.

## Clock System

The existing clock system was unable to be verified. As such, it could not be verified if replacement parts are able to be sourced. The installation date could not be confirmed but is assumed to be an obsolete system. The system is standalone and did not appear to be tied into the IT infrastructure. We recommend replacing the existing system with a new system capable of integration into the IT infrastructure at some point in the future. If this system is fully operational and parts are readily available, it is not a high priority replacement.

## Fire Alarm System

The existing fire alarm control panel (FACP) is Edwards Systems Technology EST-1 non-addressable system, shown to the left in Figure 10. This is a system that has been discontinued by EST and is estimated to be over 25 years old. This equipment has exceeded its useful life, and the parts internal to the FACP are no longer manufactured and cannot easily be sourced. Due to the necessity of maintaining this system for future years, we strongly recommend a replacement of the head end fire alarm control panel with one that meets the requirements of, and is installed in accordance with, NFPA 72 and International Building Code.

The new fire alarm system should be an addressable, emergency voice-alarm communications (EVAC) system with capacity for future building expansions. To allow the school district to monitor the site remotely, it should and be networkable to integrate it into the new IT infrastructure.

The current fire alarm notification device age and quantity are also deficient. It was observed that the women's bathrooms, some of the classrooms, Choir room, Tech Ed room, Cafeteria, and Library are all lacking adequate notification devices, as is required by NFPA 72. Other existing notification devices are past their expected useful life of 15 years, as defined by BOMA. We recommend replacing existing devices to ensure continued functionality and adding notification devices in spaces that are currently deficient.

Due to the number of devices needing replacement or to be added exceeding 20, the entire system will need to be submitted for state review. This means that the entire fire alarm system will likely need to be brought up to current code (EVAC) requirements. Because of precedent set with other state-reviewed jobs of a similar nature, we recommend a total fire alarm system replacement, as solely replacing the head end or adding and replacing devices will not meet the requirements to pass state review.

*FIGURE 10*

| FIM # | Electrical and IT Infrastructure Improvements |
|---|---|
| WMS-EE-1 | • Provide new fire alarm control panel for future expansion and voice capability<br>• Provide entirely new addressable fire alarm system |
| WMS-EE-2 | • Perform coordination study and adjust circuit breaker trip settings as necessary<br>• Perform fault current/arc flash study and apply arc flash labels to equipment<br>• Install filler plates in panelboards where circuit board spaces are missing covers<br>• Replace noncompliant general-purpose receptacles with GFCI-type receptacles in kitchens, bathrooms, and near sinks per NEC<br>• Provide new partition between washdown/mop sink until equipment can be replaced with NEMA 4X enclosures or relocated away from splashing water area<br>• Provide raceway and junction box supports in mechanical room.<br>• Relocate kiln disconnect switch to location with code-required working clearances<br>• Replace mixer disconnect switch with NEMA 4X enclosure |
| WMS-EE-3 | • Replace main service switchboard |
| WMS-EE-4 | • Replace Panelboard "E" and relocate to a code-compliant height.<br>• Replace Panelboard "K" to remedy improper installation causing incidentally "hot" parts<br>• Replace panelboard cover in Hallway to provide a functional locking door for accessing |
| WMS-EE-5 | • Provide new fire alarm devices to meet current code requirements and replace original building devices beyond their life expectancy. |
| WMS-EE-6 | • Provide new optional standby generator |
| WMS-EE-7 | • Replace original electrical equipment past useful life expectancy |

| | |
|---|---|
| WMS-EE-8 | • Replace fluorescent and HPS fixtures with dimmable LED equivalents<br>• Modify lighting controls and provide photocells in rooms with windows<br>• Add and replace existing occupancy sensors |
| WMS-EE-9 | • Provide new PA system<br>• Provide new central clock system |

| FIM # | Benefits of Electrical and IT Infrastructure Improvements |
|---|---|
| WMS-EE-1 | • Ensure a vital life safety system can be maintained into the future and meet minimum requirements of NFPA 72 and the local authority having jurisdiction, as well as be monitored remotely<br>• Ensures a system in full compliance with all current regulations, corrects device deficiencies and inadequate coverage, and most importantly, pass state review. |
| WMS-EE-2 | • Reduce risk of improper breaker function and protect electrical equipment<br>• Verify existing equipment ratings to improve safety of operation and maintenance staff working on electrical equipment and comply with NEC code requirements<br>• Improve safety of operation and maintenance staff working on electrical equipment and comply with NEC code requirements |
| WMS-EE-3 | • Ensures continued reliable operation of the entire building power distribution at the service entrance. Additionally, this provides the opportunity to install a new switchboard with enhanced components to increase safe operation of the equipment |
| WMS-EE-4 | • Ensures accessibility to staff for operation or maintenance of the uppermost breakers.<br>• Ensures safe operation of panelboard by limiting possibility of faults caused by arcing<br>• Ensures code-required accessibility to panelboards for operation and maintenance |

| | |
|---|---|
| WMS-EE-5 | • Ensure continued operation of existing notification devices, improve coverage to meet current NFPA and ADA code requirements |
| WMS-EE-6 | • Limit data loss, communications/security lapses, spoiled food, freezing temperatures, and equipment and building damage during prolonged power outages |
| WMS-EE-7 | • Improve safety of operation and maintenance staff working on electrical equipment and reduce the risk of equipment failure |
| WMS-EE-8 | • Decrease energy usage related to lighting, limit maintenance effort to replace lamps, and comply with current IECC and ASHRAE 90.1 energy codes |
| WMS-EE-9 | • Improve audible clarity of voice announcements for occupants with hearing impairment<br>• Improve ability to maintain the system into the future with readily available new parts |

## Codes and Guidelines Referenced

The following codes and guidelines are referenced within this analysis to ensure the safety and well-being of building occupants and personnel and limit fire or other building hazards:

- Building Owners and Managers Association (BOMA) International has published a preventative maintenance guidebook intended to illustrate "best practices to maintain efficient and sustainable buildings." In it, Appendix 7 lists the expected useful life for numerous building systems and components. Specifically, we reference Appendix 7, sections E and F.
- National Fire Protection Association (NFPA) is an international organization that publishes numerous codes and standards intended to eliminate death, injury, and property and economic loss due to fire- and electrical-related hazards. For our analysis, we are looking specifically at NFPA codes 70, 70E, 72, and 101. They are the National Electric Code (NEC), Standard for Electrical Safety in the Workplace, National Fire Alarm and Signaling Code, and Life Safety Code, respectively.
- NFPA 70, or as it is commonly referred to as the NEC, is "the benchmark for safe electrical design, installation, and inspection to protect people and property from electrical hazards". We refer to this often as it is the electrical code all residential and commercial building electrical construction must adhere to.
- NFPA 70E lays out requirements for safe work practices intended to protect personnel from exposure to major electrical hazards. This code was written to help comply with OSHA 1910 Subpart S and OSHA 1926 Subpart K in limiting "workplace injuries or fatalities due to shock, electrocution, arc flash, or arc blast."
- NFPA 72 defines the latest safety provisions regarding fire detection, signaling, and emergency communications demands. This code is critically focused on fire alarm and mass notification systems to ensure safety of all building occupants in the event of emergencies or threats.
- NFPA 101 is used to protect people based on building construction, protection, and occupancy features to minimize the effects of fire and related hazards, covering both new and existing buildings.
- The International Energy Conservation Code (IECC) is a widely adopted energy code which establishes a "baseline for energy efficiency by setting performance standards for the building envelope (defined as the boundary that separates heated/cooled air from unconditioned, outside air), mechanical systems, lighting systems, and service water heating systems in homes and commercial businesses." As part of this analysis, we are focused solely on the parts of the code related to lighting systems.
- The Illuminating Engineering Society (IES) is the recognized technical and educational authority on lighting, which publishes lighting standards and recommended practices for lighting design. For this analysis, we are utilizing illuminance recommendations for electrical and mechanical spaces with the intent to recommend ample light for operating and maintenance personnel to make repairs or replacements effectively and safely in often-overlooked spaces.

## MECHANICAL & ENVIRONMENTAL

### Pneumatic to Direct Digital Control (DDC) Systems, Valve Replacement

Washington Middle School utilizes a combination of pneumatic, limited DDC (Two AHUs and four-unit ventilators), and stand-alone electric control systems. Most systems in the building are Pneumatic. Pneumatic control systems are less energy efficient and are more difficult to maintain than modern DDC systems. Additionally, the stand-alone electric controls are not integrated into a building automation system. This does not allow the maintenance staff to monitor or troubleshoot the building effectively.

Nexus recommends eliminating the pneumatic and stand-alone electric control systems at Washington Middle School and replacing with DDC components and controls systems building-wide. These DDC controls would be integrated into a building automation system platform that would allow for building-wide equipment monitoring and troubleshooting while on site or remotely while using a computer or a hand-held device via the internet.

This would involve converting the re-used HVAC controls components to DDC actuators for valves, dampers, sensors, as well as the addition of DDC controllers and control panels. The pneumatic control valves would be replaced as part of this conversion as well.

Benefits of the DDC controls upgrade include reduced energy consumption, reduced maintenance, improved equipment scheduling and troubleshooting, alarm monitoring, operational tracking, and trending of mechanical equipment parameters.

| FIM # | Pneumatic to Direct Digital Controls Upgrade and Control Valve Replacement |
|---|---|
| WMS-ME-1 | • Replace pneumatic and stand-alone electric control components with DDC on HVAC equipment that is being re-used as well as on new equipment<br>• Provide DDC controllers and control panels<br>• Replace the pneumatic control valves<br>• Provide all programming required for this conversion<br>• Provide building automation system platform with remote access |

| FIM # | Benefits of Pneumatic to DDC Controls Upgrade and Control Valve Replacement |
|---|---|
| WMS-ME-1 | • Easy-to-use, modernized system control<br>• Improved building monitoring and maintenance troubleshooting<br>• Extended system life<br>• Improved occupant comfort<br>• Reduced energy consumption<br>• Reduced maintenance |

## Boiler Plant Replacement & Steam to Hot Water Conversion

The building is heated by two steam boilers that are over 50 years old. Steam is less efficient and more dangerous than conventional Hydronic Heating systems.

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

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

Nexus recommends adding propylene glycol to the hydronic heating system in a solution that is 35% propylene glycol and 65% water. Glycol is an important compound to have in hydronic heating systems that are exposed to freezing temperatures. It acts as an antifreeze, preventing the formation of ice in the system which can cause heating piping and coils to burst. A glycol fill tank and side-stream filter would be added as well. The glycol fill tank will be installed to allow for ease of refilling the heating piping system when required and the side-stream will collect any particulate, debris, and rust within the water volume.

| FIM # | Boiler Plant Replacement & Steam to Hot Water Conversion |
|---|---|
| WMS-ME-2 | • Remove existing steam boilers, piping and accessories<br>• Install new fully modulating condensing boilers with integral primary boiler pumps<br>• Install primary distribution pumps with variable speed drives<br>• Provide propylene glycol to the system<br>• Install a glycol fill tank and pump for ease of refill<br>• Install a full system flow air and dirt separator to maintain a clean hydronic heating system |

| FIM # | Benefits of Boiler Plant Replacement & Steam to Hot Water Conversion |
|---|---|
| WMS-ME-2 | • Optimized boiler plant operation<br>• Reduced future maintenance<br>• Increased energy savings<br>• Extended heating system life |

## Chilled Water Plant and Associated Chilled Water Piping Distribution

Currently, only the Office is cooled. The lack of cooling/dehumidification results in higher humidity levels and occupant discomfort in the building. The spaces are also unable to meet the American Society of Heating and Refrigeration Engineer's (ASHRAE) Thermal Environmental Conditions for Human Occupancy Standard 55-2017. 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. The indoor environmental requirements include temperature, thermal radiation, humidity, and air speed.

Nexus recommends the installation of a new Chiller and Air Handling Unit Cooling Coils. A cooling coil would be installed in each new and existing (Tech Ed) air handling unit along with the piping necessary for cooling/dehumidification of the code required ventilation air. A new Air-Cooled Chiller would be installed to supply the building with Chilled Water for cooling. The chiller would be sized to cool the entire building.

The benefits of this HVAC improvement measure include improved occupant comfort, reduced future maintenance costs, and improved temperature control.

| FIM # | Chilled Water Plant and Associated Chilled Water Piping Distribution System |
|---|---|
| WMS-ME-3 | • Provide new air-cooled chiller, pumps, and distribution piping<br>• Provide propylene glycol to the system<br>• Provide associated construction including general, electrical, and controls work required |

| FIM # | Benefits of Chilled Water Plant and Associated Chilled Water Piping Distribution System |
|---|---|
| WMS-ME-3 | • Improved thermal comfort<br>• Reduced future maintenance<br>• Extended operational life of the system |

## Classroom Unit Ventilator Replacement with Displacement Ventilation

Washington Middle School currently utilizes Unit Ventilators for HVAC control of most classroom spaces along with residential window air conditioners. The unit ventilators are beyond their useful life and in need of replacement and the window air conditioners are not adequately sized to serve the classroom spaces where they are installed. Office spaces also utilize similar systems or other unitary cooling equipment.

As an option, the district could replace the existing unit ventilators with a displacement ventilation system and the Office systems with VAV systems. New air handling systems would be installed to provide ventilation to the spaces currently being served by unit ventilators. Energy recovery would be incorporated into these units to reduce the energy required to treat the code required ventilation air.

Cabinet Displacement Ventilation Units (CDVUs) with hot and chilled water terminal coils would be provided to each zone using externally insulated overhead ductwork, which would distribute the ventilation air to each space.

Displacement units would be located on exterior walls and distribute ventilation and cooling air across the floor at a low velocity and up through the breathing zone providing occupants with the best air quality possible.

Benefits of the HVAC system modifications include increased system life expectancy, improved indoor air quality, improved occupant comfort and improved learning/work environment.

| FIM # | Classroom Unit Ventilator Replacement with Displacement Ventilation |
|---|---|
| WMS-ME-4 | • Provide new displacement cabinets with hot and chilled water coils for classroom spaces<br>• Provide rooftop Energy Recovery Units with heating water coils, chilled water coils, filters, supply and exhaust fans with variable speed drives and associated ductwork<br>• Provide variable air volume boxes (VAV) with hot water heating coils and new diffusers for office spaces<br>• Provide the associated electrical and general construction work required |

| FIM # | Benefits of Classroom Unit Ventilator Replacement with Displacement Ventilation |
|---|---|
| WMS-ME-4 | • Extend operational life of the building<br>• Improved indoor air quality<br>• Improve occupancy comfort with cooling<br>• Improved learning/work environment<br>• Reduced maintenance<br>• Energy savings with reduced fan speed |

## Gym Air Handling Unit (2) Replacement and Add Cooling

The air handling unit serving the gymnasium is well past its useful life and needs replacement.

Nexus proposes to replace the existing antiquated single wall air handling unit with a new double wall, code compliant air handling unit with: filter section, heating water coil, cooling section (Chilled Water or DX), access sections and supply fan with variable speed drive (VSD). The space would also have remote relief air fan with VSD installed to maintain neutral air pressure in the space.

Demand control, carbon dioxide level driven ventilation controls will be installed on the gymnasium unit to reduce outside airflow during lightly occupied timeframes. As ventilation requirements have increased since the original installation, increased outside air capabilities will be designed into the new unit to not only comply with current codes, but improve the indoor air quality in the space.

The air handling unit will be installed in the same location, but the design will account for improving access for easier maintenance by cutting in larger access doors to the mechanical mezzanine.

Nexus also recommends adding a cooling coil to the new unit to improve occupant comfort and reduce humidity levels which will help protect the infrastructure.

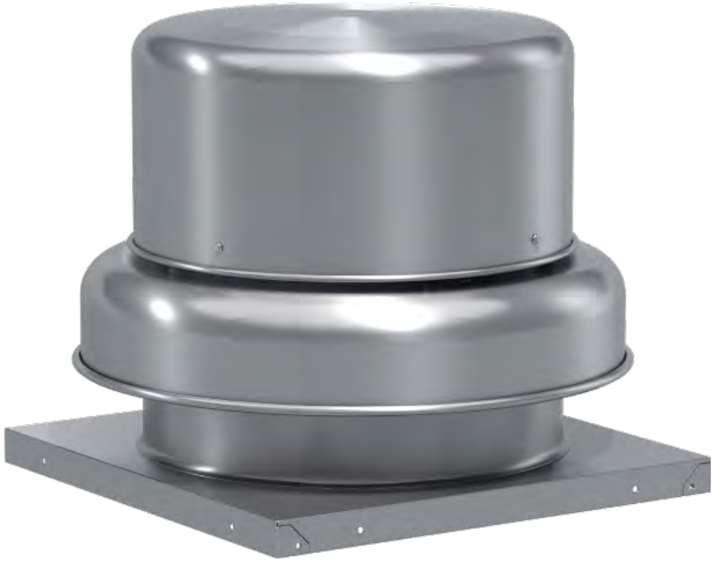
Benefits of the HVAC system modifications include increased system life expectancy, improved maintenance access, improved DDC scheduling, increased ventilation, increased energy savings, improved occupant comfort and an improved learning environment.

| FIM # | Gym Air Handling Unit Replacement (2) and Addition of Cooling |
|---|---|
| WMS-ME-5 | • Remove two existing air handling units, piping, and controls<br>• Provide two new air handling unit with hot water heating and chilled water-cooling coils<br>• Provide variable speed drives (VSD) for the supply and remote relief fans<br>• Provide carbon dioxide sensor and controls for gymnasium air handling unit<br>• Provide DDC controls, sequencing, and programming<br>• Provide all associated general and electrical construction work required |

| FIM # | Benefits of Gym Air Handling Unit Replacement (2) and Addition of Cooling |
|---|---|
| WMS-ME-5 | • Upgraded HVAC infrastructure<br>• Increased ventilation for improved indoor air quality<br>• Reduced energy costs with the incorporation of variable speed drives and demand control ventilation<br>• Improved maintenance access<br>• Improved occupant comfort<br>• Improved learning environment |

## Exhaust Fan (24) Replacements, Addition of Thermal Equalizers in Gymnasium

Some exhaust fans serving the school have exceeded their recommended service life and need replacement. The Gym (due to the height of these spaces) suffers from temperature stratification. Warmer air migrates to the ceiling making it difficult to achieve proper temperature control, especially in the winter.



The district may want to consider replacement of these fans when major work is taking place so the best pricing can be obtained from contractors. We have budgeted replacement of 24 existing exhaust fans. 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. Direct drive fans will be utilized where possible to reduce fan belt maintenance. Nexus also recommends the installation of thermal equalizer de-stratification fans in the Gym to ensure proper ventilation.

| FIM # | Exhaust Fan Replacements |
|---|---|
| WMS-ME-6 | • Replacement of existing exhaust fans<br>• Install thermal equalizers in joist space and wire to wall switch/controls<br>• Provide the associated general, electrical, and controls construction work |

| FIM # | Benefits of Exhaust Fan Replacements |
|---|---|
| WMS-ME-6 | • Increased energy savings from ECM motors<br>• Improved flow and reduced maintenance for exhaust fans<br>• Energy Savings<br>• Occupant comfort<br>• Improved temperature control |

## Dust Collector & Ductwork Replacement

The Woods Lab currently utilizes a wood dust exhaust system that exhausts directly to the outdoors but is not performing adequately as the Lab is dirty from wood dust. This results in a significant volume of conditioned air being exhausted, wasting the energy used to condition the make-up air to the space. The energy saving potential is further increased if cooling is added to the Tech Ed Spaces.

Nexus recommends replacement of the wood shop dust collector unit with modern system that includes recirculation for the conditioned air back into the building to save energy.

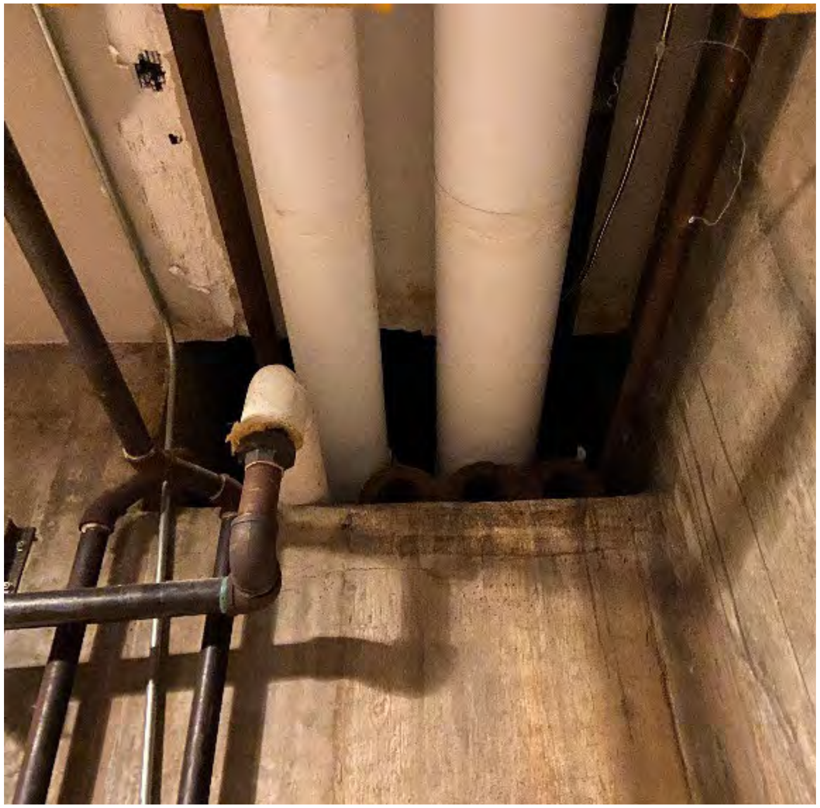
New recirculating wood dust and welding fume collector would be installed to meet current code and reduce energy cost by not requiring the need for heating/cooling of make-up air as with the non-recirculating system.

| **FIM #** | **Dust Collector & Ductwork Replacement** |
|---|---|
| WMS-ME-7 | • Remove existing wood shop dust collector<br>• Provide a new recirculating dust collector for the Wood Shop<br>• Provide new dust collection ductwork and connections to equipment<br>• Provide the associated electrical and general construction work<br>• Provide code required fire protection for collectors |

| **FIM #** | **Benefits of Dust Collector & Ductwork Replacement** |
|---|---|
| WMS-ME-7 | • Reduced future maintenance and daily cleaning<br>• Ensured proper ventilation of the equipment<br>• Energy Savings |

## Domestic Water and Natural Gas Piping Relocation from Tunnel to Overhead, Correct Kitchen Condenser Preheat

The Middle School is currently served by piping in a tunnel below the floors. This Natural Gas and Domestic Water piping that is routed in this tunnel is has had recent leaks. These leaks pose a safety hazard. There is also a potential for entrainment of iron and lead into the potable water as the soldered fittings, and piping break down over time. Access to repair, inspect, or connect to these pipes is difficult and can be dangerous because of the confined nature of access. The kitchen refrigerator/ freezer condensing unit discharges heat to the domestic water loop to preheat incoming cold water. This system is not reliable and is in place but not working.



Nexus recommends the removal of this piping and the re-installation of Natural Gas and Plumbing infrastructure above the ceilings in the building. With this relocation and pipe replacement the kitchen condenser system can be revised to a more straight forward reliable system. Any galvanized piping not in the tunnel would also be replaced with insulated copper.

The benefits of this HVAC improvement are improved maintenance access, reduced potential for natural gas leaks, reduced potential of lead or other contaminants being entrained in the domestic water system and reduced future maintenance.

| FIM # | Domestic Water and Natural Gas Piping Relocation from Tunnel to Overhead, Correct Kitchen Condenser Preheat |
|---|---|
| WMS-ME-8 | • Remove Natural Gas and Domestic Water piping in Tunnel<br>• Replace existing galvanized steel domestic water piping and components in the original building areas with insulated copper piping<br>• Replace Condensing Unit for Kitchen Refrigerator/Freezer<br>• Install new Natural Gas and Domestic Water above ceilings |

| FIM # | Benefits of Domestic Water and Natural Gas Piping Relocation from Tunnel to Overhead, Correct Kitchen Condenser Preheat |
|---|---|
| WMS-ME-8 | • Improved maintenance access<br>• Reduced potential for Natural Gas leaks<br>• Reduced potential for elevated lead and galvanized contaminants in the water supply<br>• Reduced future maintenance<br>• Energy savings |

### Fire Protection (Sprinkler System) - Building System Addition

The building does not have a fire protection system installed and is not protected from property loss or life safety during a fire event.

Nexus proposes installing a wet-pipe fire protection system to the entire building while the ceiling is being replaced.

Benefits of fire protection addition include increased occupant safety and reduced damage during a fire event.

| FIM # | Fire Protection (Sprinkler System) - Entire Building System Addition |
|---|---|
| WMS-ME-9 | • Install a wet-pipe fire protection system to fully protect the building<br>• Provide general and electrical construction as required |

| FIM # | Benefits of Fire Protection (Sprinkler System) - Entire Building System Addition |
|---|---|
| WMS-ME-9 | • Reduced damage during fire event<br>• Increased occupant safety |

### IT Room Cooling Upgrade - New Split Cooling Unit

There is currently an IT room that contains Heat Producing IT equipment that is not being cooled.

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

The benefits are improved system and room temperature control and reduced risk of system outages.

| FIM # | IT Room Cooling Upgrade - New Split Cooling Unit |
|---|---|
| WMS-ME-11 | • Provide a new split-system cooling unit appropriately sized to cool the server room during all times of the year<br>• Provide all required electrical and general construction work |

| FIM # | Benefits of IT Room Cooling Upgrade - New Split Cooling Unit |
|---|---|
| WMS-ME-11 | • Reduced risk of system outages and increased IT maintenance costs<br>• IT infrastructure protection |

# RETRO-COMMISSIONING ACTIVITIES

## HVAC Systems Optimization

Building Retro-commissioning is a systematic process that ensures all building systems 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 Nexus Retro-Commissioning Team will identify the root cause of HVAC equipment operational issues and will provide adjustments to the sequences and outdoor air settings to improve occupant comfort while reducing energy consumption where possible. The retro-commissioning process will also identify components that require adjustment or replacement.

This work will apply to all HVAC equipment that will be re-used in 1983 and 2001 Additions.

Retro-commissioning activities are defined on the following page.

**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 unit ventilator (UV) 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 UV 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 valves 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.

**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.*

| FIM # | HVAC Systems Optimization (RCx & Sequences) - 1983 and 2001 Additions |
|---|---|
| WMS-ME-10 | • Provide retro-commissioning of all existing and re-used HVAC systems<br>• Provide adjustments to existing sequences to improve HVAC system operation<br>• Verify operation of all dampers, actuators, valves, and terminal HVAC devices |

| FIM # | Benefits of HVAC Systems Optimization (RCx & Sequences) - 1983 and 2001 Additions |
|---|---|
| WMS-ME-10 | • Improved temperature control and occupant comfort<br>• Reduced energy consumption<br>• Reduced maintenance<br>• Extended HVAC equipment life |

# WASHINGTON MIDDLE | EDUCATIONAL ADEQUACY SCORECARD

Educational Adequacy (EA) is an analysis of how well the design of educational spaces in each building support instruction as defined by the District's strategic plan, personalized learning framework, technology plan, demographic trends, student enrollment and building utilization and capacities. Our analysis includes staff interviews/surveys and school space/capacity studies, as well as school utilization based on enrollment projections and boundaries to determine if they can adequately support modern learning needs. At the end of the process, each school receives a scorecard that evaluates 22 different components and ranks each as Green=Adequate, Yellow=Questionable or Red=Inadequate. These final scores guide recommendations for the most cost-effective and sustainable improvements to best address the deficiencies identified.

| Key Program Area | | Rating | Summary |
|---|---|---|---|
| **Site** | 1. Site Size, Outdoor Fields & Greenspace Areas | R | The size of the site is a significant detriment to the school. Absolutely no greenspace, no playground equipment, has some basketball hoops. Union Avenue is officially a highway. Sports (football) is held at the HS. School Forest is used when students are bussed there. |
| | 2. Site Traffic, Safe Routes, Parking | R | No staff parking, 5 buses drop off on Adams, ADA on Washington. Parent drop-off is free-for-all. City redid the streets to try to create safer situation. 1 crossing guard. |
| **General** | 3. Security/Supervision | Y | 5 entrances are FOB with camera, covered well, 6 cameras on playground. Staff member at doors. |
| | 4. ADA Accessibility | R | Washington St. Gym entrance is main ADA entrance which is NOT located near main entrance. Upper gym is not accessible. |
| | 5. Administrative/Nurse/Student Support | Y | Two secretaries, Principal, AP, Guidance, Nurse, SRO, and toilet, all staff uses one toilet. No conference rooms. Has a Vault as remnant of original building. Office Storage is non-existent/out in the open. |
| | 6. Staff Planning/Collaboration | R | Planning time occurs within classrooms....40 minutes of common planning time. |
| | 7. Community Integration (Community/Parent Room) | R | FCE 808 is often used for sewing or cooking classes, Scouts. Uses as Ag Room, makes jerky. Healthy living course. Quilting. |
| | 8. Cafeteria/Serving/Kitchen | y | 3 lunch periods, 40 minutes. Lines go into the hall. Cafeteria fits for current schedule but larger would provide schedule flexibility. Kitchen and serving is very tight. |
| | 9. Restrooms-Student/Staff | Y | Would like one set of bathrooms per grade level. Staff restrooms minimal. |
| | 10. Support Spaces (Lockers, Storage, Receiving, etc.) | R | No Receiving Dock, come in thru Commons or on Adams. Non-existent storage. Excess lockers but are located on corridor walls and are not convenient for some students. 3-minutes between classes. |
| | 11. Adaptability | R | Most of the interior walls within the building are CMU making flexibility and adaptability difficult. |
| | 11. Furniture and Equipment | R | There are many traditional desks and very little flexibility. A multitude of furniture styles and school is waiting for COVID to settle before deciding how to proceed. |
| | 12. Building Aesthetics (Interior & Exterior) | R | Building is on a very small neighborhood site that does not portray the quality of education happening within. |
| **Instructional** | 13. Classroom Quantity, Size & Suitability | R | Don't have one extra conference room. Don't have extra classrooms. 7 classrooms per grade level and all are too small. None can open to each other. 2 Math, 2 ELA, Science, Special Ed per grade. Would like better defined grade level teams. Student enrollment varies pretty significantly from grade to grade. |
| | 14. Science/STEM/STEAM Labs | Y | Need updating, sinks not working, needs more electrical, want exhaust fans. |
| | 15. Music, Art, Performance Spaces | Y | Encore courses are scattered throughout the building and scheduling could be more efficient if located closer together. |
| | 16. Flexible Learning Spaces, Student Project/Breakout Spaces | R | Almost all spaces are used throughout the day and provide very little opportunity for other functions. |
| | 17. Applied Learning Spaces (Career & Tech. Ed. Spaces) | R | Past teacher focused on drafting, there are some woodworking equipment. New instructor understands opportunity for growth of the program and potential alignment with HS. Agri-Science - Nutrition, Land Use. |
| | 18. Phy. Ed. & Athletics Spaces | Y | Gym space barely adequate for PE classes, could use a separate fitness room, wrestling space, dance team space. |
| | 19. Library/Media Center/Learning Commons | Y | Space is undersized, fairly traditional and is used for staff planning meetings. |
| | 20. Special Education Spaces | Y | Much of SPED is part of grade level teams. |
| **Reuse** | 21. Deferred Maintenance/Facility Condition Index (FCI) | | |
| | 22. Suitability for Expansion/Repurposing | R | This facility has little to no room for expansion on the current site. |

**G** Adequate - Conforms with design best practices and meets District needs for foreseeable future
**Y** Questionable - Doesn't meet design best practice but may be considered acceptable based on current usage, enrollment, or programs
**R** Inadequate - Fails to meet District needs and should be considered highest priority for correction

## Multi-Purpose Room Addition

It is evident that the existing 'old' second floor gym is not a functional multi-purpose space. It is located above classrooms space, which can cause noise and distraction concerns. The space is not ADA accessibility, as it does not have compliant stairs or an elevator for access for those in wheelchairs or leg scooters. It also is not located centrally to the building for P.E. use.

Adding a multi-purpose space between the 'new' first floor gym and the existing commons, allows for an activity zone in the building that can be used together or separately for school physical education classes, after school activities or community events. There are several middle school sports and activities that need a place to practice and gather, this would give them that space.

Existing Upper Gymnasium

| FIM # | Multi-Purpose Room Addition |
|---|---|
| WMS-EDA-1 | • Provide accessible multi-purpose room addition at grade near existing Gymnasium |

| FIM # | Benefits of Multi-Purpose Room Addition |
|---|---|
| WMS-EDA-1 | • Provides and activity zone in the building for use during school, after school and for community activities and events |

## Main Office, First Floor Classrooms, IMC, Lockers and Special Education Remodeling

The existing main office at Washington Middle School is located adjacent to the front entrance. However, there is not direct access into the office from the main entrance vestibule to create a safe, secure entrance sequence for visitors during the school day. Visitors enter through the vestibule into the main 'unsecure' lobby before turning right and entering the office through another door. Once in the main 'unsecure' lobby, visitors have uncontrolled access to the entire school. The District's desire to create a safe, secure entrance to the school would require remodeling to the existing vestibule and office to create an entry sequence that brings visitors directly into the office before having access to the school.

Furthermore, the main entrance does not have ADA compliant access to the remainder of the school, from the main office there are stairs to the main school level. If a visitor requiring ADA access comes to the main entrance, they would be required to go back outside, down the sidewalk and come back in a different entrance that is at the main school floor level. This is not a safe and secure procedure, and it is not a 'customer service' friendly entrance. An ADA ramp should be added when remodeling the main office and the adjacent classroom. This allows visitors to enter the school at one location. Remodeling this space allow for creating a more functional main office and add a community and volunteer space near the main office and secure entrance.

The classrooms now are all undersized. To create a middle school that physically matches the middle school concept of grade level pods or houses, the first-floor classrooms, library, lockers and special education spaces need remodeling and reimagining. The goal is to create grade level pods of classrooms, special education rooms and flexible collaboration space for students and staff.

*Existing Office Main Lobby*

The flexible areas allow for staff to work together in a large area that can be shared or scheduled for team activities, project-based learning or break out collaboration as needed. The spaces also provide before and after school gathering or study areas for organized student groups or individual studies while students wait for afterschool practices, etc.

Adding operable connection between existing classrooms allows for similar staff teaming and large group collaboration.

Adding visual supervision windows in the classrooms will allow for the flex areas to be used by students during class for break out and study areas, while still being supervised.

| FIM # | First Floor Classrooms, Main Office, IMC, Lockers and Special Education Remodeling |
|---|---|
| WMS-EDA-2 | • Remodeling the main office and adjacent classroom to provide a safe and secure and ADA compliant entry sequence by remodeling the vestibule and main office and adding a ramp<br>• Provide grade level pods, including classrooms, special education and flexible learning areas<br>• Provide operable connection between classrooms<br>• Provide visual supervision windows at classrooms |

| FIM # | Benefits of First Floor Classrooms, Main Office, IMC, Lockers and Special Education Remodeling |
|---|---|
| WMS-EDA-2 | • Improved security for all occupants with proper safe, secure entrance sequence and control of visitors<br>• Increased ADA compliance and customer service for visitors.<br>• Provide staff and student collaboration and teaming opportunities<br>• Provide student study and gathering space before and after school<br>• Provide supervision of flex areas to allow use during class |

### First Floor Technical Education, Multi-Purpose and Staff Lounge Remodeling

The existing Technical Education area is accessed off the narrow corridor across from Science Rooms and its access is not central to the building and secluded from most hallway traffic.

It is recommended that the Technical Education Space is remodeled and reimagined to allow for more flexibility in programming as well as positioned in an area that is more visible and appealing to all students and staff.

Adjacent to the Technical Education area are the Staff Lounge and Cafeteria/Kitchen area which would allow for possible expansion of the Technical Education program and allow for more STEM-type spaces. This location is near a central portion of the building and near Science as a STEM hub.

Examples of Technical Education and STEM Spaces

| FIM # | First Floor Technical Education, Multi-purpose and Staff Lounge Remodeling |
|---|---|
| WMS-EDA-3 | • Remodeling existing Technical Education and kitchen spaces to create functional technical education space for agriculture and STEM programming<br>• Remodel space for a staff workroom and lounge<br>• Remodel the existing commons to create a multi-purpose space for physical education, athletic and activities practice |

| FIM # | Benefits of First Floor Technical Education, Multi-purpose and Staff Lounge Remodeling |
|---|---|
| WMS-EDA-3 | • Provide modern, flexible technical education space for new and changing curriculum<br>• Provide dedicated staff space<br>• Provide additional multi-purpose athletic and activity space adjacent to a new multi-purpose addition |

## First Floor Commons Repurposing, First Floor Kitchen / Receiving Repurposing

The existing Cafeteria/Commons is small per industry design standards and the queuing of the serving line spills into the Corridor. Also, there is a not a true Receiving Area for the building and deliveries are brought in off the street through a set of exterior double doors through a Vestibule.

It is recommended to relocate the Commons to the end of the building, below the Upper Gymnasium. This would allow the kitchen and receiving to have direct access to the exterior to allow for deliveries. The space allows for ample storage adjacent to the kitchen for cooler, freezer, and dry goods. The commons would be a large open space with ample cueing and space for the food serving line. In addition, locating the Commons in a larger space and still near the parking lot will allow for playground access as well as use for Community Events and can be secured from the rest of the building at night or on weekends.

*Existing Cafeteria/Commons*

| **FIM #** | **First Floor Commons Repurposing, First Floor Kitchen / Receiving Repurposing** |
|---|---|
| WMS-EDA-4 | • Create a new kitchen with adequate serving line and space for students to que up for the serving line<br>• Create storage for the kitchen<br>• Create a receiving area, direct to the exterior but out of the student, playground area<br>• Create a new large commons |

| **FIM #** | **Benefits of First Floor Commons Repurposing, First Floor Kitchen / Receiving Repurposing** |
|---|---|
| WMS-EDA-4 | • Provide space for students to queue up for the serving line<br>• Provide new kitchen with ample storage<br>• Provide a receiving area, direct to the exterior but out of the student, playground area<br>• Provide a new commons for student and community use |

## Second Floor Music Remodeling of Upper Gym

As part of the optimization of spaces in the building, there is an opportunity to take advantage of the existing Upper Gymnasium which is a high bay space. We believe the music department should be relocated to the upper level of this building. There is adequate space for both band and choir along with their practice rooms and storage. The music department will sit above the cafeteria and this area of the building is separate from the academic classroom' pods; this is appropriate for a potentially noisy music space.

The area is high volume and will allow for appropriate music room acoustics and provide more absorptive material over the existing space.

*Existing Music Room*

| FIM # | Second Floor Music Remodeling of Upper Gym |
|---|---|
| WMS-EDA-5 | • Remodel the Upper Gymnasium into a new music department for band and choir and associated auxiliary spaces |

| FIM # | Benefits of Second Floor Music Remodeling of Upper Gym |
|---|---|
| WMS-EDA-5 | • Move Music room away from distracting the academic classroom pods<br>• High volume/ceiling space is appropriate for music room design and acoustics |

### Artificial Turf and Hardscape Replacement / Restriping

The site for the current Middle School is very constricting and there is little to no green space, play areas and parking spots for nightly events.

It is recommended to provide an artificial turfed area that would hold up to constant use, minimize maintenance, and allow for several uses year-round. It is not recommended to provide a grassed area as there would be too much traffic for such a small space and it would not hold up to such abuse and use.

In addition to the artificial turf, the hardscape area needs to be replaced and restriped for school day play areas and striped for nightly parking events.

| FIM # | Artificial Turf and Hardscape Replacement/Restriping |
|---|---|
| WMS-EDA-6 | • Provide artificial turfed area that can be used for practicing soccer, lacrosse, etc.<br>• Provide new replacement hardscape area for play surface and/or event parking |

| FIM # | Benefits of Artificial Turf and Hardscape Replacement/Restriping |
|---|---|
| WMS-EDA-6 | • Provides a substitute green area for soft surface play<br>• Provides optimized and renewed hardscape play area and more available event parking |

## Flexible Furniture of Unremodeled Areas

All remodeled areas would include new flexible furniture to assist in promoting collaboration, flexibility and project-based learning. The existing furniture in many of the spaces is traditional, standard classroom furniture. Budgeting for new furniture in the remodeled areas, of at least 50%, allows for those existing spaces to move toward a modern learning environment with flexible furniture.

Examples of Classroom Flexible Furniture

| FIM # | Flexible Furniture for Unremodeled Areas |
|---|---|
| WMS-EDA-7 | • Budget for 50% new furniture in un-remodeled areas. |

| FIM # | Benefits of Flexible Furniture for Unremodeled Areas |
|---|---|
| WMS-EDA-7 | • Moves learning toward a more collaborative, flexible, and project-based learning environment. |

**OCONTO FALLS SCHOOL DISTRICT**
Washington Middle School

# Educational Adequacy Recommendations

**6,048 SF**
- REMODEL EXISTING STORAGE ROOMS, CLASSROOMS, TECH CENTER AND CUSTODIAN ROOM INTO COMMONS, KITCHEN, STAIRS AND STORAGE.
- ADD ELEVATOR.

**1,602 SF**
- REMODEL EXISTING CHOIR ROOM INTO FOREIGN LANGUAGE AND HEATH ROOMS.

**4,305 SF**
- REMODEL EXISTING CLASSROOMS AND BAND ROOM INTO FOUR STUDIOS AND LOCKER AREA.

**3,602 SF**
- REMODEL EXISTING SCIENCE ROOMS, STORAGE AND AUDIO VISUAL INTO FLEX STUDIO, STUDIO, FLEX / LOCKERS AREA AND SPED.

**5,614 SF**
- REMODEL EXISTING CLASSROOMS INTO IMC, TWO STUDIOS, SPED AND LOCKER AREA.

**6,085 SF**
- REMODEL EXISTING KITCHEN, SERVING, PSYCH. ROOM, CAFETERIA, TECH. ED, TECH. ED CLASSROOM AND STORAGE. INTO TECH. ED / AGRI-SCIENCE, STAFF LOUNGE, MULTI-PURPOSE, TECH. ED, TECH. ED CLASSROOM AND STORAGE.

**2,727 SF**
- REMODEL EXISTING LMC AND COMPUTER LAB INTO TWO STUDIOS AND FLEX AREA.

**2,444 SF**
- MULTI-PURPOSE ROOM ADDITION.

**2,270 SF**
- REMODEL EXISTING MAIN OFFICE AND CLASSROOM INTO MAIN OFFICE, GUIDANCE, SECURE ENTRY, AND COMMUNITY ROOM.

**3,652 SF**
- REMODEL EXISTING CLASSROOMS INTO STUDIO, FLEX / LOCKERS AREA AND STUDIO SCIENCE.

**3,940 SF**
- REMODEL EXISTING CLASSROOMS INTO THREE STUDIOS, FLEX STUDIO AND SPED ROOM.

## PROPOSED USAGE PLAN - FIRST FLOOR

0' 10' 20' 40' 60'

N

## REMODEL TYPE:

🟦 REMODELING

🟩 NEW CONSTRUCTION

- · - NEW FIRE WALL

ROOM LABELS IN RED REPRESENT A CHANGE IN ROOM USE WITH NO REMODEL.

## SCHOOL CAPACITY INFORMATION:

| | |
|---|---|
| TOTAL EXIS. BUILDING AREA: | 76,380 SF |
| TOTAL ADDITION AREA: | 2,444 SF |
| TOTAL BUILDING AREA: | 78,824 SF |

2019 THIRD FRIDAY ENROLLMENT: 395

(19) STUDIOS / SCIENCE x 25 MAX. STUDENTS / ROOM = 475 STUDENTS

(5) SPECIALTY CLASSROOMS x 25 MAX. STUDENTS / ROOM = 125 STUDENTS (ART, FL, HEALTH, TECH. ED)

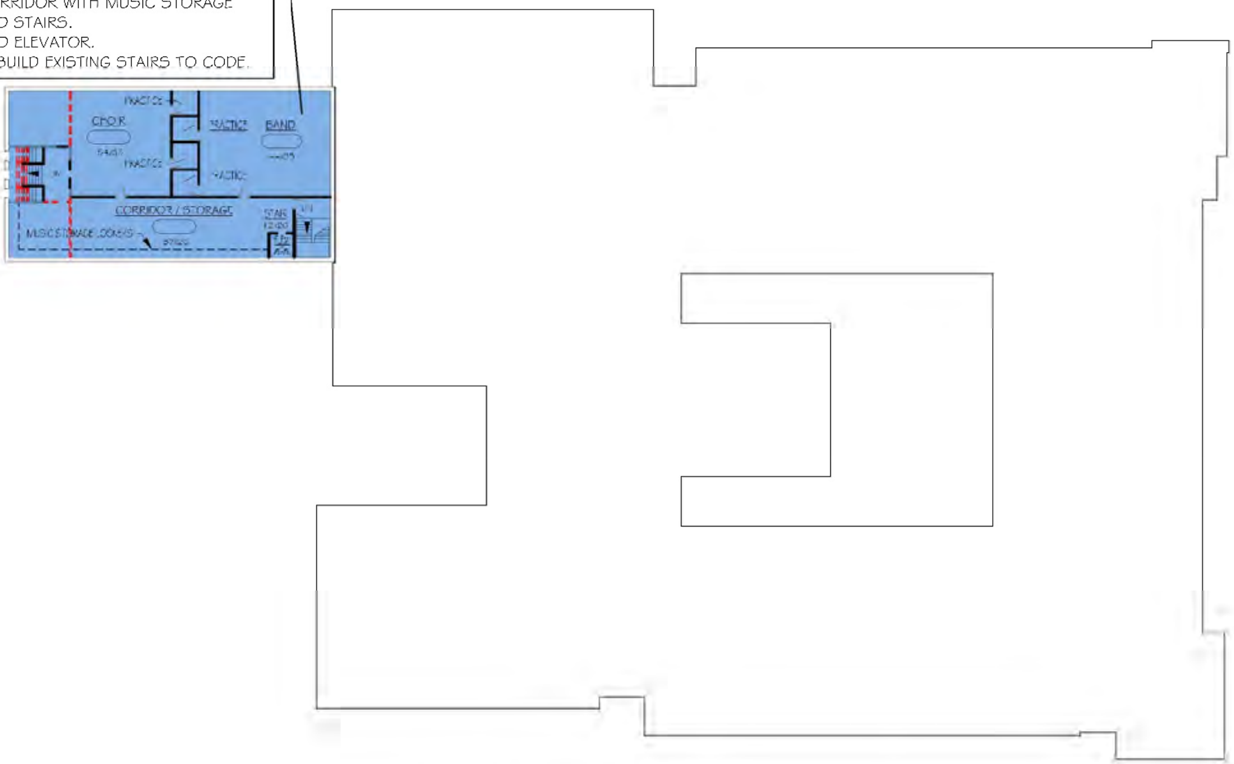
(3) PE / MUSIC ROOMS x 40 MAX. STUDENTS / ROOM = 120 STUDENTS

TOTAL CAPACITY: 720 STUDENTS
OPERATIONAL CAPACITY TARGET (80%): 576 STUDENTS

OCONTO FALLS SCHOOL DISTRICT
WASHINGTON MIDDLE SCHOOL
7510 | 7/28/20 YEAR BUILT: 1957

6,048 SF

- REMODEL EXISTING GYM, GYM STORAGE AND OFFICE INTO BAND, CHOIR, PRACTICE ROOMS. CORRIDOR WITH MUSIC STORAGE AND STAIRS.
- ADD ELEVATOR.
- REBUILD EXISTING STAIRS TO CODE.



## PROPOSED USAGE PLAN - SECOND FLOOR

REMODEL TYPE:

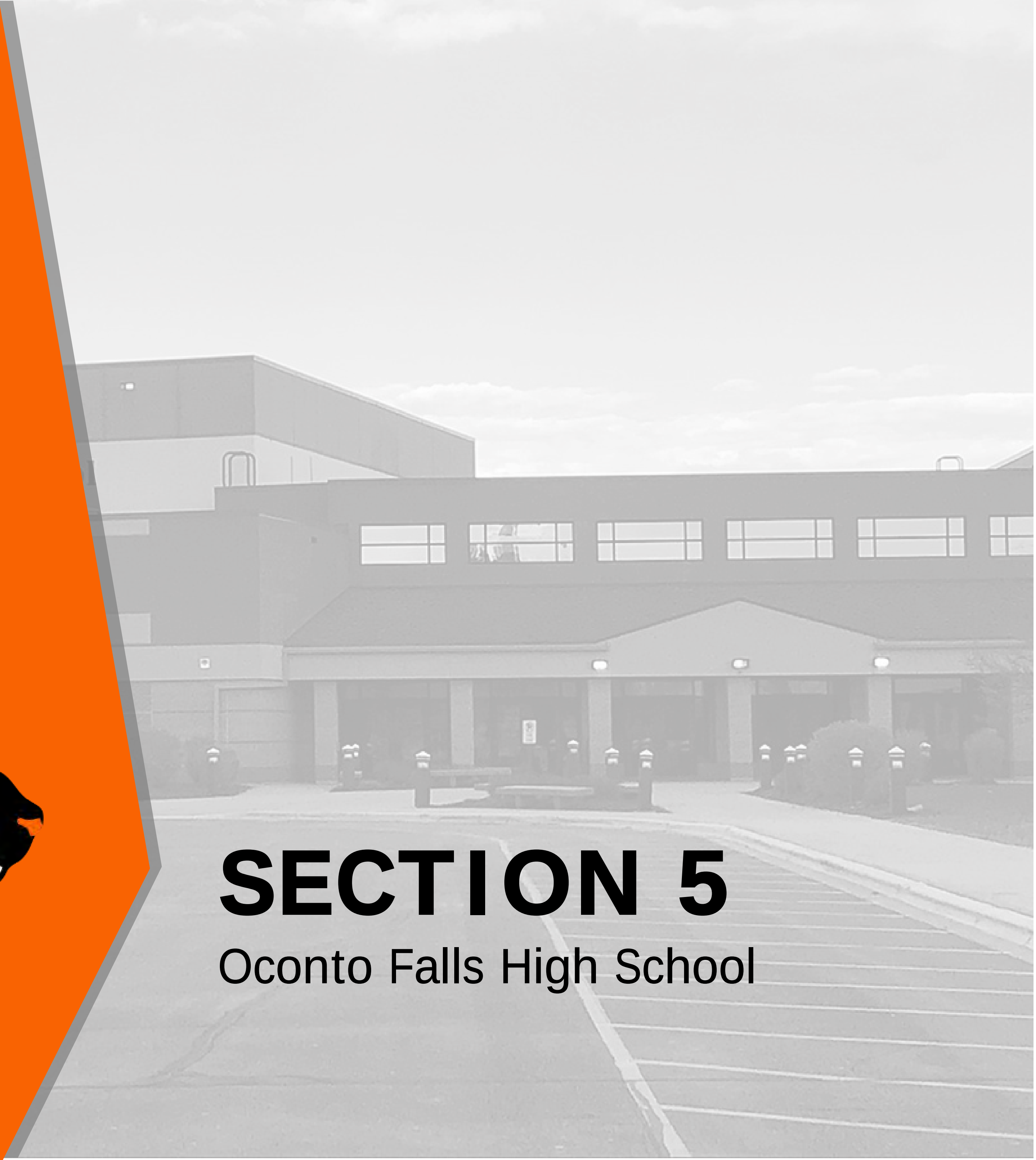
🟦 REMODELING
🟩 NEW CONSTRUCTION
– – – NEW FIRE WALL

ROOM LABELS IN RED REPRESENT A CHANGE IN ROOM USE WITH NO REMODEL.

OCONTO FALLS SCHOOL DISTRICT
WASHINGTON MIDDLE SCHOOL
7510 10/13/20

Oconto Falls School District

**FACILITY ASSESSMENT**



# SECTION 5

## Oconto Falls High School

## INTERIOR FINISHES

### Interior Doors

In the older portion of the building there are a few doors that are damaged and worn and need replacing.

A few doors have non-ADA compliant knob door hardware. Knob hardware should be replaced with compliant leveler style hardware.

The exterior doors and frames are a mix of aluminum hollow metal. The hollow metal doors and frames are showing wear and rust. The recommendation is to replace the hollow metal doors and frames with aluminum and FRP doors and frames for durability, maintenance, and longevity.

## Flooring Replacement

The majority of the flooring is VCT (vinyl composition tile). This floor product requires regular stripping and waxing. If the product is not stripped on a regular basis prior to applying the new wax, the dirt will get trapped in the flooring. VCT flooring throughout the school is discolored and appears ‘dirty’, there are few areas where this ‘dirty’ appearance is evident. However, there are more areas of the VCT floor that are stained with rust spots. It appears there was metal furniture sitting on the floor, the furniture rusted and stained the flooring.

There are multiple locations where the VCT has cracks in it. VCT is a hard and brittle product. If there are cracks in the concrete below the VCT, it is likely to transfer through the VCT; if the cracking below the VCT is not addressed (filled or stopped) replacing the existing VCT with new VCT will likely result in the same type of cracking. A more flexible, resilient flooring product (like a solid vinyl or rubber) or polishing the concrete, is recommended.

## Flooring Replacement

There is carpet throughout the building; there are areas where the carpet is stained and should be replaced with carpet tile. Carpet tile allows the school to replace stained or damaged tiles individually rather than replacing the entire room of carpet.

The terrazzo and terrazzo tile throughout the building is in good shape. There is some settlement cracking. The cracks can be filled and with a joint filler that would prevent dirt from collecting in the cracks and improve the appearance.

There is a small percentage of flooring that is 9” x 9” flooring tile. This size tile typically tests positive for containing hazardous material (asbestos). This would need to be verified by an environmental testing adjacency. Abating this tile and replace with a new flooring product is recommended.

## Interior Walls

The walls around the stairs to the lower level have peeling paint. The walls should be cleaned, prepped and painted.

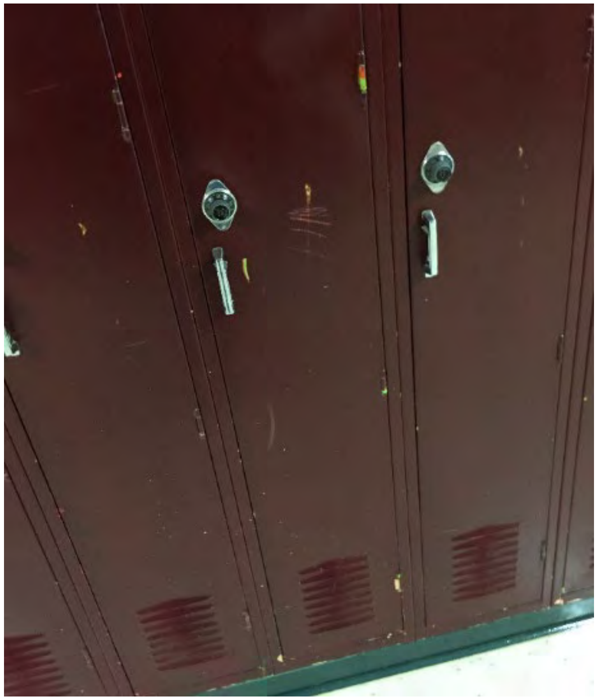
## Ceiling Replacement

The majority of ceilings are 2 x 2 ceiling tiles and are in good shape. There are a few areas where the tiles are damaged and should be replaced with new tiles, the ceiling grid can remain.

The shop spaces and the commons have exposed ductwork with peeling paint. This indicates the ductwork was not properly cleaned and prepared to receive the paint; the paint should be removed, the ductwork cleaned and prepped and repainted in the commons. Once the ductwork in the shop spaces has the painted removed and the ductwork cleaned, the ductwork does not need to be repainted in the shop areas. Unpainted ductwork in a shop space is acceptable.

## Lockers

The District has an on-going maintenance plan for painting, replacing or removing lockers. There are still lockers that need to be addressed as part of this plan to clean up the lockers.



## Casework Upgrades

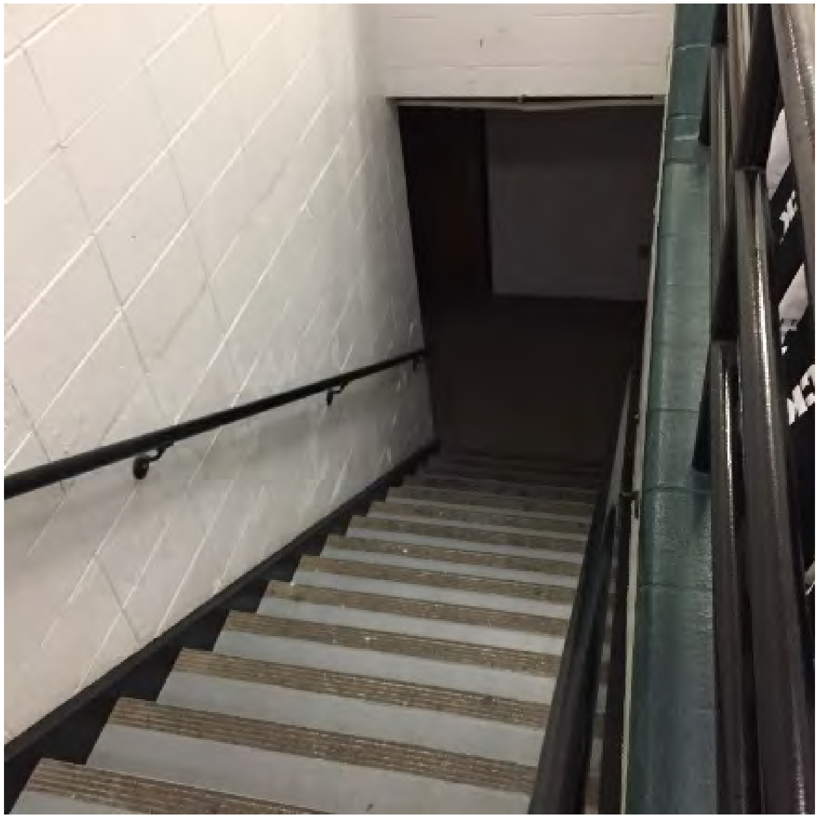
The District has an on-going maintenance plan to address upgrading and adding casework to classrooms. There were several classrooms that were designed without casework, metal storage was often used and resulted in rust spots on the VCT floors. The District has been removing the metal storage, replacing the flooring and adding plastic laminate casework. There are still classrooms and casework that need to be addressed.

# ADA ACCESSIBILITY

The building is not fully accessible. The lower-level space includes locker rooms and storage spaces. The space is currently used for boy's athletic lockers. This section of the school is not accessible by lift or elevator and does not meet ADA requirements. Any occupied use of this section of the school must be duplicated on an accessible level; for example, there are locker rooms in the building on the accessible level.

The handrails at the stairs to the lower level do not meet code for the required handrail extensions. Replacing the handrails with code compliant handrails with extensions is recommended.

The upper-level stage and wrestling room have a lift to access that level. It could not be confirmed if the lift is operational. The lift should be repaired or replaced with an operable lift to meet ADA requirements to this level.



| FIM # | Interior Finishes Upgrades |
|---|---|
| OFHS-INT-1<br>Through<br>OFHS-INT-5 | Door Hardware<br>• Replace damaged doors<br>• Replace non-ADA compliant knob hardware with compliant lever style hardware<br>• Replace exterior hollow metal doors and frames (approximately 4 pair)<br>Flooring Upgrade<br>• Replace cracked and discolored flooring<br>• Fill cracks in terrazzo floor<br>• Replace worn carpet<br>• Abate and replace all hazardous flooring<br>Walls/Ceiling Upgrade<br>• Remove, prep and paint walls and ductwork with peeling paint.<br>• Remove and replace damaged ceiling tiles<br>Locker Upgrade<br>• Replace or paint scratched, damaged lockers.<br>Casework Upgrade<br>• Replace damaged casework<br>• Provide casework in rooms without casework<br>ADA Compliance<br>• Replace handrails with code-compliant handrails<br>• Repair or replace lift for ADA requirements |

| FIM # | Benefits of Interior Finishes Upgrades |
|---|---|
| OFHS-INT-1 through OFHS-INT-5 | • Reduced future maintenance<br>• Improved school aesthetics<br>• Improved school pride<br>• Improved sanitary conditions; sealing cracks in floor in food prep areas<br>• Code compliance for safer use of stairs and access to stage |

# FOOD SERVICE EQUIPMENT

Oconto Falls High School is full production kitchen where food is received, prepped and cooked on site for daily meal service. The school provides breakfast and lunch to students. Meals are served in a dedicated cafeteria. There is a depressed loading dock and receiving corridor for food deliveries to the kitchen. Both the dry storage room and the walk-in freezer have rear access for deliveries from the receiving corridor to respective storage spaces without having to enter kitchen directly. Overall spacing and flow appears adequate from receiving and storage to prep to production. There is a dedicated servery adjacent to the kitchen with the ability to load and pass thru food during meal service. The servery is set up for students to cue in at center of room, flow in opposite directions thru lines in circular directions and exit back in cafeteria space. There is a dedicated warewashing room that includes both dishwashing and pot washing. Students drop trays at a pass thru window opening to warewashing room. There is a small storage room off the entry door to kitchen with a washer and dryer.

**Observations**

- Kitchen epoxy floor showing some signs of wear with cracking at coved base in some locations (by walk in cooler – freezer).
- Dry storage room light fixtures did not have lens covers over bulbs.
- Walk-in Freezer door was icing up (at time of walk thru). This could be due to faulty door heater, door gasketing, door sweep, door out of adjustment. Could also be a problem with heated air vent and / or defrost cycles for evaporator on unit.
- Bakers table has laminate top with galvanized base that is showing signs of rusting.
- Existing mixers: 60 qt. and 20 qt. do not have bowl guards (potential safety hazard).

- Ice maker is outdated and needs to be replaced.
- Some existing cooking line equipment is approx. 20 years old including 10 burner range and 2-burner hot top units. Combi oven and double stack convection oven appear to be newer items.
- Existing soiled dish table has a 1 HP disposer which is undersized for the amount of scrapping needed.
- Existing dishwasher has trouble maintaining temperatures.

**Recommendations**

- Repair of epoxy flooring – patching where necessary – (see interior finishes recommendations.)
- Recommend adding lens covers to light fixtures in dry storage room – (see interior finishes recommendations.)
- Recommend having authorized refrigeration service company inspect existing walk-in doors and icing issues (see notes above addressing possible failures of existing box)
- Recommend replacing ice maker
- Consider painting base cabinet section of bakers table or replacing with new (open base type).
- Consider replacing 60 Qt. Mixer (new unit with bowl guard for safety)
- Consider replacing 20 Qt. Mixer (new unit with bowl guard for safety)
- Consider replacing 10-Burner Range
- Consider replacing two burner cooktop unit.
- Recommend replacing disposer at soiled dish table with higher HP unit.
- Consider replacing dishwasher with more energy efficient unit.

| FIM # | Recommended Food Service Improvements |
|---|---|
| OFHS-INT-6 | Replace Kitchen Equipment Where Required:<br>• Repair epoxy flooring – patching where necessary – (see interior finishes recommendations.)<br>• Add lens covers to light fixtures in dry storage room – (see interior finishes recommendations.)<br>• Have authorized refrigeration service company inspect existing walk-in doors and icing issues (see notes above addressing possible failures of existing box.)<br>• Replace ice maker.<br>• Paint base cabinet section of bakers table or replace with new (open base type.)<br>• Replace 60 Qt. Mixer (new unit with bowl guard for safety.)<br>• Replace 20 Qt. Mixer (new unit with bowl guard for safety.)<br>• Replace 10-burner range.<br>• Replace two burner cooktop unit. |

| FIM # | Benefits of Food Service Improvements |
|---|---|
| OFHS-INT-6 | • Improved food safety.<br>• Reduced future maintenance on food service equipment.<br>• Increase efficiency of food service staff.<br>• Improved safety for food service staff. |

## SITE DRAWINGS

### PLAN NOTES: ⓧ

1 REMOVE AND REPLACE DOOR AND FRAME.
2 REMOVE AND REPLACE WEATHER STRIPPING.
3 PREP AND REPAINT HOLLOW METAL DOORS.
4 REMOVE AND REPLACE DOOR AND PROVIDE ADA COMPLIANT HARDWARE.
5 REMOVE AND REPLACE WOOD WINDOW SILL WITH SOLID SURFACE SILL.
6 CURRENTLY ON MAINTENANCE PLAN TO REPLACE.
7 REPAIR FLOORING AT GREASE INTERCEPTOR COVER.

### PRIORITY LEGEND

- 🟪 0-5 YEARS
- 🟧 5-10 YEARS
- 🟦 10-20 YEARS
- 🟩 SEE REPORT FOR UPGRADE DESCRIPTION
- ⬜ EXISTING BUILDING - NO WORK

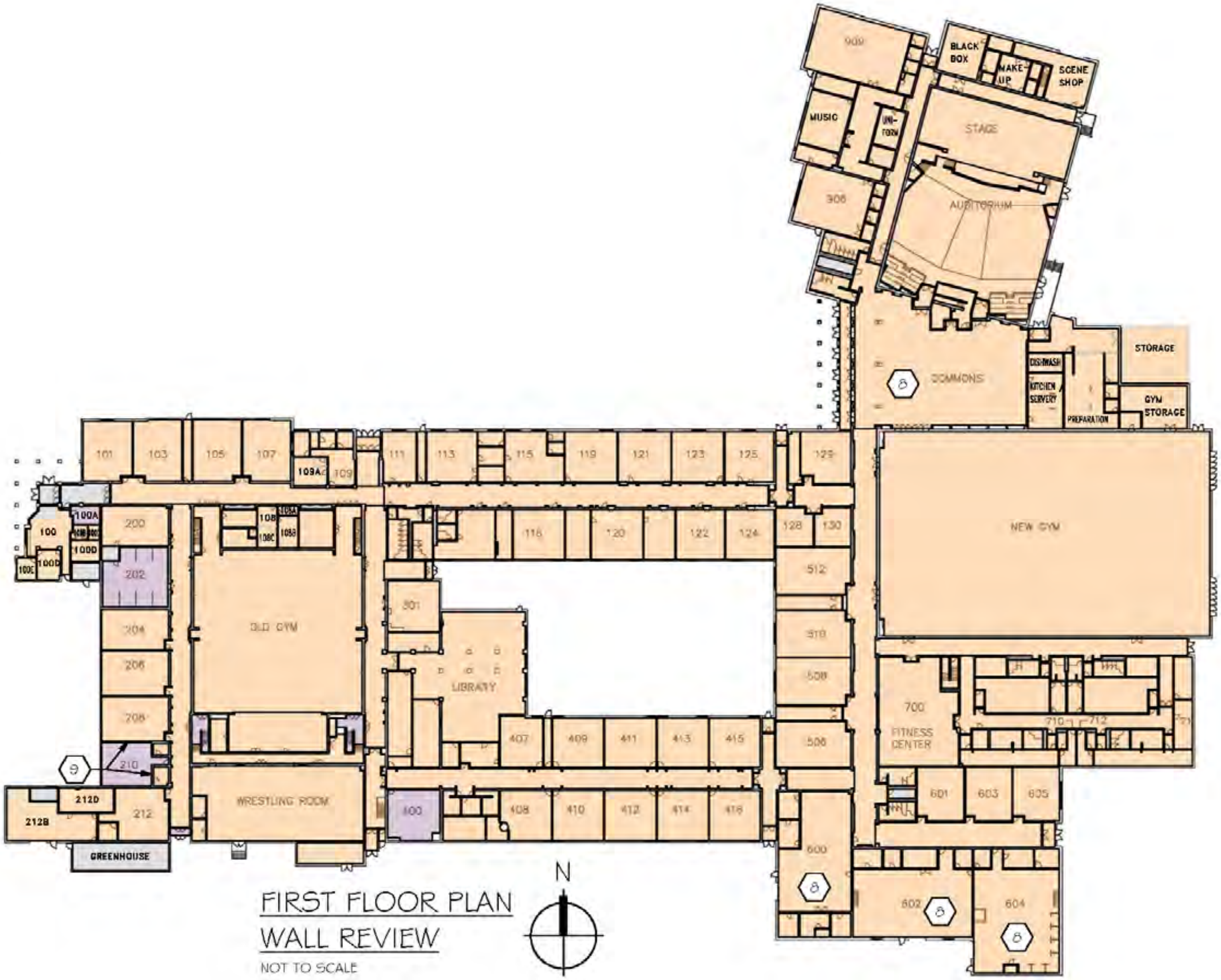
FIRST FLOOR PLAN
FLOORING REVIEW
NOT TO SCALE

## PLAN NOTES: ⟨X⟩

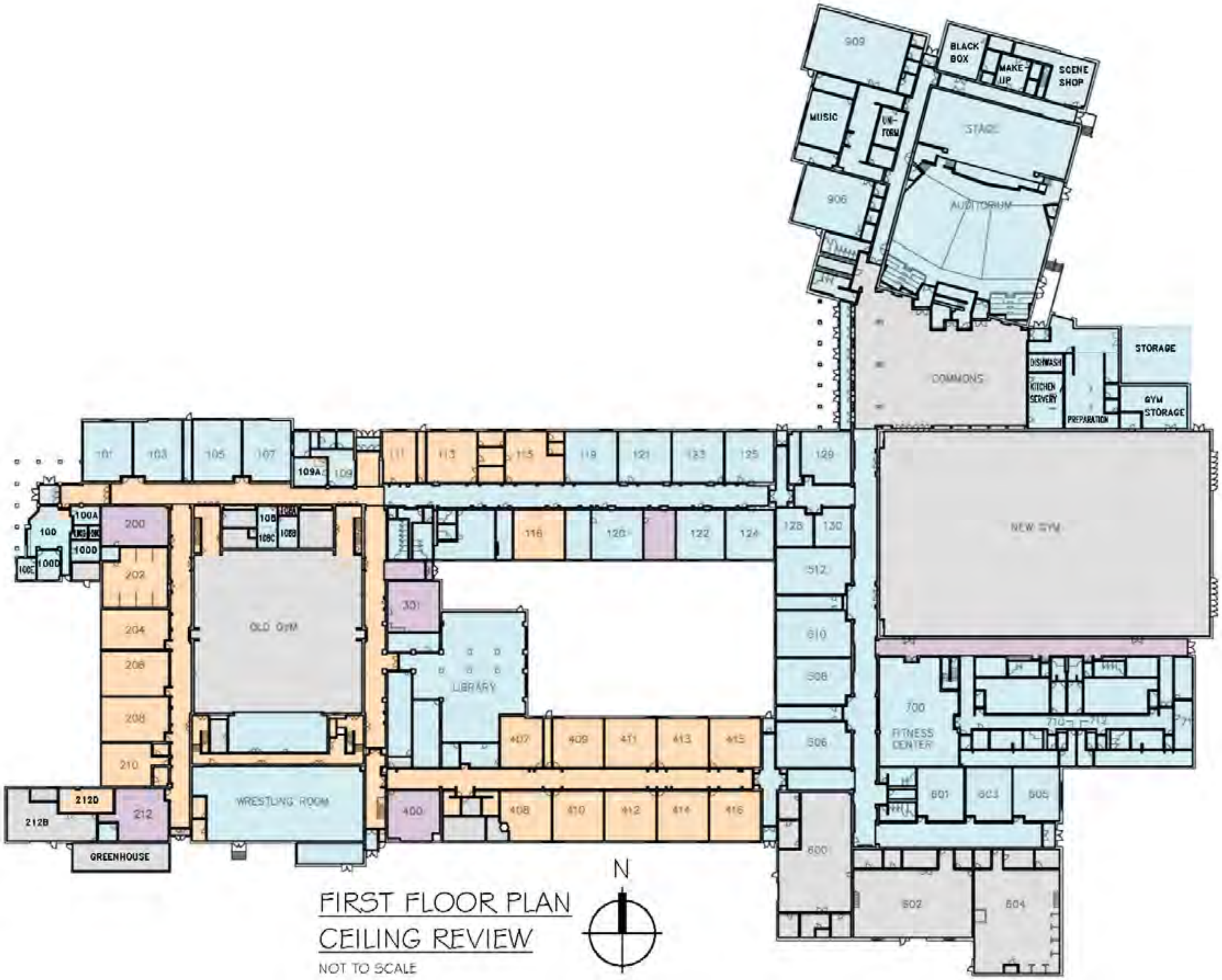
8 PAINT IS PEELING ON DUCTWORK.
9 DOOR FRAME AND WALL NEED PATCHING / PAINTING FROM NEW CONSTRUCTION.

## PRIORITY LEGEND

🟪 0-5 YEARS
🟧 5-10 YEARS
🟦 10-20 YEARS
🟩 SEE REPORT FOR UPGRADE DESCRIPTION
⬜ EXISTING BUILDING - NO WORK



FIRST FLOOR PLAN
WALL REVIEW
NOT TO SCALE



## FIRST FLOOR PLAN
## CEILING REVIEW

NOT TO SCALE

PRIORITY LEGEND

- 🟪 0-5 YEARS
- 🟧 5-10 YEARS
- 🟦 10-20 YEARS
- 🟩 SEE REPORT FOR UPGRADE DESCRIPTION
- ⬜ EXISTING BUILDING - NO WORK

## PLAN NOTES: ⓧ

10 ADD PIPE WRAP TO PIPING UNDER SINK.
11 DISPLAY CASE NEEDS REPLACING.
12 LOCKERS NEED PAINTING OR REPLACING.

FIRST FLOOR PLAN
CASEWORK REVIEW
NOT TO SCALE

## PRIORITY LEGEND

| | |
|---|---|
| 🟪 | 0-5 YEARS |
| 🟧 | 5-10 YEARS |
| 🟦 | 10-20 YEARS |
| 🟩 | SEE REPORT FOR UPGRADE DESCRIPTION |
| ⬜ | EXISTING BUILDING - NO WORK |

## SITE & CIVIL

The map below shows the areas listed in the following recommendations for Oconto Falls High School. Areas not shaded were found to be in good condition, with no improvements being recommended at this time.

### Area 1: North Drive

The existing pavement has numerous thermal cracks which have worsened over multiple freeze-thaw cycles. There are areas of base failure, which are evident by the fatigue cracking present. Edge failure and surface weathering are also present.

### Area 2: West Parking Lot

The existing pavement has numerous thermal cracks which have worsened over multiple freeze-thaw cycles. There are some areas of localized base failure, which are evident by the fatigue cracking present. The base failure is a small portion of this area, approximately 5%. Edge failure and surface weathering are also present.

### Area 3: North Parking Lot

The existing pavement has numerous thermal cracks which have worsened over multiple freeze-thaw cycles. There are some areas of localized base failure, which are evident by the fatigue cracking present. The base failure is a small portion of this area, approximately 10%. Edge failure and surface weathering are also present


Area 1


Area 2


Area 3

## Area 4: North Delivery Area

The existing pavement has numerous thermal cracks which have worsened over multiple freeze-thaw cycles. There are some areas of localized base failure, which are evident by the fatigue cracking present. The base failure is a small portion of this area, approximately 10%. Edge failure and surface weathering are also present.


Area 4


Area 5

## Area 5: South Drive

The existing pavement has numerous thermal cracks which have worsened over multiple freeze-thaw cycles. There are some areas of localized base failure, which are evident by the fatigue cracking present. The base failure is a small portion of this area, approximately 10%. Edge failure and surface weathering are also present.

## Site Concrete and ADA Panels:

Throughout the site there are sections of sidewalk that have spalled along the edges and it will continue to worsen as the sidewalk ages. There are also areas where the sidewalk had cracked and is uneven, posing a trip hazard. ADA panels (detectable warning fields) need to be added where sidewalk path directs pedestrians onto a vehicle traveled surface.


Site Concrete

| FIM # | Site and Civil Improvements |
|---|---|
| OFHS-SC-1 | Area 1: North Drive<br>• Remove existing pavement and base.<br>• Reconstruct the existing drive with 12" of dense graded base and 3.5" of HMA Pavement. |
| OFHS-SC-2 | Area 2: West Parking Lot<br>• Remove the existing asphalt to expose the base material.<br>• Inspect the base material and repair it with base course patching as needed.<br>• Pave 3 inches of new asphaltic surface and paint all pavement markings. |
| OFHS-SC-3 | Area 3: North Parking Lot<br>• Remove the existing asphalt to expose the base material.<br>• Inspect the base material and repair it with base course patching as needed.<br>• Pave 3 inches of new asphaltic surface and paint all pavement markings. |
| OFHS-SC-4 | Area 4: North Delivery Area<br>• Remove the existing asphalt to expose the base material.<br>• Inspect the base material and repair it with base course patching as needed.<br>• Pave 4 inches of new asphaltic surface and paint all pavement markings. |
| OFHS-SC-5 | Area 5: South Drive<br>• Remove the existing asphalt to expose the base material.<br>• Inspect the base material and repair it with base course patching as needed.<br>• Pave 3 inches of new asphaltic surface and paint all pavement markings.<br>• Add the detectable warning fields in required locations. |

| | |
|---|---|
| OFHS-SC-6 | Site Concrete:<br>• Remove and replace all areas of damaged or spalling concrete. |
| OFHS-SC-7 | Stormwater Management:<br>• If more than one acre is disturbed for reconstruction. stormwater management will need to be performed. |

| **FIM #** | **Benefits of Site and Civil Improvements** |
|---|---|
| OFHS-SC-1 through OFHS-SC-7 | • Improved site safety.<br>• Reduced future maintenance on paved areas and sidewalks.<br>• Improved aesthetics. |

## BUILDING ENVELOPE

### Ballasted EPDM Roofing

The roof system is good condition.  There are some flashing concerns at several locations, primarily where the EPDM wall membrane ties into the EIFS cladding.  Plans for future roof replacement were not incorporated into the design of the wall system.  Modifications to the bottom of the EIFS will need to be made when the roofs need to be replaced. Scouring of stone ballast has occurred on the lower north roof and should be put back into place.

### EIFS to Shingle Transition at Slope

There is no step-flashing observed integrated between each shingle course where the shingle roofing transitions to EIFS cladding at the interior courtyard roof slopes.  This was most likely due to added EIFS renovation required to install.

### New Fire/Smoke Exhaust Vents

Buildings and Grounds Supervisor reports that the smoke exhaust vents on the high roof have leaked for some time and it has been a recurring problem to stop the leaks.

### Sloped Roof Ventilation at west entrance on north side of building.

There is a 1/2 of an aluminum ridge vent butted up against the shingle tor EIFS wall transition. It appears this may be due to condensation ventilation of the soffit below.

### Shingle Roofing

There are a number of shingle repairs observed throughout the steep sloped roofing areas. 1) There is aluminized coating applied to a transition location on the south slope of the school. 2) There are a number of spongy locations of roof deck on the south slope of the school and misc. other areas. 3) Transition flashing at the high point of the sloped roof is improper installed on the north slope of the west side of the building. 4) Penetration flashing are improper installed into the shingle roof that will allow water infiltration. 5) Shingle to EPDM roof transition on east slope of west side of courtyard. 6) Etc.

### Steep Slope EPDM Roof System

There is an EPDM roof membrane installed on the east slope of the west side of the interior courtyard where ice damming and previous repairs were observed.

There is one round vent stack that is flashed with ice and water shield and several penetration boots that are distorted. Snowguards have fallen off at roof edge.

### Standing Seam Metal Roof System

There is one round vent stack that is flashed with ice and water shield and several penetration boots that are distorted. Snowguards have fallen off at roof edge.

### Roof Drainage Along North Elevation Steep Slope Roof System

Roof edge lacks proper gutter and downspout drainage system thus creating moisture that runs down the face of the EIFS cladding below and soil drainage issues at grade below.

### Roof Scuppers

Escutcheon plates on exterior of wall system do not extend out far enough to drain water off exterior wall system.

### Precast Concrete Wall Panels

There are a number of non-structural related hairline cracks observed throughout the school where precast panels are.  In addition to this there are a number of failed precast concrete sealant joints

### EIFS Rehabilitation

The EIFS cladding system is beginning to crack throughout the field of the cladding system.  Additionally, reveals and sealant joints are in a failed condition.  Moisture infiltration is most likely occurring resulting lack of functionality.

### Masonry at West Side of Sloped Roofing

Bricks were observed with cracks through them at the roof level on the east elevation of the west side of the school

### EIFS Kick-out Flashing

There are no kickout flashing installed where the steep slope shingle roof intersects with EIFS at eave/gutter locations which is causing excessive moisture infiltration into the EIFS cladding.

### Delaminating CMU Paint

There is significant paint peeling off of the CMU block on the west elevation at the north entrance.

### Greenhouse Masonry Wall

Interior relative humidity is apparent by evidence of condensation on interior. This is causing masonry deterioration at the foundation wall on the south elevation of the greenhouse.

### Masonry Lintel at South Entrance

The masonry lintel at the south entrance adjacent to the greenhouse requires rehabilitation. The brick veneer is also damaged.

### EIFS Band along South Elevation

There are multiple failed sealant joints and cracked reveals on the EIFS band on the South elevation. Moisture infiltration from the roof drainage above will enter the system at these failure points and prematurely deteriorate the EIFS system.

### Masonry Tuckpointing South Elevation

There are several locations along the south elevation requiring masonry tuckpointing and brick replacement.

### Masonry Cracks on West Elevation at Alcove

There were cracks observed at several locations along the west elevation in the middle alcove.

### Windows - PTAC Unit Sealant

Perimeter PTAC unit sealant is in a failed condition and requires replacement.

### Windowsill Flashing & Control Joint Sealant

Sheet metal windowsill flashings are not sealed at ends, and control joint sealant is in a failed condition.

### Windows - West Elevation at Alcove

Windows are in a deteriorated condition to include extruding seals, failed sealant, open mullion flashings, etc.

### 2nd Story Windows - West Elevation on North Side of Building

Perimeter window/EIFS interface sealant is in a failed condition and requires replacement.

| FIM # | Building Envelope Repairs |
|---|---|
| OFHS-BE-1 | Replace Ballasted EPDM Roofing - Low Priority<br>• EIFS termination will need to be cut out and removed and a new through wall flashing with counterflashing installed where the roof/wall termination occurs. |
| OFHS-BE-2 | Step Flashing Repairs/Installation, Replace Leaking Vents, Replace Roof Vent on North Side of Building<br>• Remove bottom portion of EIFS and install step-flashings at shingle courses. Install proper 2-piece counter flashing and drip edge and re-install EIFS.<br>• Replace smoke exhaust vents with new BILCO smoke vents.<br>• Remove and install less conspicuous roof to wall vent. |
| OFHS-BE-3 | Repair Precast Concrete Wall Panels, New Joints and Sealants<br>• Sand blast precast panels down to concrete substrate. Remove all sealant joints and backer rods. Install new back rod, prime, and sealant. Install elastomeric sealant over entire precast concrete wall surfaces and sealant joints. |
| OFHS-BE-4 | Repair and Reseal EIFS Cladding where Deteriorating, Repair EIFS Sealant at 2nd Story Windows on North Elevation<br>• Powerwash EIFS surface to remove dust and debris.<br>• Rehabilitate areas where the finish coat and brown coat have delaminated.<br>• Apply new coats of EIFS material to insulation substrate to match existing texture.<br>• Install an elastomeric coating the same as the precast concrete panels to prevent future moisture infiltration.<br>• Replace perimeter window to EIFS sealants. |
| OFHS-BE-5 | Repair Masonry at West Side of Sloped Roofing, Modify Greenhouse Masonry Wall with Moisture Problems<br>• There has been sealant applied which is a temporary fix that will require maintenance. Recommend eventually removing bricks and replacing.<br>• Install proper ventilation intake and exhaust at greenhouse and provide proper masonry drainage to include through wall flashing at base of greenhouse and weeps at bottom of masonry wall. |

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|---|---|
| OFHS-BE-6 | Replace Shingled Roofing System, Properly Install Flashing at Penetrations and Transitions<br>• Replace shingle roof system with shingled system or decorative PVC system.<br>• Consult a roof design expert to detail the multiple different roof system and exterior wall cladding systems to ensure a watertight building envelope. |
| OFHS-BE-7 | Replace Steep Slope EPDM Roof System with Shingled Roof, Flashing Repairs at Metal Roof, Roof Scupper Repairs<br>• Recommend replacement with new fully-adhered PVC roof system which mimics a metal roof.<br>• Repair flashing with sheet metal collar and install new roof guards.<br>• Replace escutcheon plates with longer extensions |
| OFHS-BE-8 | Repair Exterior Stairs at North Side of East Elevation<br>• Repair or replace stairs and handrails. |
| OFHS-BE-9 | Install Gutters for Roof Drainage Along North Elevation Steep Slope Roof System<br>• Install gutters and downspouts and tie into nearest stormwater drainage system |
| OFHS-BE-10 | Remove and Replace AC Unit Sealant, Windowsill Flashing and Control Joint Sealant, Install EIFS Flashing, Repaint and Seal Masonry with Peeling Paint, Repair Masonry Cracks<br>• Remove sealants and install backer rod, prime, and reseal.<br>• Cut out EIFS and install kickout flashing at eave/EIFS transition to divert water out away and into new gutter system.<br>• Sand painted masonry down to substrate. Remove all sealant joints and backer rods. Install new back rod, prime, and sealant. Install elastomeric sealant over CMU surfaces and sealant joints.<br>• Repair cracks by cutting in new control joints and replace any cracked bricks with new bricks. Install backer rod, prime, and sealant. |
| OFHS-BE-11 | Replace Windows at West Elevation at Alcove<br>• Replace windows with new, thermally efficient windows. |

| | |
|---|---|
| OFHS-BE-12 | Replace Damaged Lintel by Greenhouse, Replace Sealant Joints at South EIFS, Tuckpointing at South Elevation<br>• Remove masonry to expose lintels, remove corrosion, and coat with an epoxy to preserve. Repair damaged masonry.<br>• Cut out and replace sealant joints. Cut out cracked reveals in EIFS and install sealant joints as prescribed per industry accepted practices. See above (Power-wash EIFS surface to remove dust and debris, rehabilitate areas where the finish coat and brown coat have delaminated. Applied new coats of EIFS material to insulation substrate to match existing texture. Install an elastomeric coating the same as the precast concrete panels to prevent future moisture infiltration.)<br>• Tuckpoint cracks with new mortar and replace broken bricks with new. |

| FIM # | Benefits of Building Envelope Repairs |
|---|---|
| OFHS-BE-1 through OFHS-BE-12 | • Protection from water infiltration and further damage to roofing, interior, and walls.<br>• Reduced future maintenance on roofs and masonry.<br>• Improved exterior aesthetics. |

# ELECTRICAL & SAFETY

## Electrical Service

Oconto Falls High School was constructed in 1967 with further building updates in 1995 and 2001. The electrical service is 208Y/120V, 3-phase, 4-wire, 2000A and was added as part of the 1995 building updates. The service equipment is a Square D QED-style switchboard in Electrical Room 915A, shown right in Figure 1. The BOMA life expectancy for electrical service equipment is 40 years, so it is expected that this equipment is acceptable as installed, provided manufacturer-recommended maintenance has been executed.

*We recommend a thorough assessment of the equipment for replacement within the next 5-10 years.*

It is unclear if a coordination study has been completed to determine the appropriate trip settings on the main and distribution switchgear circuit breakers.

*We recommend performing a coordination study to determine if existing breaker trip settings are acceptable to prevent adverse equipment damage if breakers do not trip properly. If breakers are not properly coordinated, a simple fault at the branch circuit or receptacle level could potentially cause an outage for the entire building.*

The existing building switchboards, panelboards, disconnect switches, and other electrical equipment do not have arc flash labels installed, so it is unclear if an arc flash study has been performed. There is inherently an increased hazard of working on live equipment due to possible buildup of energy being released in an arcing incident. This arcing incident can occur due to failing conductors or even tools incidentally touch live bus bars or contacts causing short circuits. These arcing incidents can cause severe burns and injuries.

*Figure 1: Existing Main Switchboard*

Per NFPA 70E section 130, arc flash labels are required to be applied to electrical equipment, meaning an arc flash study is required to be performed.

*We recommend that a fault current/arc flash study is performed, and appropriate arc flash labels installed to the required electrical equipment. This will bring the existing installation into compliance with current code requirements and provide clear safety guidelines for persons performing maintenance on equipment.*

## Emergency Power System

The building is currently served by two backup generators. One is a 10-kW generator in an existing generator room (Figure 2), and the other is a 60kW generator in Mechanical Room M917A (Figure 3). Based on the panelboard schedules, we were unable to determine if life safety (NEC 700), legally required standby (NEC 701), and optional standby (NEC 702) loads are mixed. While the loads may have been compliant when installed, if any work is performed on the emergency power system, the three load types must be segregated per NEC 700.10 (B).

As part of this assessment, we are recommending other work that will require emergency power distribution work. Because of this, the existing emergency power installation will need to be brought up to current code.

*We recommend performing a study on the existing emergency power installation to evaluate the current infrastructure (generators, transfer switches, fire pump, and panelboards) and determine what work will be needed to bring it into compliance with current NEC code requirements.*

*Figure 2: 10kW Generator*

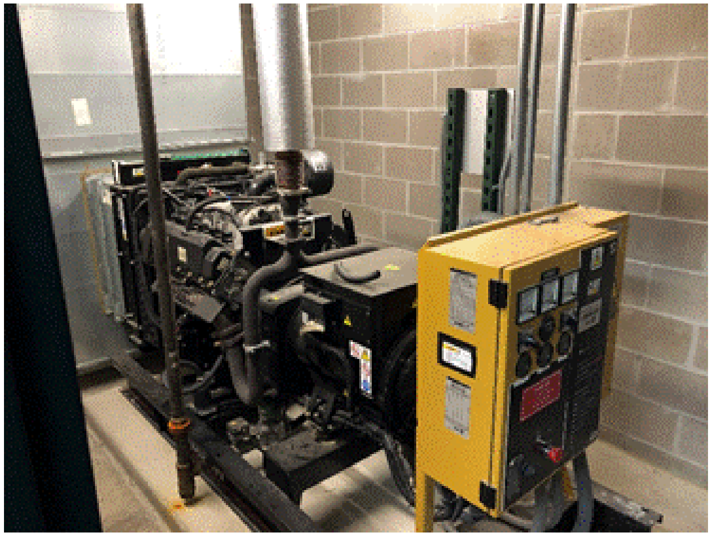


*Figure 3: 60kW Generator*

### Electrical Infrastructure and Grounding

Multiple instances of general-purpose receptacles near sinks (e.g., kitchens or bathrooms) were noted to be regular duty, non-ground fault circuit interrupting (GFCI) type. Per NEC section 210.8, GFCI protection must be installed for all 15- and 20-Amp circuits in these locations.

*We recommend replacing general duty receptacles within kitchen and bathroom areas with GFCI-protected receptacles to comply with code. Additionally, receptacles near mop or washdown sinks and basins should also be replaced with GFCI receptacles.*

In Men's Room 112, the existing panelboard and disconnect switch are located near the washdown/mop sink area but in NEMA 1 enclosures (see Figure 4, right). Per NEC Table 110.28, this enclosure should be type 4X for this installation.

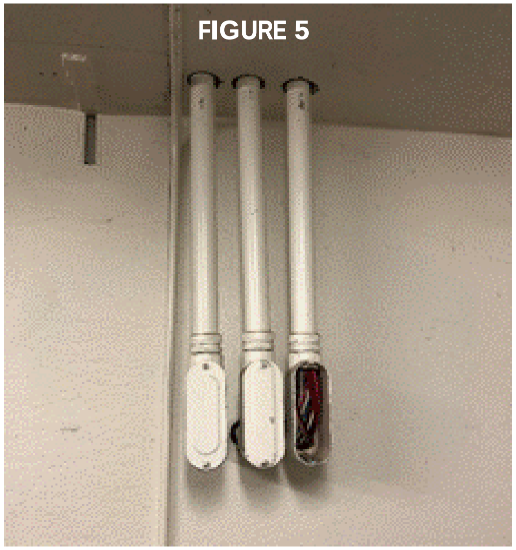
*Since an immediate replacement of the panelboards with NEMA 4X enclosures or relocating will be difficult and/or costly, we would recommend installing a solid partition from the floor to a height greater than the panelboards adjacent to the sink to reduce the chance of splashes. If these pieces of equipment are slated for replacement as part of the more comprehensive building electrical equipment assessment, consideration should just be given to replace with properly rated enclosures.*

Raceway in Gym AV Room 800A is missing a cover on one of its elbow fittings (Figure 5, right).

*We recommend replacing this to prevent incidental conductor damage.*

FIGURE 4

FIGURE 5



The roof is lacking the appropriate weatherproof convenience receptacles within 25 feet of mechanical equipment, as required by NEC 210.63.

*We recommend installing convenience receptacles as part of the next construction work on the roof.*

The existing exterior equipment disconnect switch for the condenser unit is showing signs of degradation, as seen the left in Figure 6. Per NEC Table 110.28, this enclosure should be type 3R for this installation.

*We recommend replacing the disconnect switches with new, NEMA 3R rated devices. Additionally, we would recommend a thorough inspection of all rooftop equipment connections and terminations for corrosion. All instances of corrosion should be removed and replaced with new equipment connections in liquid tight flexible metal conduit (LFMC).*

FIGURE 6

Existing distribution and branch electrical equipment is original to the building. This electrical equipment includes, but is not limited to, disconnect switches, branch panelboards, and distribution panelboards. These pieces of equipment have exceeded or are approaching their BOMA life expectancy of 30 years. In particular, equipment in the basement generator room is original to the building (Figure 7, right) and should be replaced.

*Assuming equipment has been properly maintained, we do not necessarily recommend full equipment replacement throughout the building. However, we recommend a thorough inspection and evaluation of all electrical equipment installed as part of the original building and 1995 building addition. This will limit the chance of failure by identifying equipment or parts that may need cleaning, re-torqueing, or replacement. Additionally, this offers an opportunity to re-evaluate the availability of replacement parts for continued maintenance. Repair or maintain deficient equipment when applicable, but if equipment is defective or cannot properly be maintained because of the inability to source parts, replace immediately.*

FIGURE 7

Numerous equipment working clearance (as defined by NEC 110.26) violations were noted for panelboards, disconnect switches, and other electrical equipment. Areas include, but are not limited to, Science Room 512, Mechanical Room 306A, and Mechanical Room 307A.

*We recommend removing obstructions where practical but relocating or replacing equipment where necessary.*

Existing panelboards throughout the building are missing filler plates in breaker spaces, exposing the live bus, or are only covered by duct tape. NEC 110.12(A) requires that “unused openings... shall be closed to afford protection substantially equivalent to the wall of the equipment”.

*We recommend installing filler plates in uncovered breaker spaces to comply with code and limit potential safety hazards.*

An existing weatherproof receptacle has duct tape securing the cover to the backbox, as seen left in Figure 8.

*We recommend replacing the existing receptacle and weatherproof cover.*

FIGURE 8

The existing Fire Pump controller and disconnect switch are installed adjacent to a washdown/mop sink in a Fire Pump Room 902, which appears to be shared with various other mechanical equipment in the rear of the room and a recessed heater. The fire pump itself was located on a small mezzanine above the controller. NFPA 20 section 4.14.1.1.5 requires that rooms containing fire pumps shall be free from storage, equipment, and penetrations not essential to the operation of the pump and related components. Additionally, section 4.14.1.1.2 states that “indoor fire pump rooms in non-high-rise buildings or in separate fire pump buildings shall be physically separated or protected by fire-rated construction in accordance with Table 4.14.1.1.2”. See Table 4.14.1.1.2 on right.

*We recommend the fire pump be relocated to a dedicated and properly fire-rated room.*

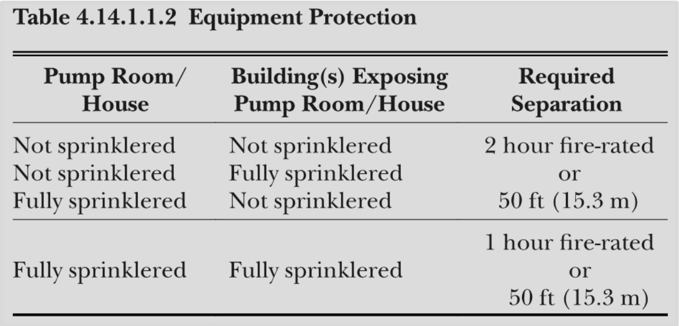


**Table 4.14.1.1.2 Equipment Protection**

| Pump Room/ House | Building(s) Exposing Pump Room/House | Required Separation |
|---|---|---|
| Not sprinklered | Not sprinklered | 2 hour fire-rated or 50 ft (15.3 m) |
| Not sprinklered | Fully sprinklered | |
| Fully sprinklered | Not sprinklered | |
| Fully sprinklered | Fully sprinklered | 1 hour fire-rated or 50 ft (15.3 m) |

FIGURE 9

## Interior Building Lighting

Existing lighting throughout the building consists primarily of fixtures with fluorescent T8 lamps. Some classrooms have fixtures with T8 lamps removed to reduce glare. Modern lighting is typically dimmable LED which has substantially lower wattage consumption than equivalent fluorescent fixtures and will allow users to adjust brightness to eliminate the glare issues previously seen. Because of this, energy savings can often offset installation costs.

*We recommend replacing the existing lighting with equivalent LED fixtures throughout for increased energy savings and reduced maintenance costs.*

Auditorium 309A utilizes high pressure sodium fixtures controlled at a breaker panel shown to the right in Figure 10.

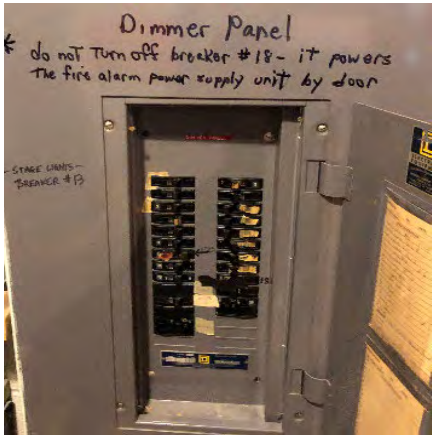
*We recommend replacing these fixtures with equivalent LED fixtures and local dimming controls.* See Figure 7 for breaker panel control.

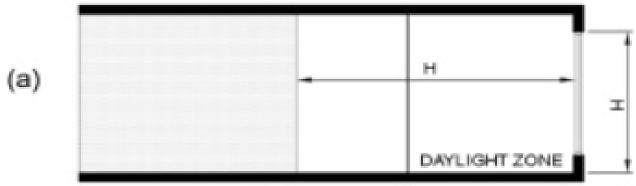
Classrooms throughout the building are controlled by a single switch. Per IECC 2018 Section C405.2.3, spaces with over 150W of lighting must have separate daylight-responsive controls. This means fixtures in the daylighting/sidelit zone (defined in IECC Figure C405.2.3.2, at right in Figure 11) must dim automatically in response to the amount of light coming in the windows separately from the rest of the room. These responsive controls must be able to be calibrated from within the space.

*In order to meet these requirements, we recommend providing photocells separately controlled switching to control new, dimmable LED fixtures that are within daylight zones. Not only would this installation comply with the latest energy code requirements, but it will also offer increased energy savings over the existing installation.*

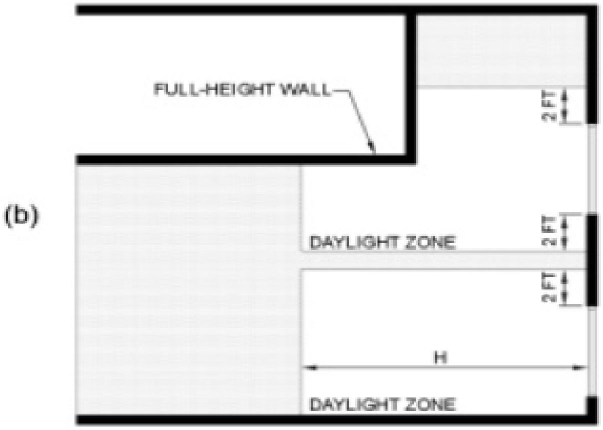
*FIGURE 10 (right)*

*FIGURE 11 (below)*





(a) Section view
(b) Plan view of daylight zone under a rooftop monitor



In addition to only having single switch controls in classrooms, some building areas have occupancy sensors that are installed, but either disabled or non-functional. For example, maintenance staff noted that gymnasium fixtures will turn on without the presence of any one in the space, indicating potentially faulty sensors. Other parts of the building do not have any occupancy sensors installed. Per IECC section C405.2.1, these are required in common school spaces that include, but are not limited to, classrooms, offices, restrooms, and locker rooms.

*As part of the replacements mentioned above, we would also recommend replacement (or addition of new) dual-technology occupancy sensors in rooms to realize greater energy savings and meet IECC requirements. Dual-technology sensors utilize ultrasonic and infrared detection technologies to eliminate false sensing and provide accurate and efficient lighting control.*

Room 112 has fixtures mounted in inaccessible areas due to piping obstructions.

*We recommend replacing these with LED equivalent fixtures in new, accessible locations.*

In Electrical Room 915A and Fire Pump room 902, general task lighting is either insufficient or not installed.

*We recommend adding new LED fixtures to meet IES recommended lighting levels.*

In Agri-Science Lab 212B, fixtures above fish tanks plug into a hanging power strip (Figure 12). We recommend replacing these with wet-listed, gasketed fixtures rated for this application.

*If fixtures need to be cord and plug, we recommend moving the receptacles further away from potential splash area.*

*FIGURE 12*

## TECHNOLOGY & SAFETY

### IT Infrastructure

The existing IT infrastructure has been recently replaced by the Oconto Falls School District over the past two years. The district server is located at Oconto Falls High School and is fed by a dual utility feed with a transfer switch between the two sources. Additionally, it has UPS power available for 400 minutes of run time. The ground bars in IT Rooms 127, 401, and 503 are connected to building steel, but not to the data racks. *We recommend installing ground leads to connect the racks to the ground bars.* In IT Room 503, the rack-mounted equipment was unusually dusty. *We recommend first safely cleaning the equipment, and then investigating the source of dust to correct it.*

### Door Access and Video Surveillance Systems

During a 2019 audit, it was identified that Oconto Falls School District did not have adequate door access control or video surveillance systems. The School District has since upgraded the security systems throughout their buildings. No deficiencies or issues were noted, and as such, we have no recommended security systems work.

### Public Address System

The existing public address (PA) system head end unit is believed to be in IT Room 401, though the make, model, and installation year were unable to be verified. As such, it could not be verified if replacement parts are still able to be sourced to perform maintenance on the system. The existing system is standalone and not currently integrated into the IT infrastructure. Based on discussion with the school district, it is safe to assume the existing system is obsolete. *We recommend replacement of the existing PA system with a new system that is capable of integration into the IT infrastructure. This will include a new head end unit and new speakers throughout the facility. However, if the existing system is fully functional and serviceable, it can remain in service as the system replacement is not high priority unless intelligibility is an issue.*

### Clock System

The existing clock system is a Simplex 1295 Time Control Center system installed in IT Room 127. The installation date could not be confirmed but is assumed to be an obsolete system. The system is standalone and did not appear to be tied into the IT infrastructure. *We recommend replacing the existing system with a new system capable of integration into the IT infrastructure at some point in the future. If this system is fully operational and parts are readily available, it is not a high priority replacement.*

## Fire Alarm System

The current main fire alarm control panel (FACP) is a Simplex 4010 addressable system, shown to the left in Figure 13. This panel was installed as part of the building updates in 2001 but has reached end of life. Due to the age of the system, we assume that mass notification/voice evacuation audio capability does not exist in the current installation. The remainder of the system appears to be pieced together over the years, and as such, has some components that are severely obsolete. For example, a long-discontinued Simplex 4002 is installed in the basement generator room. It is a zoned, non-addressable panel installed prior to the 2001 building addition when the 4010 panel was put in but was integrated into the new head end for notification device syncing.

*Due to the necessity of maintaining this system for future years, we strongly recommend a replacement of the obsoleted Fire Alarm panels with ones that meets the requirements of, and is installed in accordance with, NFPA 72 and International Building Code. The new fire alarm system should be an addressable, emergency voice-alarm communications (EVAC) system with capacity for future building expansions. To allow the school district to monitor the site remotely, it should and be networkable to integrate it into the new IT infrastructure.*

FIGURE 5: Existing Simplex 4010 Fire Alarm Control Panel

The current fire alarm notification device age and quantity are deficient. It was observed that numerous classrooms were missing required devices including, but not limited to, the Basement Generator Room, Mechanical room 307A, Counseling Center, and 1995 addition classrooms as is required by the current NFPA 72. Most notification and initiating devices are past their expected useful life of 15 years, as defined by BOMA. *We recommend replacing existing devices in the original, 1995, and 2001 building areas to maintain continued functionality. We also recommend adding notification and initiating devices in rooms that are currently deficient.*

Classrooms 103 and 208 and Art Room 113 had Smart Boards and cabinetry blocking strobe notification devices. *We recommend relocating the obstructing equipment as soon as possible.*

However, due to the number of devices needing replacement or to be added exceeding 20, the entire system will need to be submitted for state review. This means that the fire alarm system will likely need to be brought up to current code (EVAC) requirements. *Because of precedent set with other state-reviewed jobs of a similar nature, we recommend a total fire alarm system replacement, as solely replacing the panels or adding and replacing devices will not meet the requirements to pass state review.*

| FIM # | Electrical and IT Infrastructure Improvements |
|---|---|
| OFHS-EE-1 | • Provide emergency power system study<br>• Based on our assumptions of corrections to be made (likely worst case) the required corrective work will include addition of ATS, replacement of older panelboards, and re-feeding/segregating loads by NEC type classifications |
| OFHS-EE-2 | • Provide new fire alarm control panel for future expansion and voice capability<br>• Provide entirely new addressable fire alarm system |
| OFHS-EE-3 | • Perform coordination study and adjust circuit breaker trip settings as necessary<br>• Perform fault current/arc flash study and apply arc flash labels to equipment<br>• Provide new partition between washdown/mop sink and electrical equipment in Men's Room 112 until it is viable to replace or relocate panel<br>• Replace rooftop disconnect switches with NEMA 3R rated equipment, and inspect and replace equipment connections<br>• Provide breaker filler plates where currently exposed or duct taped<br>• Relocate (or replace in new location) electrical equipment with inadequate working clearances |
| OFHS-EE-4 | • Replace noncompliant general-purpose receptacles with GFCI-type receptacles in kitchens, bathrooms, and near sinks per NEC<br>• Add grounding lead from ground bar to data rack in IT Rooms<br>• Inspect original electrical equipment past useful life expectancy, and repair or replace as necessary<br>• Replace conduit box/LB fitting cover in Gym AV Room 800A<br>• Install new weatherproof roof receptacles within 25' of all existing rooftop equipment |

| | |
|---|---|
| OFHS-EE-5 | • Replace fluorescent and HPS fixtures with dimmable LED equivalents<br>• Modify lighting controls and provide photocells in rooms with windows<br>• Add and replace existing occupancy sensors with new, dual-technology sensors<br>• Replace lighting over fish tanks with appropriately rated fixtures<br>• Replace auditorium light fixtures and controls with dimmable LED equivalent<br>• Relocate inaccessible light fixtures in mechanical/electrical spaces and supplement lighting to meet IES recommended lighting levels |
| OFHS-EE-6 | • Provide new PA system<br>• Provide new central clock system |

| **FIM #** | **Benefits of Electrical and IT Infrastructure Improvements** |
|---|---|
| OFHS-EE-1 | • Corrective work needs to take place to facilitate all future EM additions/rework |
| OFHS-EE-2 | • Ensures a system in full compliance with all current regulations, corrects device deficiencies and inadequate coverage, and passes state review. Ensures a system in full compliance with all current regulations, corrects device deficiencies and inadequate coverage, and most importantly, pass state review. |
| OFHS-EE-3 | • Reduce risk of improper breaker function and protect electrical equipment<br>• Verify existing equipment ratings to improve safety of operation and maintenance staff working on electrical equipment and comply with NEC code requirements<br>• Reduces risk of fault caused by splashing water infiltrating panel enclosure. Panel should ultimately be replaced or relocated<br>• Reduces risk of fault caused by water infiltrating enclosure or shorting caused by corroded/degrading connections<br>• Prevents accidental contact with exposed panelboard bus<br>• Relocate (or replace in new location) electrical equipment with inadequate working clearances |

| | |
|---|---|
| OFHS-EE-4 | • Provides safe operation of convenience receptacles to reduce or eliminate possibility of fault<br>• Provides a path for unwanted current/static discharge away from sensitive networking equipment<br>• Reduces risk of equipment failure and extends the life of equipment before replacement is required |
| OFHS-EE-5 | • Prevents exposed conductors in raceway being accidentally damaged<br>• Provides code compliant installation and reduces possibility of tripping hazards because of extension cords when roof equipment is being serviced |
| OFHS-EE-6 | • Ensures adequate visibility for safe maintenance of mechanical and electrical equipment<br>• Decrease energy usage related to lighting, limit maintenance effort to replace lamps, and comply with current IECC and ASHRAE 90.1 energy codes<br>• Drastically reduces chance of a fault caused by water infiltration<br>• Provides local controls to control lighting instead of breaker panel control. Reduces energy usage with higher efficacy fixtures |
| OFHS-EE-7 | • Improve audible clarity of voice announcements for occupants with hearing impairment<br>• Improve ability to maintain the system into the future with readily available new parts |

## Codes and Guidelines Referenced

The following codes and guidelines are referenced within this analysis to ensure the safety and well-being of building occupants and personnel and limit fire or other building hazards:

- Building Owners and Managers Association (BOMA) International has published a preventative maintenance guidebook intended to illustrate “best practices to maintain efficient and sustainable buildings.” In it, Appendix 7 lists the expected useful life for numerous building systems and components. Specifically, we reference Appendix 7, sections E and F.
- National Fire Protection Association (NFPA) is an international organization that publishes numerous codes and standards intended to eliminate death, injury, and property and economic loss due to fire- and electrical-related hazards. For our analysis, we are looking specifically at NFPA codes 70, 70E, 72, and 101. They are the National Electric Code (NEC), Standard for Electrical Safety in the Workplace, National Fire Alarm and Signaling Code, and Life Safety Code, respectively.
- NFPA 70, or as it is commonly referred to as the NEC, is “the benchmark for safe electrical design, installation, and inspection to protect people and property from electrical hazards”. We refer to this often as it is the electrical code all residential and commercial building electrical construction must adhere to.
- NFPA 70E lays out requirements for safe work practices intended to protect personnel from exposure to major electrical hazards. This code was written to help comply with OSHA 1910 Subpart S and OSHA 1926 Subpart K in limiting “workplace injuries or fatalities due to shock, electrocution, arc flash, or arc blast.”
- NFPA 72 defines the latest safety provisions regarding fire detection, signaling, and emergency communications demands. This code is critically focused on fire alarm and mass notification systems to ensure safety of all building occupants in the event of emergencies or threats.
- NFPA 101 is used to protect people based on building construction, protection, and occupancy features to minimize the effects of fire and related hazards, covering both new and existing buildings.
- The International Energy Conservation Code (IECC) is a widely adopted energy code which establishes a “baseline for energy efficiency by setting performance standards for the building envelope (defined as the boundary that separates heated/cooled air from unconditioned, outside air), mechanical systems, lighting systems, and service water heating systems in homes and commercial businesses.” As part of this analysis, we are focused solely on the parts of the code related to lighting systems.
- The Illuminating Engineering Society (IES) is the recognized technical and educational authority on lighting, which publishes lighting standards and recommended practices for lighting design. For this analysis, we are utilizing illuminance recommendations for electrical and mechanical spaces with the intent to recommend ample light for operating and maintenance personnel to make repairs or replacements effectively and safely in often-overlooked spaces.

# MECHANICAL & ENVIRONMENTAL

## Direct Digital Controls (DDC) Supervisor Upgrade

The Oconto Falls High School utilizes DDC systems, however the school does not utilize a district supervisor control system, so the high school building is managed independently from the other facilities within the district.

Nexus recommends integrating the High School into a District Supervisor, which is a control interface on which all schools can be monitored from one platform. Benefits of this controls upgrade include improved equipment scheduling and troubleshooting, alarm monitoring, operational tracking, and trending of mechanical equipment parameters.

| FIM # | Direct Digital Controls Supervisor Upgrade |
|---|---|
| OFHS-ME-1 | Provide building automation system platform with remote access via a District Supervisor<br>• Provide all programming required for this conversion |

| FIM # | Benefits of Direct Digital Controls Supervisor Upgrade |
|---|---|
| OFHS-ME-1 | Easy-to-use, modernized system control<br>• Improved building monitoring and maintenance troubleshooting<br>• Extended system life<br>• Improved occupant comfort<br>• Reduced energy consumption<br>• Reduced maintenance |

## Heating Plant Upgrades - Boiler Replacement, Heating System Glycol, Replace 1995 Heating Pumps, Upgrade Air Separators

Currently, there are 4 hot water boilers that serve the 1967 and 1995 portions of the building. These existing heating water boilers are 25 years old and have reached the end of their recommended service life. This results in potentially more equipment downtime and increased maintenance costs.

Nexus recommends replacing the old inefficient boiler plant with three (3) new high-efficiency condensing boilers. The installation of three (3) boilers will provide the required redundancy should one of the boilers require service during the heating season. The system pumps will also be replaced and increased in size to match the capacity of the new heating system.

Replacing these boilers will reduce gas consumption. Condensing, high-efficiency boilers will be specified and sequenced to take advantage of lower water temperatures and provide an aggressive hot water reset schedule resulting in lower operating costs.

The existing heating water system does not contain glycol. Glycol is an important compound to have in hydronic heating systems that are exposed to freezing temperatures. It acts as an antifreeze, preventing the buildup of ice in the system which can cause heating piping and coils to burst.

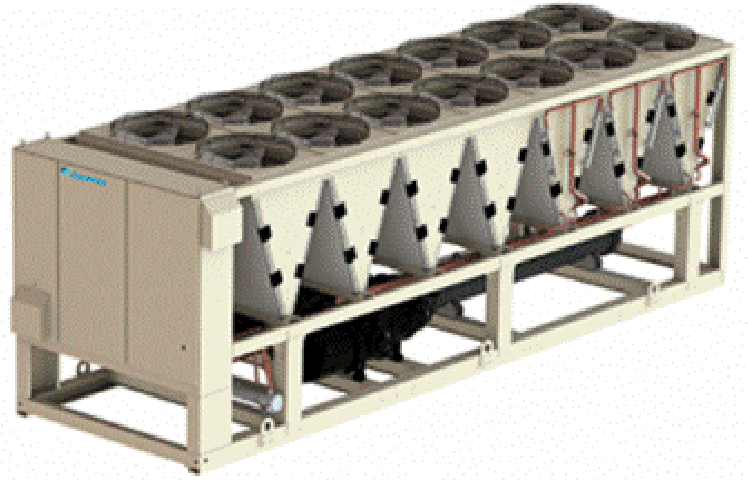
We recommend adding propylene glycol to the hydronic heating system in a solution that is 35% propylene glycol and 65% water. An air and dirt separator would be added to collect any particulate, debris, and rust within the water volume and keep the glycol and piping clean. A glycol fill tank would be installed to allow for ease of refilling the heating piping system when required.

| FIM # | Heating Plant Upgrades - Boiler Replacement, Heating System Glycol, Replace 1995 Heating Pumps, Upgrade Air Separators |
|---|---|
| OFHS-ME-2 | • Remove existing inefficient boilers<br>• Install three (3) new fully modulating condensing boilers with integral primary boiler pumps<br>• Add propylene glycol to the system<br>• Add a glycol fill tank and pump for ease of refill<br>• Add side-stream filter to collect debris and rust |

| FIM # | Benefits of Heating Plant Upgrades - Boiler Replacement, Heating System Glycol, Replace 1995 Heating Pumps, Upgrade Air Separators |
|---|---|
| OFHS-ME-2 | • Optimized boiler plant operation<br>• Reduced future maintenance<br>• Increased energy savings<br>• Extended heating system life |

## Chiller Replacement and Increased Chilled Water Capacity & Piping System for 1967 & 1995 Additions

Currently, the majority of the High School is cooled. This excludes the 1967 Old Gym and Locker Rooms as well as the Tech Ed laboratory spaces. The lack of cooling/dehumidification results in higher humidity levels and occupant discomfort in those areas of the building. The spaces are also unable to meet the American Society of Heating and Refrigeration Engineer's (ASHRAE) Thermal Environmental Conditions for Human Occupancy Standard 55-2017. 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. The indoor environmental requirements include temperature, thermal radiation, humidity, and air speed.



Nexus recommends the installation of a new air-cooled chiller and pumps. A new air-cooled chiller would be installed to supply the building with chilled water for cooling. The chiller would be sized to cool the entire building including a possible future conversion of the direct expansion cooling systems from 1995 additions to chilled water. A cooling coil would be installed in each new or existing air handling unit serving spaces without cooling. The piping necessary for cooling/dehumidification of the code required ventilation air would be installed. An air and dirt separator would be added to collect any particulate, debris, and rust within the water volume and keep the glycol and piping clean. A glycol fill tank would be installed to allow for ease of refilling the heating piping system when required. There is a not a glycol fill tank currently and this makes it more difficult to maintain consistent pressure in the system if not full charged or if a leak occurs.

The benefits of this HVAC improvement measure include improved occupant comfort, reduced future maintenance costs, and improved temperature control.

| FIM # | Chiller Replacement and Increased Chilled Water Capacity & Piping System for 1967 & 1995 Additions |
|---|---|
| OFHS-ME-3 | • Provide new air-cooled chiller, pumps, and distribution piping<br>• Provide propylene glycol to the system<br>• Provide associated construction including general, electrical, and controls work required |

| FIM # | Benefits of Chiller Replacement and Increased Chilled Water Capacity & Piping System for 1967 & 1995 Additions |
|---|---|
| OFHS-ME-3 | • Improved thermal comfort<br>• Reduced future maintenance<br>• Extended operational life of the system |

## Classroom Ventilation Upgrades to Displacement Ventilation

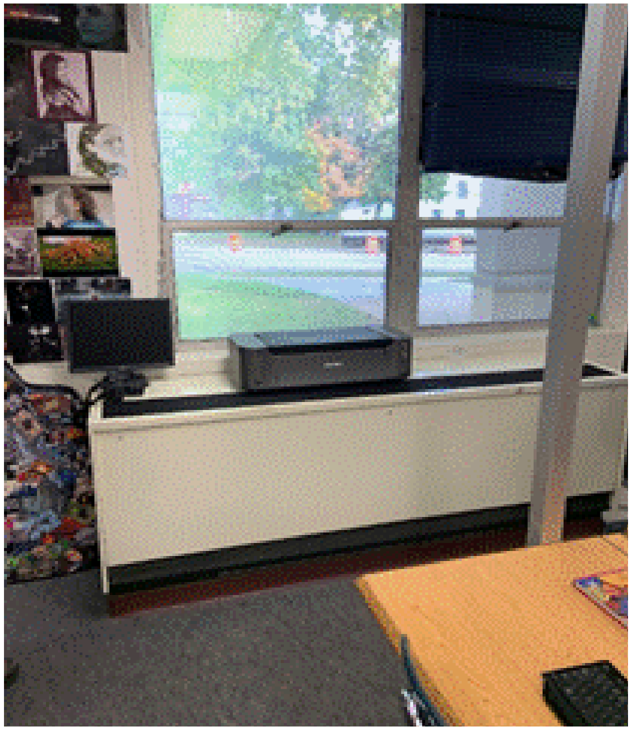
There are some existing 2001-unit ventilators that are beyond their useful life and in need of replacement. Older Unit Ventilators are noisy and often do not keep good temperature control of spaces.

As an option, the district could replace the existing unit ventilators with a displacement ventilation system. New air handling systems would be installed to provide ventilation to the spaces currently being served by unit ventilators. Energy recovery would be incorporated into these units to reduce the energy required to treat the code required ventilation air.

Cabinet Displacement Ventilation Units (CDVUs) with hot and chilled water terminal coils would be provided to each zone using externally insulated overhead ductwork, which would distribute the ventilation air to each space.

Displacement units would be located on exterior walls and distribute ventilation and cool air across the floor at a low velocity and up through the breathing zone providing occupants with the best air quality possible. Air is not shared between classrooms.

Benefits of the HVAC system modifications include increased system life expectancy, improved indoor air quality, improved occupant comfort and improved learning/work environment.



| FIM # | Classroom Ventilation Upgrades to Displacement Ventilation |
|---|---|
| OFHS-ME-4 | • Provide new displacement diffusers with hot and chilled water coils for classroom spaces<br>• Provide variable air volume boxes (VAV) with hot water heating coils and new diffusers for office spaces<br>• Provide the associated electrical and general construction work required |

| FIM # | Benefits of Classroom Ventilation Upgrades to Displacement Ventilation |
|---|---|
| OFHS-ME-4 | • Extend operational life of the building<br>• Improved indoor air quality<br>• Improve occupancy comfort with cooling<br>• Improved learning/work environment<br>• Reduced maintenance<br>• Energy savings with reduced fan speed |

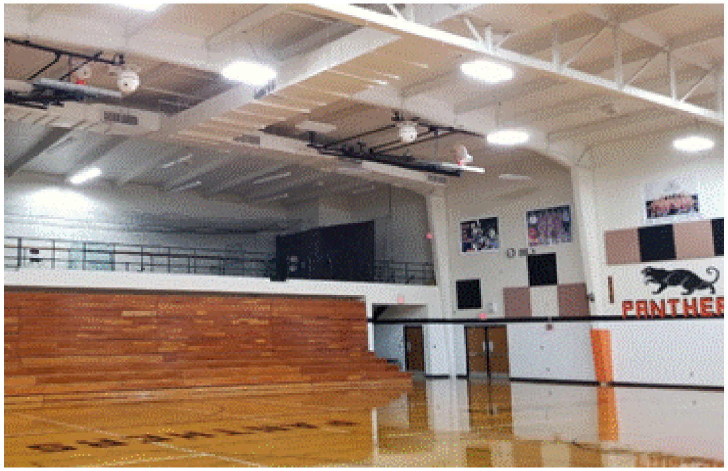
### 1967 Gym Air Handling Unit (AHU) Replacement and Addition of Cooling

The air handling units serving the 1967 gymnasium and locker room area are 65 years old and well past their useful life and are in need of replacement. These air handling units do not contain cooling coils and can not cool the spaces served.

Nexus proposes replacing this unit with a new air handling unit. The existing antiquated single wall air handling unit will be replaced with a new double wall, code compliant air handling unit with filter sections, heating water coils, chilled water-cooling coils, access sections, and supply fans with variable speed drives (VSD). These spaces would also have remote relief air fans with VSDs installed to maintain neutral air pressure in the spaces.

Demand control, carbon dioxide level driven ventilation controls will be installed on the gymnasium unit to reduce outside airflow during lightly occupied timeframes. As ventilation requirements have increased since the original installation, increased outside air capabilities will be designed into the new unit to not only comply with current codes, but improve the indoor air quality in the space.

Benefits of the HVAC system modifications include increased system life expectancy, improved maintenance access, improved DDC scheduling, increased ventilation, increased energy savings, improved occupant comfort and an improved learning environment.



| FIM # | 1967 Gym Air Handling Unit (AHU) Replacement and Addition of Cooling |
|---|---|
| OFHS-ME-5 | Remove existing air handling unit, piping, ductwork, and controls<br>• Provide new air handling unit with hot water heating coil, chilled water-cooling coil, and new ductwork<br>• Provide variable speed drives for the supply and remote relief fans<br>• Provide carbon dioxide sensors and controls for demand control ventilation<br>• Provide DDC controls, sequencing, and programming<br>• Provide all associated general and electrical construction work required |

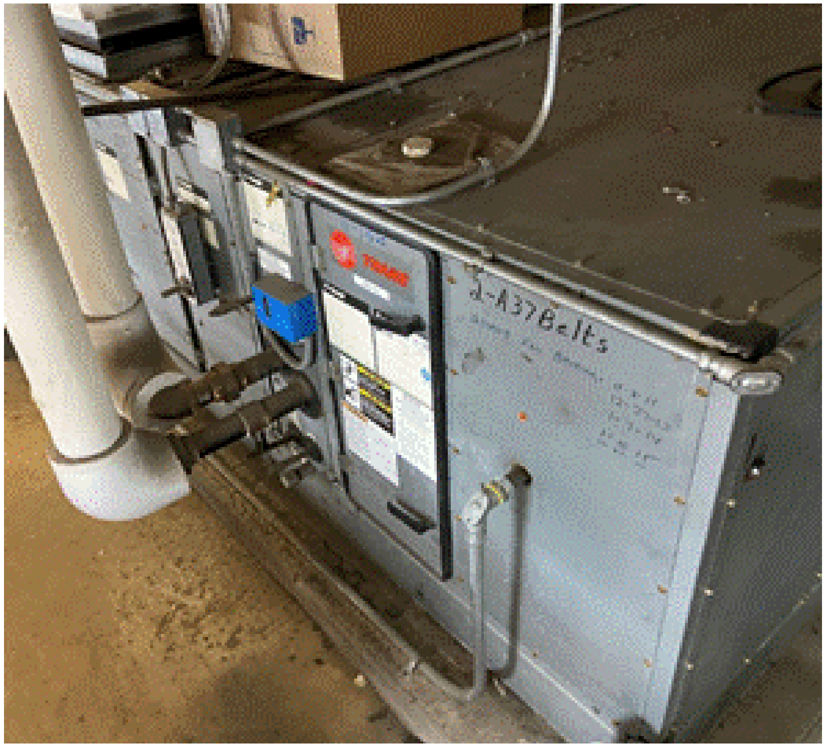
| FIM # | Benefits of 1967 Gym Air Handling Unit (AHU) Replacement and Addition of Cooling |
|---|---|
| OFHS-ME-5 | • Upgraded HVAC infrastructure<br>• Increased ventilation for improved indoor air quality<br>• Reduced energy costs with the incorporation of demand control ventilation<br>• Improved occupant comfort<br>• Improved learning/work environment |

## Air-Conditioning Additions to Tech Ed

The Tech Ed spaces including the Woods, Metals, and Small Engines shop areas are not cooled. This decreases occupant comfort and leads to issues with humidity control of the spaces and longevity of equipment in these spaces.

Nexus recommends the addition of cooling to these spaces. Cooling would be added to the three Tech Ed air handling units (AHU) via the addition of new cooling coils in the Units. A full analysis of loads will be completed, and ventilation will be brought up to current code in all spaces.

Benefits of this addition would include reduced maintenance costs and increased occupant comfort and air quality.



| FIM # | Air-Conditioning Additions to Tech Ed |
|---|---|
| OFHS-ME-6 | • Add cooling to existing Tech Ed AHUs<br>• Provide the associated electrical and general construction work |

| FIM # | Benefits of Air-Conditioning Additions to Tech Ed |
|---|---|
| OFHS-ME-6 | • Improved occupant comfort<br>• Improved indoor air quality<br>• Improved occupant health<br>• Improved air filtration<br>• Reduced future maintenance<br>• Upgraded system control<br>• Ensured proper ventilation of the equipment |

### 1995 IMC and Classroom AHU and Condensing Unit Replacement

The 1995 IMC and Classroom addition is served by an Air Handling Unit (AHU) with Direct Expansion (DX) cooling that is provided by a condensing unit on grade adjacent to the addition. This AHU has some significant maintenance issues including leaks, lack of access, and insulation and other components that no longer work as originally designed. The condensing unit has reached the end of its recommended service life and is in need of replacement.

Nexus recommends the replacement of this condensing unit and the repair of the air handling unit. As an option, the district could opt to replace the AHU as well as the condensing unit with a new variable air volume air handling unit.

Benefits of the HVAC system modifications include increased system life expectancy, improved maintenance access, increased ventilation, energy savings, and improved occupant comfort.

| FIM # | 1995 IMC and Classroom AHU Replacement |
|---|---|
| OFHS-ME-7a | Condensing Unit Replacement<br>• Remove existing condensing unit, piping, and controls<br>• Provide new remote condensing unit and piping to AHU<br>• Provide the associated electrical and general construction work |
| OFHS-ME-7b | Air Handling Unit Replacement<br>• Remove existing air handling unit, piping, ductwork, and controls<br>• Provide new air handling unit with hot water heating and chilled water or DX cooling coil<br>• Provide the associated electrical and general construction work |

| FIM # | Benefits of 1995 IMC and Classroom AHU Replacement |
|---|---|
| OFHS-ME-7a | Condensing Unit Replacement<br>• Improved occupant comfort<br>• Reduced future maintenance<br>• Improved ability to maintain equipment |
| OFHS-ME-7b | Air Handling Unit Replacement<br>• Improved occupant comfort and health<br>• Improved indoor air quality<br>• Improved air filtration<br>• Reduced future maintenance<br>• Improved ability to maintain equipment |

## Replacement of Fan Coil Units serving Guidance and Pupil Services with Air Handling Unit

The Guidance and Pupil Services offices to the north of the Old Gym are currently cooled by two fan coil units. Many of these spaces do not have adequate airflow or thermostatic control leading to comfort issues in these spaces.

Nexus recommends the replacement of the Fan Coil Units in these spaces with a new variable air volume air handling unit that would supply heated or cooled air to each space via VAV Boxes with hot water reheat coils.

Benefits of the HVAC system modifications include increased system life expectancy, improved maintenance access, increased ventilation, energy savings, and improved occupant comfort.

| FIM # | Replacement of Fan Coil Units serving Guidance and Pupil Services with Air Handling Unit |
|---|---|
| OFHS-ME-8 | • Remove existing fan coil units, piping, ductwork, and controls<br>• Provide new air handling unit with hot water heating, DX or chilled water-cooling coil, and new ductwork<br>• Provide Variable Air Volume terminal boxes with hot water reheat coils for zone temperature control.<br>• Provide the associated electrical and general construction work |

| FIM # | Benefits of Replacement of Fan Coil Units serving Guidance and Pupil Services with Air Handling Unit |
|---|---|
| OFHS-ME-8 | • Improved occupant comfort<br>• Improved indoor air quality<br>• Improved air filtration<br>• Reduced future maintenance<br>• Improved ability to maintain equipment<br>• Upgraded system control |

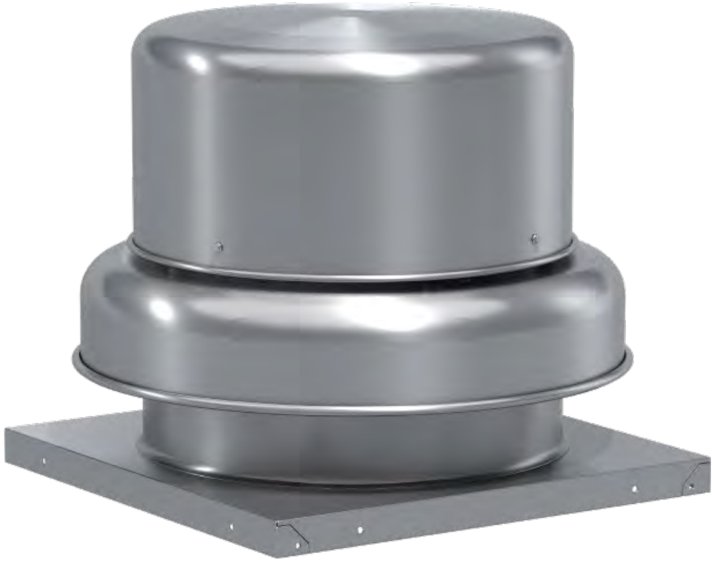
## Exhaust Fan (7) Replacements, Addition of Thermal Equalizers in 1967 Gym, Wrestling, and Commons

Some exhaust fans serving the school have exceeded their recommended service life and are in need of replacement. The Gym (due to the height of these spaces) suffers from temperature stratification. Warmer air migrates to the ceiling making it difficult to achieve proper temperature control, especially in the winter.

The district may want to consider replacement of these fans when major work is taking place so the best pricing can be obtained from contractors. We have budgeted for the replacement of 10 existing exhaust fans. 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. Direct drive fans will be utilized where possible to reduce fan belt maintenance.

Nexus also recommends the installation of thermal equalizer de-stratification fans in the Gym to ensure proper ventilation.

The benefits include improved workstations and proper ventilation for the equipment.



| FIM # | Exhaust Fan (7) Replacements, Addition of Thermal Equalizers in 1967 Gym, Wrestling, and Commons, Welding Exhaust Improvements |
|---|---|
| OFHS-ME-9 | • Replacement of 7 existing exhaust fans<br>• Install thermal equalizers in joist space and wire to wall switch/controls<br>• Provide the associated general, electrical, and controls construction work |

| FIM # | Benefits of Exhaust Fan (7) Replacements, Addition of Thermal Equalizers in 1967 Gym, Wrestling, and Commons |
|---|---|
| OFHS-ME-9 | • Increased energy savings from ECM motors<br>• Improved flow and reduced maintenance for exhaust fans<br>• Energy Savings<br>• Occupant health<br>• Occupant comfort<br>• Improved temperature control |

## Dust Collector & Ductwork Replacement and Welding Exhaust Improvements

The wood dust collector is currently having issues capturing dust due to possible lack of airflow or pressure and results in all surfaces being covered with dust. Additionally, the system does not recirculate air back into the building. This results in a significant volume of conditioned air being exhausted, wasting the energy used to condition the make-up air to the space.

The energy saving potential is further increased if cooling is added to the Tech Ed Spaces. The current welding hoods are also located directly above users and exhaust travels past the student's breathing zone. This does not meet current ventilation standards.

Nexus recommends replacement of the wood shop dust collector unit with modern system that includes recirculation for the conditioned air back into the building to save energy. Nexus also recommends replacing the existing welding hoods with new slotted plenum capture hoods and any associated ductwork. The new hoods would be located on the back wall of the welding booths where welding exhaust capture pulls the contaminants away from the user and complies with the most current Industrial Ventilation Handbook.

Benefits if these changes include energy savings and increases in the safety and comfort of students using the spaces via improved air quality with proper ventilation. Maintenance costs would also be reduced.

| **FIM #** | **Dust Collector Replacement and Welding Exhaust Improvements** |
|---|---|
| OFHS-ME-10 | • Remove existing wood shop dust collector<br>• Provide a new recirculating dust collector for the Wood Shop<br>• Demo existing weld hoods and all associated ductwork<br>• Provide all new hoods and ductwork required<br>• Provide the associated electrical and general construction work<br>• Provide code required fire protection for collector |
| **FIM #** | **Benefits of Replacing Dust Collector and Welding Exhaust Improvements** |
| OFHS-ME-10 | • Energy savings<br>• Reduced future maintenance<br>• Improved indoor air quality<br>• Ensure proper ventilation of welding booths<br>• Occupant health<br>• Occupant comfort<br>• Upgraded system control |

## IT Room Cooling

There is an IT Room in the 1995 addition that is currently utilizing a temporary air conditioning system for cooling. The temporary system uses conditioned air and exhausts it to the outside which uses more energy for the air handling unit which provides the makeup air. Also, the temporary system does not have the life expectancy that a permanently installed system does.

Nexus recommends adding a new split-system cooling unit to this room to provide a more reliable and energy efficient source of cooling in this critical space.

The benefits are improved system reliability and room temperature control and reduced risk of system outages.

| FIM # | IT Room Cooling Upgrade - Replace Portable Air Conditioner with Split Cooling Unit |
|---|---|
| OFHS-ME-11 | • Provide new split-system cooling unit appropriately sized to cool the IT equipment space during all times of the year<br>• Provide all required electrical and general construction work |

| FIM # | Benefits of IT Room Cooling Upgrade - Replace Portable Air Conditioner with Split Cooling Unit |
|---|---|
| OFHS-ME-11 | • Reduced risk of system outages<br>• IT infrastructure protection<br>• Improved temperature control and monitoring ability<br>• Improved system life expectancy |

## Handwashing Sink Conversions from Manual to Sensor Operation & Wrestling Locker Room Shower Valve (14) Replacement

Some existing handwashing sinks throughout the building utilize manual metering faucets which require several pushes to use and may be frustrating for users. Many of these valves use higher flow volumes than modernized valves. The boy's locker room shower valves are not functioning properly and are a maintenance issue.

Nexus recommends replacement of the faucets with modern, battery powered sensor operated units that are more water efficient. It is also recommended to replace the shower valves that function properly and are newer.

Benefits would include decreased water consumption and increased hygiene as well as reduced maintenance.

| **FIM #** | **Handwashing Sink Conversions from Manual to Sensor Operation & Wrestling Locker Room Shower Valve (14) Replacement** |
|---|---|
| OFHS-ME-12 | • Replace existing manual lavatory faucets with sensor operated faucets and wrestling room shower valves |

| **FIM #** | **Benefits of Handwashing Sink Conversions from Manual to Sensor Operation & Wrestling Locker Room Shower Valve (14) Replacement** |
|---|---|
| OFHS-ME-12 | • Reduced Water Consumption and Maintenance<br>• Increased hygiene |

### Water Heater Capacity Increase with Addition of Storage Tank

The existing water heater serving the 1967 Old Gym Wrestling Locker Rooms located in the boiler room is not able to utilize a storage tank to increase system capacity because the storage tank was disconnected by the Ameresco project and has sat empty for the past seven years. The wrestling team runs out of hot water when all the showers are operating.

Nexus recommends replacement of the existing storage tank with a right-sized tank as required for that area of the building. Nexus does not recommend reusing the tank since we are unsure of the integrity of the inside of the tank and that a new tank can be rightsized and be smaller.

Benefits would include improved system operation and increased Domestic Hot Water heating system capacity.

| FIM # | Water Heater Capacity Increase with Addition of Storage Tank |
|---|---|
| OFHS-ME-13 | • Replace existing Domestic Hot Water Storage Tank |

| FIM # | Benefits of Water Heater Capacity Increase with Addition of Storage Tank |
|---|---|
| OFHS-ME-13 | • Improved system operation<br>• Improved DHW capacity |

### Fire Protection (Sprinkler System) - Entire Building System Addition

The building does not have a fire protection system installed and is not protected from property loss or life safety during a fire event.

Nexus proposes installing a wet-pipe fire protection system to the entire building while the ceiling is being replaced.

Benefits of fire protection addition include increased occupant safety and reduced damage during a fire event.

| FIM # | Fire Protection (Sprinkler System) - Entire Building System Addition |
|---|---|
| OFHS-ME-14 | • Install a wet-pipe fire protection system to fully protect the building<br>• Provide general and electrical construction as required |

| FIM # | Benefits of Fire Protection (Sprinkler System) - Entire Building System Addition |
|---|---|
| OFHS-ME-14 | • Reduced damage during fire event<br>• Increased occupant safety |

# RETRO-COMMISSIONING ACTIVITIES

## HVAC Systems Optimization

Building Retro-commissioning is a systematic process that ensures all building systems 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 Nexus Retro-Commissioning Team will identify the root cause of HVAC equipment operational issues and will provide adjustments to the sequences and outdoor air settings to improve occupant comfort while reducing energy consumption where possible. The retro-commissioning process will also identify components that require adjustment or replacement.

This work will apply to all 2000 HVAC equipment as well as the 1995 HVAC equipment that will be re-used. Retro-commissioning activities are defined on the following page.

**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 unit ventilator (UV) 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 UV 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 valves 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.

**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.*

| FIM # | HVAC Systems Optimization (RCx & Sequences & Sensors) |
|---|---|
| OFHS-ME-15a | 2000 HVAC Equipment & Any Reused 1995 HVAC Equipment<br>• Provide retro-commissioning of all existing and re-used HVAC systems from the 2000 and 1995 areas of the building<br>• Provide adjustments to existing sequences to improve HVAC system operation<br>• Verify operation of all dampers, actuators, valves, and terminal HVAC devices |
| OFHS-ME-15b | Entire Building<br>• Provide retro-commissioning of all existing and re-used HVAC systems<br>• Provide adjustments to existing sequences to improve HVAC system operation<br>• Verify operation of all dampers, actuators, valves, and terminal HVAC devices |

| FIM # | Benefits of HVAC Systems Optimization (RCx & Sequences & Sensors) 2000 HVAC Equipment & Any Reused 1995 HVAC Equipment |
|---|---|
| OFHS-ME-15a Through OFHS-ME-15b | • Improved temperature control and occupant comfort<br>• Reduced energy consumption<br>• Reduced maintenance<br>• Extended HVAC equipment life |

# OCONTO FALLS HIGH | EDUCATIONAL ADEQUACY SCORECARD

Educational Adequacy (EA) is an analysis of how well the design of educational spaces in each building support instruction as defined by the District's strategic plan, personalized learning framework, technology plan, demographic trends, student enrollment and building utilization and capacities. Our analysis includes staff interviews/surveys and school space/capacity studies, as well as school utilization based on enrollment projections and boundaries to determine if they can adequately support modern learning needs. At the end of the process, each school receives a scorecard that evaluates 22 different components and ranks each as Green=Adequate, Yellow=Questionable or Red=Inadequate. These final scores guide recommendations for the most cost-effective and sustainable improvements to best address the deficiencies identified.

| Key Program Area | | Rating | Summary |
|---|---|---|---|
| Site | 1. Site Size, Outdoor Fields & Greenspace Areas | G | Newer athletics fields. Erosion issue built into a hill. Don't own a baseball facility, trade with facility. Two baseball fields would be preferred. |
| | 2. Site Traffic, Safe Routes, Parking | Y | Parking is good on school day, tight on events. 10-12 buses stack at any one time. Sight line issue at main entry when you used for parent pick up. SPED Dropoff doesn't have automatic opener on doors. 2 SPED buses. |
| General | 3. Security/Supervision | G | Some blind spots in camera coverage. Somewhat secure entry. |
| | 4. ADA Accessibility | G | Main office doesn't have automatic opener. SPED entrance also not ADA. |
| | 5. Administrative/Nurse/Student Support | Y | Small conference room, Principal's Office is large, AP smaller, mailboxes, workspace probably a little tight, max 8 people or have to use LMC. Small toilet/medical supplies by copier. SRO is in 101. Bellin counselor once a week in Student Services, counseling offices is really small. Student Resource Officer has a classroom for an office. |
| | 6. Staff Planning/Collaboration | R | Departmentally organized and most staff planning time is spent in individual classrooms. |
| | 7. Community Integration (Community/Parent Room) | R | Existing Fitness Room designated as a community use space was not located in a good location to support that use. The community interaction with this building, other than arts/athletic event attendance, is sporadic. |
| | 8. Cafeteria/Serving/Kitchen | G | Kitchen Director is on other side of the building, would like it closer. Commons is somewhat crowded, serving area is congested. |
| | 9. Restrooms-Student/Staff | Y | Staff toilets only at lounge, would like for them all to be accessible. Don't have any unisex toilets. |
| | 10. Support Spaces (Lockers, Storage, Receiving, etc.) | G | Have Team and PE locker rooms and could use one as a unisex changing area. Lockers at 400 need replacement and have close to 1000, installed in 1995. A lot of shared storage. PE Lockers are great, Athletic locker rooms and supervision is very difficult. |
| | 11. Adaptability | R | Most of the interior walls within the building are CMU making flexibility and adaptability difficult. |
| | 11. Furniture and Equipment | Y | Some furniture is more up to date while other areas need attention. |
| | 12. Building Aesthetics (Interior & Exterior) | G | Some areas of the interior and exterior are very nice aesthetically. |
| Instructional | 13. Classroom Quantity, Size & Suitability | Y | Quantity of classrooms are sufficient, "200" wings classrooms are smaller. |
| | 14. Science/STEM/STEAM Labs | G | Good size, "500" wing classrooms. |
| | 15. Music, Art, Performance Spaces | G | Small Art Rooms, Music/Band rooms have outdoor access and across from PAC. PAC acoustics are phenomenal. |
| | 16. Flexible Learning Spaces, Project/Breakout Spaces | R | Teachers are doing breakout spaces, don't have pull-out spaces. IMC has been used for that at times. Writing Lab has been used for that as well. Teachers would use these spaces all the time. |
| | 17. Applied Learning Spaces (FAB Lab, Career & Tech Ed) | Y | Want to update the curriculum to Robotics. 410 has been used for computers, drafting. Want to refresh. Need to do auto. Want to get lathe, failed 3 grants to get. Separate CR from Labs. Some spaces are used infrequently. Program evolution could include student input and coordination with regional business partners. |
| | 18. Phy. Ed. & Athletics Spaces | G | Old Stage - Can it be repurposed. Cheer team uses Stage. Dance team would go to upper Bleacher area instead of batting cage. PE Lockers columns. Internal Community Fitness Center, needs cardio/weights/etc. packed at 4:30 pm. |
| | 19. Library/Media Center/Learning Commons | Y | IMC is centrally located and appears to support more individual research and work time, does have small café. |
| | 20. Special Education Spaces | G | Have a seclusion room but not sensory, needs more options. |
| Reuse | 21. Deferred Maintenance/Facility Condition Index (FCI) | | |
| | 22. Suitability for Expansion/Repurposing | G | |

G Adequate - Conforms with design best practices and meets District needs for foreseeable future
Y Questionable - Doesn't meet design best practice but may be considered acceptable based on current usage, enrollment, or programs
R Inadequate - Fails to meet District needs and should be considered highest priority for correction

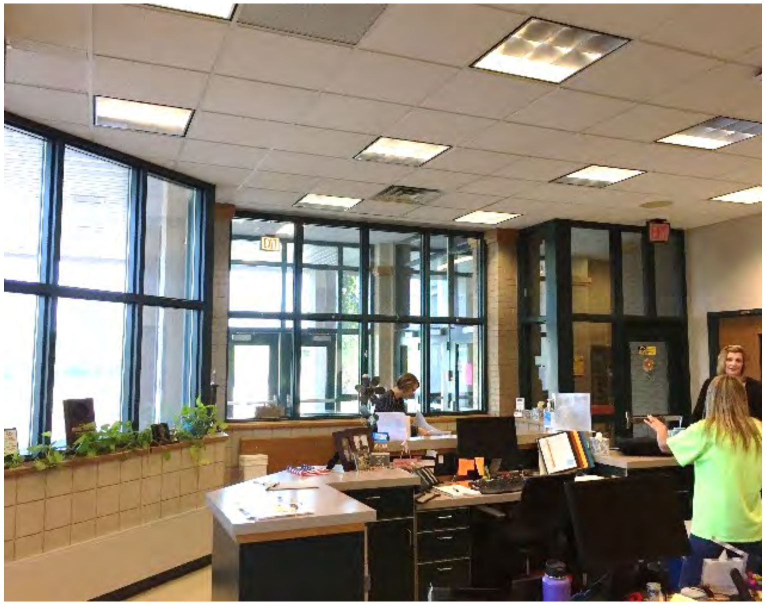
## Office Consolidation, Create Community Room and SRO / Food Service Relocation

The existing main office at the Oconto Falls High School is located adjacent to the front entrance. There are a few steps that can be easily taken to require all visitors must pass through the office prior to having access to the remainder of the school. This would require creating a secure access point at the second interior set of doors beyond the office door.

Additional remodeling of the main office and adjacent spaces would allow for a more secure and visitor friendly experience. Remodeling would allow for the secure doors and entrance to the main office to be appropriately located and an exit door from the office to the remainder of the building could be added. This would allow the visitor to move from a secure entrance, to the office, and back out to the school directly from the office rather than having to return to the secure entry vestibule to be buzzed or allowed in the school.

There are two classrooms near the main office that are currently being used of office space; one for the SRO and the other for the food service staff. Our recommendation is to relocate these two offices to more appropriately sized spaces further into the school. For the SRO it is more appropriate for their office to be located near student activity.

Two classrooms (one currently used as the food service office) and the other a former family and consumer home economics room could be remodeled and consolidated with the current main office to create better student service and community room space.



Existing Upper Gymnasium

| FIM # | Office Consolidation, Create Community Room and SRO/Food Service Relocation |
|---|---|
| OFHS-EDA-1 | • Create a safe and secure entry sequence by remodeling the vestibule and main office.<br>• Consolidate the office functions in one general area of the building<br>• Relocate the food service and SRO spaces to appropriately sized spaces |

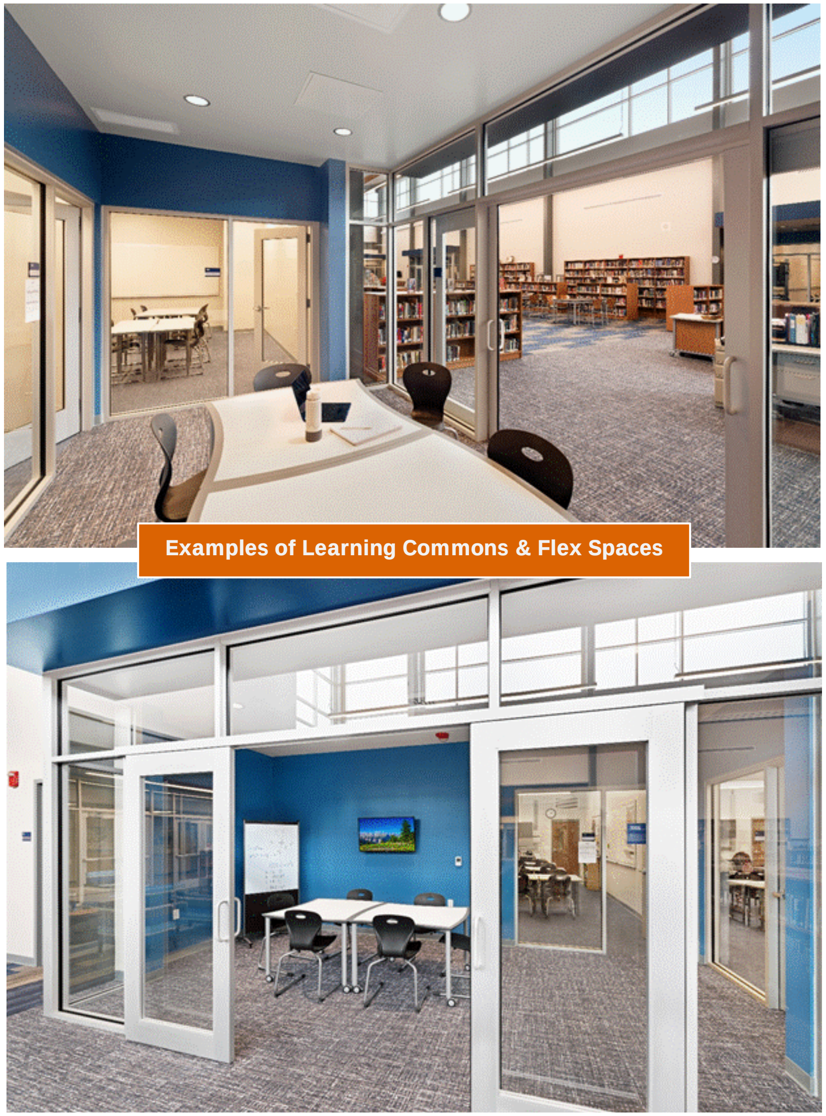
| FIM # | Benefits of Office Consolidation, Create Community Room and SRO/Food Service Relocation |
|---|---|
| OFHS-EDA-1 | • Improved security for all occupants with proper safe, secure entrance sequence and control of visitors<br>• Keep all the office functions in one consolidated area in the building<br>• Move the SRO into a student centric area of the building<br>• Provide better space for student services and guidance |

### IMC Remodeling into Learning Commons and Flex Spaces

The existing Information Media Center is mostly set up as a traditional library space. There is a 'café' area that has high top tables and chairs, which provides a unique seating and gathering area for the students and staff. There is also a writing lab that was created out of an old computer lab.

The remainder of the library is traditional seating, tables and chairs, and book stacks. There is an adjacent conference room, storage and staff area.

These spaces could be remodeled to turn the IMC into a learning lab with flexible spaces. These spaces would allow for flexibility in private study, small group study, and a variety of collaboration spaces.



Examples of Learning Commons & Flex Spaces

| FIM # | IMC Remodeling into Learning Commons and Flex Spaces |
|---|---|
| OFHS-EDA-2 | • Remodel the existing IMC and auxiliary spaces to a Learning Commons with flex space |

| FIM # | Benefits of IMC Remodeling into Learning Commons and Flex Spaces |
|---|---|
| OFHS-EDA-2 | • Provide modern learning environments for staff and students; study, small group and collaboration areas |

### Stage Remodeling into Connecting Corridor and Storage

The existing stage has had limited usage as a stage since the performing arts center was built. The Old Gym and Stage are in an area where there is not an east-west connection between the Languages and IMC corridors.

It is recommended to remove the stage and remodel to create a corridor across the back half of the building to improve circulation of the two halves of this portion of the building. The corridor allows for the classroom wing to be integrated with the rest of the building.

The remaining area of the stage could be used for building or athletic storage to support Wrestling, Athletics and general school needs.

Existing Old Gym Stage

| FIM # | Stage Remodeling into Connecting Corridor and Storage |
|---|---|
| OFHS-EDA-3 | • Remodel stage area into cross corridor and building storage |

| FIM # | Benefits of Stage Remodeling into Connecting Corridor and Storage |
|---|---|
| OFHS-EDA-3 | • Provides improved circulation in the building to make a more cohesive campus building connect the halves of the building |

### Special Education Science Lab and Social Studies Remodeling

The existing departments of the High School do not have specialized Special Education spaces near other spaces. Pupil Services has indicated that it would be desired to have more spaces near Math, Science, Social Studies and ELA.

Modern education environments are incorporating individualized special education curriculum and each department is trending towards dedicated spaces for those students with special needs.

Example of ADA Lab Station

| FIM # | Special Education Science Lab and Social Studies Remodeling |
|---|---|
| OFHS-EDA-4 | • Remodel and repurpose existing spaces for Special Education near departments |

| FIM # | Benefits of Special Education Science Lab and Social Studies Remodeling |
|---|---|
| OFHS-EDA-4 | • Provides special education spaces in departments for student and teacher benefit |

## Flex Area Remodeling from Pupil Services and ELA Rooms

Along the ELA and Social Studies classroom corridor, the recommendation is to take the pupil services area, adjacent storage and two of the ELA classrooms to create flexible collaborate space for the students and staff dedicated to the ELA and Social Studies departments.

The flexible areas allow for staff to work together in a large area that can be shared or scheduled for team activities, project-based learning or break out collaboration as needed.

The spaces also provide before and after school gathering or study areas for organized student groups or individual studies while students wait for afterschool practices, etc.

Adding operable connection between existing classrooms allows for similar staff teaming and large group collaboration.

Adding visual supervision windows in the classrooms will allow for the flex areas to be used by students during class for break out and study areas, while still being supervised.

Examples of Flex Spaces & Supervision Windows

| FIM # | General Remodeling |
|---|---|
| OFHS-EDA-5.1, 5.2, 5.3 | Flex Area Remodeling from Pupil Services and ELA Rooms<br>• Remodel existing pupil services, storage, and classrooms to create flex areas<br>• Add operable connection between classrooms<br>• Add visual supervision windows at classrooms |

| FIM # | Benefits of General Remodeling |
|---|---|
| OFHS-EDA-5.1, 5.2, 5.3 | • Provide staff and student collaboration and teaming opportunities<br>• Provide student study and gathering space before and after school<br>• Provide supervision of flex areas to allow use during class |

## Technical Education Reimagining

The technical education wing built in 2001 has traditional wood, metals, and engine laboratories separated from their instructional classrooms by hallway, offices, and storage rooms.  Having separated classrooms and laboratories use supervision issues and these trades may not be aligned with industry partners and what the workforce demands of high school graduates or two-year colleges.

Modern spaces would position classrooms adjacent to the laboratories with vision glass available for teacher supervision through the spaces.  Changes in industry, student interests and advances in technology would be a reason why the current spaces need to be reimagined and positioned for the integration of electronics, rapid prototyping, robotics, and updated machinery and equipment.

Examples of Modern Technical Education Spaces

| **FIM #** | **Technical Education Area Reimagining** |
|---|---|
| OFHS-EDA-6 | • Remodel the existing tech ed labs and classrooms to provide windows and operable connection between the two spaces. |

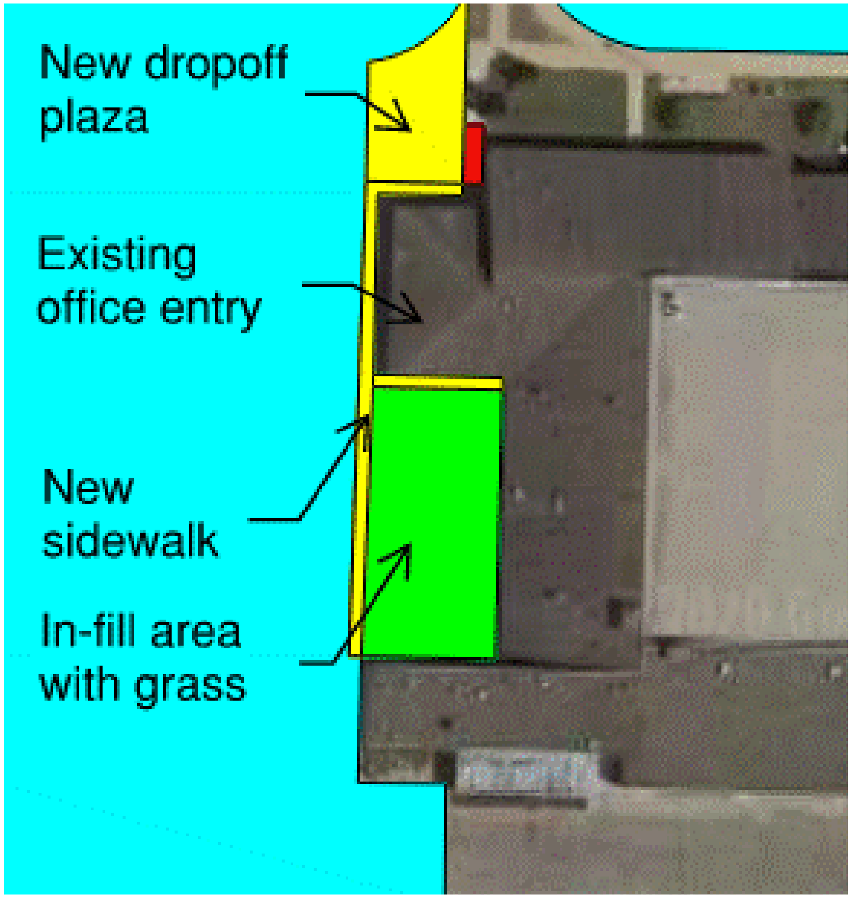
| **FIM #** | **Benefits of Technical Education Area Reimagining** |
|---|---|
| OFHS-EDA-6 | • Allows for staff to use the classrooms and labs simultaneously |

### Dropoff and Main Office Sidewalk, Grass, and Curb/Gutter

The High School office entrance/exit to the parking lot does not have any buffer from car traffic and is a safety concern for pedestrians. There is not a designated drop-off location as well.

It is proposed to introduce a drop-off plaza for student transfer from cars into the building. In addition, sidewalk along the west face of the building will provide for a safe path of travel to the student parking area.

To soften the front entry and west façade, it is recommended to fill in the west asphalt cove south of the main office with grass and landscaping.



| FIM # | Dropoff and Main Office Sidewalk, Grass, and Curb/Gutter |
|---|---|
| OFHS-EDA-7 | • Provide new sidewalk and drop off/pickup plaza<br>• In-fill parking/utility area with grass |

| FIM # | Benefits of Dropoff and Main Office Sidewalk, Grass, and Curb/Gutter |
|---|---|
| OFHS-EDA-7 | • Improve traffic and pedestrian safety<br>• Soften front entrance and improve curb-appeal of school |

### Flexible Furniture of Unremodeled Areas

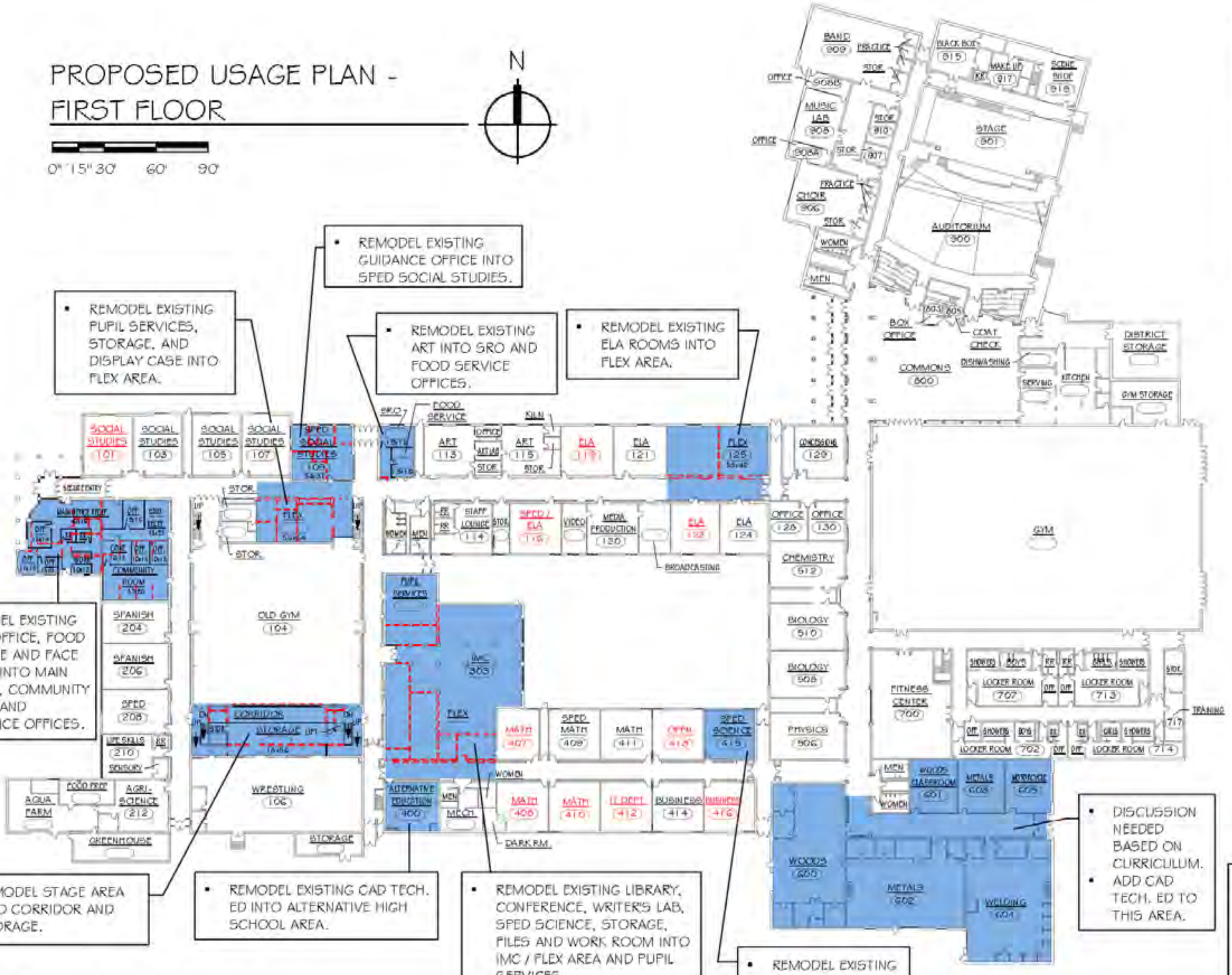
All remodeled areas would include new flexible furniture to assist in promoting collaboration, flexibility and project-based learning. The existing furniture in the majority of the spaces is traditional, standard classroom furniture. Budgeting for new furniture in the remodeled areas, of at least 50%, allows for those existing spaces to move toward a modern learning environment with flexible furniture.

Examples of Classroom Flexible Furniture

| FIM # | Flexible Furniture for Unremodeled Areas |
|---|---|
| OFHS-EDA-8 | • Budget for 50% new furniture in unremodeled areas. |

| FIM # | Benefits of Flexible Furniture for Unremodeled Areas |
|---|---|
| OFHS-EDA-8 | • Moves learning toward a more collaborative, flexible, and project-based learning environment. |

# Educational Adequacy Recommendations



- REMODEL EXISTING GUIDANCE OFFICE INTO SPED SOCIAL STUDIES.

- REMODEL EXISTING PUPIL SERVICES, STORAGE, AND DISPLAY CASE INTO FLEX AREA.

- REMODEL EXISTING ART INTO SRO AND FOOD SERVICE OFFICES.

- REMODEL EXISTING ELA ROOMS INTO FLEX AREA.

- REMODEL EXISTING MAIN OFFICE, FOOD SERVICE AND FACE ROOM INTO MAIN OFFICE, COMMUNITY ROOM AND GUIDANCE OFFICES.

- REMODEL STAGE AREA INTO CORRIDOR AND STORAGE.

- REMODEL EXISTING CAD TECH. ED INTO ALTERNATIVE HIGH SCHOOL AREA.

- REMODEL EXISTING LIBRARY, CONFERENCE, WRITER'S LAB, SPED SCIENCE, STORAGE, FILES AND WORK ROOM INTO IMC / FLEX AREA AND PUPIL SERVICES.

- REMODEL EXISTING CLASSROOM INTO SPED SCIENCE.

- DISCUSSION NEEDED BASED ON CURRICULUM.
- ADD CAD TECH. ED TO THIS AREA.

## INFRASTRUCTURE AND SAFETY PROJECTS:

- REPLACE NORTH DRIVE PAVEMENT.
- HIGH PRIORITY FINISHES, CASEWORK AND ADA IMPROVEMENTS.
- POWER AND LIGHTING UPGRADES AND FIRE ALARM AND PA / CLOCK REPLACEMENTS.
- MISCELLANEOUS WALL REPAIRS AND ROOF REPLACEMENT.
- HEATING PLANT, IT COOLING AND BUILDING CHILLER REPLACEMENTS.

## REMODEL TYPE:

🟦 REMODELING

🟩 NEW CONSTRUCTION

- - - NEW FIRE WALL

ROOM LABELS IN RED REPRESENT A CHANGE IN ROOM USE WITH NO REMODEL.

## SCHOOL INFORMATION:

| | |
|---|---|
| TOTAL EXIS. BUILDING AREA: | 206,272 SF |
| TOTAL ADDITION AREA: | 0 SF |
| TOTAL BUILDING AREA: | 206,272 SF |

PLANNED ENROLLMENT: 453 STUDENTS
PLANNED OPERATING CAPACITY: 761 STUDENTS

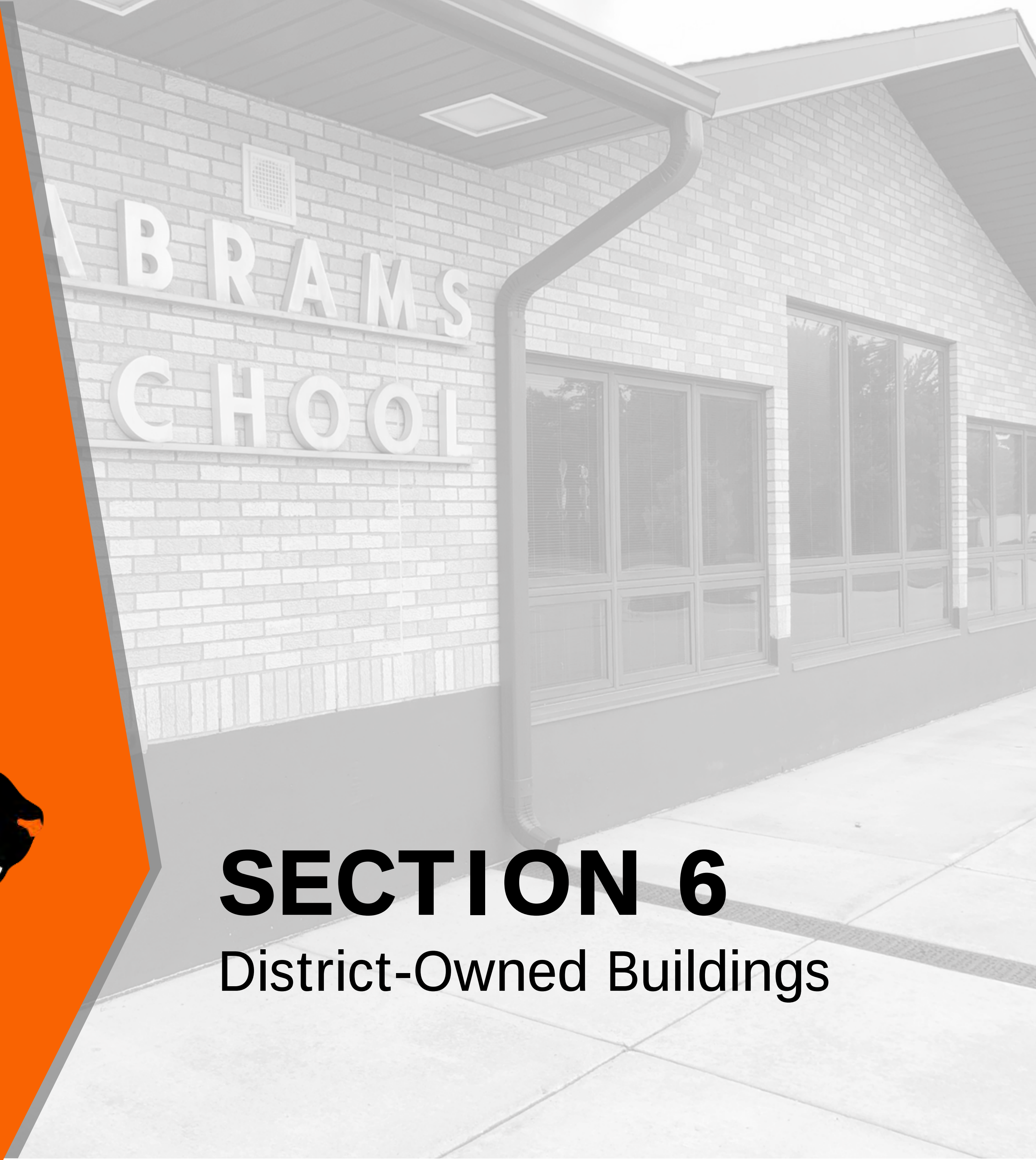
OCONTO FALLS SCHOOL DISTRICT

OCONTO FALLS HIGH SCHOOL

7510 | 11/12/20 YEAR BUILT: 1967

Oconto Falls School District

**FACILITY ASSESSMENT**



# SECTION 6

## District-Owned Buildings

# INTERIOR FINISHES

## DISTRICT OFFICE:

The Oconto Falls School District Office is a residential-style building, originally constructed in 1987. Due to the use of this space, no major recommendations are made at this time.

### Finishes

- The flooring in one bathroom is Vinyl Composite Tile (VCT) flooring, which is not a recommended floor finish for a bathroom. VCT can be replaced with epoxy or tile, but this is not a pressing concern.
- Entry flooring was not complete at the time of the audit. Primary flooring is rolled carpet, found to be in good shape. When this carpet becomes worn, it is recommended to be replaced with carpet tile.

### ADA Accessibility

- Door hardware appears to be ADA-compliant levers.
- The basement is not accessible. Since it is used for storage and as a mechanical space, this is not an issue.
- The sink in the bathroom that is marked as accessible should have an ADA-compliant pipe wrap installed, as well as a vertical grab bar.
- The sink in the kitchen does not offer appropriate clearances (no shroud at the sink for a front approach, no side approach clearances).

## BUS GARAGE:

The Oconto Falls Bus Garage was constructed in 1952 and contains space for mechanical repairs of busses as well as an office area for drivers and staff.

### Finishes

- Interior finishes throughout this space are dated and in generally poor condition.
- A full renovation of the interior spaces could be performed, but the space was reported to be too small and not efficient for the current use.
- A new garage could also be constructed on the existing lot if it is a priority for the district.

### ADA Accessibility

- Door hardware and the restroom are not ADA compliant.

## SITE & CIVIL

**DISTRICT OFFICE:**

- No recommendations are included for the Oconto Falls District office.
- Hardscapes were found to be in good condition, with no major work required.

**BUS GARAGE:**

- The map to the right shows the area surrounding the District Bus Garage. The majority of the site is gravel, with paved areas directly surrounding the building.

### Area 1: Parking Lot Surrounding Bus Garage

The existing pavement has numerous thermal cracks which have worsened over multiple freeze-thaw cycles. There are some areas of localized base failure, which are evident by the fatigue cracking present. The base failure is a small portion of this area, approximately 12%. Edge failure and surface weathering are also present.

| FIM # | Recommended Site and Civil Improvements |
|---|---|
| DW-SC-1 | Area 1: Parking Lot Surrounding Bus Garage<br>• Remove existing pavement.<br>• Inspect the base material and patch where necessary.<br>• Place 4 inches of asphalt and install pavement markings. |
| DW-SC-1a | Concrete Pavement Alternative:<br>• Remove existing asphalt pavement.<br>• 12” Base and subgrade removal.<br>• 8” Dense graded base and 8” reinforced concrete.<br>• Pavement markings. |

| FIM # | Benefits of Site and Civil Improvements |
|---|---|
| DW-SC-1 | • Improved site safety.<br>• Reduced future maintenance on paved areas. |

## BUILDING ENVELOPE

### DISTRICT OFFICE:

**Shingle Roofing System, Drainage, Roof Ventilation**

- No splash blocks are installed at the base of the rood downspouts. Water infiltration into the lower level has been reported occasionally. Splash blocks should be installed at the base of downspouts, or downspouts should be extended.
- There are several locations around the perimeter of the building where moisture in the form of efflorescence was observed on the underside of the metal soffit panels. Investigate attic/roof system for possible condensation issues and perform roof ventilation calculations. Install proper intake and exhaust ventilation to prevent condensation.
- The shingled roofing system is in good condition and does not require any attention at this time.

**Window Sealants**

Window sealants were observed to be in a failed condition at the perimeter of windows and doors.

- One control joint was missing sealant.
- Existing sealant should be cut out, removed, and replaced at all windows and exterior doors.

## BUS GARAGE:

### Flat Roofing System

The existing roof is an Ethylene Propylene Diene Tetrapolymer (EPDM) rubber roofing system, typical for this style of building. Ponding is evident along north perimeter edge at gutter. Insulation fasteners are poorly installed, some traversing board edges. Flashings are poorly installed with field fabricated flashing membrane. Roof edge detailing is poorly installed. It is recommended to replace this roof system with new insulation and fully-adhered EPDM membrane. Incorporate a thermal barrier and vapor retarder prior to installation of the roof insulation and membrane. Incorporate slope into roof system design to improve drainage. Adhere all insulation layers down. Fully-adhere new EPDM membrane, properly install edge details and gutter.

### Wood Siding at Windows

Laminated plywood siding is installed over all window openings. Siding panels are deteriorated from unsealed edge treatment and failed sealant joints. Siding requires replacement. Fasteners are overdriven through the outer face of the siding and there is poorly installed perimeter edge sealant installation. Replacement of window openings with new fixed or partially operable windows is recommended. Alternatively, remove existing siding and install new aluminum composite metal panel system. Incorporate an appropriate substrate with an air/weather barrier, and install aluminum composite metal panels with proper perimeter flashing and sealant system.

### Door Replacement

Replace overhead doors. Overhead doors are beginning to rust and are non-energy efficient. Installing new insulated doors and weather-stripping is recommended. New doors should be insulated, energy efficiency doors with new weather stripping to prevent air infiltration and heat loss.

### Masonry Repairs

There are several locations requiring masonry tuckpointing repairs on the south elevation of the building at the west and east corners of the building where Concrete Masonry Units (CMUs) have displaced. Remove damaged/displaced masonry units and reset. Tuck point where required.

| FIM # | Recommended Building Envelope Repairs |
|---|---|
| DW-BE-1 | District Office - Replace Window Sealants, Repair Roof Drainage and Roof Ventilation<br>• Cut out and remove existing sealant, install new backer rod, prime as necessary, and install new sealant at window and door perimeters.<br>• Install splash blocks are base of downspouts, and/or extend down spouts.<br>• Investigate attic/roof system for possible condensations issues and perform roof ventilation calculations.<br>• Install proper intake and exhaust ventilation to prevent condensation. |
| DW-BE-2 | Bus Garage – Replace EPDM Roofing System<br>• Replace roofing system with new insulation and fully-adhered EPDM membrane.<br>• Incorporate a thermal barrier and vapor retarder prior to installation of roof insulation and membrane.<br>• Incorporate slope into the roof system design to improve drainage.<br>• Adhere all insulation layers down, fully adhere new EPDM membrane, properly install edge details and gutter. |
| DW-BE-3 | Bus Garage – Replace Wood Siding, Replace Overhead Doors, Repair Masonry<br>• Remove existing wood siding and replace with aluminum composite metal system. Incorporate an appropriate substrate with weather barrier. Install panels with proper perimeter flashing and sealant system.<br>• Replace overhead doors with new insulated, energy efficient doors and weather stripping.<br>• Remove concrete masonry units that have been displaced and reset into original position. Tuckpoint. |

| FIM # | Benefits of Building Envelope Repairs |
|---|---|
| DW-BE-1 through DW-BE-3 | • Protection from water infiltration and further damage to roofing, interior, and walls.<br>• Reduced future maintenance on roofs and masonry.<br>• Improved exterior aesthetics. |

# ELECTRICAL & SAFETY

## DISTRICT OFFICE:

### Electrical Service

The Oconto Falls District Office building construction date could not be verified. It is equipped with a 120/240V, 200A main service. The service equipment is a Square D QO load center in the main electrical room. The Building Owners and Managers Association (BOMA) life expectancy for electrical service equipment is 40 years, so it is expected that this equipment is approaching or has exceeded its useful life. While the size of the service appears adequate for the facility, this equipment is unacceptable as installed as it is not listed for service entrance use. We recommend replacement with a service entrance rated panelboard.

The existing building panelboards, disconnect switches, and other electrical equipment do not have arc flash labels installed, so it is unclear if an arc flash study has been performed. There is inherently an increased hazard of working on live equipment due to possible buildup of energy being released in an arcing incident. This arcing incident can occur due to failing conductors or even tools incidentally touch live bus bars or contacts causing short circuits. These arcing incidents can cause severe burns and injuries.

Per NFPA 70E section 130, arc flash labels are required to be applied to electrical equipment, meaning an arc flash study is required to be performed. We recommend that a fault current/arc flash study is performed, and appropriate arc flash labels installed to the required electrical equipment. This will bring the existing installation into compliance with current code requirements and provide clear safety guidelines for persons performing maintenance on equipment.

*Figure 1: Existing Main Panelboard with Exposed Nonmetallic Cable*

### Electrical Infrastructure and Grounding

It is easily noticed that at the main panel, a majority of the building utilizes nonmetallic (NM) cabling. Per NEC 334.10(3), this cabling should be protected within walls with a minimum 15-minute rating. Additionally, NM is not permitted to be exposed within a dropped or suspended ceiling cavity in buildings other than single- or multifamily dwellings, per NEC 334.12(A)(2). We recommend replacement of NM circuits with more traditional wire-in-conduit circuiting to comply with the latest NEC requirements and reduce the risk of fire potentially caused by a wire fault. It is likely this will be required by the inspector when the main panelboard is replaced.

Some existing distribution and branch electrical equipment including, but not limited to disconnect switches and panelboards, appear to be approaching or have exceeded their BOMA life expectancy of 30 years. Assuming equipment has been properly maintained, we do not necessarily recommend full equipment replacement throughout the building. However, we recommend a thorough inspection and evaluation of all aging electrical equipment installed around (or prior to) 1990. This will limit the chance of failure by identifying equipment or parts that may need cleaning, re-torqueing, or replacement. Additionally, this offers an opportunity to re-evaluate the availability of replacement parts for continued maintenance. Repair or maintain deficient equipment. If equipment is defective or cannot properly be maintained because of the inability to source parts, replace immediately.

### Interior Building Lighting

Existing lighting throughout the building consists primarily of fixtures with fluorescent T8 lamps. Modern lighting is typically dimmable LED which has substantially lower wattage consumption than equivalent fluorescent fixtures. Because of this, energy savings can often offset installation costs. We recommend replacing the existing lighting with equivalent LED fixtures throughout for increased energy savings and reduced maintenance costs. Emergency fixtures replaced with LED equivalents shall be specified to include battery back-up.

Emergency light wall pack coverage appeared to be deficient. Minimum emergency egress lighting requirements as defined by NFPA 101 section 7.9.2.1.1 must be met. Because of this, we recommend performing a detailed walkthrough with a light meter to assess the existing emergency lighting installation and installing new emergency fixtures as required.

## BUS GARAGE:

### Electrical Service

The Oconto Falls Bus Garage was constructed in 1962. Since then, it appeared the electrical service was upgraded to a 120/240V, 400A service. The service equipment is a Square D NQOD-style panelboard. The BOMA life expectancy for electrical service equipment is 40 years, so it is expected that this equipment is acceptable as installed, provided manufacturer-recommended maintenance has been executed. Some equipment is being stored/hung in front of the panelboard, violating National Electrical Code (NEC) working clearance requirements. We recommend relocating stored materials to provide a 30” wide and 36” clear space in front of the panelboard to comply with NEC section 110.26.

The existing building panelboards, disconnect switches, and other electrical equipment do not have arc flash labels installed, so it is unclear if an arc flash study has been performed. There is inherently an increased hazard of working on live equipment due to possible buildup of energy being released in an arcing incident. This arcing incident can occur due to failing conductors or even tools incidentally touch live bus bars or contacts causing short circuits. These arcing incidents can cause severe burns and injuries. Per NFPA 70E section 130, arc flash labels are required to be applied to electrical equipment, meaning an arc flash study is required to be performed. We recommend that a fault current/arc flash study is performed, and appropriate arc flash labels installed to the required electrical equipment. This will bring the existing installation into compliance with current code requirements and provide clear safety guidelines for persons performing maintenance on equipment.

*Figure 2: Existing Panelboard that May have Exceeded its BOMA Useful Life Expectancy*

### Electrical Infrastructure and Grounding

Existing rooftop electrical equipment condition was unable to be verified. The condition should be assessed, and any disconnect switches, receptacles, or connections that are exhibiting signs of degradation should be replaced. However, we are not recommending any work at this time.

Most existing branch electrical equipment appears to have exceeded or is approaching its BOMA life expectancy of 30 years. See Figure 2, right, for an example of an older vintage panel we suspect may be due for replacement. Assuming equipment has been properly maintained, we do not necessarily recommend full equipment replacement throughout the building. However, we recommend a thorough inspection and evaluation of all electrical equipment due to the building being a service garage.

This will limit the chance of future failure by identifying equipment or parts that may need cleaning, re-torqueing, or replacement. Additionally, this offers an opportunity to re-evaluate the availability of replacement parts for continued maintenance. Repair or clean and maintain deficient equipment. If equipment is defective or cannot properly be maintained because of the inability to source parts, replace immediately.

### Interior and Exterior Building Lighting

Existing lighting throughout the building consists primarily of fixtures with fluorescent T8 lamps. Modern lighting is typically dimmable LED which has substantially lower wattage consumption than equivalent fluorescent fixtures. Because of this, energy savings can often offset installation costs. We recommend replacing the existing lighting with equivalent LED fixtures throughout for increased energy savings and reduced maintenance costs. Emergency fixtures replaced with LED equivalents shall be specified to include battery back-up.

Emergency lighting levels could not be confirmed while on site. We expect that the minimum lighting requirements as defined by NFPA 101 section 7.9.2.1.1 may not be met. We recommend performing a detailed walkthrough of the facility with a light meter to assess the existing emergency lighting installation. New emergency fixtures should be installed as required in areas noted to be deficient.

Exit sign locations was inadequate for the coverage required in paths of egress as defined in NFPA 101, section 7.10 “Marking of Means of Egress”. We recommend reviewing the paths of egress for the building and adding exit signs as needed to comply.

## TECHNOLOGY & SAFETY

### DISTRICT OFFICE:

**Fire Alarm System**

No fire alarm system is currently installed in the building, and per the occupancy classification of this building (business with less than 50 occupants), no system is required. If an increased level of detection/notification is desired, we would suggest installing a plug-in Carbon Monoxide Detector that can be purchased off-the-shelf at most home improvement stores.

### BUS GARAGE:

**Fire Alarm System**

There is no existing fire alarm system installed. Per the classification of this building, a fire alarm system is not required. For a greater level of safety for occupants in the office/lounge, we would suggest installing a plug-in Carbon Monoxide Detector that can be purchased off-the-shelf at most home improvement stores.

| FIM # | Recommended Electrical and IT Infrastructure Improvements |
|---|---|
| DW-EE-1 | District Office – Replace Service Panel, Arc Flash Study, Replace Nonmetallic Cabling<br>• Replace the existing panelboard with an equivalent that is service rated.<br>• Prove detailed analysis of the entire electrical system to determine the risk of fault at each device.<br>• Replace nonmetallic cabling with wiring in conduit. |
| DW-EE-2 | District Office – Replace Existing Lighting with LED Lighting<br>• Replace existing troffers with LED retrofits.<br>• Replace exterior lighting fixtures with LED equivalents.<br>• Assess egress lighting levels and add emergency fixtures if required. |
| DW-EE-3 | Bus Garage – Arc Flash Study<br>• Prove detailed analysis of the entire electrical system to determine the risk of fault at each device.<br>• Replace any aging/original panels found to be in poor condition. |
| DW-EE-4 | Bus Garage – Replace Existing Lighting with LED Lighting<br>• Replace existing fluorescent lighting with LED retrofits.<br>• Replace exterior lighting fixtures with LED equivalents.<br>• Assess egress lighting levels and add emergency fixtures if required.<br>• Add additional LED exit signs where required by code. |

| FIM # | Benefits of Electrical and IT Infrastructure Improvements |
|---|---|
| DW-EE-1<br>Through<br>DW-EE-4 | • Reduces risk of equipment failure and provides a code-compliant and safer installation with a more robust panelboard construction.<br>• Verify existing equipment ratings to improve safety of operation and maintenance staff working on electrical equipment and comply with NEC code requirements<br>• Reduces risk of fire hazard potentially caused by a wire fault, protects wiring from damage, and complies with code requirements.<br>• Reduces risk of equipment failure and extends the life of equipment before replacement is required<br>• Decrease energy usage related to lighting, limit maintenance effort to replace lamps, and comply with current IECC and ASHRAE 90.1 energy codes. |

## Codes and Guidelines Referenced

The following codes and guidelines are referenced within this analysis to ensure the safety and well-being of building occupants and personnel and limit fire or other building hazards:

- Building Owners and Managers Association (BOMA) International has published a preventative maintenance guidebook intended to illustrate “best practices to maintain efficient and sustainable buildings.” In it, Appendix 7 lists the expected useful life for numerous building systems and components. Specifically, we reference Appendix 7, sections E and F.
- National Fire Protection Association (NFPA) is an international organization that publishes numerous codes and standards intended to eliminate death, injury, and property and economic loss due to fire- and electrical-related hazards. For our analysis, we are looking specifically at NFPA codes 70, 70E, 72, and 101. They are the National Electric Code (NEC), Standard for Electrical Safety in the Workplace, National Fire Alarm and Signaling Code, and Life Safety Code, respectively.
- NFPA 70, or as it is commonly referred to as the NEC, is “the benchmark for safe electrical design, installation, and inspection to protect people and property from electrical hazards”. We refer to this often as it is the electrical code all residential and commercial building electrical construction must adhere to.
- NFPA 70E lays out requirements for safe work practices intended to protect personnel from exposure to major electrical hazards. This code was written to help comply with OSHA 1910 Subpart S and OSHA 1926 Subpart K in limiting “workplace injuries or fatalities due to shock, electrocution, arc flash, or arc blast.”
- NFPA 72 defines the latest safety provisions regarding fire detection, signaling, and emergency communications demands. This code is critically focused on fire alarm and mass notification systems to ensure safety of all building occupants in the event of emergencies or threats.
- NFPA 101 is used to protect people based on building construction, protection, and occupancy features to minimize the effects of fire and related hazards, covering both new and existing buildings.
- The International Energy Conservation Code (IECC) is a widely adopted energy code which establishes a “baseline for energy efficiency by setting performance standards for the building envelope (defined as the boundary that separates heated/cooled air from unconditioned, outside air), mechanical systems, lighting systems, and service water heating systems in homes and commercial businesses.” As part of this analysis we are focused solely on the parts of the code related to lighting systems.
- The Illuminating Engineering Society (IES) is the recognized technical and educational authority on lighting, which publishes lighting standards and recommended practices for lighting design. For this analysis, we are utilizing illuminance recommendations for electrical and mechanical spaces with the intent to recommend ample light for operating and maintenance personnel to make repairs or replacements effectively and safely in often-overlooked spaces.

## MECHANICAL & ENVIRONMENTAL

### DISTRICT OFFICE:

**Re-zone Hydronic Heating Systems & Replace Boiler**

Currently, there is one boiler and heating system that serves the perimeter heating and temperature control for individual and open spaces. It does not appear that the zoning and thermostat placement are sufficient and is affecting occupant comfort negatively.

The existing heating water boiler is 33 years old and has reached the end of its recommended service life. This results in potentially more equipment downtime and increased maintenance costs.

Nexus recommends replacing the old inefficient boiler plant with new high-efficiency condensing boilers. The installation of two (2) boilers will provide the required redundancy should one of the boilers require service during the heating season. The system pumps will also be replaced and increased in size to match the capacity of the new heating system.

Replacing these boilers will reduce gas consumption. Condensing, high-efficiency boilers will be specified and sequenced to take advantage of lower water temperatures and provide an aggressive hot water reset schedule resulting in lower operating costs.

Rezoning the building with proper terminal heating control to provide occupant comfort is recommended to reduce maintenance calls/time and improve staff satisfaction.

## BUS GARAGE:

### Replace Office Ventilation System

The Bus Garage Office Areas do not have adequate airflow or thermostatic control leading to comfort issues in these spaces.

Nexus recommends the replacement of the heating and cooling system with a new gas-fired furnace and air-conditioner and duct zoning.

Benefits of the HVAC system modifications include increased system control, increased air quality and filtration, energy savings, and improved occupant comfort.

### Install Garage Ventilation System

The bus garage services vehicles are repaired and operated inside of the building structure without proper ventilation/exhaust which is a life safety issue for District staff and does not meet current code.

It is recommended to install new code compliant exhaust that is high and low per code requirements and controlled by gas sensors. Fans will be upgraded to new required size/capacity and will have premium efficiency motors installed to increase energy savings. The fan speed will modulate based on internal loading. Direct drive fans will be utilized where possible to reduce fan belt maintenance.

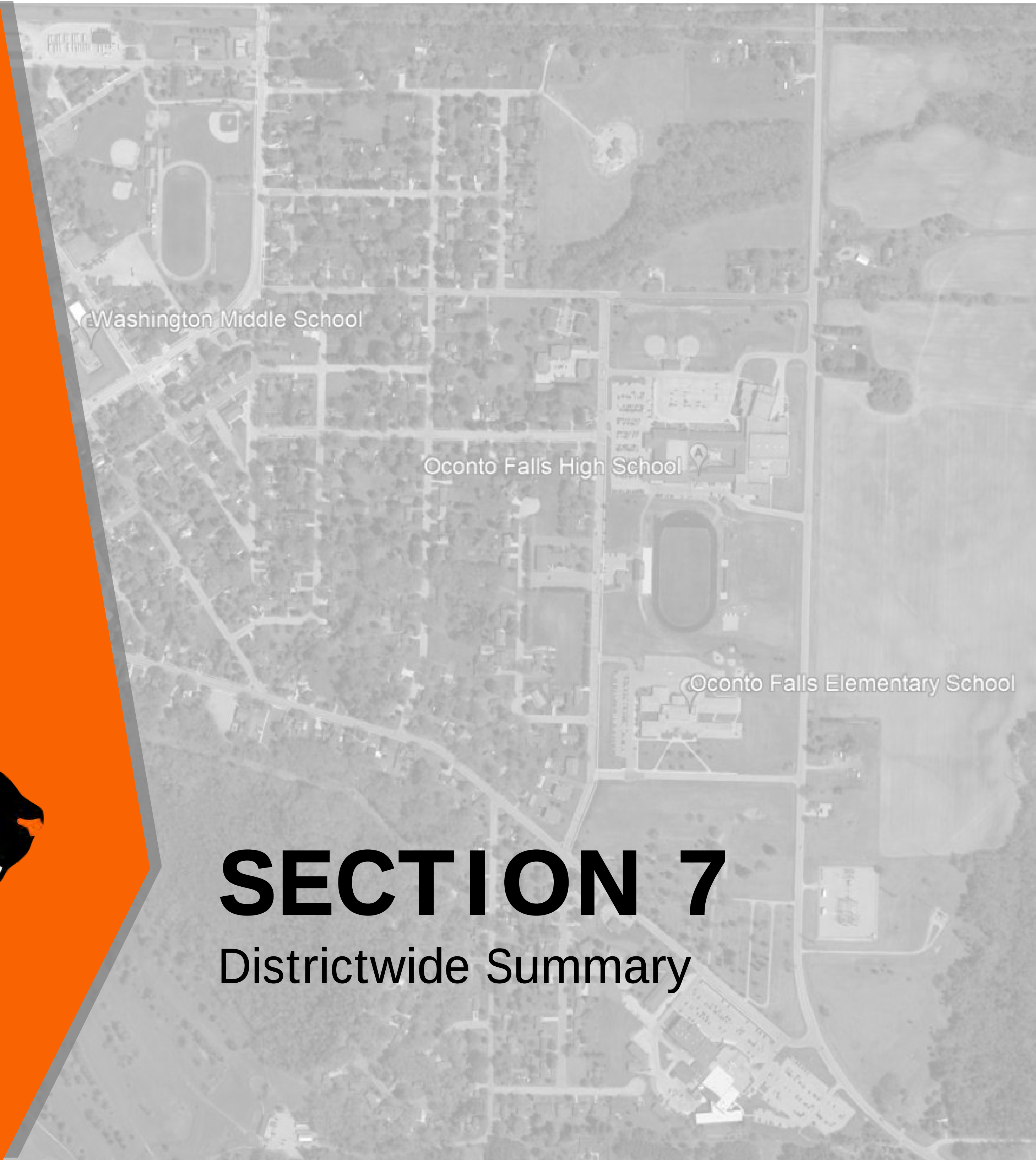
The benefits include proper ventilation for occupants and energy savings.

| FIM # | Mechanical System Upgrades |
|---|---|
| DW-ME-1 | District Office – Re-zone Hydronic Heating Systems & Replace Boiler<br>• Remove existing inefficient boiler.<br>• Install two (2) new condensing boilers and boiler pumps.<br>• Rezone piping and terminal heating/thermostats. |
| DW-ME-2 | Bus Garage – Replace Office Ventilation System<br>• Remove existing window air-conditioner and furnace.<br>• Provide new gas-fired furnace, air-conditioner, and new ductwork.<br>• Provide the associated electrical and general construction work. |
| DW-ME-3 | Bus Garage – Install Garage Ventilation System<br>• Provide new exhaust fan with high and low intakes<br>• Provide carbon monoxide and other gas sensors<br>• Provide the associated general, electrical, and controls construction work |

| FIM # | Benefits of Mechanical System Upgrades |
|---|---|
| DW-ME-1 | • Reduced maintenance<br>• Improved occupant comfort<br>• Increased energy savings<br>• Extended heating system life<br>• Upgraded system control |
| DW-ME-2 | • Improved occupant comfort<br>• Improved indoor air quality<br>• Improved air filtration<br>• Upgraded system control |
| DW-ME-3 | • Increased energy savings from EC motors<br>• Ensure proper ventilation<br>• Occupant health<br>• Occupant comfort |

Oconto Falls School District

**FACILITY ASSESSMENT**



# SECTION 7

## Districtwide Summary

# ABRAMS ELEMENTARY | FACILITY IMPROVEMENT MEASURES & BUDGETS

**Abrams Elementary School**

| Selected | FIM # | Facility Improvement Measure (FIM) Description | Priority | Project Budget |
|---|---|---|---|---|
| **Interior Finishes and Food Service** | | | | |
| X | AES-INT-1 | High Priority Interior Finishes - Floors, Walls, Ceilings, Lockers, ADA Upgrades | 0-5 Years | $559,500 |
| | AES-INT-2 | Medium Priority Interior Finishes - Floors, Walls, Ceilings | 5-10 Years | $741,500 |
| | AES-INT-3 | Low Priority Interior Finishes - Floors, Ceilings | 10-20 Years | $536,000 |
| | AES-INT-4 | Low Priority Classroom Casework Replacement | 10-20 Years | $404,500 |
| | AES-INT-5 | Kitchen Equipment and Dishwasher Replacements | 5-10 Years | $88,500 |
| **Site and Civil Improvements** | | | | |
| | AES-SC-1 | Replace Pavement at North Playground and Walking Path (New Base and Asphalt) | 5-10 Years | $289,500 |
| X | AES-SC-3 | Remove Damaged Playground Pavement, Replace with Grass, Add Concrete Drive to Overhead Door | 0-5 Years | $45,000 |
| X | AES-SC-4 | Site Concrete - Remove Parking Islands, Add ADA Panels | 0-5 Years | $25,000 |
| **Building Envelope Repairs** | | | | |
| X | AES-BE-1 | Replace Ballasted EPDM Roofing on Gym Roof | 0-5 Years | $165,500 |
| | AES-BE-2 | Replace Shingled Roofing | 10-20 Years | $479,500 |
| X | AES-BE-3 | Repair Roof Drainage Along East & North Elevations, Reseal Gutter Joints, Address Underslab Moisture | 0-5 Years | $63,000 |
| X | AES-BE-4 | Replace Window Seals and Gaskets, Remove and Replace Window Flashing Sealant Joints | 0-5 Years | $19,500 |
| X | AES-BE-5 | Remove and Replace Masonry and EIFS Control Joints | 0-5 Years | $35,500 |
| | AES-BE-6 | Install New Wall Vent and A/C Flashings to Prevent Moisture Infiltration | 5-10 Years | $13,000 |
| X | AES-BE-7 | Replace Aging Soffit Panels, Install Adequate Roof Ventilation | 0-5 Years | $327,500 |
| X | AES-BE-8 | Repaint and Reseal Masonry where Peeling. Clean, Repair, and Recoat EIFS Cladding. Repair Cladding Transitions. | 0-5 Years | $34,000 |
| X | AES-BE-9 | Repair Structural CMU Step Cracks. Address Masonry/EIFS Movement. | 0-5 Years | $11,000 |
| **Electrical and Safety Systems** | | | | |
| X | AES-EE-1 | Replace Fire Alarm System with New Addressable System | 0-5 Years | $121,000 |
| X | AES-EE-2 | Coordination, Arc Flash, and Panel Safety Improvements. Replace Enclosures, IT Grounding Bar Addition. | 0-5 Years | $23,000 |
| X | AES-EE-3 | Add Notification Devices Where Required, Replace Original Devices Past Useful Life Expectancy | 0-5 Years | $58,500 |
| X | AES-EE-4 | Provide New Backup Generator, Transfer Switches, and Distribution Panel (EM Lighting, Heating, Cooler/Freezer, IT, Well Pump) | 5-10 Years | $215,000 |
| | AES-EE-5 | Replace Original 1957 Electrical Panels | 5-10 Years | $97,500 |
| X | AES-EE-6 | Replace Existing Lighting with LED Lighting and Controls (Dimming, Occupancy Sensors, Tunable Lighting for SPED) | 0-5 Years | $169,500 |
| | AES-EE-7 | Replace new PA and Clock System with New, Integrated System | 10-20 Years | $43,500 |
| **Mechanical and Environmental Systems** | | | | |
| | AES-ME-1 | DDC Controls Upgrade to Classroom Unit Ventilators (4) and Supervisor Upgrade | 10-20 Years | $26,000 |
| X | AES-ME-2 | Heating Plant Upgrades - Heating Systems (2) Glycol, Replace 1995 Heating Pumps, Upgrade Air Separators (2) | 0-5 Years | $160,000 |
| | AES-ME-3 | Chilled Water Plant and Associated Chilled Water Piping Distribution System (Size to Replace Condensing Units) | 5-10 Years | $501,500 |
| | AES-ME-4 | 1957 Underground Ventilation System and 1995 Unit Ventilator Conversion to Displacement Ventilation with Cooling | 5-10 Years | $2,348,000 |
| | AES-ME-5 | Add Cooling to Gymnasium (Install Cooling Coil in Existing Air Handling Unit) | 5-10 Years | $136,500 |
| X | AES-ME-6 | Kitchen Make-Up Air Unit Addition - Replacement of Existing Unit Ventilator | 0-5 Years | $190,000 |
| | AES-ME-7 | Exhaust Fan (5) Replacements | 5-10 Years | $42,500 |
| | AES-ME-8 | Domestic Water Heating Plant Replacement - 1995 Addition and Kitchen | 5-10 Years | $67,000 |
| | AES-ME-9 | 1957 Galvanized Domestic Water Piping Replacement | 5-10 Years | $84,500 |
| X | AES-ME-10 | Add Domestic Hot Water and Recirculation to 1957 Sinks, Sump Pump Replacement, Iron Removal System Addition | 0-5 Years | $208,500 |
| X | AES-ME-11 | Wash Fountain (2) and Sink (8) Replacement with Sensor Battery Operated | 0-5 Years | $38,500 |
| | AES-ME-12 | Fire Protection (Sprinkler System) - Entire Building System Addition | 10-20 Years | $366,500 |
| | AES-ME-13a | HVAC Systems Optimization (RCx & Sequence Review) - 2000 Building Addition (Only if ME-4 is Selected) | 0-5 Years | $8,500 |
| X | AES-ME-13b | HVAC Systems Optimization (RCx & Sequence Review) - Entire Building | 0-5 Years | $35,500 |
| X | AES-ME-14 | IT Room Cooling Upgrade - New Split Cooling Unit | 0-5 Years | $18,000 |
| **Deferred Maintenance - All Selected Totals** | | | | **$2,523,000** |

| | | | | |
|---|---|---|---|---|
| **Educational Adequacy** | | | | |
| X | AES-EDA-1 | Relocate Front Office into IMC, Create Secure Entry, Renovate Library to Learning Commons, Remodel Student Services Area | EDA | $601,000 |
| X | AES-EDA-2 | Create Separate Cafeteria, Reconfigure Kitchen/Servery and Add Receiving, Remodel Restrooms and Create Gym Storage | EDA | $845,000 |
| X | AES-EDA-3 | Create 3 Flex Spaces, Provide Operable Connection between Classrooms, Add Visual Supervision Windows | EDA | $280,000 |
| X | AES-EDA-4 | Renovate Computer Lab and Old Office into SPED spaces | EDA | $73,500 |
| X | AES-EDA-5 | Relocate Playground Equipment - Drainage Improvements | EDA | $130,000 |
| X | AES-EDA-6 | Allowance to Replace 50% of Classroom Furniture in Unremodeled Areas | EDA | $176,000 |
| **Educational Adequacy - All Selected Totals** | | | | **$2,105,500** |

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| **Abrams Elementary - All Selected Totals** | **$4,628,500** |

# OCONTO FALLS ELEMENTARY | FACILITY IMPROVEMENT MEASURES & BUDGETS

**Oconto Falls Elementary School**

| Selected | FIM # | Facility Improvement Measure (FIM) Description | Priority | Project Budget |
|---|---|---|---|---|
| **Interior Finishes and Food Service** | | | | |
| X | OFES-INT-1 | High Priority Interior Finishes - Flooring, Doors | 0-5 Years | $205,000 |
| | OFES-INT-2 | Medium Priority Interior Finishes - Floors, Walls, Ceilings | 5-10 Years | $936,000 |
| | OFES-INT-3 | Low Priority Interior Finishes - Floors, Ceilings | 10-20 Years | $852,000 |
| | OFES-INT-4 | Low Priority Casework Replacement | 10-20 Years | $653,500 |
| | OFES-INT-5 | Kitchen Equipment - Replace Convection Ovens, Disposer, Dishwasher, Repair Shelving | 5-10 Years | $62,000 |
| X | OFES-INT-6 | Replace Walk-in Cooler / Freezer - Condenser, Evaporator, and Controls | 0-5 Years | $62,500 |
| **Site and Civil Improvements** | | | | |
| | OFES-SC-1 | Replace Pavement at West Parking Lot (New Base and Asphalt) | 5-10 Years | $180,500 |
| | OFES-SC-2 | Replace Pavement at North Playground (New Base and Asphalt) | 5-10 Years | $186,000 |
| X | OFES-SC-3 | Replace Damaged Concrete, Add ADA Panels (Sidewalk, Curbing) - Parking Lot Concrete Drainage | 0-5 Years | $39,000 |
| | OFES-SC-4 | Stormwater Management (Required if Over 1 Acre of Land is Disturbed) | 10-20 Years | $195,500 |
| **Building Envelope Repairs** | | | | |
| X | OFES-BE-1 | Replace Ballasted EPDM Roof System with TPO Roofing System (Entire Building) | 0-5 Years | $1,210,000 |
| X | OFES-BE-2 | Replace Deteriorated Windows at South Entrance Cupola | 0-5 Years | $20,000 |
| X | OFES-BE-3 | Remove and Replace Masonry Control Joints, Install Gutters and Drainage to Prevent Further Masonry Damage | 0-5 Years | $106,000 |
| | OFES-BE-4 | Remove, Repair, Coat, and Reinstall Rusting Masonry Lintels | 5-10 Years | $97,500 |
| X | OFES-BE-5 | Replace Roof Flashing at Wall Transitions, Replace Through-Wall Flashing | 0-5 Years | $58,500 |
| X | OFES-BE-6 | Replace Spalling Brick where Damaged, Repair Crack at N.E. Corner, Repair Cracks and Tuckpoint at South Entrance | 0-5 Years | $8,000 |
| X | OFES-BE-7 | Replace Failed Window Seals and Gaskets, Remove and Replace Window Perimeter Sealant where Deteriorated | 0-5 Years | $46,500 |
| **Electrical and Safety Systems** | | | | |
| X | OFES-EE-1 | Replace Fire Alarm System with New Addressable System | 0-5 Years | $181,000 |
| X | OFES-EE-2 | Coordination, Arc Flash, and Panel Safety Improvements. | 0-5 Years | $16,000 |
| X | OFES-EE-3 | Add Notification Strobes to Classrooms and Kitchen (Code Compliance) | 0-5 Years | $60,000 |
| | OFES-EE-4 | Provide New Backup Generator, Transfer Switches, and Distribution Panel (EM Lighting, Heating, Cooler/Freezer, IT) | 5-10 Years | $215,000 |
| X | OFES-EE-5 | Replace Existing Lighting with LED Lighting and Controls | 0-5 Years | $299,500 |
| | OFES-EE-6 | Provide new PA and Clock System with New, Integrated System | 10-20 Years | $45,500 |
| **Mechanical and Environmental Systems** | | | | |
| | OFES-ME-1 | DDC Controls Upgrade to Air Handling Unit (1) and Supervisor Upgrade | 10-20 Years | $32,500 |
| X | OFES-ME-2 | Heating Plant Improvements - Boiler & Pump Replacement, Glycol Addition, Air Separator Improvements | 0-5 Years | $319,500 |
| | OFES-ME-3 | Chilled Water Plant and Associated Chilled Water Piping Distribution System and AHU Cooling Coil Additions (7) | 5-10 Years | $1,444,000 |
| | OFES-ME-4 | Addition of Variable Air Volume (VAV) Boxes to Classroom Systems | 5-10 Years | $190,000 |
| | OFES-ME-5 | Exhaust Fan (5) Replacements | 5-10 Years | $42,500 |
| X | OFES-ME-6 | Misc. HVAC Upgrades - Gym Office Noise, Add Diffusers to Classrooms, Music Room Zoning Improvements and Rebalance System | 0-5 Years | $232,500 |
| X | OFES-ME-7 | Sink Replacement with Sensor Battery Operated & Washfountain Additions to Main Bathrooms | 0-5 Years | $82,500 |
| X | OFES-ME-8 | Domestic Hot Water Recirculation Upgrades - Upsize Pump and Recirculation Line | 0-5 Years | $50,000 |
| | OFES-ME-9 | Fire Protection (Sprinkler System) - Entire Building System Addition | 10-20 Years | $473,500 |
| X | OFES-ME-10 | HVAC Systems Optimization (RCx & Sequence Review) | 0-5 Years | $49,500 |
| X | OFES-ME-11 | IT Room Cooling Upgrade - New Split Cooling Unit | 0-5 Years | $18,000 |
| **Deferred Maintenance - All Selected Totals** | | | | **$3,064,000** |

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| **Educational Adequacy** | | | | |
| X | OFES-EDA-1 | Commons and Flexible Space in Addition, Kitchen, Receiving, Restrooms in Addition | EDA | $2,464,500 |
| X | OFES-EDA-2 | Remodel Main Office and Art Room into Main Office, Community Room & SPED | EDA | $610,500 |
| X | OFES-EDA-3 | Remodel Computer Lab and IMC into Maker Space | EDA | $199,000 |
| X | OFES-EDA-4 | Repurpose Cafeteria into Music/Lab & Classrooms into Art/Kiln Room | EDA | $424,500 |
| X | OFES-EDA-5 | Remodel for Flex Rooms, Staff Lounge, Kids Station, SPED, etc., Operable Connection between Classrooms, Visual Supervision Windows | EDA | $945,000 |
| X | OFES-EDA-6 | Add Bus Loop and Add 4K/EC Parking | EDA | $286,500 |
| X | OFES-EDA-7 | Allowance to Replace 50% of Classroom Furniture in Unremodeled Areas | EDA | $246,000 |
| **Educational Adequacy - All Selected Totals** | | | | **$5,176,000** |

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| **Oconto Falls Elementary - All Selected Totals** | **$8,240,000** |

## WASHINGTON MIDDLE SCHOOL | FACILITY IMPROVEMENT MEASURES & BUDGETS

**Washington Middle School**

| Selected | FIM # | Facility Improvement Measure (FIM) Description | Priority | Project Budget |
|---|---|---|---|---|
| **Interior Finishes and Food Service** | | | | |
| | WMS-INT-1 | High Priority Interior Finishes - Flooring, Ceilings, Walls, Doors, ADA Upgrades | 0-5 Years | $1,133,000 |
| | WMS-INT-2 | Medium Priority Interior Finishes - Floors, Walls, Ceilings | 5-10 Years | $725,000 |
| | WMS-INT-3 | Low Priority Interior Finishes - Floors, Ceilings, Walls | 10-20 Years | $277,000 |
| | WMS-INT-4 | High Priority Casework Replacement | 0-5 Years | $609,500 |
| | WMS-INT-5 | Low Priority Casework Replacement | 10-20 Years | $106,000 |
| | WMS-INT-6 | Kitchen Equipment - Replace Hot Well, Hot Holding Cabinet, Two-Burner Cooktop, Dishwasher | 5-10 Years | $71,500 |
| **Site and Civil Improvements** | | | | |
| | WMS-SC-1 | Replace West Playground Pavement (New Base and Asphalt) | 5-10 Years | $547,500 |
| | WMS-SC-2 | Repair Concrete Sidewalk, Add ADA Panels | 5-10 Years | $4,000 |
| **Building Envelope Repairs** | | | | |
| | WMS-BE-1 | Replace Ballasted EPDM Roofing Area in Poor Condition with New Insulation and EPDM Membrane | 0-5 Years | $171,000 |
| | WMS-BE-2 | Replace Shingled Roof, Repair Flashings, Install Step Flashing, Flash Roof Penetrations, Review Roof Ventilation | 0-5 Years | $437,000 |
| | WMS-BE-3 | Replace Adhered EPDM Roofing Area, Repair Edge Detail, Thermal Barrier, Insulation | 0-5 Years | $135,500 |
| | WMS-BE-4 | Repair Loose Wall Flashing at Upper PVC Roofing Area | 10-20 Years | $6,500 |
| | WMS-BE-5 | Replace Deteriorated Panels Covering Windows in Old Gym | 0-5 Years | $130,000 |
| | WMS-BE-6 | Repair Cracked Masonry, Replace Window Seals & Gaskets where Deteriorated, Splash Blocks and Gutter Repairs | 0-5 Years | $11,000 |
| | WMS-BE-7 | Install Weep Holes in Lintels where None Exist | 5-10 Years | $39,000 |
| | WMS-BE-8 | Remove and Replace Masonry Sealant Joints on Front Elevation, Tuckpointing, Repair Lintels on East Elevation | 0-5 Years | $58,500 |
| | WMS-BE-9 | Repair Sealants at East EIFS and North Metal Panels, Install Flashing for Metal Panels | 0-5 Years | $16,000 |
| | WMS-BE-10 | Tuckpointing along East and North Sides of Old Gymnasium | 5-10 Years | $293,000 |
| | WMS-BE-11 | Repair Corroded Door Frames along Stair Platform | 5-10 Years | $11,000 |
| **Electrical and Safety Systems** | | | | |
| | WMS-EE-1 | Replace Fire Alarm System with New Addressable System | 0-5 Years | $235,500 |
| | WMS-EE-2 | Coordination, Arc Flash, and Panel Safety Improvements. Kiln and Mixer Disconnects. Supports/Hangers in Mech. Room. | 0-5 Years | $17,500 |
| | WMS-EE-3 | Replace Main Service Switchboard | 0-5 Years | $68,500 |
| | WMS-EE-4 | Replace Panelboards E, K. Replace Hallway Panel Cover/Door. | 0-5 Years | $17,000 |
| | WMS-EE-5 | Add Notification Strobes to Classrooms for Code Compliance | 0-5 Years | $58,500 |
| | WMS-EE-6 | Provide New Backup Generator, Transfer Switches, and Distribution Panel (EM Lighting, Heating, Cooler/Freezer, IT) | 5-10 Years | $215,000 |
| | WMS-EE-7 | Replace Original 1957 Electrical Distribution Equipment | 5-10 Years | $117,000 |
| | WMS-EE-8 | Replace Existing Lighting with LED Lighting and Controls | 0-5 years | $320,500 |
| | WMS-EE-9 | Provide new PA and Clock System with New, Integrated System | 10-20 Years | $114,000 |
| **Mechanical and Environmental Systems** | | | | |
| | WMS-ME-1 | Pneumatic to DDC Controls Upgrade and Control Valve Replacement | 0-5 Years | $577,000 |
| | WMS-ME-2 | Boiler Plant Replacement & Steam to Hot Water Conversion | 0-5 Years | $3,856,500 |
| | WMS-ME-3 | Chilled Water Plant and Associated Chilled Water Piping Distribution System | 0-5 Years | $812,500 |
| | WMS-ME-4 | Classroom Unit Ventilator Replacement with Displacement Ventilation (Only if ME-3 is selected) | 0-5 Years | $4,827,000 |
| | WMS-ME-5 | Gym Air Handling Unit (2) Replacement and Add Cooling | 0-5 Years | $353,000 |
| | WMS-ME-6 | Exhaust Fan (24) Replacements, Addition of Thermal Equalizers in Gymnasium | 0-5 Years | $180,500 |
| | WMS-ME-7 | Dust Collector & Ductwork Replacement | 5-10 Years | $114,500 |
| | WMS-ME-8 | Domestic Water and Natural Gas Piping Relocation from Tunnel to Overhead, Correct Kitchen Condenser Preheat - Replace Galvanized | 5-10 Years | $1,135,500 |
| | WMS-ME-9 | Fire Protection (Sprinkler System) - Entire Building System Addition | 10-20 Years | $430,500 |
| | WMS-ME-10 | HVAC Systems Optimization (RCx & Sequences) - 1983 and 2001 Additions | 10-20 Years | $10,500 |
| | WMS-ME-11 | IT Room Cooling Upgrade - New Split Cooling Unit | 0-5 Years | $18,000 |
| **Deferred Maintenance - All Selected Totals** | | | | **$0** |

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| **Educational Adequacy** | | | | |
| | WMS-EDA-1 | Multi-Purpose Room Addition | EDA | $745,500 |
| | WMS-EDA-2 | First Floor Classrooms, Main Office, IMC, Lockers and SPED Remodeling, Provide Operable Connection between Classrooms, Add Visual Supervision Windows at Classrooms | EDA | $3,172,000 |
| | WMS-EDA-3 | First Floor Tech Ed, Multi-Purpose, & Staff Lounge Remodeling | EDA | $357,500 |
| | WMS-EDA-4 | First Floor Commons Repurposing, First Floor Kitchen/Receiving Repurposing | EDA | $1,001,500 |
| | WMS-EDA-5 | Second Floor Music Remodeling of Upper Gym | EDA | $860,500 |
| | WMS-EDA-6 | Artificial Turf and Hardscape Replacement/Restriping | EDA | $57,500 |
| | WMS-EDA-7 | Allowance to Replace 50% of Classroom Furniture in Unremodeled Areas | EDA | $521,000 |
| **Educational Adequacy - All Selected Totals** | | | | **$0** |

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| **Washington Middle School - All Selected Totals** | **$0** |

## WASHINGTON MIDDLE SCHOOL | FACILITY IMPROVEMENT MEASURES & BUDGETS

**New Middle School**

| Selected | FIM # | Facility Improvement Measure (FIM) Description | Priority | Project Budget |
|---|---|---|---|---|
| **New Construction and Athletic Fields** | | | | |
| X | NS-EDA-1 | Construct New Middle School | EDA | $29,588,000 |
| X | NS-EDA-2 | Create Two New Baseball Fields | EDA | $911,500 |
| **New Middle School - All Selected Totals** | | | | **$30,499,500** |

## OCONTO FALLS HIGH SCHOOL | FACILITY IMPROVEMENT MEASURES & BUDGETS

**Oconto Falls High School**

| Selected | FIM # | Facility Improvement Measure (FIM) Description | Priority | Project Budget |
|---|---|---|---|---|
| **Interior Finishes and Food Service** | | | | |
| X | OFHS-INT-1 | High Priority Interior Finishes - Flooring, Ceilings, Walls, Doors, ADA Improvements | 0-5 Years | $432,000 |
| | OFHS-INT-2 | Medium Priority Interior Finishes - Floors, Walls, Ceilings | 5-10 Years | $1,502,500 |
| | OFHS-INT-3 | Low Priority Interior Finishes - Floors, Ceilings, Walls | 10-20 Years | $3,050,000 |
| X | OFHS-INT-4 | High Priority Casework Replacement | 0-5 Years | $158,500 |
| | OFHS-INT-5 | Low Priority Casework Replacement | 10-20 Years | $797,500 |
| | OFHS-INT-6 | Kitchen Equipment - Replace Icemaker, Mixers (2), 10-Burner Range, Two-Burner Cooktop, Disposer, Dishwasher | 5-10 Years | $101,000 |
| **Site and Civil Improvements** | | | | |
| X | OFHS-SC-1 | Replace Pavement at North Drive (New Base and Asphalt) | 0-5 Years | $136,500 |
| | OFHS-SC-2 | Replace Pavement at West Parking Lot (New Base and Asphalt) | 5-10 Years | $327,000 |
| | OFHS-SC-3 | Replace Pavement at North Parking Lot (New Base and Asphalt) | 5-10 Years | $263,000 |
| | OFHS-SC-4 | Replace Pavement at North Delivery Area (New Base and Asphalt) | 5-10 Years | $98,500 |
| | OFHS-SC-5 | Replace Pavement at South Drive (New Base and Asphalt) | 5-10 Years | $176,000 |
| | OFHS-SC-6 | Concrete Sidewalk Repairs, Add ADA Panels | 5-10 Years | $38,000 |
| | OFHS-SC-7 | Stormwater Management (Required if Over 1 Acre of Land is Disturbed) | 5-10 Years | $163,000 |
| **Building Envelope Repairs** | | | | |
| | OFHS-BE-1 | Replace Ballasted EPDM Roofing - Low Priority | 10-20 Years | $518,000 |
| X | OFHS-BE-2 | Step Flashing Repairs/Installation, Replace Leaking Vents, Replace Roof Vent on North Side of Building | 0-5 Years | $43,500 |
| X | OFHS-BE-3 | Repair Precast Concrete Wall Panels, New Joints and Sealants | 0-5 Years | $136,500 |
| X | OFHS-BE-4 | Repair and Reseal EIFS Cladding where Deteriorating, Repair EIFS Sealant at 2nd Story Windows on North Elevation | 0-5 Years | $85,000 |
| | OFHS-BE-5 | Repair Masonry at West Side of Sloped Roofing, Modify Greenhouse Masonry Wall with Moisture Problems | 5-10 Years | $21,500 |
| | OFHS-BE-6 | Replace Shingled Roofing System, Properly Install Flashing at Penetrations and Transitions | 5-10 Years | $747,500 |
| X | OFHS-BE-7 | Replace Steep Slope EPDM Roof System with Shingled Roof, Flashing Repairs at Metal Roof, Roof Scupper Repairs | 0-5 Years | $202,500 |
| | OFHS-BE-8 | Repair Exterior Stairs at North Side of East Elevation | 5-10 Years | $18,000 |
| X | OFHS-BE-9 | Install Gutters for Roof Drainage Along North Elevation Steep Slope Roof System | 0-5 Years | $65,000 |
| X | OFHS-BE-10 | Replace AC Unit Sealant, Window Sill Flashing & Control Joint Sealant, Install EIFS Flashing, Seal Masonry with Peeling Paint, Repair Masonry Cracks | 0-5 Years | $35,500 |
| | OFHS-BE-11 | Replace Windows at West Elevation at Alcove | 5-10 Years | $66,500 |
| X | OFHS-BE-12 | Replace Damaged Lintel by Greenhouse, Replace Sealant Joints at South EIFS, Tuckpointing at South Elevation | 0-5 Years | $27,500 |
| **Electrical and Safety Systems** | | | | |
| X | OFHS-EE-1 | Provide Emergency System Corrective work and Load Redistribution - Proper Separation of Emergency Loads | 0-5 Years | $85,500 |
| X | OFHS-EE-2 | Electrical Systems - Replace Fire Alarm System with New Addressable System. Correct Coverage Deficiencies. | 0-5 Years | $586,000 |
| X | OFHS-EE-3 | Coordination, Arc Flash, and Panel Safety Improvements. Replace Rooftop Disconnect Switches. | 0-5 Years | $26,500 |
| X | OFHS-EE-4 | Replace Original 1967 Electrical Panels. GFCI Outlets, IT Grounding Leads, Replace Conduit Cover in 800A | 0-5 Years | $200,000 |
| X | OFHS-EE-5 | Replace Existing Lighting with LED Lighting and Controls. Auditorium Lighting Replacement. | 0-5 Years | $789,500 |
| X | OFHS-EE-6 | Replace PA and Clock Systems with New, Integrated System | 0-5 Years | $330,000 |
| **Mechanical and Environmental Systems** | | | | |
| | OFHS-ME-1 | DDC Supervisor Upgrade | 10-20 Years | $10,000 |
| X | OFHS-ME-2 | Heating Plant Upgrades - Boiler Replacement, Heating System Glycol, Replace 1995 Heating Pumps, Upgrade Air Separators | 0-5 Years | $629,000 |
| X | OFHS-ME-3 | Chiller Replacement and Increased Chilled Water Capacity & Piping System for 1967 & 1995 Additions | 5-10 Years | $532,500 |
| | OFHS-ME-4 | Classroom Ventilation Upgrades to Displacement Ventilation | 10-20 Years | $3,255,500 |
| | OFHS-ME-5 | 1967 Gym Air Handling Unit (AHU) Replacement and Addition of Cooling | 5-10 Years | $702,000 |
| | OFHS-ME-6 | Air-Conditioning Additions to Tech Ed | 5-10 Years | $277,500 |
| | OFHS-ME-7a | 1995 IMC and Classroom Condensing Unit Replacement (Not needed if ME-3 is selected) | 0-5 Years | $73,000 |
| | OFHS-ME-7b | 1995 IMC and Classroom AHU Replacement | 10-20 Years | $195,500 |
| X | OFHS-ME-8 | Replacement of Fan Coil Units serving Guidance and Pupil Services with Air Handling Unit | 0-5 Years | $234,500 |
| | OFHS-ME-9 | Exhaust Fan (7) Replacements, Addition of Thermal Equalizers in 1967 Gym, Wrestling, and Commons | 5-10 Years | $139,500 |
| X | OFHS-ME-10 | Dust Collector & Ductwork Replacement, Welding Exhaust Improvements | 0-5 Years | $153,000 |
| X | OFHS-ME-11 | IT Room Cooling Upgrade - Replace Portable Air Conditioner with Split Cooling Unit | 0-5 Years | $18,000 |
| X | OFHS-ME-12 | Handwashing Sink Conversions from Manual to Sensor Battery Operation & Wrestling Locker Room Shower Valve (14) Replacement | 0-5 Years | $98,000 |
| X | OFHS-ME-13 | Water Heater Capacity Increase with Addition of Storage Tank | 0-5 Years | $31,500 |
| | OFHS-ME-14 | Fire Protection (Sprinkler System) - Entire Building System Addition | 10-20 Years | $1,107,000 |
| | OFHS-ME-15a | HVAC Systems Optimization (RCx & Sequence Review) - 2000 HVAC Equipment & Any Reused 1995 HVAC Equipment | 0-5 Years | $51,000 |
| X | OFHS-ME-15b | HVAC Systems Optimization (RCx & Sequence Review) - Entire Building | 0-5 Years | $110,500 |
| **Deferred Maintenance - All Selected Totals** | | | | **$5,147,000** |

## OCONTO FALLS HIGH SCHOOL | FACILITY IMPROVEMENT MEASURES & BUDGETS

| **Educational Adequacy** | | | **Priority** | **Project Budget** |
|---|---|---|---|---|
| X | OFHS-EDA-1 | Office Consolidation, Create Community Room and SRO/Food Service Relocation | EDA | $646,000 |
| X | OFHS-EDA-2 | IMC Remodeling into Learning Commons & Flex Spaces | EDA | $419,000 |
| X | OFHS-EDA-3 | Stage Remodeling into Connecting Corridor and Storage | EDA | $163,500 |
| X | OFHS-EDA-4 | SPED Science and Social Studies Remodeling | EDA | $189,000 |
| X | OFHS-EDA-5 | Remodel Pupil Services & ELA into Flex Area, Operable Connection between Classrooms, Add Classroom Visual Supervision Windows | EDA | $424,000 |
| X | OFHS-EDA-6 | Technical Education Area Remodeling | EDA | $2,216,500 |
| X | OFHS-EDA-7 | Dropoff and Main Office Sidewalk, Grass, and Curb/Gutter | EDA | $46,000 |
| X | OFHS-EDA-8 | Allowance to Replace 50% of Classroom Furniture in Unremodeled Areas | EDA | $246,000 |
| **Educational Adequacy - All Selected Totals** | | | | **$4,350,000** |

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| **Oconto Falls High School - All Selected Totals** | **$9,497,000** |

## DISTRICT-OWNED BUILDINGS | FACILITY IMPROVEMENT MEASURES & BUDGETS

| Administration Building and Bus Garage | | | | |
|---|---|---|---|---|
| **Selected** | **FIM #** | **Facility Improvement Measure (FIM) Description** | **Priority** | **Project Budget** |
| **Site and Civil Improvements** | | | | |
| | BUS-SC-1a | Bus Garage - Replace Existing Asphalt Pavement with New Asphalt | 5-10 Years | $54,000 |
| | BUS-SC-1b | Bus Garage - Replace Existing Asphalt Pavement with Concrete | 5-10 Years | $164,500 |
| **Building Envelope Repairs** | | | | |
| | ADM-BE-1 | Admin Building - Replace Window Sealants | 5-10 Years | $10,000 |
| | ADM-BE-2 | Admin Building - Extend Downspouts for Drainage, Install Roof Ventilation | 5-10 Years | $8,000 |
| | BUS-BE-1 | Bus Garage - Replace Roofing System | 5-10 Years | $81,000 |
| | BUS-BE-2 | Bus Garage - Replace Degraded Wood Siding at Windows | 5-10 Years | $39,000 |
| | BUS-BE-3 | Bus Garage - Replace Overhead Doors with New, Insulated Doors | 5-10 Years | $13,000 |
| | BUS-BE-4 | Bus Garage - Masonry Repairs and Tuckpointing | 5-10 Years | $13,000 |
| **Electrical and Safety Systems** | | | | |
| | ADM-EE-1 | Replace Service Entrance Panel, Arc Flash and Panel Study | 0-5 Years | $11,000 |
| | ADM-EE-2 | Remove All Non-Metallic Cabling and Replace with Wiring in Conduit | 0-5 Years | $13,000 |
| | ADM-EE-3 | Replace Fluorescent Lighting with LED System | 0-5 Years | $16,000 |
| | BUS-EE-1 | Arc Flash Study and Panel Retrocommissioning | 0-5 Years | $11,000 |
| | BUS-EE-2 | Replace Fluorscent Lighting with LED System, Add Additional Exit Signs | 0-5 Years | $11,000 |
| **Electrical and Safety Systems** | | | | |
| | ADM-ME-1 | Re-zone Hydronic Heating System and Replace Boiler | 5-10 Years | $71,500 |
| | BUS-ME-1 | Upgrade Office Ventilation System with New Furnace, AC, and Zoning | 0-5 Years | $23,000 |
| | BUS-ME-2 | Install Garage Ventilation System | 0-5 Years | $12,500 |
| **Bus Garage and Admin Building - All Selected Totals** | | | | **$0** |

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| **All Schools - All Selected Totals** | **$52,865,000** |
| **Construction Inflation Allowance (4%)** | **$2,114,600** |
| **Grand Total** | **$54,979,600** |