Glen Oaks Community College

Five-Year Capital Outlay Plan

Submitted
October 2023

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Glen Oaks Community College
Five-Year Capital Outlay Plan
2024-2028

I. Mission Statement

At the October 19, 2023, Board of Trustees Meeting, the Board approved the College's Mission, Vision and updated Strategic Plan. Glen Oaks Community College's Vision for engagement with our service area & our Mission reads:

VISION: Transforming Lives and Advancing Communities

MISSION: The mission of Glen Oaks Community College is to provide students opportunities for academic and lifelong success through excellence in teaching and comprehensive support services that meet our community's diverse educational needs.

GOCC Strategic Plan, 2023-26

GOAL #1: Our students will succeed.

Objective 1: By August 2026, of those testing at a pre-college level in math, increase the proportion of credential-seeking students who successfully complete college level math by 3%. The 2020 VFA* baseline is 17.6%.

Objective 2: By August 2026, increase the proportion of credential seeking part-time students attaining an associate degree or certificate by 3%. The VFA 2023 baseline is 40.3%.

Objective 3: By August 2026, decrease the performance gap to ≤ 0.35 for the following items on the Student Satisfaction Inventory (SSI):

(a) Receive ongoing feedback about progress toward my academic goals.
(b) Faculty provide timely feedback about my academic progress.

Objective 4: By August 2026, meet or exceed the national benchmark (50th percentile) for Engaged Learning on the Survey for Entering Student Engagement (SENSE). The 2022 baseline rate is 43.2%. *

Objective 5: By August 2024, establish pathways for all programs of study.

Objective 6: By August 2026, implement three additional features of Watermark to enhance communication and track key engagements with prospective and enrolled students.
Objective 7: By August 2026, eliminate the gap between student-athletes' mean GPA and that of the overall student population. The 2022-23 baseline is 2.95 for student-athletes and 3.19 for the overall student population.

GOAL #2: We will become a community model committed to the values of diversity, equity, and inclusion.

Objective 1: By August 2025, improve overall employee satisfaction related to the college's commitment to diversity, equity, and inclusion, as evidenced by achieving a minimum satisfaction rate of 60% on the PACE survey for the following items:

(a) *The College maintains a campus culture that values diversity of opinion.*

(b) The institution effectively promotes diversity in the workplace.

Objective 2: By August 2024, the college will revise and enact an employee recruitment plan aimed at diversifying the faculty and staff to better match the student profile.

Objective 3: By August 2026, implement a diversity lecture series for students. *

Objective 4: By August 2026, increase student engagement in college committees to seek ideas, perspectives, and voices of the community we serve. Achieve and maintain a minimum of two student committee members per academic year. *

Objective 5: By August 2026, support faculty and staff by providing two new professional development opportunities in cultural competency and inclusion. *

Objective 6: By August 2026, create and invest in spaces that value diversity. *

Objective 7: By August 2026, increase both curricular and co-curricular learning opportunities that advance cultural competence, diversity, and inclusion. *

GOAL #3: We will continue to grow in stability and innovation.

Objective 1: New: By August 2026, overall enrollment (as measured by fiscal year equated students, or FYES) will reach or exceed the pre-pandemic level of 760, representing an increase of 9.4% from 2022-23.

Objective 2: By August 2024, plan and conduct a Summer College for Kids program enrolling twenty-five area middle school students to begin building a college going culture within traditionally non-college attending families.

Objective 3: By August 2024, establish a new and/or update an existing vocational certificate and/or degree program that aligns with one of the "Southwest Michigan Career Outlook (through ~~(~~**2030**)" high-wage or in-demand careers established through the Michigan Bureau of Labor Market Information and Strategic Initiatives.

Objective 4: By August 2024 migrate the Ellucian Colleague ERP to the cloud.

Objective 5: By December 2024, complete Phase Two of the five-year capital outlay plan via a 7.7-million-dollar USDA loan.

Objective 7: By June 2024, the college will investigate the potential for solar energy installation on campus.

Objective 8: Increase revenue opportunities during the summer term by offering housing for local business internships and summer camps for the college and community. * Baseline for 2023 is three individuals served. *
Objective 9: By August 2024, conduct a compensation study to promote growth, consistency, and transparency. *

Objective 10: By January 2025, publish a digital dashboard on the college website reflecting key performance indicators (KPIs) related to student success. *

Objective 11: With Foundation support, secure funding to procure and install an irrigation center pivot on the Hagen Farm and utilize the equipment to explore additional curriculum related to irrigation and water management. *

GOAL #4: We will expand and strengthen our collaborative relationships.

Objective 1: By August 2024, provide wide community access to diverse perspectives and relevant national issues via the Viking Speaker Series, reaching a minimum of 600 attendees each year.

Objective 2: By January 2025, increase the faculty presence in high schools to promote academic programs to both CTE and traditional GOCC student populations.

Objective 3: By January 2024, a minimum of four courses will have been taught in county high schools using synchronous educational technology made available through the GOCC Center for Rural Sustainability grant.

Objective 4: By January 2025, expand advisory meetings to include additional students, business and industry partners, and the ISD (as appropriate) at bi-annual advisory committee meetings.

Objective 5: By January 2025, increase the number of articulation agreements by 25%and communicate transfer

pathways to students through multiple sources.

Objective 6: By July 2025, conduct a minimum of 29 Going Pro Talent Fund (GPTF) trainings for area manufacturers and businesses, reflecting an increase of 38% over 21 training sessions offered in 2022-23. *

Objective 7: By, under the GPTF, hold a Sales and Leadership Summit in which a minimum of 20 individuals will engage (i.e, 10 for each, sales and leadership). *

Objective 8: By July 2025, a minimum of two new Michigan New Jobs Training Program (MNJTP) contracts will be secured. *

Objective 9: By December 2024, increase the number of Motorcycle Safety Program – Basic Rider course by 25%. Baseline for 2023 is 16 sessions. *

* **Denotes new objectives**

Approved by BOT, 9/14/23

II. Instructional Programming

a. Existing Academic Programs

As of the Fall semester of 2023, the following degree and certificate programs were offered at Glen Oaks:

Agriculture

- Agricultural Equipment Technology, Associate of Applied Science
- Agricultural Equipment Technology, Certificate
- Agricultural Operations, MSU Certificate
- Agricultural Operations, MSU Certificate laddered into a GOCC Associate of Science Degree
- Agricultural Operations, MSU Certificate laddered into a GOCC Associate of Applied Science Degree
- Mechanized Irrigation, Certificate of Achievement
- Mechanized Irrigation, Certificate

Arts and Communication

- Visual Arts: Emphasis in Commercial Photography, Associate of Arts Degree
- Visual Arts: Emphasis in Fine Art, Associate of Arts Degree
- Visual Arts: Emphasis in Graphic Design, Associate of Arts Degree

Business

- Accounting, Certificate
- Business, Associate of Applied Science Degree
- Business, Associate of Business Degree
- Management/Marketing, Certificate
- Management/Supervision, Certificate

Computers and Information Technology

- Computer Information Systems, Associate of Applied Science Degree
- Computer Information Systems, Associate of Science Degree
- Computer Science, Associate of Arts Degree
- Computer Support Technician, Certificate of Achievement
- Computer Support Technician, Certificate
- Cybersecurity, Associate of Arts Degree
- Cybersecurity, Certificate of Achievement
- Cybersecurity, Certificate
- Network Administration Technician, Certificate
- Network Management, Certificate of Achievement

General

- Arts, Associate of Arts Degree
- General Studies, Associate of General Studies Degree
- Science, Associate of Science Degree

- General Studies, Certificate

Health and Human Services

- Allied Health, Associate of Applied Science Degree
- Medical Coding and Billing Specialist, Certificate
- Criminal Justice, Associate of Applied Science Degree
- Medical Administrative Specialist, Certificate
- Medical Assistant, Certificate
- Nursing- LPN to RN, Associate of Applied Science Degree
- Nursing, Associate of Applied Science Degree
- Phlebotomy Technician, Certificate

Manufacturing and Industrial Technology

- Automotive Service, Certificate of Achievement
- Automotive Technician, Certificate
- Computer Aided Drafting and Design, Certificate
- Electrical Technologies, Certificate
- Machine Tool, Certificate
- Technology, Associate of Applied Science Degree
- Welding, Certificate

Many courses are available via various instructional modalities including face-to-face, online, and some combination of mediated and face-to-face methods. The college has been approved by the Higher Learning Commission to offer complete academic programs online.

New Academic Program currently exploring in 2021

Registered Behavior Technician (University of Michigan – Dearborn)
Sterile Supply Technician
Athletic Trainer (certified)
American Sign Language
Water & Sewer Technology

b. Identify the unique characteristics of each institution's academic mission:

For Community Colleges:
Two-year degree and certificate technical/vocational training, workforce development activities, adult education focus, continuing or lifelong educational programming, partnerships with intermediate school district(s), community activities; geographic service delivery area(s), articulation agreements or partnerships with four-year institutions, etc.

The college strives to hold all programs to nationally recognized standards. To this effect, the institution seeks external certifications or accreditations whenever possible and appropriate. Currently, the following programs are externally certified or accredited, or prepare students to take externally accredited licensure examinations:

- Associate of Applied Science in Nursing
- Automotive Service

- Automotive Technician
- Medical Assistant
- Medical Administrative Specialist
- Phlebotomy Technician
- Nurse Aide / CNA

Workforce Development Activities
Glen Oaks offers customized and business training programs to area businesses. The Business Outreach and Services office has the capability to develop customized and virtual training (due to COVID-10 Governor's Executive Orders) opportunities to meet a company's needs. Some examples of programs offered include Microsoft Office, , Supervision training, Geometric Dimensioning and Tolerancing (GC&T), Blueprint Reading, Manufacturing Principles, Orientations, 8-D Problem Solving, Working with Baby Boomers, Gen X's, Millennials and iGens, QuickBooks, Project Management, Team Building Skills, Safety Training and Social Media and Business. The college partners with the area Chambers of Commerce, the Economic Development Corporation, and area Michigan Works! offices to offer additional customized training and educational programs.

Additional examples of courses and programs offered:
- Electrical—training modules offered as open entry/open exit for area businesses
- Manufacturing Principles
- Six Sigma – Green Belt Training
- 8-D Problem Solving
- Computer Applications
- G D & T
- Core Tools
- CNC
- Welding
- Electrical
- Blueprint Reading
- 5 S
- Supervisory Training

Adult/Continuing Education Focus
Glen Oaks, in partnership with the Adult Basic Education Offices in Three Rivers and Sturgis provides placement testing and preparation for college to students graduating with a GED. The College is now the Pearson Vue Testing Center for GED Testing.

The College offers Continuing Education, non-credit bearing, "ed2GO" courses in Computer Training for the adult learner, including Word, Excel, QuickBooks, Internet and E-Mail basics, iPad Basics, and programs for personal enrichment and fitness.

Partnerships with ISD
Glen Oaks has current partnerships with the local ISD and school districts in St. Joseph County. Through these agreements, the local high schools can determine the college courses that best fit their needs, while the college provides the expertise and personnel to teach the courses. In recent years the partnership led to new joint programming in CNA, and graphic design, development of programs in agri-business. Dual Enrollment and Early/Middle College approximately 600 area high school students were enrolled in one or more Glen Oaks courses. This partnership takes the shape of CTE, dual enrollment,

general education dual enrollment and Early/Middle College offerings.

Geographical Service Area Glen Oaks serves students from four distinct service areas.

(1) Students are considered in-district if they reside in St. Joseph County plus areas outside the county that pay property taxes to Glen Oaks.
(2) Service area students live in Cass County and Branch County, and are within the White Pigeon, Three Rivers, or Constantine school districts, plus Elkhart, LaGrange and Steuben counties in northern Indiana.
(3) Students who live in Michigan but outside of St. Joseph County and the college's service area.
(4) Students who live out of state or are international students.

Articulation Agreements
Glen Oaks is continuing to develop and update articulation agreements with feeder and receiving institutions.
Articulation agreements are recognized with:

St. Joseph County CTE:
- Automotive
- Graphic Design
- Information Technology
- Gaming & Coding
- Welding
- Computer Aided Drafting and Design
- Medical Occupations
- Marketing
- Machining Technology
- Teacher Academy
- HVAC

Branch Area Career Center:
- Auto/Diesel Technologies
- Business Administration & Technology
- Computer Aided Drafting
- Electrical Technologies
- Information Technology
- Law Enforcement
- Medical Technologies
- Marketing/Management & Entrepreneurship

Partnership with 2-Year Institutions
Glen Oaks Community College has developed and continually reviews joint transfer and cooperation programs with other community colleges. These agreements include:

Kalamazoo Valley Community College
- Cardio Respiratory Care
- Dental Hygiene
- Chemical Technology
- Law Enforcement

Kellogg Community College
- Dental Hygiene
- Law Enforcement
- Physical Therapist Assistant
- Radiography
- Medical Laboratory Technician

Partnerships with 4-Year Institutions

Glen Oaks participates in the MiTransfer Project which is valid throughout the State of Michigan. The college develops and maintains articulation agreements with other institutions of higher education in order to increase collaboration and cooperation among schools as well as improve student transferability and success. The current agreements include:

Baker College
- ADN to BSN agreement utilizing the $2,000,000 State Grant to help GOCC nursing graduates complete BSN's

Davenport University
- Management
- Marketing
- Finance
- Human Resources Management
- International Business
- Computer Information Systems
- Nursing (completion program)
- Health Services Administration
- Health Information Management
- Technology Project Management
- Network Management and Security
- Business
- Accounting Fraud Investigation
- Industrial Production Management
- Leadership and Organizational Performance
- Sports Management
- Biological Laboratory Science
- Computer Science
- Digital Forensics
- Medical Case Management

Michigan State University
- Associate of Science in Agricultural Operations – conferred by GOCC in partnership with MSU

Olivet College
- All programs

Andrews University
- All programs

Ferris State University – institutional partnership
- Accounting

- Allied Health
- Automotive Management
- Business Administration
- Health Information Management
- Nursing (RN to BSN)
- Project Management
- Surveying

University of Phoenix
- Business

Western Michigan University – Institutional Articulation Agreement

Glen Oaks is a signatory of the Michigan Transfer Agreement. With this plan a student can complete 30 semester credits of college level credits which will fulfill a portion of the general education requirements at a participating College or University. The college is also heavily engaged with the Guided pathways initiative and has been a signatory on the pathways that have been completed. Glen Oaks also participates in the MiTransfer Partnership.

The college also has a special relationship with the Michigan Colleges Alliance for transfer of students to the organization's fifteen private institutions.

c. Unique Characteristics of GOCC Mission:

The college houses six K-12 Career Technical Education programs on campus. These include:

- Welding Technology
- Automotive Technology
- Graphic Design
- Gaming & Coding
- IT Hardware
- HVAC

The college's Ag Equipment technology program is unique in west Michigan and provides skills that are in great demand in the vast agricultural businesses of west Michigan and northern Indiana.

d. Demonstrate Economic Impact

The College engaged a national agency, EMSi, to conduct an Economic Impact Study on behalf of the institution. This comprehensive study report is more than one-hundred pages long. The two-page executive summary is presented here to address the question concerning the impact the college has on the regional economy.

FACT SHEET

The Economic Value of Glen Oaks Community College | October 2016

Glen Oaks Community College (GOCC) creates a significant positive impact on the business community and generates a return on investment to its major stakeholder groups—students, taxpayers, and society. Using a two-pronged approach that involves an economic impact analysis and an investment analysis, this study calculates the benefits to each of these groups. Results of the analysis reflect Fiscal Year (FY) 2015-16.

RETURN ON INVESTMENT TO STUDENTS, TAXPAYERS, AND SOCIETY

Student perspective

GOCC's FY 2015-16 students paid a total of **$2.8 million** to cover the cost of tuition, fees, and supplies. They also forwent **$4.0 million** in money that they would have earned had they been working instead of learning.

In return for the monies invested in the college, students will receive a present value of **$53 million** in increased earnings over their working lives. This translates to a return of **$7.80** in higher future earnings for every $1 that students invest in their education. The average annual return for students is **23.2%**.

ECONOMIC IMPACT OF RESIDENCE HALL CONSTRUCTION SPENDING

In FY 2016-17, GOCC will spend $5.6 MILLION on the construction of its new residence hall, generating subsequent spending and ripple effects on the GOCC Service Area economy.

The net impact of this construction spending will amount to **$403.4 THOUSAND** in total added income for the GOCC Service Area economy, which is equivalent to supporting **16** new jobs.

III. Staffing and Enrollment

a. Student Enrollment Levels

The unduplicated number of students enrolled for credit in Fall 2021 was 1,068 as reported on the Integrated Postsecondary Education Data System (IPEDS) in January 2022. Of the total enrollment, 6536 (61.1%) were degree or certificate seeking; the remaining were non-program students. At 94.4%, the vast majority of non-program students reflect those dual enrolled in high school. Of those who are degree/certificate-seeking, 44.72% were full-time. Overall, 54.7% of students enrolled in one or more distance learning courses. Excluding non-program students, the rate of distance learning enrollment (at least one course) increased to 62.7%. Of these enrolled in a program, 46.4% are enrolled in associate degrees designed for transfer; 39.4% in an associate of applied terminal-designed programs (which, by design includes a specialized certificate program; and, 14.2% in a certificate only. Approximately 19.8% of degree/certificate seeking students are pursuing a health-related program.

b. Projected Enrollment Patterns – Next 5 years

In the span of five years, Glen Oaks Community College experienced a rise and fall in fiscal year equated students (FYES) enrollment reaching 760 just prior to the pandemic. Longitudinal data is provided below. We continue to serve large numbers of high school students via dual enrollment, early middle college, and career technical education opportunities, but the population of students in grades 9-12 in the county has been on the decline. Post-Covid, we anticipate a moderate increase in FYES for 2022-23 reflecting the adoption of several new and innovative academic programs. We saw an increase of over 4% in students enrolled in health-related programs (nursing, medical assistant, etc.) in just the past academic year.

c. Evaluate Enrollment Patterns – Last 5 years

We project those increased opportunities for distance learning, including hybrid and synchronous instruction, will continue to offer more flexibility to meet students' needs, thus resulting in moderate enrollment growth over time.

FYES
SUMMARY

FY	FYES
2016-17	677
2017-18	708
2018-19	760
2019-20	746
2020-21	690
2021-22	676
2022-23	682

d. The IPEDS student-to-faculty ratio is 23:1. The methodology used by IPEDS for calculating this ratio excludes adjunct instructors employed by a third party. The actual student-to-faculty ratio, including adjuncts, is significantly lower. The methodology used by the National Community College Benchmark Project (NCCBP) results in a student-to-faculty ratio of 12:1. This is more representative of the student's experience in the classroom.

e. Future staffing needs are expected to remain unchanged in the foreseeable future.

f. The average class size is 15 students, as reported in our most recent submission to the NCCBP. Average class size is not projected to change in the foreseeable future.

IV. Facility Assessment: A-C

***please see APPENDIX B - Facility Assessment Report – 87 pages)

This facility assessment was completed in 2018 to build the case for the significant renovation needed on the GOCC Campus. At the time, the central concourse had already been renovated utilizing a 2.2 million-dollar USDA Rural Development loan. This left the B/C, D, E and F Wings as well at the Tech-Building to be updated. Of special concern was the exterior wall deterioration of the facility.

Since this report was completed, the total north half of the campus comprised of the E and F Wings and the Tech-Building have been renovated utilizing a 7.3-million-dollar State of Michigan Capital Outlay Project and $350,000 Tech-Building renovation self-funded.

The remaining renovation is for the south half of the campus comprised of the B/C, and D Wings and this will begin soon utilizing a 7.7 million-dollar USDA Rural Development loan.

V. Implementation Plan

a. Prioritize major capital projects requested from the State, including a brief project description and estimated cost, in the format provided. (Adjust previously developed or prior year's figures utilizing industry standard CPI indexed where appropriate).

PRIOITY ONE: South Campus Renovation

Included in this year's Capital Outlay Plan is a request to renovate the south half of the 1969 main campus facility. This portion of the facility houses two full floors of academic classrooms and laboratories in addition to the gym and associated facilities, the instructional theatre, restrooms and public spaces. The focus of the project will be the major upgrading of the instructional laboratories for graphic design, commercial photography, water technology, and certified nurse aid programs.

In addition, the fifty-plus year-old restrooms will be updated, the instructional theatre will be updated with the latest instructional technology and seating and the complete exterior refinish will address the bowed and subpar walls to mirror the same solution applied to the north half of the facility. The total square footage being renovated is 65,000. The total project cost is $7,000,000.

b. If applicable, provide an estimate relative to the instruction's current deferred maintenance backlog. Define the impact of addressing deterred maintenance and structural repairs, including programming impact, immediately versus over the next five years.

Please refer to Section IV Facility Assessment.

c. Include the status of on-going projects financed with State Building Authority resources and explain how completion coincides with the overall Five-year Capital Outlay Plan.

The college currently is approaching bidding for the $7.3 million dollar renovation of the south half of the original campus facility. It is projected to be completed in December 2022. (please see Section 4)

d. Identify, to the extent possible, a rate of return on planned expenditures. This could be expresses as operational "savings that a planned capital expenditure would yield in future years.

With each planned expenditure the College strives to improve overall operations, either by enhancing the student environment, decreasing operational costs, and/or addressing issues in a timely, scheduled manner. The continual goal is to replace or restore infrastructure as planned, versus incurring the additional costs inherent with emergency repairs.

e. **Where applicable, consider alternatives to new infrastructure, such as distance learning.**

The College continually examines the means and methods for delivering instruction, seeking effectiveness and efficiency. In general, the intent is to renovate current facilities rather than build new. While distance learning can be highly effective, many forms of instruction require or are enhanced with the environment of the College facilities.

f. **Identify a maintenance schedule for major maintenance items in excess of $1,000,000 for fiscal year 2023 through fiscal year 2027.**

Please refer to Section IV Facility Assessment

g. **Identify the amount of non-routine maintenance the institution has budgeted for in its current fiscal year and relevant sources of funding.**

The College utilizes capital reserves accumulated over several budget years. Current reserves ensure the college will meet the portion of the current capital outlay project; $3,450,000 and would also be able to support the $3,500,000 requirement for this proposed $7,000,000 request.

FY 2024-28 CAPITAL OUTLAY PROJECT REQUEST

Institution name:	***Glen Oaks Community College***
Capital Outlay Code:	Request Code:
Project title:	**South Campus Renovation**
Project Focus:	*Academic/Upgrades*
Approximate Square Foot:	_____
Total Estimated Cost	*$7,700,000*
Estimated Duration of Project:	1 year

Is the Five-Year Plan posted on the institution's public internet site? *Yes*
Is the requested project the top priority in the Five-Year Capital Outlay Plan? *Yes*

Please provide detailed, yet appropriately concise responses to the following questions that will enhance our understanding of the requested project:

1.0 Project Purpose:

Glen Oaks Community College is committed to providing the most robust and student-centered offerings available with the regions served. The College Vision, "Improving Lives and Advancing Communities speaks directly to the desire of all faculty and staff to be impactful in positive, life-changing ways. The campus is now 50 years old and while ire remains serviceable at a basic level, it must be improved to extend the useful life of the building, allowing the college to realize its full potential and continue to provide a 21st Century student experience.

The project is in total, a "South Campus Renovation Project" that is intended to rehabilitate the aging campus, focusing on the areas of greatest importance at the present date. The areas are Unit B, C, D, and the building systems within. The complexity of the building system components, coupled with furnishings and equipment associated with the facility has resulted in an estimated project cost of $7,000,000.

2.0 South Campus Renovation Project Synopsis Scope of the Project:

Units B-C

The mechanical, electrical, and technology infrastructure with Units B-C need replacement to increase the serviceable life of the building. As these building systems are upgraded, the spaces will be returned to an appropriate finished state. The uninsulated exterior façade system will be upgraded to meet the current energy code, as will doors and windows. When complete, the upgrades will bring this unit up to current code compliance.

Unit D

The mechanical, electrical and technology infrastructure within Unit D needs replacement to increase the serviceable life of the building. As these building systems are upgraded, the spaces will be returned to an appropriate finished state. The uninsulated exterior façade system will be upgraded to meet the current energy code, as will doors and windows. When complete, the upgrades will bring this unit up to current code

compliance.

Building and Construction Systems

This campus renovation project focuses on building infrastructure improvements to Unit B, C, and D, replacing critical mechanical, electrical, and building envelope systems that are at the end of their serviceable life, increasing the useful life of these building units for another 50-years or longer. When complete, the upgrades will bring the units up to current code compliance.

Unit D Building Infrastructure Improvements

Unit D includes teaching spaces for the technology laboratories, including nursing, graphic design, commercial photography and water technology. The overall square footage of Unit D is 22,000 square feet. There are also six standard instructional classrooms, and the instructional theatre. The mechanical, electrical, and technology infrastructure with Unit D needs replacement to increase the serviceable life of the building. As they building systems are upgraded, the spaces will be returned to an appropriate finished state, meeting all current code requirements. The exterior façade will be upgraded to meet the current energy code, as well as doors and windows.

UNIT B & C BUILDING INFRASTRUCTURE IMPROVEMENTS

Units B & C include the gym, various classroom spaces, office space and circulation space. The overall square footage of Unit B & C is approximately 65,000 -square foot. The mechanical, electrical, and technology infrastructure within unit B & C needs replacement to increase the serviceable lift of the building. As these building systems are upgraded, the spaces will be returned to an appropriate finished state, meeting all current code requirements. The exterior façade will be upgraded to meet the current energy code, as will doors and windows.

ARCHITECTURAL

Once the building systems infrastructure updates are complete, each space will be returned to an appropriate finished state with new finishes materials provided for the ceilings, walls and floors, as appropriate, to return the space to its functional use.

The existing exterior façade system is a non-insulated wall system with structural integrity deficiencies. This wall system will be upgraded and replaced with a composite wall system to meet the current energy code. As the façade system is upgraded, doors and windows will also be upgraded to meet energy code and building code requirements. Window systems will be upgraded with aluminum storefront systems, aluminum curtainwall systems, or insulated translucent sandwich panel systems, as appropriate to meet pertinent code requirements. All exterior doors and windows will be replaced with energy efficient systems.

Below is a summation of the proposed building infrastructure improvements:

Lighting – The existing lighting will be replaced with LED type fixtures. Light levels will be increased to meet today's IES standards. The light fixtures specified will have a minimum five-year warranty and be DLC certified to qualify for utility rebates. Emergency lighting will be connected to the new generator system per NFPA and NEC requirements.

Lighting Controls – Lighting controls will be provided to increase the learning environment and to meet today's energy code. Daylight harvesting will be provided where required by code. Occupancy sensors, low voltage switches and associated wiring will be provided for all spaces. Each area will be controlled separately with low voltage dimmers. Daylight sensors will be provided to meet the energy code.

Fire Alarm – Provide new fire alarm devices to meet NFPA requirements. All fire alarms will be

connected to a new addressable main fire alarm control panel located in Unit D.

TECHNOLOGY – provide new technology systems as noted below:

Fiber Optic Cabling

New fiber optic cabling shall be installed form the Data Center TR to each of the TRs, fiber cable shall be OM4, 24 strand, plenum rated, armored. New fiber enclosures shall be installed in each TR. All strands to be terminated by fusion splicing, with LC connectors. All existing fiber optic cabling shall be removed after the new fiber optic cable is functional.

Network Cabling

There will be a new access control system provided, basis of design a Lenel S2 enterprise or Genetic system. The new access control platform will have access controllers located in the nearest electrical room with wall space closet to each of the following tech rooms. Each controller will have a Cat16 cable run.

AV Systems

Classrooms shall be equipped with an AV system for projector, audio, computer inputs, controller, etc. Audio systems shall be integrated with a projector with a wall touchscreen control. Wireless microphones shall be part of the system.

Network Gear

All telecommunication rooms shall have a minimum of three Cisco layer-3 switches with dual power supplies, PoE+, 1 u, 48 port. New wireless access points shall be deployed throughout campus, each wireless access point shall serve approximately 900sq/ft. Wireless access point shall be Cisco or Meraki and work with a wireless controller.

Safety & Security

Cabling and devices will be installed at the following locations:

Exterior doors, entry/exit (10 total), door position switch, 18/2 cable (each leaf), request to exit motion sensor, 18/2 cable (Qty 13 – each pair of doors), Electric-Strike, rim-style, 18/4 cable (each leaf), card-reader, 18/6 cable (Qty 8 - ne for each bank of entry doors), rough in/cat6 cable for future camera install – provide 30’ slack at the ceiling next to door. Barrier free doors – Provide 120-volt circuit to power operated door. Provide rough in for two barrier-free buttons per door location. Provide low voltage wiring between buttons and door operator. All conduit and backboxes shall be concealed in existing walls and doorframe.

3. Program Focus of Occupants:

The occupants of the building will be students and faculty participating in nursing, allied health, graphic design and water technical education programs. In addition, the occupants will utilize the gym and general classrooms.

4. How does the project support Michigan’s talent enhancement, job creation and economic growth initiatives on a local, regional, and/or statewide basis?

The project provides space to enable the college to enhance local talent development by offering additional support for student curricular and co-curricular activities and making additional space available for community activities. Increased student engagement, especially through participation in the group study environment and tutoring opportunities encourages improved talent enhancement and connections between students and community needs.

5. How does the project enhance the core academic and/or research mission of the

institution?

This renovation project will allow the College to update existing technologies in high demand areas and focus on emerging technology sectors. It will allow Glen Oaks Community College to be a leader is skilled trade areas. The fifty-year age and high utilization of the building are readily apparent. In addition, outdated equipment from defunct programs should be removed to make room for emerging programs. Providing an excellent state-of-the-art facility is critical in attracting and retaining students and is absolutely necessary for the development and growth of these programs.

6. Is the requested project focused on a single, stand-alone facility?

Yes, the southern half of the original 1969 facility comprised of two attached wings to a central core

7. Does the project support investment in or adaptive re-purposing of existing facilities and infrastructure?

Yes, to the extent required to upgrade current and new technical laboratories.

8. Does the project address or mitigate any current health/safety deficiencies relative to existing facilities?

Yes, as the renovation efforts are underway. Glen Oaks Community College will address lab safety by utilizing and implementing best practices and standards (eye-wash stations, ventilation and current building codes). Current classrooms and lab areas are out-of-date and newer safety standards exist that will be integrated during the building process. Gender neutral and barrier-free restrooms will be added to facilitate the requirements of our students and employees. Access and accommodation for entrance and egress will also be addressed. Interior door locks and phones will be installed in all classrooms and labs in order to address potential safety deficiencies. Fire suppression and life safety systems will be examined and upgraded as necessary.

9. How does the institution measure utilization of its existing facilities, and how does it compare relative to established benchmarks for educational facilities? How does the project help to improve the utilization of existing space and infrastructure, or conversely how does the current utilization support the need for additional space and infrastructure?

BUILDING AND CLASSROOM UTILIZATION RATES

The following chart contains building and classroom utilization rates for each teaching space at GOCC's Main Campus, identifying classroom and lab usage rates. The following data reflects course use only, though many of the spaces on campus not listed here are utilized for student or employee-related events, labs activities, student services, community meetings, and many other items. Not all the utilized space is electronically tracked and/or reportable. Fall 2019 Semester data were utilized as a typical example, since Winter 2020 semester and beyond, up to present time, has been affected by COVID-19 adjustments.

SPACE UTILIZATION AVERAGE: Fall 2019 Semester (08/26/19 – 12/13/19)					
BUILDING/WING	**PEAK (10 am – 3 pm)**	**OFF-PEAK (8 am – 10 am)**	**OFF-PEAK (3 pm – 5 pm)**	**EVENING (5 pm – 10 pm)**	**WEEKEND**
D Wing	28.2%	54.4%	4.4%	11.3%	0%
E Wing	35.4%	35.6%	12.2%	36.0%	0%

F Wing	23.4%	21.7%	4.2%	19.7%	0%
G Wing	38.0%	25.0%	31.7%	7.3%	0%

10. How does the institution intend to integrate sustainable design principles to enhance the efficiency and operations of the facility?

Glen Oaks Community College recognizes the importance of its environmental impact. The college is committed to incorporate energy efficient systems and sustainable building practices. This includes automated controls, light sensors and the use of recyclable materials. Glen Oaks intends to ensure the building's mechanical; electrical and plumbing systems work and interact efficiently to promote optimal performance.

11. Are matching resources currently available for the project? If yes, what is the source for the match resources? If not, identify the intended source and the estimated timeline for securing said resources.

Yes, the matching requirements of this project will be funded by College reserves. All financial resources will be available prior to the start of the project. The College has allocated resources to fund at least two-thirds of the project cost

12. If authorized for construction, the state typically provides a maximum of 50% of the total cost for community college projects. Does the institution intend to commit additional resources that would reduce the state share from the amounts indicated? If so, by what amount.

No, the college currently does not plan to fund more than 50% of the project.

13. Will the completed project increase operating costs to the institution? If yes, please provide an estimated cost (annually, and over a five-year period) and indicate whether the institution has identified available funds to support the additional costs.

No, there are no substantial operational costs anticipated as part of this project. In fact, based on the age of the building and planned improvements, the College anticipates any increased energy costs to be offset by the efficiencies realized through renovating the remainder of the existing building.

14. What impact, if any, will the project have on tuition costs?

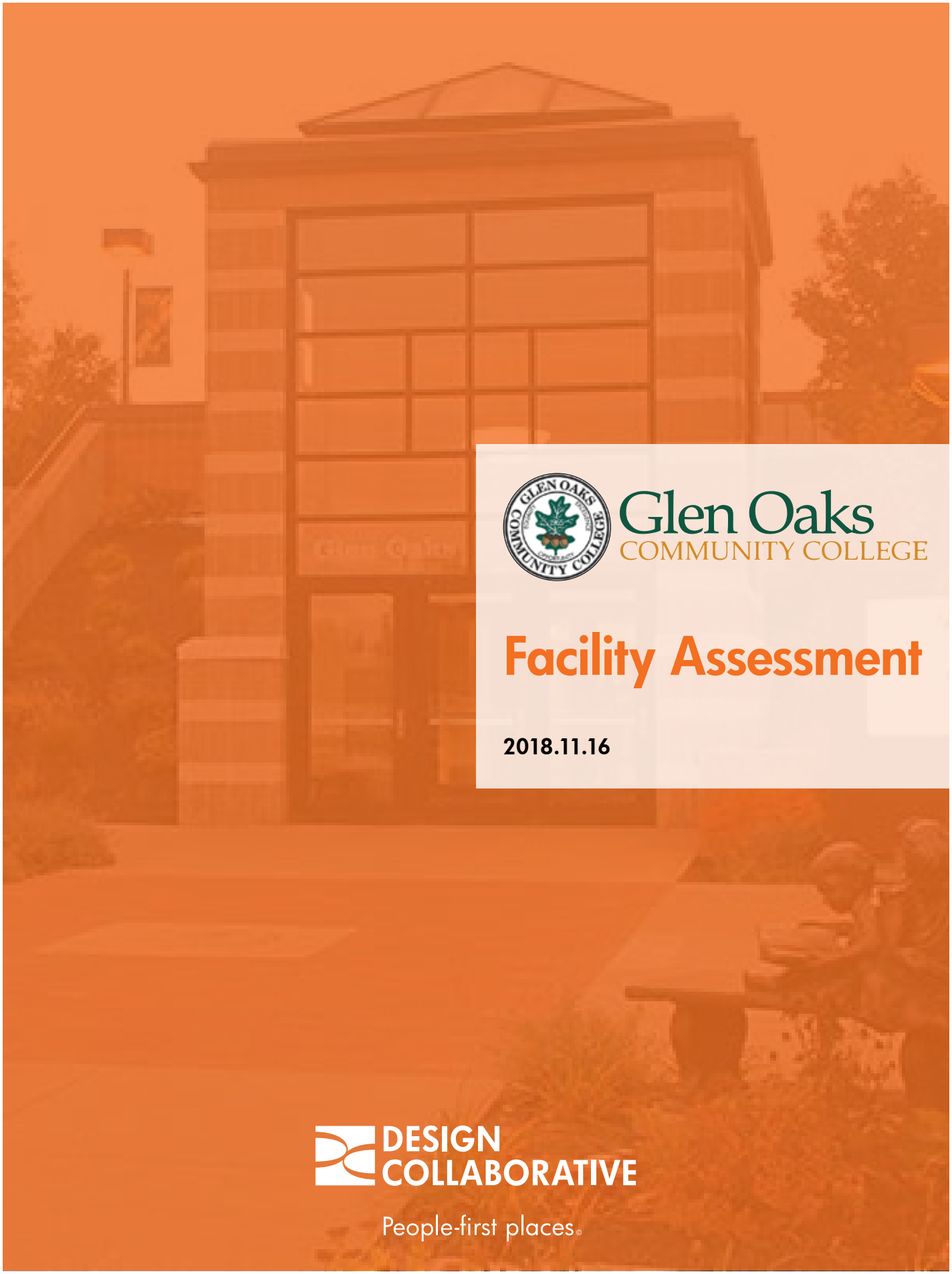
We do not anticipate the project to have any impact on future tuition costs. Glen Oaks is currently proud to be the lowest in-district tuition and the most affordable community college in the State of Michigan. It is our desire to continue providing affordable tuition and also, with the assistance of the Capital Outlay funding, provide state-of-the-art facilities for our students.

15. If this project is not authorized, what are the impacts to the institution and its students?

The students will continue to have subpar laboratories and related instructional spaces as well as the continual deterioration of the building.

16. What alternatives to this project were considered? Why is the requested project preferable to those alternatives?

Without State Capital Outlay support, Glen Oaks will pursue the alternative solution of a phased renovation approach. This approach will be disruptive to our students and more costly to the College, in addition it will not adequately address the current skilled workforce needs of area businesses and industries. The safety, security and academic potential of our students will be impaired if we have to renovate the building in phases.



Glen Oaks
COMMUNITY COLLEGE

Facility Assessment

2018.11.16

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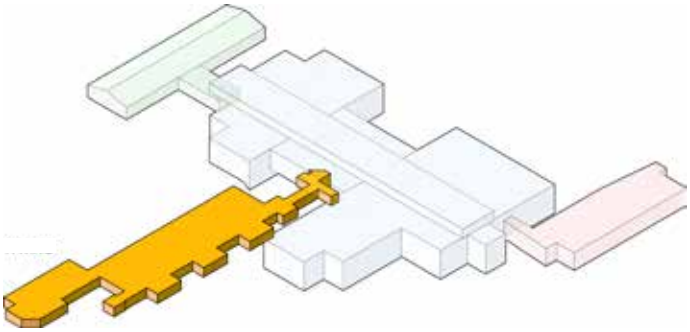
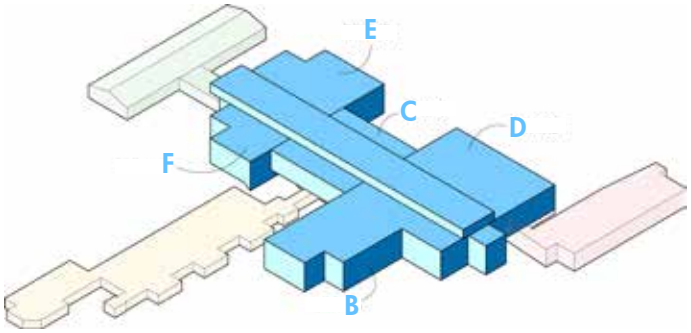
Glen Oaks Community College

For this assessment, the college has been broken down into the following 4 wing groups: A Wing, B/C/D/E/F Wings, E Wing, and G Wing. Each wing group is assessed individually by relevant building project types listed on page iii. Each wing group's recommended corrective actions are then prioritized by the levels also listed on page iii.

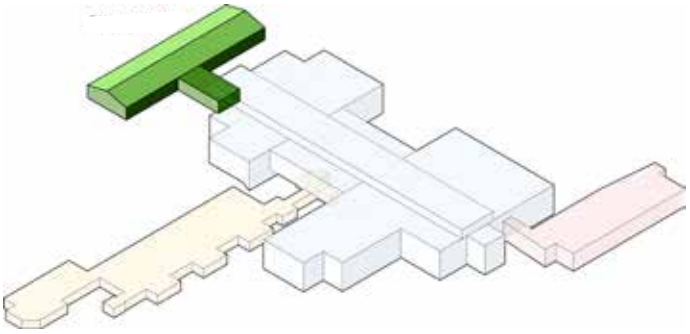
A WING (Administration)



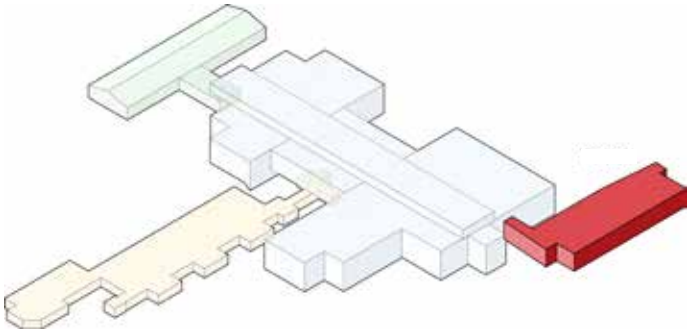
B/C/D/E/F/G WINGS (Core)



E WING (Pre-Engineered)



G WING (Science)



Building Project Types

1. Site Considerations
   - 1.1 Entrance Accessibility
   - 1.2 Parking and & Accessibility
   - 1.3 Service Entrances
2. Life Safety / Structural Review
   - 2.1 Egress Components
   - 2.2 Building Structure
3. Building Envelope
   - 3.1 Exterior Wall Materials & Systems
   - 3.2 Windows & Doors
   - 3.3 Roof Systems
4. Building Interiors & Finishes
   - 4.1 Ceiling System Types & Finishes
   - 4.2 Wall Partition Types & Finishes
   - 4.3 Flooring Types & Finishes
   - 4.4 Doors and Hardware
5. Accessibility
   - 5.1 Vertical Circulation (Stairways, Ramps & Elevators)
   - 5.2 Door Access and Hardware
   - 5.3 Restrooms and Casework
   - 5.4 Miscellaneous
6. Mechanical Systems
   - 6.1 Heating Plants
   - 6.2 Cooling Plants
   - 6.3 Hydronic Infrastructure
   - 6.4 Air Handling Systems
   - 6.5 Terminal Devices, Sheet Metal and Air Terminals
   - 6.6 Building Management Systems
7. Plumbing Systems
   - 7.1 Piping Systems
   - 7.2 Water Heaters
   - 7.3 Fixtures
8. Fire Protection
9. Electrical Systems
   - 9.1 Electrical Service and Distribution
   - 9.2 Branch Circuiting
   - 9.3 Lighting
   - 9.4 Fire Alarm
   - 9.5 Life Safety / Emergency Power

Corrective Action Priority Levels

Level 1 – Critical

Urgent life safety issues including the following:

- Structural deterioration or failure that may result in serious personal injury
- Building component or system deficiency that may result in serious personal injury
- Hazardous fire safety conditions

Level 2 – Required

Potential health and building integrity issues including the following:

- Health issues related to the presence of mold or contamination of HVAC systems
- Active leaks or building envelop damage affecting one or more building materials or systems
- Structural issues causing material damage or deterioration

Level 3 – Recommended

Code, comfort and energy issues including the following:

- ADA compliance issues
- International Building Code deficiencies
- Energy code compliance
- Temperature control and humidity issues

Level 4 – Optional

Miscellaneous life cycle improvements and aesthetic upgrades including the following:

- Architectural finish upgrades and aesthetic improvements
- Lighting improvements
- Miscellaneous building equipment or systems improvements

Site Considerations

Site Considerations

Glen Oaks Community College

Site Considerations

Bridges Land on Steeply Graded Mounds

Accessibility Concerns

Structural Crack

Vines

Handrails Needed

The overall assessed building is comprised of four distinct buildings. They are situated on a site that contains significant changes in topography which creates unique circulation conditions and challenges. The original building concourse level spans over the main road through campus. The road is flanked by the administration building that transitions from on grade entries on the west to an elevated green roof. The overall building is surrounded by limited pockets of open greenspace and dense woods. Overall parking capacity for the campus appears to be sufficient.

It was stated that all the campus buildings sanitary sewer systems eject into an open lagoon. Future additions will need to evaluate the capacity and the feasibility of adding to this system.

The bridges from the second level exits particularly on the north side land on steeply graded mounds with insufficient areas of refuge. These mounds are also overgrown with plants. It is recommended to partially regrade some of the mounds as wells as maintain minimal vegetation to allow for safer exiting from the building.

ADA transitions from sidewalk to parking lot/roadways do not contain detectable warnings. Recommend that these be added to ensure pedestrian safety. Additionally, the main pedestrian circulation collector from the parking lot that is stripped does not have ADA curb cuts so it is not accessible. It is advisable that the main pedestrian circulation path from the parking meet accessibility requirements.

The windows on the north side of the administration building set very low in relation to adjacent topography. There is a steep hill that slopes towards the building. It appears that in the wintertime snow could drift at this location and exceed the sill height of the windows. This area requires periodic monitoring to ensure water doesn't infiltrate the wall and window systems.

There appears to be a structural crack in the site stair north concrete wall on A Wing stair. This crack is visible from both sides of the wall. This condition needs to be monitored to ensure future degradation does not result in partial failure of the wall. Recommend epoxy injection to fill crack an prevent further freeze/thaw complications.

Vines are growing on the north side of original building adjacent to the connection to the pre-engineered metal building. The vines are located both on the masonry and high metal panel. They can damage the wall joints if they are not removed.

There are no handrails on the ramp on the north of the main gym. The existing concrete sides meet guardrail height, but handrails need added. Additionally, the stair on the east side of D Wing is missing handrails. Code compliant handrails need to be installed.

Site Recommendations

Site

a. Provide handrails at the concrete ramp north of main gym.

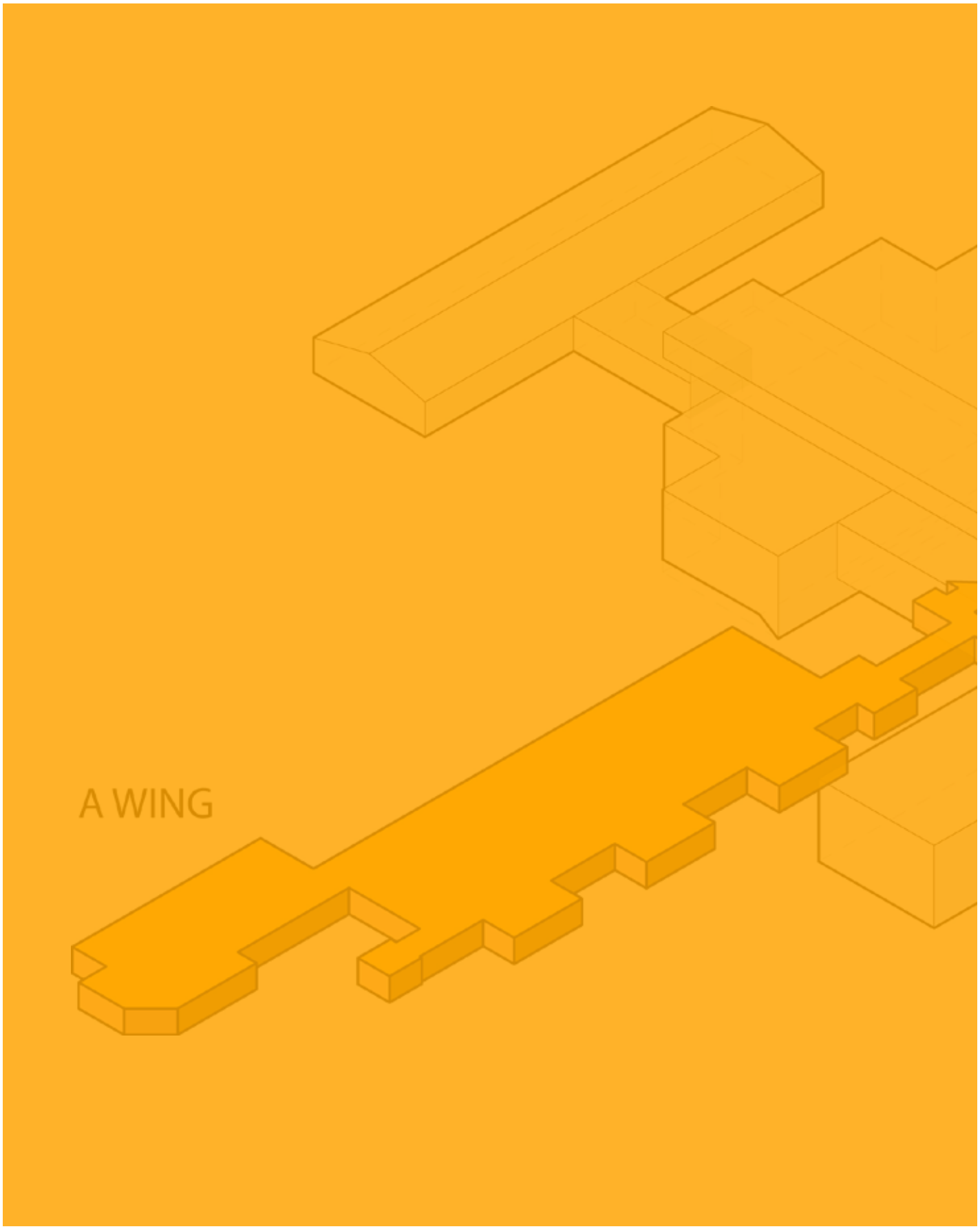
b. Provide handrails at the concrete stairs on the east side of D Wing

c. Provide curb cuts and detectable warnings at sidewalks at main circulation pathway from parking.

d. Repair significant concrete stair foundation wall settlement crack with epoxy.

e. Remove vines from north side of building

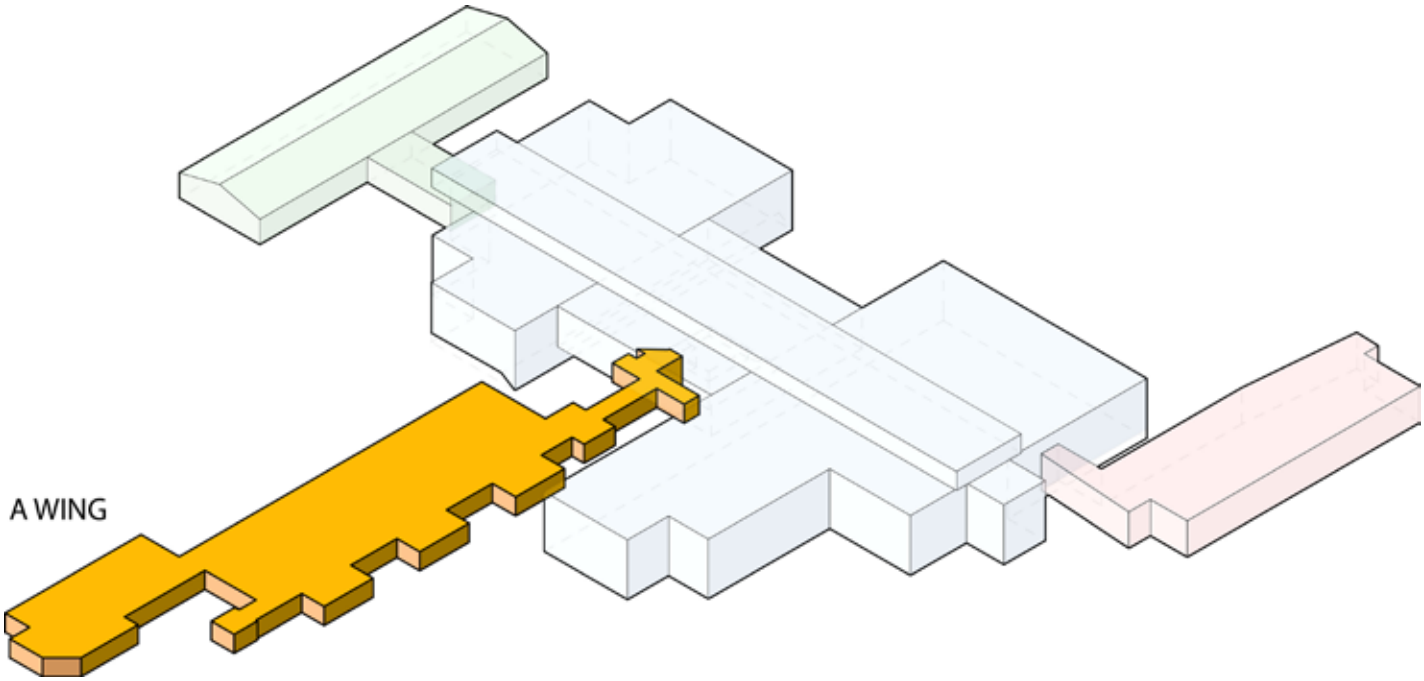
f. Regrade mounds on northside of building and clear debris and overgrown vegetation.


A WING

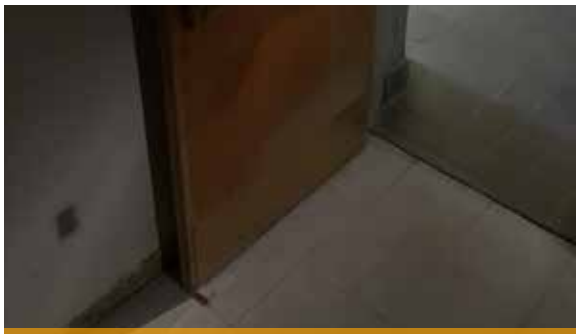
A WING

(Administration)

A WING (Administration) ASSESSMENT



Life Safety



Open Rated Doors

Combustibles Under Egress Stair

Blinds Obstructing Exit

The 1992 building addition was filed with the State of Michigan and followed all code requirements listed in the 1989 Michigan Fire Safety Rules / State Construction Code for Type IIA construction. It contains a combination of concrete columns and structure along with steel framed portions. It is assumed that all previous renovations and building additions met building code at the time that they were constructed. The A Wing is divided into a separate building from the concourse connection by a two-hour fire separation. These fire separations have allowed the building to expand without the installation of automatic fire sprinklers.

It was noted that door wedges are being used to hold open rated doors at some locations.

Storage under the egress stair is not permitted. There are several combustible items that are stored in the stairwell and the underside of the stairs are not sprinklered.

As noted in the door section items, there are some operational issues regarding the exterior doors on southwest side of A Wing that egress out of the large classroom. Additionally, there were blinds installed in front of these doors. These blinds could obstruct the exit access, we recommend removing the blinds. If either privacy or glare is the issue a solution would be to install a film on the glazing.

There are fire extinguishers that are in locked storage rooms. Consider locating these in a cabinet that occupants have access to

Exterior Wall Materials and Systems

Brick Veneer Masonry Wall Systems

All exterior walls are comprised of quad size (8"x8" nominal) face brick with split face and ground face CMU watertable coursing. In general, the brick is in good condition with minimal areas exhibiting breakage or excessive efflorescence. Recommend masonry restoration to resolve these areas of concern.

Brick control joint caulking in most of the original and 1992 building area is brittle or has shown instances of both cohesive failure and adhesive failure and should be replaced with new backer rod and compatible sealant. Water infiltration at these joints has the potential to damage infiltrate the wall cavity and cause damage to the underlying substrate or damage the brick veneer through cycles of freeze/thaw.

Many of the weep tubes at through wall flashing conditions are completely clogged and need cleaned out to allow for proper drainage. This condition is prevalent throughout the exterior and needs to be addressed to prevent water damage within the wall.

Isolated brick veneer areas with visible efflorescence are primarily located on the north elevation. The north elevation is typically the last side of the building to dry out after weather events and, as a result, more water can penetrate and be retained within the masonry veneer. Most locations do not warrant major concern, but it would be a good idea to inspect mortar and caulk joints near the areas with efflorescence to make sure that there are not large joints or cracks allowing water to get behind the brick veneer, requiring masonry restoration to resolve.

There are locations adjacent to the south entry doors in which the control joint in the brick was not carried down through the CMU base portion of the wall and the mortar joint has cracked. This mortar joint should be removed and replaced with backer rod and sealant.

There are louver penetrations on the northwest end of the building which have not been sealed. Provide backer rod and sealant around perimeter of these penetrations.

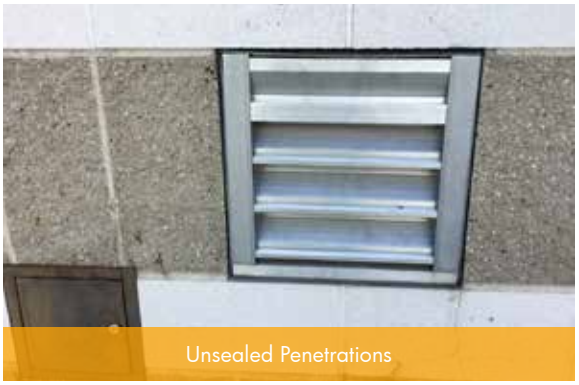
The only visibly cracked or damaged brick is located at the head of the recessed windows just to the east of the south facing entry doors. The brick extends down and forms the soffit above the windows. There a couple locations where the corner brick has cracked likely due to water infiltration below the through wall flashing. While this does not represent a serious structural concern, the damaged brick should be replaced. Water infiltration at these locations has the potential to damage the window soffits. Recommend masonry restoration to correct damaged areas and evaluate through wall flashing condition at this location.

Control Joint Caulking Failure

Clogged Weep Tubes

Efflorescence

Cracked Mortar Joint



Unsealed Penetrations

Cracked Brick

Missing Mortar

Damaged Brick

Excess Flashing

Brittle Expansion Joints

Lack of Sub Sill

Gaps in Pocket Seals

Missing Hardware

There are a few locations on the underside of the brick soffit that sections of mortar have fallen out of the joint. The vertical mortar joint adjacent to the window systems has also cracked for the full length of the joint. This mortar joint should be removed and replaced with backer rod and sealant.

The brick on the backside of parapets show signs of water damage, particularly at handrail bracket mount locations. Additionally, there are areas that control joints do not contain any sealant. These need to be addressed to prevent further water damage. Recommend masonry restoration at damaged locations. Consider protecting the backside of parapets that are adjacent to roofs that scheduled to be re-roof by covering brick with plywood and extending the roofing up the backside of the parapet.

Through wall flashing materials were left with excess material protruding from the face of the masonry which has over time curled up. This has created a small end damn at the edge of the flashing that prevents water from fully draining. All flashing to be trimmed flush with face of brick.

Building expansion joints need replaced. The material is brittle and has signs of both adhesive and cohesive failure.

Windows and Door Openings

All windows are dark bronze anodized aluminum systems with insulated glass units. The overall system and glazing are in good condition.

Storefront systems do not appear to have a sub-sill for drainage or waterblock at sill condition. Would recommend providing backer rod and sealant behind the plane of the weeps to prevent moisture infiltration through the on-grade sill condition.

It was noted that numerous glazing pocket seals have significant wear and shrinkage resulting in gaps. These should be replaced to keep excessive amounts of water out of the window framing system glazing pockets.

Storefront doorways on southwest side of A Wing that egress from auditorium space appear to be missing top pivot hinge hardware. These doors contain panic hardware and are part of the egress from the classroom. The doors that are missing the top hinge have sagged slightly and are rubbing at the top corner of the frame. This causes the doors to stick and require additional opening force. Ensure that doors are fully operational. [IMG_0153]

Roof Systems

A large portion of the "A" wing roof membrane layers are concealed from view by over burden consisting of grass areas commonly known as a garden roof, landscaping and hardscapes such as concrete walkways. Therefore no visual assessment of those roof assemblies was possible. However, there are portions of the 1992 "A" wing roofs that protrude above the adjacent garden roof/ landscape areas. These roof areas include the following

1. Roof area over the public meeting room, mechanical room, classroom and lobby on the far west end of the 1992 expansion.
2. Roof over Men's and Women's Toilet Room and main East-West corridor on the south side of the 1992 expansion.
3. Roof over Mechanical Room 72 on the south side of the 1992 expansion.
4. Roof over the stairwells on the far East end of the 1992 expansion.

Each of these roof levels that are visible are covered with a ballasted loose laid black EPDM rubber roof system.

Far west roof area of the 1992 expansion

The roof area on the far West end of the 1992 expansion has a ballasted Carlisle 45 mil black EPDM roof membrane system that is near the end of its lifespan. The roof membrane is showing signs of tenting. Tenting results from dimensional changes associated with roof membrane movement as a result of membrane shrinkage and thermal expansion and contraction forces. This movement can overstress perimeter reinforcement of the EPDM roof membrane where the membrane transitions from a horizontal surface to a vertical surface causing the roof membrane to tent or balloon away from the parapet wall. Additionally, much of the ballast material contains jagged, sharp edges which in the absence of a protective ballast mat increases the risk of punctures in the roof membrane.

The parapet EPDM wall flashings are turned up the inside face of the low parapet walls. The EPDM flashings are terminated with a surface mounted termination bar on the vertical face of the parapet. The termination bar is weather protected by a two piece recessed fixed sheet metal receiver/reglet and removable counterflashing. Above this sheet metal termination detail is one course of exposed 8" x 8" masonry brick. Atop this brick course the parapet wall is capped with wood blocking and a sheet metal coping cap. Upon closer observation there is no weather protective membrane wrapping the top of the parapet wall leaving these walls susceptible to water infiltration when water breaches the sheet metal joinery in the coping cap assembly. .

The exposed course of brick on the inside face of the parapet wall

Susceptible to Water Infiltration

Susceptible to Water Infiltration

Roof Membrane Concerns

Cracked Brick

Oxidation and Corrosion

Dry Rotted Blocking

shows evidence of cracked brick units, spalled units, efflorescence, loss of mortar adhesion and missing mortar. These deformations are potentially the result of several factors and may include the following:

- Moisture infiltration from the top of the parapet walls underneath the sheet metal coping cap in the absence of a weather proof protective membrane capping the top of the parapet wall. Moisture infiltration through the top of the parapet wall in turn subjects the backside of the masonry and roofing system to moisture.
- Moisture infiltration where fasteners securing the railing mounting brackets penetration the masonry veneer.

Sheet metal copings on this particular roof area are aged and show evidence of extensive delamination of the factory applied finish coat exposing the base metal steel to oxidation and corrosion.

There are several areas where the metal splice/ backing plate at the expansion joint between sections of sheet metal coping caps is missing. In the absence of a splice plate to bridge the joint gaps in excess of 1/8" between coping cap sections are prevalent, allowing someone to look down onto the top of the masonry parapet wall through the gaps. These gaps in conjunction with the absence of both a splice plate and a waterproofing membrane atop the parapet wall provides a direct pathway for water to infiltrate and permeate down inside the parapet wall. From what wood blocking we could see that supports the sheet metal coping, that wood blocking appears to be dry rotted. It is recommended the wood blocking be replaced as part of a reroofing project and new roof membrane extended up, across the top of the parapet wall then turned down a minimum of 2" over the exposed face brick to better protect this portion of the parapet wall assembly.

It's recommended the ballasted 45 mil EPDM and insulation boards be removed down to structural roof deck and replaced with a new single ply roof membrane and insulation system. All metal coping caps in this area should also be removed and replaced with a new.

Garden Roof

The green roof / plaza deck areas are used for pedestrian circulation and connectivity to other portions of the facility. Of interest here is that the only barrier between the garden roof and the roof area over the far west roof area of the 1992 expansion is a low parapet wall with decorative guard railings surface mounted to the garden roof side of the parapet wall. The other roof areas over the men's and women's restrooms, mechanical room and East-West corridor are simply protected by low parapet walls.

The parapet wall with the surface mounted guard railing serves as a deterrent however given the design of the guard railing, which includes horizontal rails the guard railing itself can simply be used as a ladder to easily get onto the roof level of the far West end of the

1992 expansion. This is how DC accessed this roof level to perform our assessment.

DC also had no problem climbing over the other parapet walls to gain access to the roof areas where the skylights look down onto the main East-West corridor.

In the opinion of Design Collaborative the ease of access to these roof areas adjacent the garden roof/ plaza deck presents both hazard and liability concerns for the College. Even though there may be no reported incidents in the past the potential for liability still exists.

Some of these roof top areas contain MEP infrastructure which could be subjected to potential vandalism and mischief if accessed by someone not authorized to be on that roof level. The potential for personal injury also exists.

Additionally along the perimeter of some of these roof areas the potential for a fall is a possibility not only for someone not authorized to be on the roof but authorized personnel as well. It is recommended to provide screening / higher railings to prevent unauthorized access to ballasted roof areas adjacent the green roof / plaza deck. It is also recommended that horizontal fall arrest systems to be considered as part of rooftop personnel safety.

Fall Risk

Roof over Men's and Women's Toilet Room and main East-West corridor and Mechanical Room 72

The ballasted Carlisle 45 mil black EPDM roof membrane system on these roof levels are near the end of their lifespans and should be considered for replacement with new.

Sheet metal copings in these roof areas have been replaced and appear to be in good condition.

It appears that the same phenomenon associated with the description with the lack of weather protective membranes atop the parapet walls on the west end of the 1992 expansion also exists on these smaller roof areas.

DC observed torn EPDM roof membrane in the corners and there are areas where EPDM has pulled out from underneath the sheet metal counterflashing which signifies there might not be a termination bar at the roof to wall flashing conditions or if there is a termination bar the installation has failed. EPDM roofing membrane and sheet metal flashings are recommended to be replaced.

Most of the rooftop equipment over the mechanical room is not mounted high enough off the roof membrane to accommodate proper terminations of the roofing membrane or compliance with good roofing practices. Most of the equipment will have to be raised up as part of a re-roof project. It is recommend that 24" high insulated equipment rails be provided for all rooftop equipment as part of a reroofing

Roof Membrane Concerns

Roof Membrane Concerns

Placement Interferes with Membrane

Reinsulate the MEP Support

Obstructed Drain

Erosion Occurring

project. The increased curb heights is likely to result in extension of MEP infrastructure to accommodate curb height modifications. Raising and resetting roof top equipment onto taller curbs will likely result in disruption to building conditioning and support services therefore this work would need to be closely coordinated with the Schools calendar.

A raised curb with a sheet metal cap and multiple "ganged" mep penetrations was observed on this roof level. Sealant material is the main seal around the circumference of conduits and piping being routed up from the mechanical room below through the sheet metal cap and to the rooftop equipment. Sealant deformations consisting of adhesion issues and UV degradation has compromised the ability of the sealant material to maintain a long term water tight seal around the circumference of each conduit and pipe penetration. Additionally, the pipe insulation wrap was severely degraded and sealants were in poor condition. It is recommended that this assembly be eliminated and replaced with a pre-manufactured curb/ boot assembly specifically designed to accommodate mep penetrations to both enhance weather protection and water tight flashing performance. This will likely result in disruption to building conditioning and support services to rework and reinsulate the mep support infrastructure. Therefore this work would need to be closely coordinated with the Schools calendar.

Some of the primary roof drains on these roof levels are obstructed by vegetation, moss, sediment and possibly other debris not visible at the time of our assessment. Roof drain maintenance is recommended.

Most aluminum downspouts on these small roof areas appear to be in good condition and have been sized to handle storm water from normal rain events. One area that could present a problem is the downspout that discharges onto a steep incline grade. The downspout discharges adjacent to the mechanical room wall and has eroded some of the soil. The splash block has been washed down the hill and needs repositioned and secured. It is recommended that the downspout outlet be extended further away from the building to eliminate erosion.

Sloped Skylight Roof System

The large sloped skylight systems along the south side of "A" wing as part of the roof areas over the men's and women's restrooms, mechanical room and East-West corridor appear to be in fair condition. It is assumed that all sections of the system are insulated glass units. The sill flashings appear to be in good shape and there wasn't any observed water damage, past water residue stains or signs of active water leaking through the skylight frames.

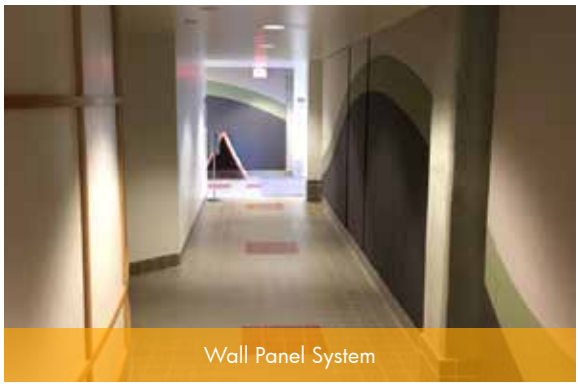
General "A" Wing Roof Observations

It was observed that there are no overflow drains on “A” Wing. In the absence of overflow drains it places more emphasis to maintain and keep clear all primary roof drains. Therefore, it’s recommended that roof drain maintenance be performed to assure all storm drain lines remain clear and unobstructed. Storm drain pipes should be scoped for a minimum of 100 feet to assure the storm drain piping is not obstructed and to verify the general condition of joints in the piping. If it is not already part of facilities preventative maintenance workload, scheduled observation and maintenance of roof drains should be put in place to assure roof drains are periodically monitored and maintenance to remain operational under all weather conditions.

It was observed that some parapet copings had sealant in the sheet metal splice plate expansion joints which signifies potential ongoing water infiltration issues through the top of the parapet walls. These copings need replaced. It is recommended any rotted or compromised wood blocking be replaced with new as part of a reroofing project and new roof membrane extended up, and turned down a minimum of 2” over the exposed face brick of the parapet wall assembly to better protect this portion of the parapet wall assembly.

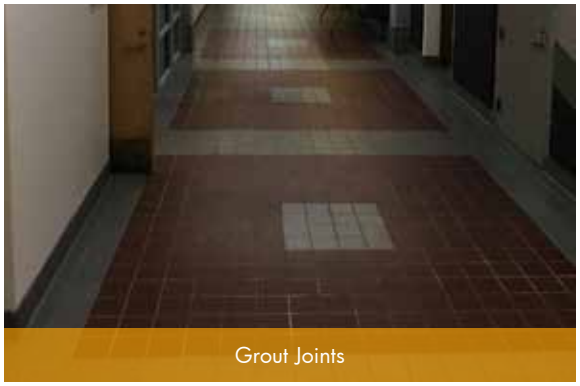
Water Infiltration Issues

Building Interiors & Finishes



Wall Panel System

Bookstore



Grout Joints

Thick Walk-off Mats

Ceilings

The A Wing contains a combination of lay-in acoustical tile ceilings, gypsum board bulkheads and hard ceilings. Most all classrooms and offices have lay-in acoustic ceiling systems in good condition. There are a few areas in the office suites that have damaged acoustical ceiling tiles, but the damage did not appear to be extensive.

The corridors are comprised of exposed concrete structure and gypsum board bulkheads. In general, these appear to be in good condition with a few areas that need paint touch-up.

Walls

Most walls separating classrooms and office spaces have been framed with drywall partitions. The corridors contain rated gypsum board walls in addition to concrete foundation walls. Most of the concrete walls have been covered with a graphic wall panel system. The restrooms have ceramic wall tile that are in good condition. There are some corner grout joints that need cleaned and restored. A few tile base trim pieces have portions that are chipped off.

In general, walls in this building section are in good condition and receive maintenance and refinishing on an as-needed basis.

The finishes in the bookstore are in great condition as it appears that space has been renovated in recent years.

Floors

The A Wing has a variety of flooring types. The hallways have 12”x12” tile in square accent patterns. As expected with the amount of floor tile, there are numerous grout joints to maintain and clean. Along with some discolor grout joints, there were locations where grout joints need repaired. These mainly occurred near the restrooms and vestibule areas and are probably a result of water and salt being tracked onto the tile. It was noted that walk-off mats have been added to combat this, however these mats could pose a tripping hazard due to their thickness.

Most of the office suites, private offices, and classrooms have broadloom carpeting with some of the main reception and staff lounge areas containing ceramic floor tile. These floor finishes are in good to fair condition as some of the carpet show signs of wear. It is recommended for future office suite and classroom renovations to consider installing carpet tiles in lieu of broadloom. Additionally, there are some storage and staff work rooms that have VCT flooring.

The restrooms have 1”x1” floor tile that is good condition.

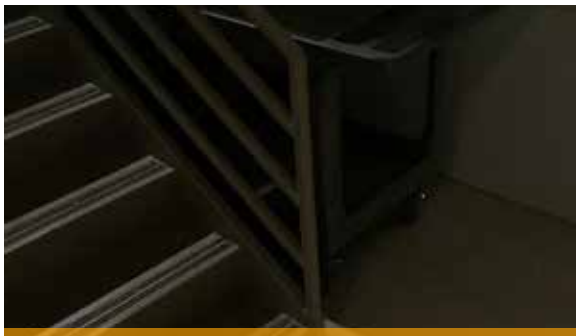
Doors

The hollow metal frames and wood door panels throughout A Wing are in good condition. The finish on the restroom doors needs restored on the bottom portion of the door as it appears that it has wore off through use or water degradation.

Other than the additional noted deficiencies highlighted in the accessibility sections the doors appear to be functioning properly and well maintained.

Worn Finish

Accessibility



36" Handrail

Clearances on Strike Side Not Met

Missing Vertical Grab Bar

The following list of deficiencies were noted as they apply to current ADA guidelines. While many of the conditions met code at the time of construction, they represent non-compliant conditions based on the 2010 accessibility guidelines that are part of the current Michigan Building Code.

Vertical Circulation

- The handrails/guardrails at the egress stair do not meet code based on 42" guardrail height and 12" extension of handrails beyond the upper and lower stair treads. The existing railing is only 36" high and does not have any extensions.

Door Access and Hardware

- Clearances at the strike side of some doors do not meet current requirements. A minimum of 12" is required on the push side of doors while 18" is typically required on the pull side of doors. The corner offices within the office suites consistently did meet this requirement. More notable are some of the exit doors for office suites and the exterior door at the top of the stair landing do not contain clearances at the strike side of the doors.

Restrooms and Casework

- Missing 18" vertical grab bars at all accessible water closets.
- There are base cabinets with sinks rims higher than the 2'-10" maximum dimension. Additionally, a few sinks in staff areas don't have the clear floor space for an accessible approach.

Heating Plants

There are no heating plant in this portion of the building. The heating hot water enters the building from underground from the main boiler room.

Cooling Plants

There are no cooling plant in this portion of the building. The cooling chilled water enters the building from underground from the main boiler room.

Hydronic Infrastructure

As the heating and chilled water enters the foundation from the main boiler room, it enters secondary pumps that installed in series with the incoming piping and boost the pressure. The chilled water then feeds the two air handlers AHU-401 and AHU-501. The hot water routes overhead and feeds a number of VAV terminal units, finned tube radiators and unit heaters in the area.

The heating and chilled water pumps are inline pumps that are piped in a parallel configuration and based on air handler sizes and flow rates, these pumps are sized at 50% of the load on each pump. This means that each pump is required to run to make the building load demand on a design day. This does not allow any redundancy if there is a failure in one of the pumps. There is also no VFD installed on either pump in the system. These pumps are constant speed only and will not be able to have the speed reduced under part load conditions.

Air Handling Systems

Two large air handlers serve VAV terminal devices in this area of the building. The AHUs have cooling coils with no preheat coils installed in the units. These units feed air to all the VAV terminal units in the addition. There are also return fans that bring air back to the unit from the space. AHU-401 pulls return air from the hallway which is a code violation by today's building codes. Intake for the fresh air to the space is through the green roof space above the mechanical rooms.

Unit	Type	CFM
AHU-401	Variable Air Volume	22,000 cfm
AHU-501	Variable Air Volume	11,000 cfm

Terminal Devices, Sheet Metal and Air Terminals

Spaces are heated and cooled with overhead duct distribution to VAV terminal devices located above the ceiling. These VAV boxes utilize hot water reheat to provide all the heating for spaces. Each VAV is controlled by a single zone sensor located in the space.

Hydronic Infrastructure

Hydronic Infrastructure

Hydronic Infrastructure

Air Handling System

Air Handling System

Building Management System

This area of the building has a Barber Coleman control system and is outdated by today's standards. All communication from room level to the air handler systems is over low voltage wiring, however a newer direct digital controls (DDC) would be recommended in this area.

Air Handling System

Direct Digital Controls Recommended

Storm

All storm water piping is routed through overhead roof drains to below grade and leaves the building to the site storm sewer.

Sanitary

Sanitary leaves the building on the southwest end of the wing west of the mechanical room and ties into the existing sanitary line from the core building. This sanitary all collects to the septic pond on the building site.

Domestic Water

Cold domestic water is fed into this portion of the building from main core mechanical room from underground. This water is distributed overhead to the plumbing fixtures and kitchen space in the wing. This piping looks in good shape in this portion of the building.

Natural Gas

Natural gas is fed underground to this area from the main core mechanical room and the gas feeds equipment in the kitchen area as well as a gas water heater in mechanical room 500.

Water Heaters

There are two tank water heaters, one in each mechanical room that provide hot water for the fixtures throughout the addition. In mechanical room 400, this water heater is a 50 gallon electric tank unit. In mechanical room 500, this is a gas tank unit for the kitchen space. Both of these heaters have hot water return pumps to keep the hot water lines warm, but neither is equipped with a safety thermostatic mixing valve. This valve should be installed to meet requirements of current codes.

Fixtures

Fixtures in this area, generally look in good condition, however they do not meet ADA requirements.

Piping in Good Condition

Safety Thermostatic Mixing Valve Missing

Fire Protection Systems

Fire Protection System

The mechanical room 500 and the storage room adjacent to the auditorium appear to be the only locations that have fire protection nipping installed. The fire protection piping comes into the area from the main mechanical room with the other utilities.

Electrical Systems

Large Step Down Transformer

Distribution Panel

Fluorescent Lighting

Electrical Service and Distribution

Electrical distribution in the 1992 A-Wing consists of a 480 volt distribution panel located in the mechanical room. This distribution panel is fed from a 600 amp branch in the main building switchgear in the mechanical room in B Wing. This panel in turn feeds a large step-down transformer and 208 volt distribution panel in the room. These two distribution panels then feed smaller branch circuit panelboards for the smaller 20-60 amp branch circuits to convenience outlets, lights, and other smaller loads. The size and capacity of the distribution in this wing are more than adequate to handle the existing load in this wing, and any additional loads that would likely be added in the future. All of the panels and wiring in this wing are in good condition. This equipment should continue to work properly, and parts should be available for the next 25-35 years or longer.

Branch Circuiting

The 208 volt distribution panel in the mechanical room feeds eight branch circuit panelboards located in the mechanical room and throughout the A Wing. Normally a building wing of this size would have two or three branch panels for lights and convenience outlets. The eight panels in this space should provide more than enough capacity and breaker space in the panels for any foreseeable future loads. In addition, all of the panels and branch circuit wiring appear to be in very good condition.

Lighting

Lighting throughout the A wing is primarily fluorescent. In most areas, light fixtures contain 4 ft. T8 type fluorescent lamps, or compact fluorescent lamps in can lights and wall sconces. In the areas we surveyed the light levels were adequate, and they appear to meet Illuminating Engineering Society standards based on the tasks being performed. The light fixtures themselves all appear to be operational, and are in good condition. Other than the replacement of burned out lamps, there should be little maintenance or repair required on these fixtures.

There appeared to be very few automatic controls on lights in the

A Wing. Current energy codes require automatic control of lights in most areas, either through occupancy type sensors or time of day control. These codes would not apply to existing lights in the building, but will be required as part of any building renovation. Beyond that, there are many areas in the building – corridors, restrooms and similar areas, where simple inexpensive ceiling mounted occupancy sensors could provide significant energy savings. In smaller spaces such as offices, replacing the existing light switch with all wallbox type occupancy sensor could also provide savings.

Fire Alarm

The A Wing has an old National Time & Signal zoned fire alarm panel located in the main mechanical room. The panel appears to be functioning properly, however almost all zoned fire alarm panels have been replaced by newer addressable type panels. This manufacturer, while still in business, is not a large manufacturer, and given the age of the equipment, repair and replacement parts on this panel will become more difficult and expensive. Currently, there do not appear to be any significant code violations with the fire alarm system, or any items that would adversely affect occupant safety. However, given the age and condition of the fire alarm system in this wing, and in the B thru F wings, described below, we would recommend that these fire alarm systems be replaced.

Life Safety/Emergency Power

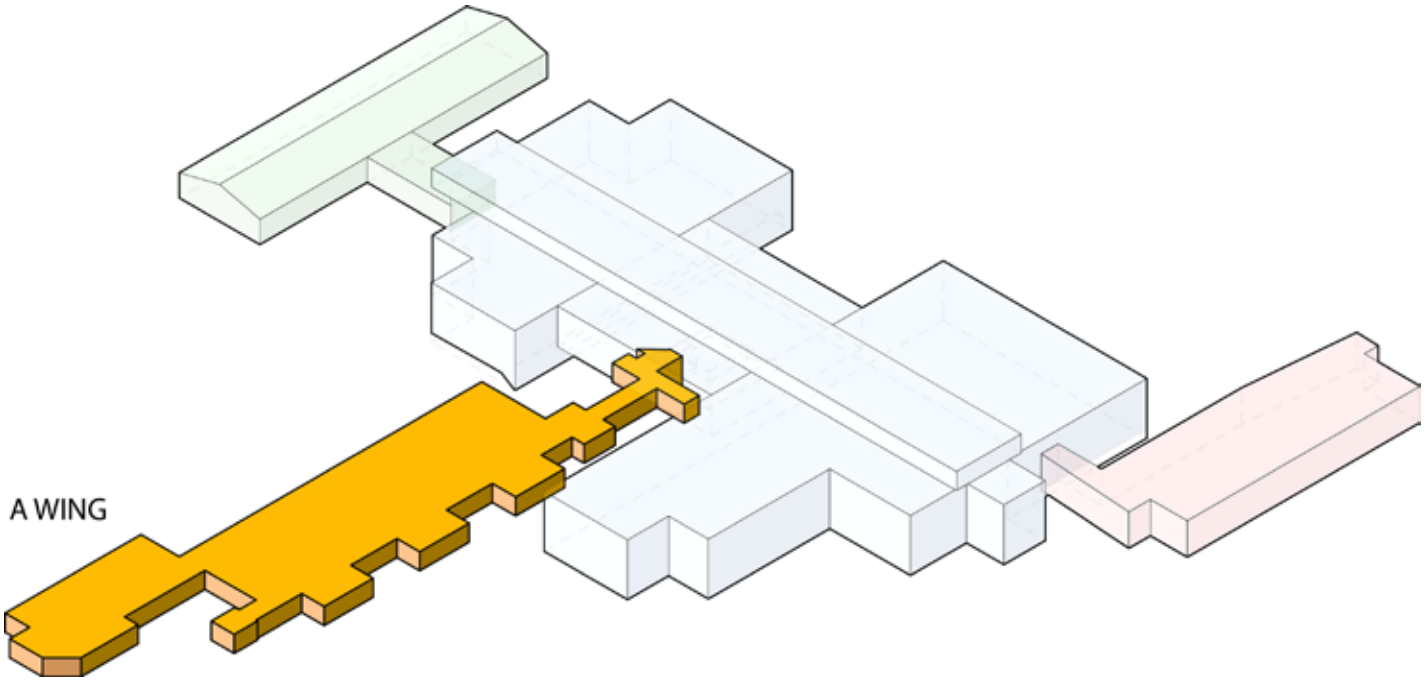
There does not appear to be a generator anywhere on campus to provide emergency power. We observed very few emergency light fixtures in the A Wing at the time of our survey. This likely means that there are areas that do not have adequate emergency lighting, or that battery units have been added in the ballast compartment of fluorescent fixtures, and they are not readily visible. Building codes dictate that emergency lighting must be provided along all paths of egress, and they also spell out the minimum and average light levels required along those paths. There are several areas in the A wing that do not appear to have any type of emergency lighting, or if they do it is unlikely that it meets the required light levels. Additional battery powered wall pack units are a cost effective way to provide additional egress lighting, however this also comes with an increased maintenance cost going forward. Emergency lights are required to be tested both monthly and yearly, and for a large building or campus, the maintenance cost of testing all of the fixtures can become prohibitive, or more commonly, the testing does not get performed. As additional units are added, the college may want to consider emergency lights that include a self test feature. These fixtures have internal circuitry that perform the required monthly operational test, and the required yearly 90 minute test. If there or problems, or the unit does not pass the test, then LED indicators on the fixture tell maintenance staff what the problem is. This can greatly reduce maintenance cost on these units, and can also reduce the liability on the College.

Fire Alarm Panel

Emergency Light Fixtures

In addition to the interior, the building code also defines the path of egress to be the area on the exterior that leads people away from the building. At the time of our survey, we did not see any emergency egress lighting on the exterior of the building. This is not an immediate safety issue, but it should be addressed as part of any building renovation.

A WING (Administration) RECOMMENDATIONS



Life Safety and Structural

a. Remove blinds in front of exterior exit doors and install window film.

b. Replace pivot hinge hardware on exterior exit doors from large classroom

c. Provide accessible fire extinguisher cabinets.

Building Envelope

a. Develop a phasing strategy for replacing the roofing system on all original and 1954 building sections. Create positive slope to roof drain locations and install overflow roof drains.

b. In conjunction with the 1954 roofing replacement, install metal copings at roofing sections #17-#20 and install metal fascia materials over the existing wood painted fascia surrounding section #16.

c. Replace the built-up, gravel surfaced roofing system at section #32 including the replacement of the expansion joint. Re-work the metal coping to allow expansion at the parapet.

d. Disconnect internal roof drain conductors that collect water from roof area #5. Install external downspouts down to lower roof levels.

e. Rework the roof edge/gutter flashing along the east side of roof area 21a. This EPDM membrane surface is beginning to get very 'chalky', so complete roofing replacement in this area may be the most cost effective solution.

f. Perform annual inspections on all remaining roof areas to identify minor damage and repair items.

g. Paint the unfinished concrete block wall area at the south side of roof section #30.

h. Install coping section at the southeast corner of roof section #33 to cover exposed wood parapet blocking and edge of roofing membrane. Tuck point damaged brick mortar joints below this location.

i. Patched damaged areas of the foundation wall on original building.

j. Perform periodic maintenance on the north entrance canopy and decorative wood columns.

k. Spot tuck point damaged mortar joints on 1954 building sections including the diagonal settlement cracks at the southwest corner.

l. Continue to monitor deteriorated window lintels at the northeast section of the 1954 building section. Eventual replacement of the lintels will be required.

m. Repair the loose stone surround at the recessed door #4 entrance. Replace the damaged soffit following masonry repair.

n. Replace failed insulated glass unit at storefront entrance #5.

o. Repair loose siding and sill trim at the upper large gymnasium.

p. Repair the masonry control joint on the west elevation between 1983 and 1998 building sections.

q. Repair/caulk isolated masonry joints at window and door heads.

r. Re-caulk all masonry control joints.

s. Repair base of exterior door jambs at door #18. Remove surface rust and refinish interior door surfaces.

Building Interiors & Finishes

a. Replace damaged ceiling tile.

b. Repair corner grout in restrooms.

c. Continue to upgrade dated and worn interior finishes periodically.

e. Replace damaged ceiling tile as related work is completed to correct water infiltration, leaks or condensation issues.

Accessibility

a. Replace knob-type door hardware in the older building sections with lever-type hardware.

Mechanical Systems

a. Sweating on chilled water pumps and piping that is not insulated. Severe corrosion and rust on the valves and piping that should be replaced and the new piping insulated to prevent condensation

b. Install VFD for hot and chilled water pumps to reduce energy usage and close bypass on 3-way valves.

c. Most VAV's appear to have 2-way valves already installed but do not have variable pump installed. Possible pressure issue and noise.

d. Modify return air to not be through corridor

e. Test all fire dampers in space

f. Update older controls to new controls with higher end encryption for security

Plumbing

a. Install thermostatic mixing valve on water heaters.

b. Update restrooms to meet ADA requirements

Fire Protection

a. None

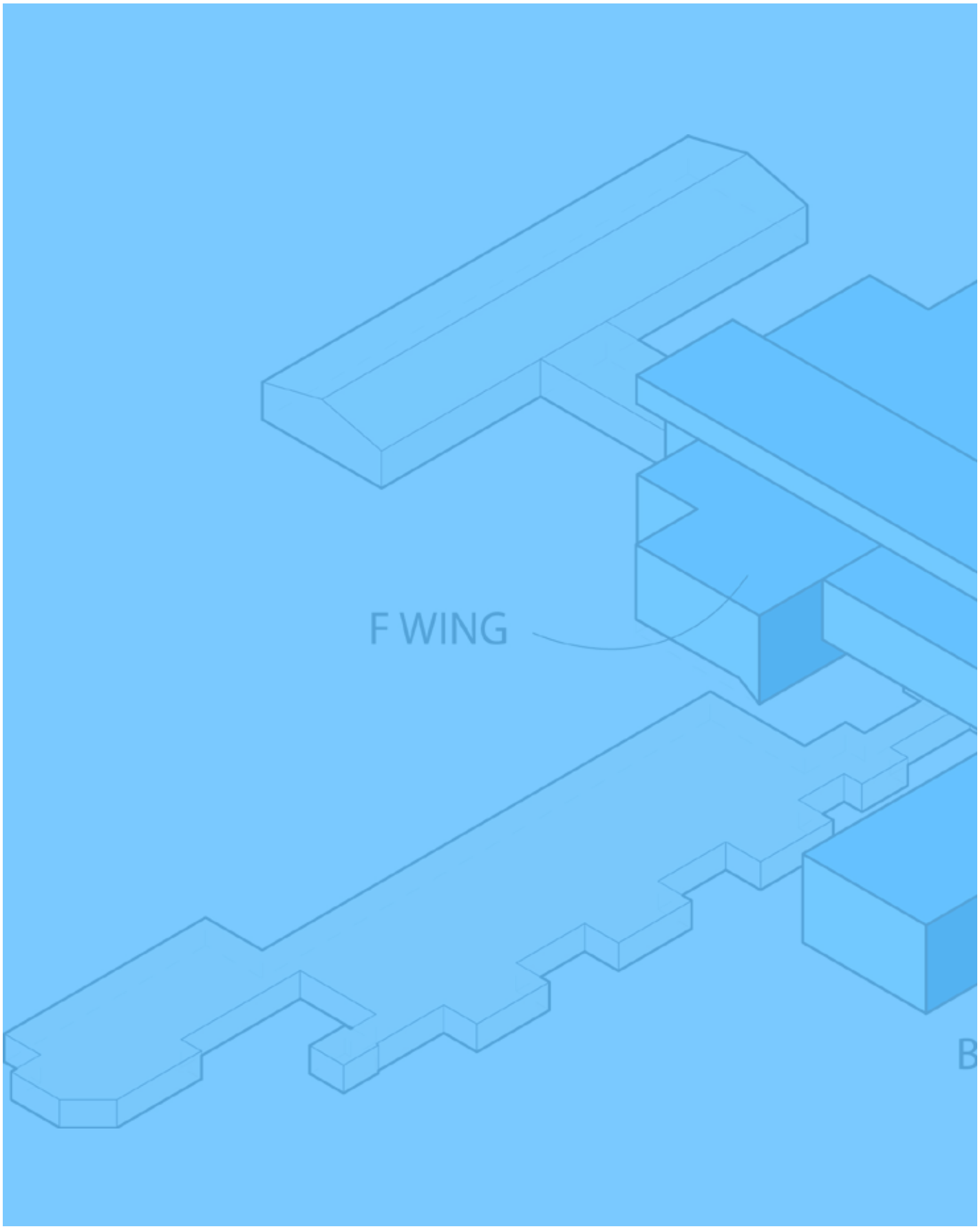
Electrical Systems

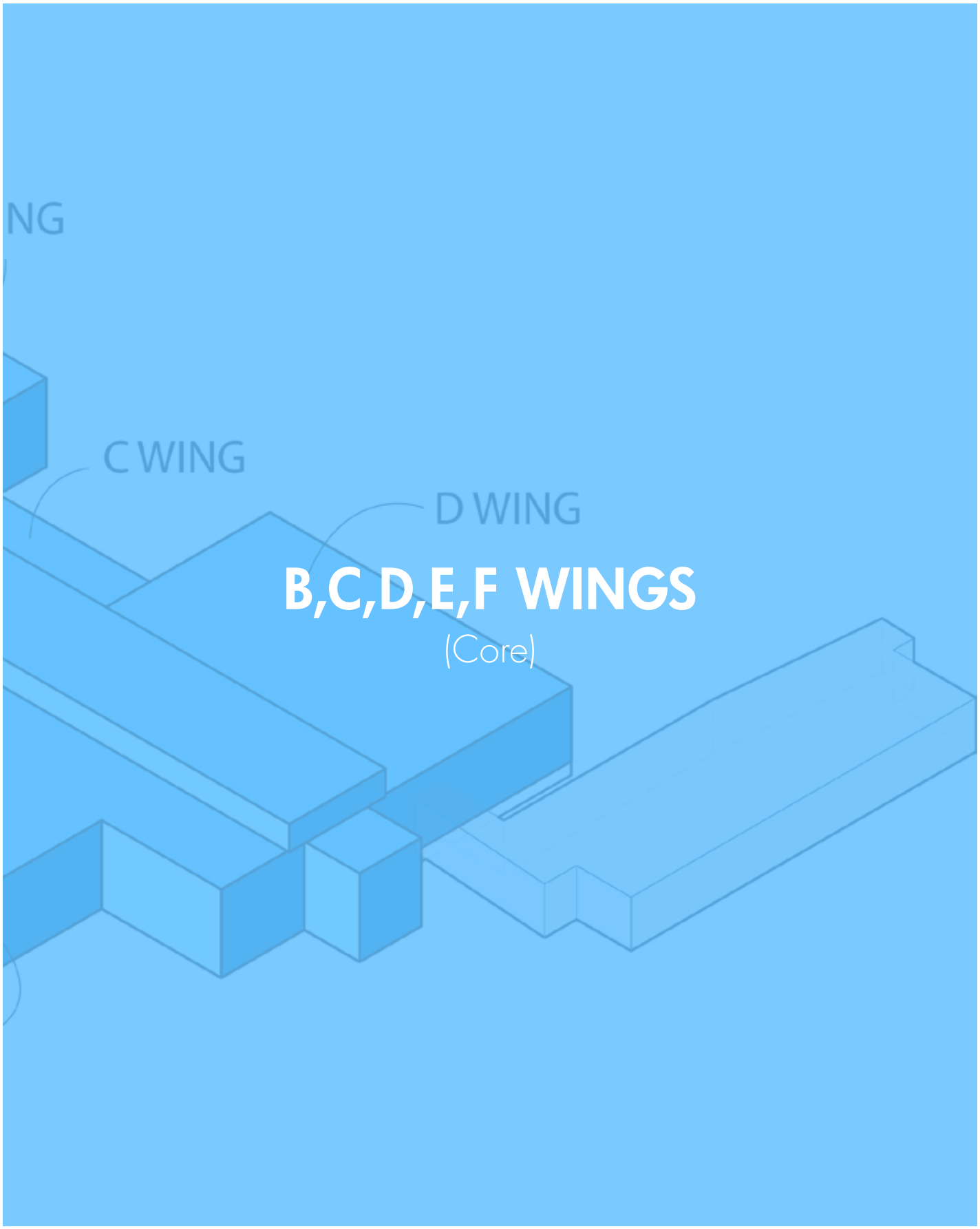
a. Provide new fire arm system

b. Provide additional emergency egress lighting in areas that do not meet current code requirements

c. Provide automatic lighting controls in selected areas where it is cost effective to to install and will provide significant energy savings

d. Replace existing lighting and circuit panel boards as part of any significant architectural renovations.

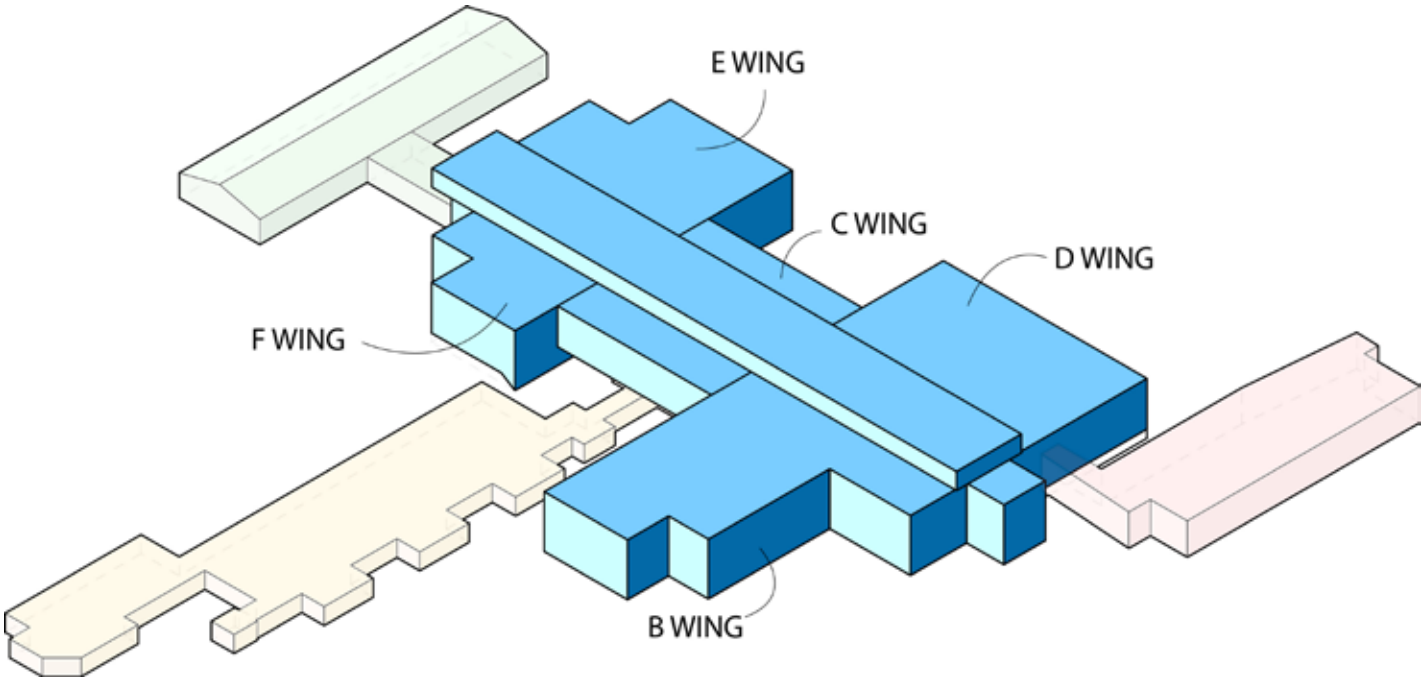

F WING



B,C,D,E,F WINGS

(Core)

B,C,D,E,F WINGS (Core) ASSESSMENT



Life Safety / Structural Review

Accessibility and Egress Concerns

Little Clearance with Side Rails

Egress Roof Holding Water

Low Railings

The original building was constructed in 1967 and comprised of a precast concrete structure and precast wall panels. It is assumed that all previous renovations and building additions met building code at the time that they were constructed. There are numerous concrete bridges extending to site topography mounds that are part of the existing egress.

None of the emergency egress precast bridges comply with egress requirements. There is approximately a 1' drop-off at the end of the bridge which creates a dangerous condition and is not accessible for someone exiting in a wheelchair. Ideally the landing areas would be elevated to provide an area of refuge at the end of the ramps that is level with the elevation of the ramp. Additionally, the bridges need to have code compliant guardrails to ensure safety. Consider providing new side mounted railings to increase clearance between handrails and enhance maneuverability of someone in a wheelchair. These conditions were not observed in the wintertime, but it can be assumed that these exits become dangerous and a serious liability with the addition of ice and snow.

Some of the emergency egress doors that exit out onto the precast bridges appear to require excessive opening force are extremely close to the railing when they open. There is very little clearance between the door and the side railing. This could block the exit if something damages the railing or gets wedged between the railing and door.

Egress onto existing low roofs from both the weight room and art studio are dangerous. It was noted that the roof surface does not drain well and holds water for long periods of time. The roof surface becomes extremely slippery when wet. At a minimum it is recommended to provide roof walkway pads across the roof from the exit doors to the bridge or stair.

The integrity of the existing railings on the low roofs is compromised due to rust and degradation. Additionally, these railings don't meet the requirements for guardrails. Since part of the path of emergency egress in onto these areas, it is recommended that code compliant guardrails be installed.

Several fire rated doors were being held open with wedges or other weights. Additionally, the latching hardware is either not functioning properly or has been removed from many of the rated doors in the stairs. Some of these rated exit doors don't have required panic hardware. This hardware needs replaces to maintain the integrity of the rated door.

The exit door on the north side of F Wing by the dumpster appeared to either not have functioning latching hardware or was unsecured. It was noted that there are multiple unsecured entry points around the entirety of the building. It is recommended to limit the number of unsecured doors and monitor all doors with either an access control system or campus wide security cameras.

The large computer classroom on the fourth floor of E Wing could be

out of compliance due to the size and number of occupants. The room only has 1 exit therefore the occupants are limited to 49.

The existing building is a concrete structure with most of the exterior walls being comprised precast structural panels with thin brick veneer. Many of the precast panels have significant bow which has created several cracking and joint issues. A full structural evaluation of the pre-cast panel wall bowing was performed in 2014. The most applicable remedial action that was recommended from the report was to focus on maintaining the continuity of the building enclosure moisture barrier system façade by sealing the vertical joints in the precast panels.

There are a few areas around the building which appear to have some structural degradation. They include the precast T bridge support exit from the north roof, the concrete piers on the north roof adjacent to the pre-engineered building, and the concrete pier on the southeast corner of the south low roof.]

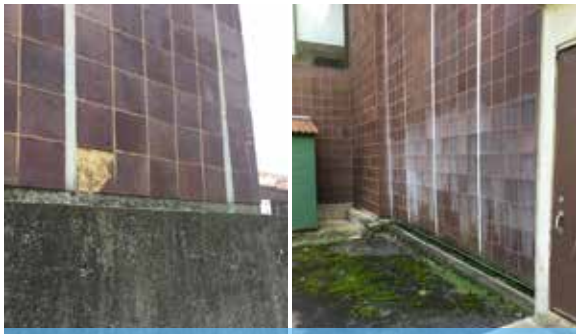
Missing Panic Hardware

Unsecured Entry

Structural Degradation

Structural Degradation

Differential Movement Areas



Brick Concerns

Exposed Steel

Painted Metal Panel

Exterior Wall Materials and Systems

Precast Wall Systems

Typically, the corner joints of the precast panels are areas that have separated the most and have the greatest potential for water infiltration. A possible solution to weather protect the separated corner joints would be to add a cladding at the corners that could cover the joint.

Most of the precast joint caulking appears to be in decent condition except for locations where panels have experienced extreme differential movement. These areas need new backer rod and sealant.

There are some thin veneer brick areas that are cracked or have popped off. These areas should either be replaced by adhering a new matching thin veneer tile or using a high performance paint coating to match the brick.

Isolated brick veneer areas with visible efflorescence are primarily located on the north elevation. Most locations do not warrant major concern, but it would be a good idea to inspect and repair mortar and caulk joints near the areas with efflorescence to make sure that there are not large joints or cracks allowing water to get behind the brick veneer.

Many locations of the steel plates that are buried in the precast columns are now exposed. There was not enough concrete coverage over the steel and it has spalled off. Over time, water penetrates to the steel where it slowly oxidizes creating rust staining and causing the concrete face to spall off. Would recommend prepping and protecting the exposed steel with high performance paint coating and patching the concrete.

The grouted water table slope at top of concrete foundation wall is deteriorated and should be replaced to ensure water is being directed away from building.

Metal Wall Panel

Most of the high metal panel appears to have been painted or coated previously and the coating has failed and is flaking. The metal panel itself still seams to be in fair condition. For extending the life of the panel consider recoating the panels with a high-performance coating.

Windows / Glazing systems and Door Openings

All windows are dark bronze or medium anodized aluminum systems with insulated glass units. There are some newer windows that were either part of a previous addition or renovation but most of the original window systems remain and new replaced.

Windows on F Wing need replaced in their entirety. The window system has several issues and is nearing the end of its serviceable life. The spandrel/ transom panels are deteriorating, the caulking needs replaced, and numerous glazing gaskets have significant gaps or are completely dry rot. The metal sill pieces are showing signs of signifi-

cant water infiltration as several locations are bulged out and severely rotted out.

The Kalwall panels have been painted over and the sealant is deteriorating. The sealants need replaced throughout however, it is recommended to replace this entire glazing systems with a new system or and infill panel.

The exterior doors out of the southwest gym hallway do not cover the CMU at the jamb condition. It appears that some of the interior CMU wall is exposed on the exterior. It is recommended that the frame be replaced with a wider frame to cover the gap or provide a jamb extension trim piece to cover the exposed CMU.

The hollow metal door frames on both the north and south that exit out onto the low roofs need replaced in their entirety. It looks like portions of aluminum storefront systems have been infilled into the upper portion of the hollow metal frame system. The doors don't function smoothly and could pose a life safety risk for emergency exit.

Most hollow metal exterior doors and frames show signs of rust and degradation. In some instances this appears to have affected the opening force required to open the door due to the door sticking. Recommend to replace exterior hollow metal doors and frames.

Kalwall Panels

Interior CMU Exposed

Roof Systems

The majority of the roofing on the 1967 structure is a fully adhered white on black EPDM rubber roof membrane with glued seams. Additionally, areas of ballasted white on black loose laid EPDM rubber roofing with glued seams was also observed.

Overall the main field of the roofing membrane throughout this portion of the building appeared to be in satisfactory condition. However there were areas of concern in regards to termination of the roofing system at perimeter and penetration type conditions. These areas of concern included the following

1. At roof to wall terminations, replacement of sealant along the top edge of sheet metal counterflashing trim conditions is warranted where the sealant has been improperly installed and/or is demonstrating loss of adhesion or cohesion failures.
2. EPDM rubber flashing terminations at MEP utility penetrations.
3. Fishmouths, separation and loss of adhesion at glued lap seams creating entry points for water.
4. Loss of adhesion, improper termination and lack of sheet metal counter flashing protection of the roofing membrane at the roof edge to vertical wall resulting in a weak condition and a high risk location for water entry. It is these areas of concern that DC would recommend a more thorough and detailed assessment be conducted to determine scope of work associated with corrective actions.

Sealent Concerns

Fishnouth

High Risk of Water Infiltration

Excess Wrinkling

Parapet Height with Single Drain

In addition to the aforementioned, following are areas of additional concern and deficiencies that were observed.

1. Roof membrane contorted around the outside edge of the roof sump, resulting in wrinkles which prevent proper drainage not to mention lack of glued securement of the roof membrane to the underlying insulation boards. In this instance it appears that instead of piecing and fitting the roof membrane and flashing sheets to better accommodate the recessed sump profile a single sheet of roof membrane was forced down into the sump and secured to the throat of the roof drain with the clamping ring. This installation method likely resulted in excessive wrinkling around the perimeter of the roof drain sump. It is recommended that the roof drain termination flashing membrane detail be reworked to better accommodate existing conditions so that the EPDM roof membrane and flashing materials lay flat and promote proper adhesion of the roof membrane sheet.

2. All existing roof drains and leader piping to be scoped. It's recommended that roof drain maintenance be performed to assure all storm drain lines remain clear and unobstructed. Storm drain pipes should be scoped for a minimum of 100 feet to assure the storm drain piping is not obstructed and to verify the general condition of joints in the piping. If it is not already part of facilities preventative maintenance workload, scheduled observation and maintenance of roof drains should be put in place to assure roof drains are periodically monitored and maintenance to remain operational under all weather conditions.

3. It was observed that in some areas the primary roof drains do not have a secondary means of protection to provide drainage relief in the event that the primary roof drains are obstructed. At the time of construction this was likely acceptable per the building code in affect at that time. A single roof drain is not uncommon and typically a non-issue if the primary drain is protected by a low profiled roof edge or through wall scupper where these components are designed to be no more than 2" in height above the roof drain inlet elevation. What was observed in the field are parapet walls in excess of 12" high bordering these single holed roof drains. This can be problematic if the roof drains become clogged and water accumulates to a depth that could potentially start to infringe on the structural loading capacity of the existing roof framing system. It is recommended that in addition to a preventative maintenance, that additional field assessment be considered to determine the appropriate corrective action to provide proper overflow protection.

4. In several instances it was observed that roof top equipment was either resting directly on top of the EPDM rubber membrane or the equipment rail heights are too low. Given the physical limitations to access the roofing materials underneath both of these pieces of equipment, disruption to existing MEP support functions, temporary removal and resetting of these pieces of equipment would be

required to allow for proper removal and replacement of the roof membrane systems. It is recommended that as part of a reroofing project that both of these pieces of equipment be reset on taller rails in compliance with minimum height and clearance requirements for rail mounted equipment as established by NRCA best roofing practice recommendations. These minimum clearances will allow for proper access underneath these pieces of equipment, eliminating the need for future prolonged shut down periods to accomplish any type of reroofing scope of work. The increased rail heights is likely to result in extension of MEP infrastructure to accommodate taller rails. Raising and resetting roof top equipment onto taller rails will likely result in disruption to building conditioning and support services therefore this work would need to be closely coordinated with the Schools calendar.

5. Air intake louvers, with a large footprint, that are installed in a flat horizontal orientation on the higher roof levels are mounted on a perimeter curb that has an extremely low curb height that barely elevates these louvers above the adjacent roof membrane. This very low curb height has the potential to

- Complicate proper termination of the roof membrane.
- Increase the probability of water infiltration during a potentially heavy rain event where water may be temporarily pooling on the roof level.
- Diminished snow drift protection.

It is recommended that these louvers be raised up as part of a reroofing project. It is recommended that these curbs have a minimum height of 18".

6. In various locations exterior piping is mounted very close to the roof membrane complicating reroofing in, around and underneath the piping. Yes, it may be possible given the relatively small footprint of the piping to reroof underneath the pipes however, there are several other concerns associated with the current orientation of the piping to the roof membrane. These concerns include the following.

- Potential of the piping acting as a snow fence promoting drift and loading concerns associated with the existing load capacity of the roof framing system
- Drifted snow potentially concealing the location of the pipe layout which could lead to damage of the pipes if stepped on.
- Low profile pipe layout facilitates a tripping hazard and/or fall protection hazard in all weather conditions.

It is recommended that as part of a reroofing project these pipes be elevated onto taller equipment support stanchions to minimize snow drift concerns and to promote better circulation across the field of the roof.

Equipment on Membrane

Equipment Rail Height Too Low

Diminished Snow Drift Protection

Piping Close to Roof Membrane

OSHA Compliance Concerns

Safety Concerns

Deteriorated Joints

Water Stains

7. Several of the existing roof access ladders are awkward to use and navigate. Although these ladders were likely code and OSHA compliant at the time of construction the ladders no longer meet current OSHA standards and requirements. It is recommended as part of a reroofing project that existing ladder locations be consider for replacement to be in compliance with current OSHA access ladder design requirements.

8. Roof access to some roof levels involves sliding down an incline then having to climb your way back out of the depressed area. Any miscues here could result in a personal injury. Other roof areas are equipped with the use of non OSHA compliant portable extension ladders to navigate from one roof level to another. This current means of access is a potential safety issue for personnel tasked with roofside preventative maintenance and a liability issue for the college if an employee or outside contractor were to become injured. It is recommended that as part of a future reroofing project that OSHA compliant ladder assemblies be considered to replace the use of portable staged extension ladders.

Miscellaneous Exterior Building Systems

Plaster & Exterior Insulation Soffits

The main area under the concourse has plaster soffits that are in good condition requiring periodic cleaning and re-painting. The soffit to wall joints on the north and south need backer rod and sealant where existing joints have deteriorated. The perimeter soffit joint is to remain open to allow for air flow around the soffit.

Some minor water stains are visible on the sloped plaster soffits. It appears the water is simply washing down the face of the soffit from wind driven rain due to the steep slope of the soffits. These require periodic cleaning and re-painting.

Ceilings

Most ceilings throughout the building are acoustical lay-in ceiling tile. The lay-in ceilings are in fair condition with an average amount of surface damage for a building of this age. In addition to the lay-in ceilings, there are areas of exposed precast structural tees mainly in the common circulation areas adjacent to the common's connector. Additionally, the Gymnasium contains painted exposed concrete structure and what appears to be Tectum panels. The Auditorium appears to be a linear metal pan ceiling system. There are also painted plaster ceilings in the restrooms and locker rooms.

It should be noted that there are numerous locations where the lay-in ceiling tile and plaster ceiling systems have visible water damage. These locations include the following:

- High ceiling tile in the media center.
- Excessive water damage on high ceiling tile in the art studio.
- Computer Lab E432 contains damaged ceiling tile near the classroom entry and along the exterior wall.
- Plaster ceiling in Boys Locker room B133 was damaged and contains water staining.
- East hallway in B Wing adjacent to locker rooms
- Evidence of water damage on slopped plaster ceilings in stairs. Need to evaluate source of water damage to prevent further damage. Recommend refinishing and repainting plaster ceilings in stairways.
- Miscellaneous isolated locations throughout the building.

While some of these locations are related to obvious issues with the roofing directly above the rooms, some may also be caused by condensation from ductwork and leaking piping. Identifying and repairing the sources of the water damage is important for maintaining a healthy interior building environment.

Walls

A majority of the walls throughout the 1966 building sections are painted concrete block. Many of the office suites, classrooms, and labs have painted finishes of either plaster or gypsum board walls. Most paint finishes are in good to fair condition. There are a few wall areas of notable damage.

- More aggressive, active water infiltration can be seen at the upper portion of exterior concrete wall in B Wing exit hallway southeast of main gym. This could be a result of water infiltration from the low roof which does not drain well. Finish plaster is flaking off the concrete.
- Brick in stairways has water damage adjacent to treads likely due to clean products and methods used to clear the terrazzo treads

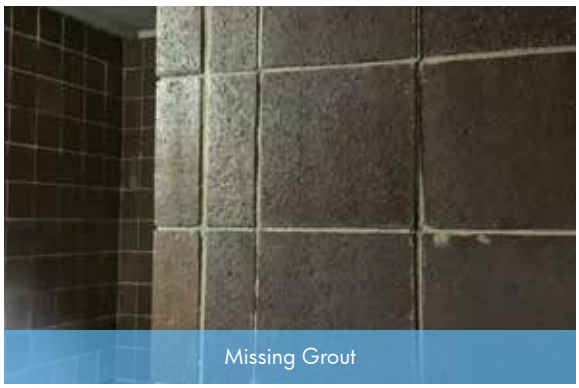
Media Center Ceiling

Art Studio Water Damage

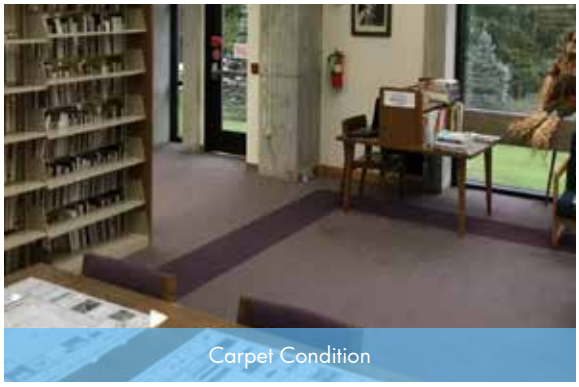
Water Damage

Flaking Plaster

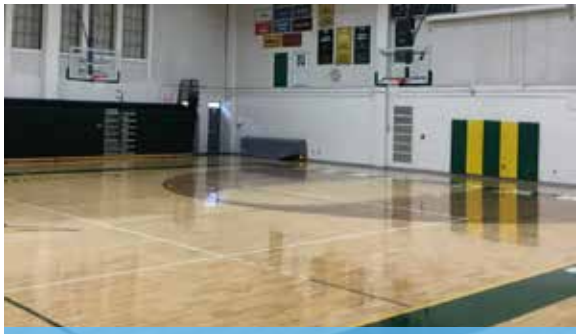
Water Damage



Missing Grout



Carpet Condition



Gymnasium Floor

- While it appears to be minimal, water infiltration can also be seen at some of the interior columns brick walls in the weight room.
- It was observed that the are areas of brick that are missing grout. This was mainly identified in the stairways
- There are some damaged tile in the restroom in E Wing.
- Wall tile staining in locker rooms.

Floors

Most of the office, and classrooms have broadloom carpeting with some classrooms containing carpet tile. These floor finishes are in good to fair condition as some of the carpet show signs of wear. It is recommended for future office suite and classroom renovations to consider installing carpet tiles in lieu of broadloom. In general, circulation corridors are mainly VCT flooring with some areas of carpeting.

Most of the flooring throughout the D Wing level 200 flooring is in good condition with the hallways consisting of VCT and the nursing labs having new carpet tile.

The F Wing 200 Level hallways have newer carpet tile while the classrooms have broadloom carpeting. These flooring materials are in good condition.

The E. J. Shaheen Library within E Wing level 200 has carpet flooring throughout. Overall the carpet is in fair condition with some areas of wear and staining.

Most of D wing level 400 contains VCT that is in good condition throughout the hallway and classrooms. There are a few rooms in this section that don't have any flooring just exposed concrete. This include D403, D410, D411, D412, and D413

The E Wing 400 level floor finishes are in good condition. The hallway is VCT and the classrooms have carpeting. E442 Computer lab has new carpet tile.

The F Wing 400 level hallway flooring is carpet in fair condition with areas of water damage near the exterior hollow metal door.

The gymnasium has a wood flooring that is well-maintained. It appears that is refinished periodically to maintain longevity.

Locker room shower and toilet rooms have ceramic tile in fair condition. While there are a few chipped tile, most areas are sound. There is tile and grout staining throughout.

Vinyl wall base in the original building is in fair to poor condition. Some is due for replacement. Wall base in most other areas is in good condition.

Overall, there is a wide variety of flooring types and conditions. The areas of older finishes and greater wear should be addressed during renovation projects or through replacement.

Doors

Most of the interior doors are wood Algoma Hardwoods brand doors that are in decent condition. More notably were issues with door hardware. Several of the doors contain knob hardware or older hardware that needs replaced. As noted in the life safety section, many of the fire doors latching hardware is not functioning properly.

The doors that appeared to be in the worst condition were restroom and locker entry doors as there appears to be wear and water damage to most of those doors.

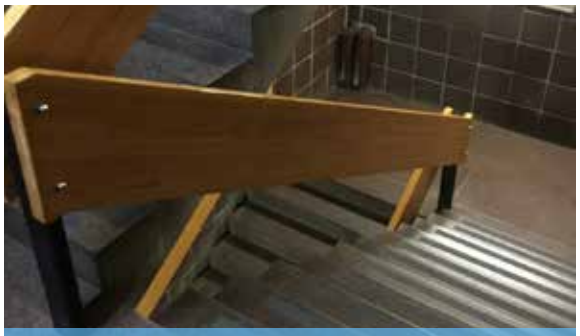
Many of the hollow metal exterior doors show significant signs of water damage and deterioration. Additionally, the hollow metal exterior doors at the weight room and art studio that exit onto the roof area are in need of replacement. Several of the doors which are part of the egress are difficult to open due to failing hardware.

Most of the interior hollow metal doors are solid but contain numerous areas for surface defects and scratches. The doors along with the frames should be repainted with typical routine maintenance.

Significant Damage and Deterioration

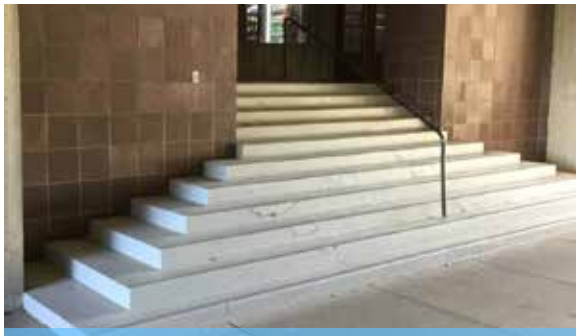
Failing Hardware

Accessibility

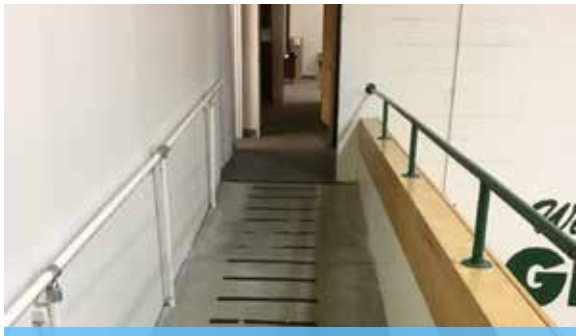


Large Gaps

Non-compliant Elevators



Missing Handrails



Missing Handrail

The following list of deficiencies were noted as they apply to current ADA guidelines. While many of the conditions met code at the time of construction, they represent non-compliant conditions based on the 2010 accessibility guidelines that are part of the current Michigan Building Code.

Vertical Circulation

- The handrails/guardrails at all the interior stairs do not meet code based on 42" guardrail height, 4" maximum spacing and 12" extension of handrails beyond the upper and lower stair treads. Additionally, there are large open gaps between the railing and stair that do not comply with fall protection requirements.
- The small elevators at each wing do not comply with the minimum 36" clearance for entry and do not meet the minimum elevator cab dimensions established by the ADA standards.
- Building entrance stairways under the concourse do not contain handrails on both sides. Need to add handrails adjacent to side walls.
- The railing that overlooks the gym is too low as you approach the south end of the ramp. This does not comply with guardrail height. The ramp itself is missing a handrail on one side.

Door Access and Hardware

- Many door locksets in various locations have knob-type hardware in lieu of the lever-type required per the current code.
- Vestibule doors heading into gym balcony from stairs are too close together. By code there needs to be 4' clear beyond the swing of the door in the open position. Currently there is only about 4' clear between the two doors.
- Clearances at the strike side of several doors do not meet current requirements. A minimum of 12" is required on the push side of doors while 18" is typically required on the pull side of doors.
- Existing restrooms and locker rooms do not meet code for some fixture clearances and entry door maneuvering clearances into each restroom.
- It was noted that the only accessible entrance to the E and F wings is on the north side of the building through the connector to the pre-engineered building and back by the dumpster. While it appears that handicap parking spaces are provided nearby neither door has an automatic operator to assist in entry.
- Door threshold out of auditorium exit door does not meet ADA.

Restrooms and Casework

- There are no handicapped toilet stalls or accessible shower stalls in the locker rooms. A locker room renovation and reconfiguration would be required to provide a code compliant functioning locker

room.

- There are some base cabinets with sinks rims higher than the 2'-10" maximum dimension.

Miscellaneous

- The theater does not contain any accessible seating and the stage is not accessible.

Non-compliant Threshold

No Accessible Seating/Stage

Mechanical Systems

Boiler Piping

Boiler

Boiler Flue

Chiller, No Redundancy

Heating Plants

The main heating plant for the core and administration wing resides in a large mechanical room adjacent to the main gymnasium at the west end of the original building construction. This heating plant consists of four (4) Hydrotherm KN-20 boilers. These boilers are high efficiency condensing style boilers with a maximum efficiency of 92% when the return water is reduced to near 100°F. Each boiler is natural gas-fired and is approximately 2,000,000 Btu/hr input. The boilers are piped in a primary/secondary piping arrangement with each boiler having a single primary vertical inline pump on it. The boiler pumps attached to each boiler are constant volume style pumps and have digital controls connected to them.

Each boiler has a separately ducted stainless steel flue that route up through the roof and combustion air piped directly into the boiler from a large combustion air duct that routes to the exterior wall. The boilers were manufactured in 2010 and appear to be in good working order.

Each boiler is connected to the Building Automation System (BAS) with digital controls to help the boilers work together as a single unit and keep run times down and efficiency elevated.

Cooling Plants

The main cooling for the core and administration wing is from a large McQuay centrifugal chiller. This chiller is located in the main mechanical room where the boilers are located. The cooling tower for the heat rejection is located on the roof above the mechanical room. The chiller model WSC079-DAABC is approximately 420 tons based on flow rates and temperature design temperature drops. At the time of visit the entering temperature from the condenser tower was 73.5°F and it was leaving the chiller at 76.8°F. The chiller was producing 44°F water to be pumped out to the chilled water coils and air handlers throughout the building area.

This chiller utilizes refrigerant R-134a and was manufactured in 2008. This is a single chiller for the entire building area, and there is no redundancy on the chiller. A failure to the chiller I would take down cooling for the majority of the building.

The condenser water routes up through the roof to the tower located above. This piping is uninsulated as the temperatures are below the typical dewpoint of the condenser water. The water from the tower flows through a Thompson strainer to eliminate large debris prior to flowing through the chiller. The tower on the roof is a Baltimore Air Coil induced draft single cell cooling tower. There is a pallet in the mechanical room with barrels of chemicals for the chemical feed equipment for the tower. Injection pumps and a water meter determine how much water is used to fill up the tower system due to evaporation loss and meter in the chemicals to keep bacteria and algae under control.

Hydronic Infrastructure

The main heating and cooling pumps are located in the mechanical room where the boilers and chiller are located. The systems are configured in a primary/secondary piping configuration. This allows the secondary building pumps to be able to slowed down to match the load of the building needs and save energy. The chilled water pumps sending chilled water out to the system are 40 hp Bell and Gossett split case pumps with a capacity of 1040 GPM at 98 feet of head. The hot water pumps sending hot water out to the system are 20 hp Bell and Gossett split case pumps with a capacity of 680 GPM at 65 feet of head.

Hydronic Infrastructure

Each pump system has redundant pumps, with the exception of the individual boilers. This would allow each system to keep operating with the failure of a single pump. These pumps have variable frequency drives installed on them mounted on the wall to be able to modulate the flow rates when valves are closing downstream. It should be noted that the chilled water pumps had a large amount of condensation on the pump bodies and piping where some gaps in insulation were found. This insulation should be fixed to help prolong the life of the pumps.


Insulation Needed

Each main hydronic system has a pot feeder for adding chemical treatment into the systems. The pot feeder for the chemicals to the chilled water closed loop system had a tremendous amount of water on the floor and the filling cone was full. It seems there is a small leak on the system allowing this to fill up into the pot feeder.

Piping from the main mechanical room is routed to additional spaces in the building through a tunnel space. There are number of old hot water pipes that have been abandoned and cut that went into an old tunnel system. These pipes look corroded and have been cut and broken off at the tunnel entrance and new piping is been replaced. It appears as though there were corrosion leaks and this piping was abandoned in place and new piping was installed to get to the existing heaters.


Pot Feeder

At some point in the past there was a catastrophic pipe failure that lead to new hot water piping routing from the main boiler room to the fan rooms in the penthouse. There is large hot water piping that is installed across the roof between the two mechanical rooms. [IMG_2276] [IMG_2282]

Air Handling Systems

In the boiler room, there is a large air handler AC-10 located hung from roof structure above. This air handler feeds the main gymnasium. There is a return duct stubbed through the wall that then routes up to the air handler where outside air is mixed with the unit. The supply duct then runs into the gymnasium and feeds multiple diffusers. This


Corrosion Leaks

HVLS Ceiling Fan

Large Air Handler

Valved and Capped

Positive Upgrades

unit has a constant volume fan motor on it and is not able to modulate its fan speed down. This air handler has a cooling coil in it with large hot water coils in the duct to reheat the air. The gymnasium also has a large high volume low velocity (HVLS) ceiling fan to help distribute the air in the space.

The majority of the core building is heated and cooled with air from large air handlers located in two main penthouse fan rooms. These air handlers are a combination of single zone, multi-zone and variable air volume units or VAV. There is also a large amount of space in the fan rooms for possible future air handlers. The piping in the rooms to these units were valved and capped for future connections.

Unit Type

AC-1 Single Zone

AC-2 Multizone

AC-3 Multizone

AC-4 Single Zone

AC-5 VAV

AC-6 VAV

AC-7 Multizone

AC-8 Single Zone

AC-9 Multizone

AC-10 Single Zone

The air handler rooms act as a return air plenum as all the return air from the spaces is dumped into the room and the return fans pull the air back to its respective air handler. This theory works well, but this also requires the entire room to have all items meet the 25/50 flame/smoke spread rating.

These air handlers have been retrofit with variable frequency drives as part of an HVAC project in the last few years. The constant volume reheat coils have been retrofit with new VAV terminal boxes to allow lower airflow when not needed. They have also had modulating 2-way hot water valves installed on the terminal boxes to allow partial flow of hot water to heat when needed. These new terminal boxes have new hot water piping and insulation installed. They also have new digital operating controls installed. This is a great upgrade as it affords a lot of energy savings for the air handling system and allows areas that don't require a lot of air to modulate the airflow down.

The multizone units have also been retrofit with new dampers to allow modulation of the hot decks and cold decks down independently of each other as opposed to having linkages and got keeping the

airflow constant. Much of the energy savings that could be done with this equipment has already been done. The units are original to the building. However, upgrades and good maintenance could keep the usage of these units well past the 50 year lifespan that is recommended.

In the north of the complex down on the main level there is a welding shop. This area utilizes large exhaust fans to remove the toxic fumes from the welding process. There is a large supply duct feeding air into the space with vertical hoods along one wall and slot hoods along the other wall for different types of welding and fabrication stations. There is a storage room to the side of the welding booths where a large air compressor with a large receiver tank to serve the shop area resides. Overhead there is argon and carbon dioxide gas for the welding process that is pipe to each of the welding stations.

Terminal Devices, Sheet Metal and Air Terminals

The majority of the terminal units for the core area are in the penthouse fan rooms. These VAV terminal units are relatively new and operate with new DDC controls.

In the majority of the core though outside of the fan room, the systems are original to the 1950s era construction. The diffusers are starting to be corroded and years of dust and dirt are evident on the majority of the ceiling tiles where they have not been replaced.

Ducts in the core area are original and have evidence of dirt and dust filled in them.

Building Management System

Temperature Controls in the main core building have been updated with new Honeywell controllers on all of the new VAV boxes with zone sensors located below. Many of the air handlers have also had some new digital controls installed for the control valves and fans. There is still a lot of original controls throughout though. This means that there is a combination of Johnson Controls, Honeywell, Barber-Coleman and pneumatic systems located throughout the entire facility.

A recommendation would be to unify the control system to keep one singular system in the facility to help with energy monitoring and troubleshooting items.

In one are in the main library area, there is a VAV Zone labeled AC-9-2 that feeds a central area as well as an enclosed testing space. The thermostat sensor is located out in the main open area and it was noted that there are large temperature fluctuations inside the testing area most likely due to not having the zone sensor installed in this room recommendation would be to add an additional zone sensor and allow that space to dictate the box control.

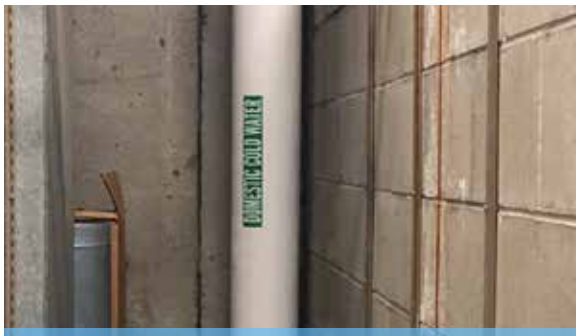
More upgrades

Welding Station

Ducts, Dirt and Dust Evidence

Multiple Systems

Plumbing Systems



Incoming Water

Culligan Water Softener


Corrosion


Multistage Natural Gas Tree

Storm

The majority of the storm systems for this area of the building take the rain water through internal roof drains and route the storm down to below grade. These storm lines route underground to the south end of the building. From this location the storm routes to surface drainage and eventually to water bodies.

Much of this system is original to each construction and has not been updated unless an addition has been made to the building. These systems should be continually investigated to be sure that the water is flowing freely and that leaves and other debris are not getting into the storm piping and clogging up the pipes.

Sanitary

The sanitary for this section of the building appears to be all gravity drain. It routes to the northwest of the building and combines with the other building additions. From this location the sanitary goes to a septic lagoon on the site.

There is a large exterior lift station notes on the existing drawings to raise up the sanitary invert elevations. It is recommended to connect this lift station into the building controls to monitor a high sump level.

Domestic Water

The main domestic water feeds in from underground in the back corner of the boiler room with a large gate valve. This is the incoming water from the site well system.

There is a large water softener system in the boiler house. It is a duplex Culligan system with the brine tank. This softened water system appears to feed multiple compression storage tanks in the boiler room. There are four of these large steel tanks that then feed the domestic water throughout the entire complex. There is a lot of corrosion around the base of these tanks and the piping to these is corroded as well.

Some piping in the original construction appears to have asbestos elbows in the insulation with cloth covered fittings which is usually an indicator of asbestos containing material.

Natural Gas

There is natural gas entering the main mechanical room building from underground outside between the boiler room and the main gym. There is a multistage natural gas tree with multiple regulators installed inside. There are also vents coming out of the wall to vent the meter/regulator assembly. This gas feeds the boilers in the room.

Water Heaters

A large tank water heater is located in the main mechanical room. This water heater was manufactured in 2010 and serves the main core building with hot water. It has a 100 gallon storage tank with

a 200 MBH gas burner. The burner is atmospheric, meaning it pulls combustion air out of the room for the gas process. Due to the chiller being located in the mechanical room, there should be no gas appliances located in this room due to the nature of the refrigerant.

The single tank water heater appears to feed hot water throughout much of for the restrooms throughout the building and is the only domestic water heater on the on the core system. There is also a hot-water recirculating pump for hot water return back from the core building to keep the lines prime domestic water. There is no redundant water heater for the system so a loss of this unit will prevent any fixtures from having hot water.

Gas Burner Near Chiller

Fixtures

Many of the plumbing fixtures in the building are original to the construction. The combination of age and the hard well water that feeds these fixtures have eroded many of the internals. It is highly recommended to start replacing these fixtures as the restroom upgrades are started throughout.

Very few of the original plumbing fixtures meet the current ANSI ADA codes required in new construction.

Recirculating Pump

Eroded Fixtures

ADA Compliance Concerns

Fire Protection Systems

Fire Water Storage Tank

Fire Protection Systems

In the main boiler room there is a large fire water storage tank for the fire protection system. Very little of the building has sprinklers installed, but in the original welding lab has a wet sprinkler system installed due to the nature of the spaces.

Electrical Systems

Electrical Service

Transformer

Electrical Service and Distribution

The electrical service for the entire campus, besides the new residence hall, is located in a 5 kv switchgear lineup located outdoors, near the mechanical room at the southwest corner of B Wing. This switchgear has two branch switches. One feeds a unit substation inside of the mechanical room, which in turn feeds A-F Wings, and the second feed from the switchgear feeds a padmount transformer outside of the G Wing, which then provides power throughout the G Wing.

Inside the B Wing mechanical room, there is a 1500 kva liquid filled transformer which steps the voltage down to 480 volt, 3 phase, and feeds a 480 volt fusible switchboard. This 480 volt switchboard then distributes power throughout the A,B,C,D,E and F Wings through distribution panels and motor control centers located in those wings.

At the time of our survey, the load on the 1500 kva transformer and switchgear was approximately 500 amps. This transformer has a full load capacity of 1800 amps, so the electrical service is only load to 25-30% of its capacity. It appears that the 480 volt switchgear is remaining from the original 1967 building construction. Based on that age, although everything is currently operating properly, this switchgear is nearing the end of its expected life. At this age, equipment starts to become unreliable. The fusing inside of the branch switches should still perform properly, and prevent overcurrent on branch circuits, however due to age and heat, springs and other equipment inside of the disconnect switches can become brittle and fail, particularly when the switches are operated. When this happens the switch usually cannot be closed, meaning a large portion of the building would be without power until a replacement switch could be found and installed. In addition, the environment inside the mechanical room

is harsh, and the switchgear is starting to show rust and deterioration.

While the switchgear is remaining from the original building construction, the nameplate on the 1500 kva transformer shows that is was manufactured in 1989. This would indicate that there are no PCBs in the oil of the transformer. Given it's age and the fact that it not heavily loaded means that it should continue to operate for the foreseeable future. As it gets older however, the oil should be tested periodically, which can determine if there is any overheating or arcing inside of the transformer.

During our survey, we opened two of the branch switches in the switchgear to check the conditions inside, and all of the wiring appeared to have thermoplastic insulation and was in very good condition. Typically switchgear and wiring of this age will have type RH, rubber based insulation on the wiring which becomes brittle at this age. Given the condition of the wire, it appears that it has been replaced at some time in the past, and with thermoplastic insulation, it should last indefinitely.

Branch Circuiting

From the main 480 volt switchgear section described above, 480 volt power is distributed to several distribution panels and motor control centers located in the A-F Wings. From there the 480 volt power is distributed to lights and mechanical equipment, and it also stepped down further, by smaller dry type transformers to 120/208 volt, 3 phase power which feeds smaller, branch circuit breaker panelboards located throughout the wings. These panelboards provide multiple 20 amp, 120 volt circuits for convenience outlets and other similar loads.

The condition of these panels depends mainly on when they were installed. There are many panels which are remaining from the original building construction. These panels are still functioning properly, but they are reaching the end of their expected life. There are no safety issues with these panels, but circuit breakers may start to fail, and replacement parts will likely become hard to find. In other building areas that have been added or renovated, the panelboards are newer and in good condition. The condition of the older panels is not an immediate concern, however when any significant building renovation is performed, the age and condition of the panels in that area should be assessed and the panels replaced if necessary.

Similar to the main switchgear, we removed the cover from panelboards to examine the interior. In all of the panels we surveyed, all of the panelboard feeders and branch circuit wiring had new type THHN thermoplastic insulation. We did not see any wiring with rubber based insulation which leads us to believe that almost all of the branch circuit wiring has been replaced at some time in the recent past, and should last indefinitely.

Lighting

Lighting throughout the B,C,D,E and F wings is primarily fluorescent. In most areas, light fixtures contain 4 ft. T8 type fluorescent lamps. In

Switchgear

Updated Insulation

Aging Panels

Updated Wiring

Fluorescent Lighting

Fluorescent Lighting

Fluorescent Lighting

Aging Fire Alarm Devices

the areas we surveyed the light levels were adequate, and they appear to meet Illuminating Engineering Society standards based on the tasks being performed.

While the majority of new commercial lighting is LED, T8 fluorescent fixtures are still very energy efficient, and are the most prevalent fixtures in existing buildings. New LED fixtures do offer some significant advantages over fluorescent however. First there is energy savings. Early LED fixtures were actually similar in efficiency to fluorescent lamps (85-100 lumens/watt), however newer generations of LED chips are now at 120 lumens/watt or more, making them up to 40% more efficient. In addition to this, LED fixtures are typically able to direct all of the generated light out of the light fixture, as opposed to fluorescent where a significant portion gets lost and wasted inside of the fixture. The lack of a physical "light bulb" requiring maintenance and replacement, ease of dimming, and the downward cost curve are other reasons why LED is now the primary choice for new fixtures.

While the advantages of LED are significant, in facilities where the existing light fixtures are energy efficient fluorescent, it typically is not cost effective to unilaterally replace these fixtures with new LED type simply for energy savings. Unless there are other reasons to replace the fixtures, the energy savings alone does not provide a short enough payback to warrant the replacement cost. However as part of any building renovation, we would recommend that existing fixtures be replaced with new LED. There are also LED retrofit kits or lamps available for fluorescent fixtures. In some areas, these may be a viable option, such as areas where the lights are on continuously, or areas that are hard to reach.

There are very few areas in these wings that have any type of automatic controls on the lights. Current energy codes require automatic control of lights in most areas, either through occupancy type sensors or time of day control. These codes would not apply to existing lights in the building, but will be required as part of any building renovation. Beyond that, there are many areas in the building – corridors, classrooms, restrooms and similar areas, where simple inexpensive ceiling mounted occupancy sensors could provide significant energy savings. In smaller spaces such as offices, replacing the existing light switch with all wallbox type occupancy sensor could also provide savings.

Fire Alarm

Fire alarm devices in the B,C,D,E and F wings are antiquated, and are remaining from the original building construction, and are controlled through a National Time and Signal fire alarm control panel in the mechanical room. The peripheral devices consist mainly of manual pull stations at building exits and some horn units located in common areas. Although there is documentation on the panel showing it was maintained in 2017, it is very doubtful this system works correctly given its age. In addition current system falls short of several code requirements. The biggest code deficiencies are the lack of strobe

appliances anywhere in these wings, and the lack of duct smoke detectors on any air handling units.

Given the age and condition of the existing equipment, the code deficiencies and the life safety requirement of the system, we would recommend that a new fire alarm system be a high priority of any capital improvement. We would recommend that a new system be installed, consisting of an addressable type control panel, manual pull stations at building exits and stairwells, smoke detectors in code required areas, duct smoke detectors on air handling units, and flow & tamper switches on any sprinkler system. It should also include both horn and strobe type notification appliances, and a digital dialer/communicator to automatically contact a monitoring service on alarm.

Emergency Egress Lighting

Life Safety/Emergency Power

There does not appear to be a generator anywhere on campus to provide emergency power. Emergency egress lighting is accomplished mainly through battery powered, self contained wall mount emergency lights located in corridors and other common areas. In other areas, such as the gymnasium, emergency battery units have been installed in the ballast compartment of selected fluorescent light fixtures to provide emergency lighting upon power loss of normal power. Building codes dictate that emergency lighting must be provided along all paths of egress, and they also spell out the minimum and average light levels required along those paths. There are many areas inside of the B thru F wings that do not appear to have any type of emergency lighting, or if they do it is unlikely that it meets the required light levels. Additional battery powered wall pack units are a cost effective way to provide additional egress lighting, however this also comes with an increased maintenance cost going forward. Emergency lights are required to be tested both monthly and yearly, and for a large building or campus, the maintenance cost of testing all of the fixtures can become prohibitive, or more commonly, the testing does not get performed. As additional units are added, the college may want to consider emergency lights that include a self test feature. These fixtures have internal circuitry that perform the required monthly operational test, and the required yearly 90 minute test. If there or problems, or the unit does not pass the test, then LED indicators on the fixture tell maintenance staff what the problem is. This can greatly reduce maintenance cost on these units, and can also reduce the liability on the College. Another option in addition to self contained battery units would be to add an emergency generator to the facility to power selected light fixtures upon loss of commercial power. This option would be significantly more expensive than adding battery units due to the cost of the generator and the additional wiring required, however the ongoing maintenance cost would be significantly reduced. This option could become more feasible if the generator could also be used for other emergency power requirements, such as networking equipment, coolers & freezers, data centers, or other equipment.

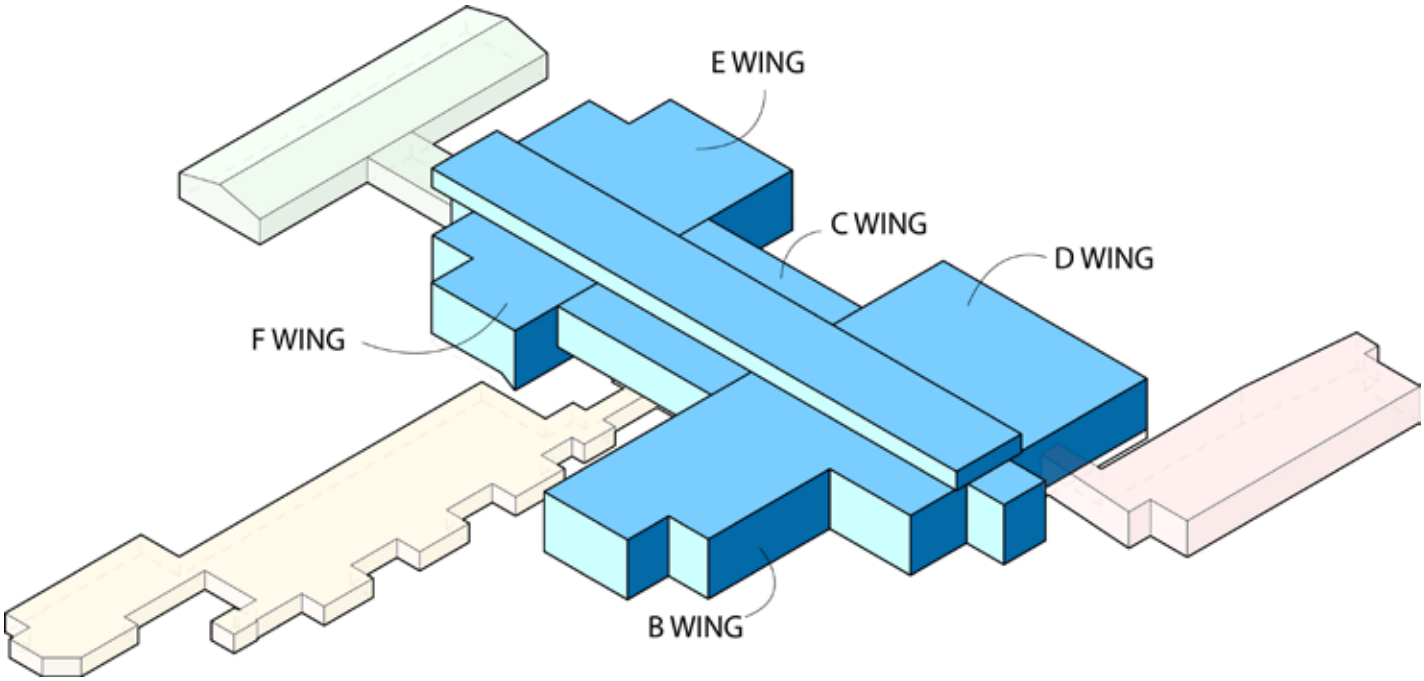

Missing Emergency Lighting

In addition to the interior, the building code also defines the path of

egress to be the area on the exterior that leads people away from the building. At the time of our survey, we did not see any emergency egress lighting on the exterior of the building. This is not an immediate safety issue, but it should be addressed as part of any building renovation.

Beyond emergency lighting on the paths of egress from a building, building codes also require proper exit signage to guide people out of the building. In most areas, there are functional exit signs at exit doors, but there are other areas where proper exit signage is not readily visible. Given the complexity of the building and floor levels, it might be difficult to find the correct exit path for people who are unfamiliar with the building.

B,C,D,E,F WINGS (Core) RECOMMENDATIONS



Life Safety and Structural

a. None

Building Envelope

a. Develop a phasing strategy for replacing the roofing system on all original and 1954 building sections. Create positive slope to roof drain locations and install overflow roof drains.

b. In conjunction with the 1954 roofing replacement, install metal copings at roofing sections #17-#20 and install metal fascia materials over the existing wood painted fascia surrounding section #16.

c. Replace the built-up, gravel surfaced roofing system at section #32 including the replacement of the expansion joint. Re-work the metal coping to allow expansion at the parapet.

d. Disconnect internal roof drain conductors that collect water from roof area #5. Install external downspouts down to lower roof levels.

e. Rework the roof edge/gutter flashing along the east side of roof area 21a. This EPDM membrane surface is beginning to get very 'chalky', so complete roofing replacement in this area may be the most cost effective solution.

f. Perform annual inspections on all remaining roof areas to identify minor damage and repair items.

g. Paint the unfinished concrete block wall area at the south side of roof section #30.

h. Install coping section at the southeast corner of roof section #33 to cover exposed wood parapet blocking and edge of roofing membrane. Tuck point damaged brick mortar joints below this location.

i. Patched damaged areas of the foundation wall on original building.

j. 100 % tuck point remainder of brick veneer on the original building. Maintain the higher level of quality found on lower building elevations.

k. Perform periodic maintenance on the north entrance canopy and decorative wood columns.

l. Spot tuck point damaged mortar joints on 1954 building sections including the diagonal settlement cracks at the southwest corner.

m. Continue to monitor deteriorated window lintels at the northeast section of the 1954 building section. Eventual replacement of the lintels will be required.

n. Repair the loose stone surround at the recessed door #4 entrance. Replace the damaged soffit following masonry repair.

o. Replace failed insulated glass unit at storefront entrance #5.

p. Repair loose siding and sill trim at the upper large gymnasium.

q. Repair the masonry control joint on the west elevation between 1983 and 1998 building sections.

r. Repair/caulk isolated masonry joints at window and door heads.

s. Re-caulk all masonry control joints.

t. Repair base of exterior door jambs at door #18. Remove surface rust and refinish interior door surfaces.

Building Interiors & Finishes

a. Replace damaged ceiling tile as related work is completed to correct water infiltration, leaks or condensation issues.

b. Continue to upgrade dated and worn interior finishes periodically.

Accessibility

a. Replace knob-type door hardware in the older building sections with lever-type hardware.

Mechanical Systems

a. Segregate chiller plant from remaining part of the room so that it is in its own room due to the refrigerant requirements.

b. Install an additional chiller to gain redundancy.

c. Test the integrity of the chilled and heating water piping

d. Repair/replace chemical feed water systems

e. Repair insulation gaps

f. Verify unit have correct quantities of ventilation for occupants and exhaust.

g. Add energy recovery to welding area exhaust and makeup.

h. Confirm no combustible materials are in mechanical room as it is a return air plenum.

i. Clean duct systems

j. Update BAS system to a unified building wide system.

Plumbing

a. Verify sanitary lift station is in proper working order and add alarm contacts.

b. Replace domestic water storage tanks

c. Replace corroded piping in the mechanical room.

d. Install an additional water heater to add redundancy to the system.

e. Install thermostatic mixing valve on water heaters.

f. Update restrooms to meet ADA requirements

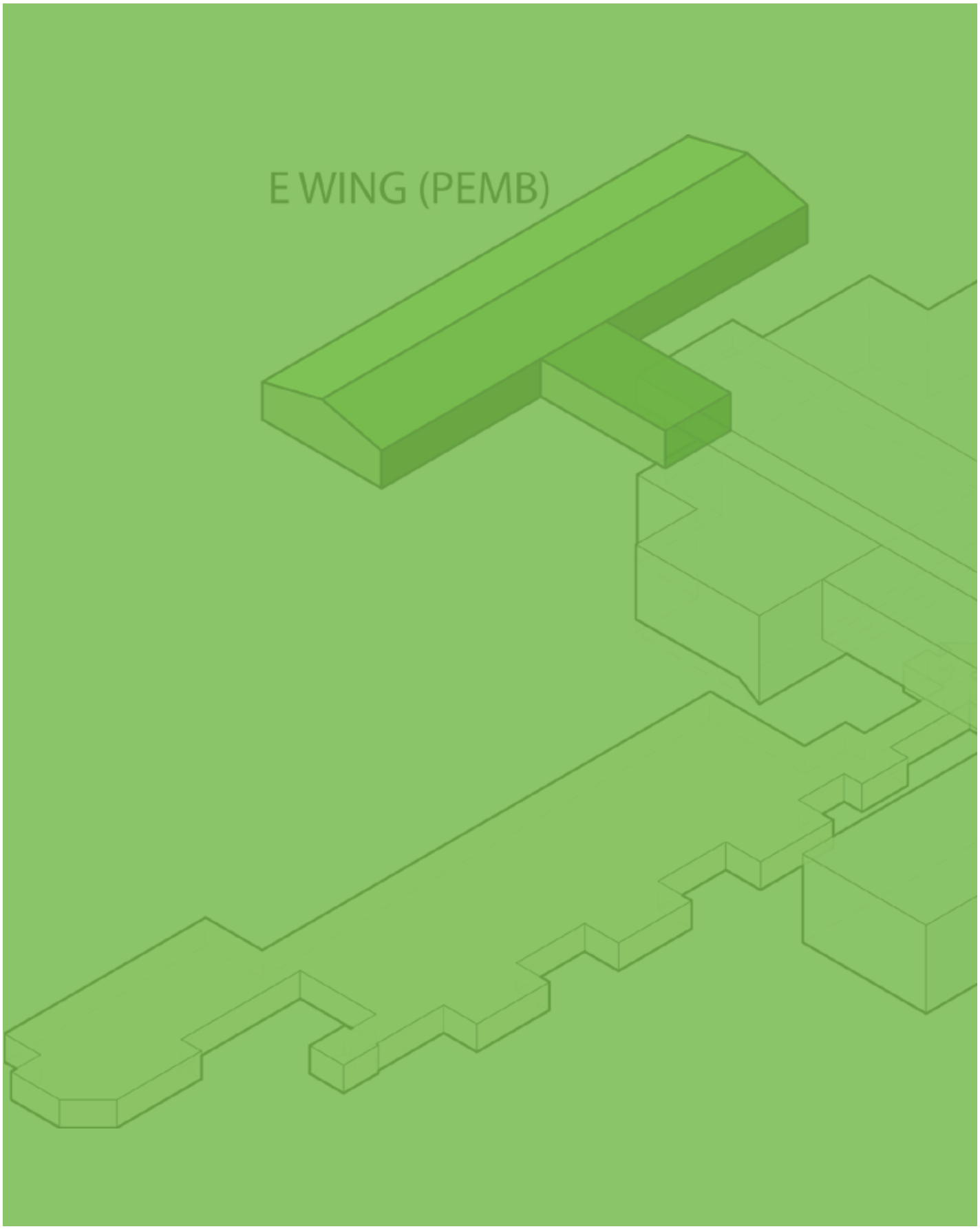
Electrical Systems

a. Provide new fire arm system

b. Provide additional emergency egress lighting in areas that do not meet current code requirements

c. Provide automatic lighting controls in selected areas where it is cost effective to to install and will provide significant energy savings

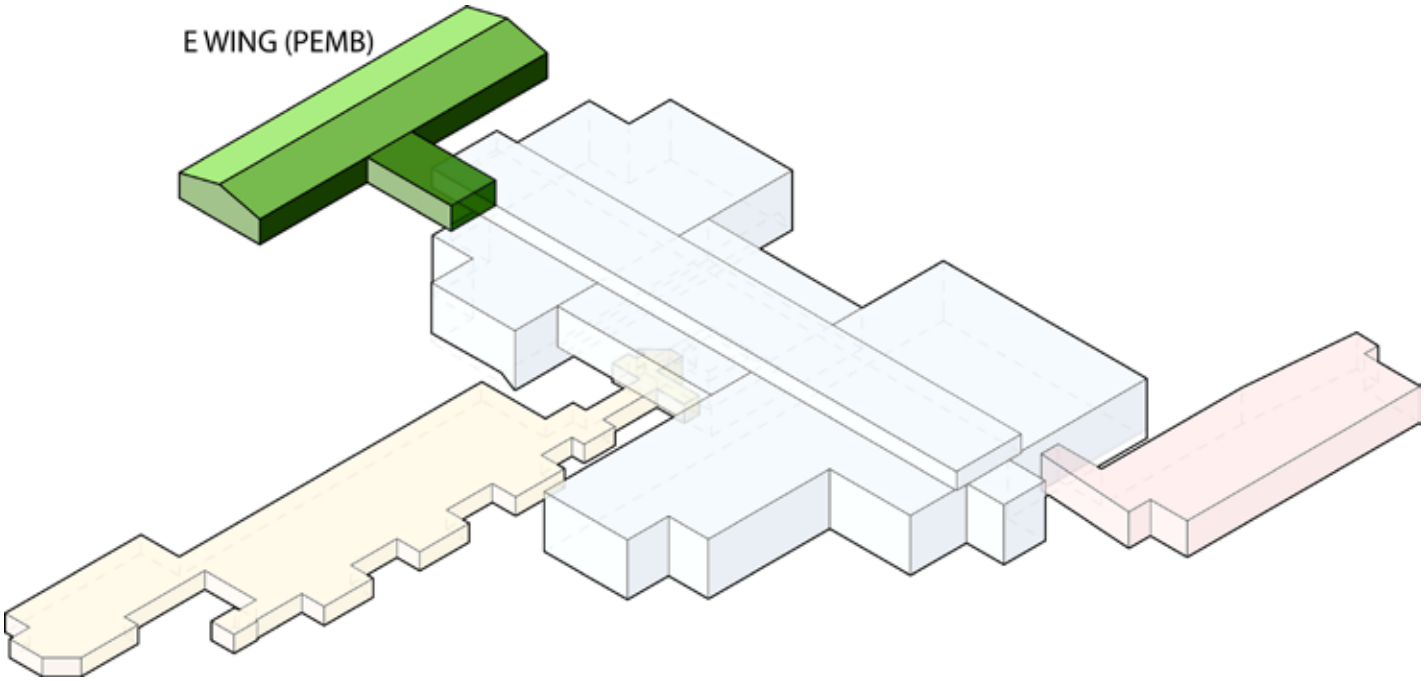
d. Replace existing lighting and circuit panel boards as part of any significant architectural renovations.


E WING (PEMB)

E WING

(Pre-Engineered)

E WING (Pre-Engineered) ASSESSMENT



Mechanical Systems

Hydronic Piping


Localized Cooling Unit


Relief Air Ducts and Exhaust System

Non-Networked Thermostats

Heating Plants

There is no heating plant in this portion of the building. The heating hot water enters the building though the E wing above the ceiling of the spaces.

Cooling Plants

There is no cooling plant in this portion of the building. No chilled water enters this area.

Hydronic Infrastructure

Heating water enters from overhead through the E wing (core) of the building. This hot water piping feeds miscellaneous unit heaters and makeup air handlers. The hydronic piping is all insulated and no real deficiencies exist.

Air Handling Systems

Due to the nature of these areas, there are a few large air handlers that provide ventilating and makeup air for the large spaces where lab work and teaching occur. Many of these air handlers are original to the building and are due for replacement as they are at the end of their life cycle.

In this area of the building the majority of the heating is done with hot water unit heaters and hot water makeup air units in the automotive and welding shop areas.

There are some localized cooling units that are window air conditioners or mini-split type of systems that provide some cooling in the classroom areas inside these shop classes.

Terminal Devices, Sheet Metal and Air Terminals

Most all duct is exposed in these areas and is all provided through single zone heating units. There are some relief air ducts and exhaust systems that relieve the shop air.

Building Management System

Most of the controls in this area are original pneumatics on the air handler and unit heater systems with some of the stand alone cooling system utilizing digital programmable thermostats that are not networked into anything.

Storm

This metal building utilizes gutter and downspouts to drain the storm water in this area.

Sanitary

The sanitary from the area connects into the E wing (core) section of the building near where the welding labs are located. In the garage there are oil separators that protect the sanitary systems from oil and grease entering the system. These oil interceptors should be maintenance every year to clean out the sand, debris and oils in them.

Domestic Water

All water is routed through the core building to this location.

Natural Gas

No natural gas was evident in this area of the building.

Water Heaters

No water heaters are present in this area of the building.

Fixtures

The majority of fixtures are handwash sinks. These units are used often and have been repaired over the years. These fixtures are due to be replaced.

Oil Separator

Due to be Replaced

Fire Protection

No fire protection exists in this area of the building.

Electrical Systems

Distribution Panels

Step Down Transformers

Adequate Condition

Fluorescent Lighting

Electrical Service and Distribution

Electrical distribution in the pre-engineered portion of the E Wing consists of a 480 volt distribution panels located in the automotive shop and in the industrial arts area. These distribution panels are fed from branch switches in the main building switchgear in the mechanical room in B Wing. These panel feeds large electrical loads and HVAC equipment. In the industrial arts area, the distribution panel also feeds several runs of overhead bus duct, for power to tools and machinery in the space.

The distribution panels also feed stepdown transformers which then feed 208 volt branch circuit panelboards for branch circuits to convenience outlets and other similar loads in the automotive and industrial arts areas. This equipment appears to be in adequate condition, and should be able to handle the existing load in this wing, and any additional loads that would likely be added in the future.

Branch Circuiting

The 208 volt branch circuit panels in the automotive and industrial arts areas appear to be full, with limited space for additional branch breakers. However the distribution to this wing, and the stepdown transformers should have sufficient capacity for any needs in the space. If additional 120 volt branch circuits are needed, new panelboards could be added onto the existing transformers with minimal cost.

Lighting

Lighting throughout the pre-engineered E Wing is primarily chain mounted industrial type fluorescent fixtures with T8 lamps. These fixtures provide good light levels for the work being performed in the space.

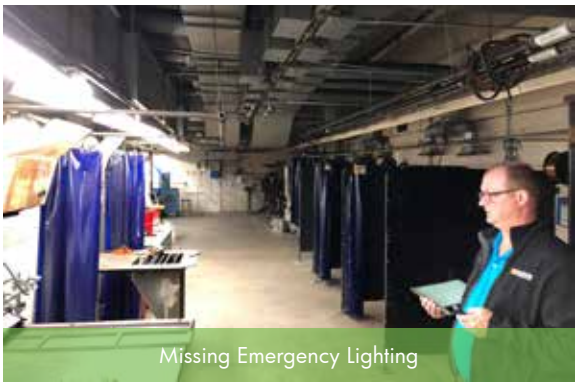
There does not appear to be any type of automatic controls on lights in this wing. Caution should be used before adding any however. In ancillary spaces like the classrooms or storage rooms, automatic controls could be installed inexpensively and provide energy savings. In the automotive and industrial areas however, we would recommend that there be no automatic controls for safety reasons. Students could be seriously injured if the lights were to go out while they were working on equipment. Energy codes all provide exemptions for automatic controls in areas where occupant safety may be compromised.

Fire Alarm

Similar to the other B through F Wings, the fire alarm devices in this wing are connected to an antiquated control panel located in the B Wing mechanical room. Our recommendation, similar to the other wings, is that this system should be replaced, and new initiating devices and notification appliances be installed.

Life Safety/Emergency Power

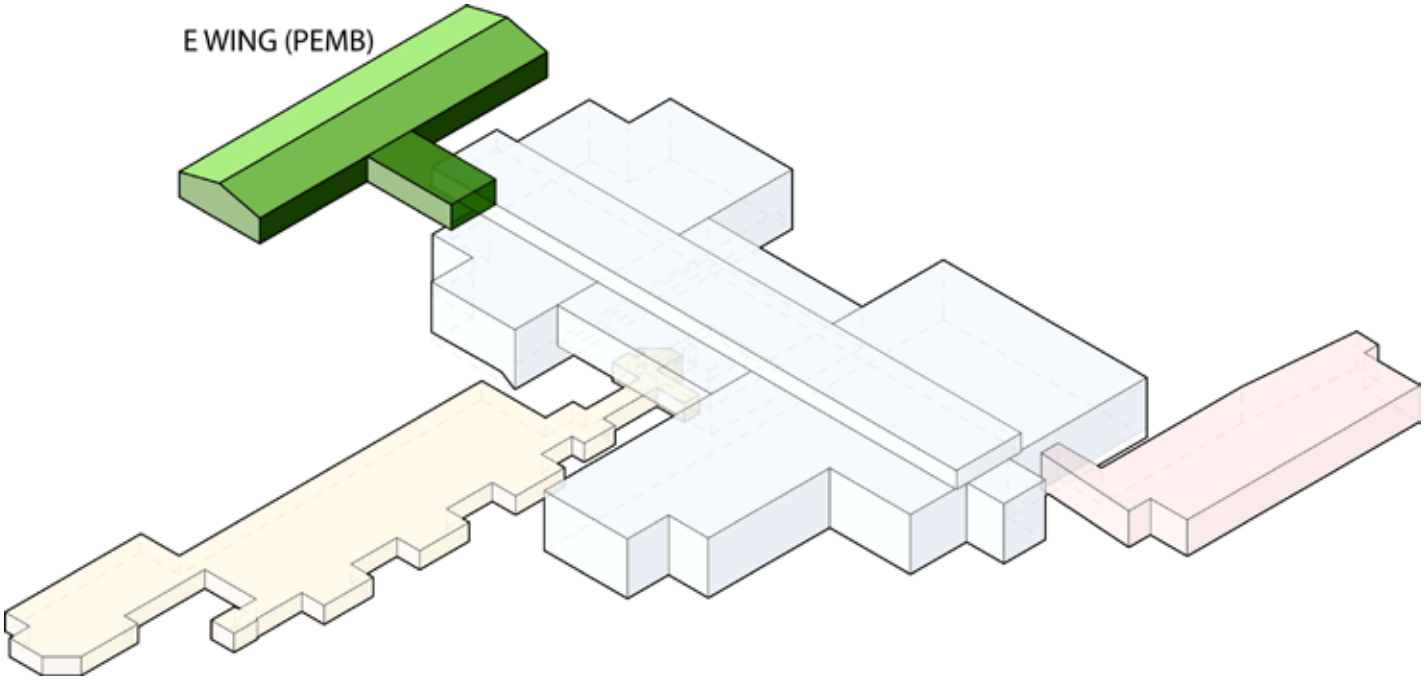
We observed very few emergency light fixtures in the E Wing at the time of our survey. In the industrial arts area, there were some units installed on the building trusses at the ceiling level. Given the height however, these units are very difficult to test and maintain. Given the nature of the work in the automotive and industrial areas, it could not only be an exit issue if normal building power is lost, but it could also be a serious safety issue for students operating machinery.



Missing Emergency Lighting

High Location for Emergency Lighting

E WING (Pre-Engineered) RECOMMENDATIONS



Electrical Systems

a. Provide new fire arm system

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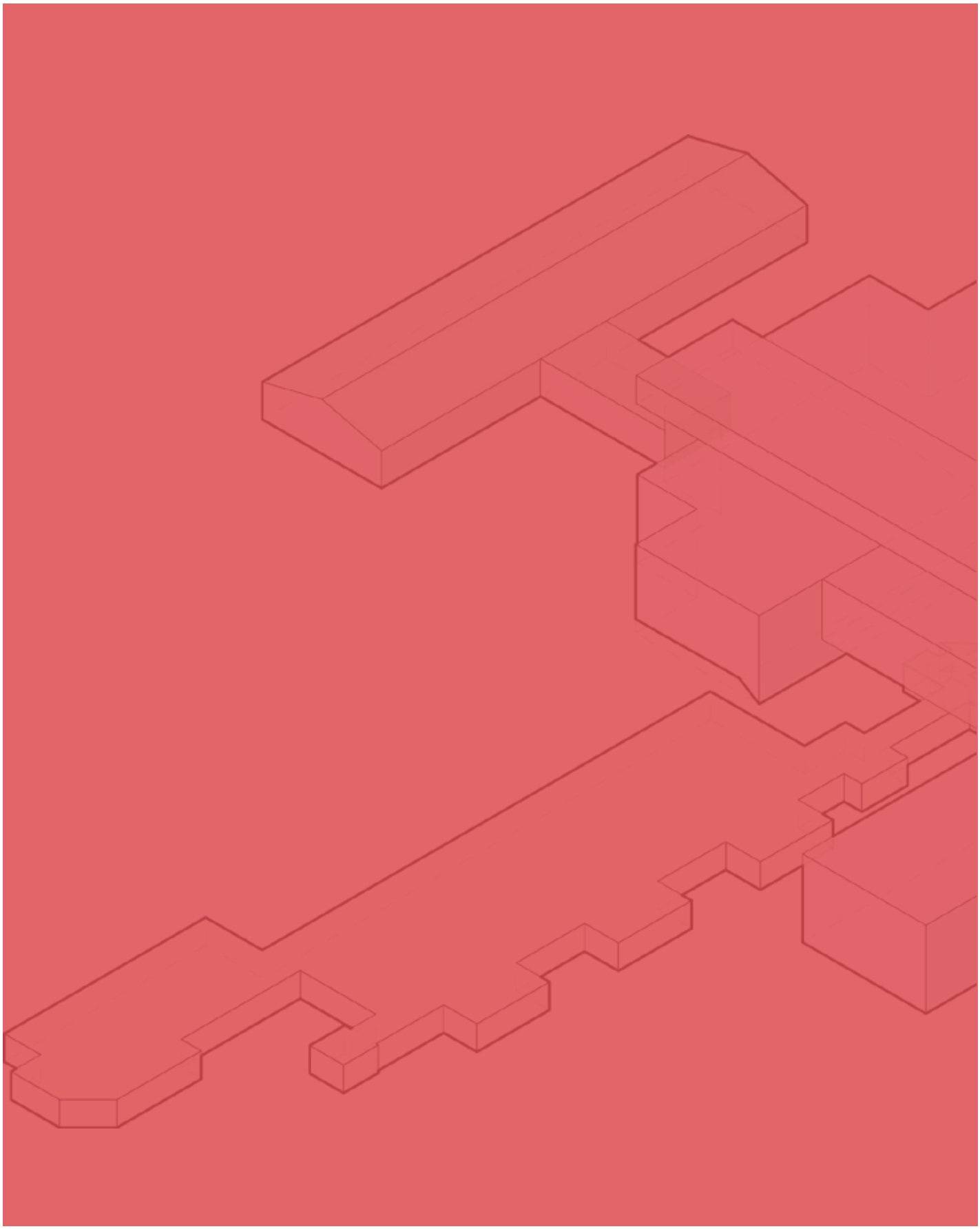
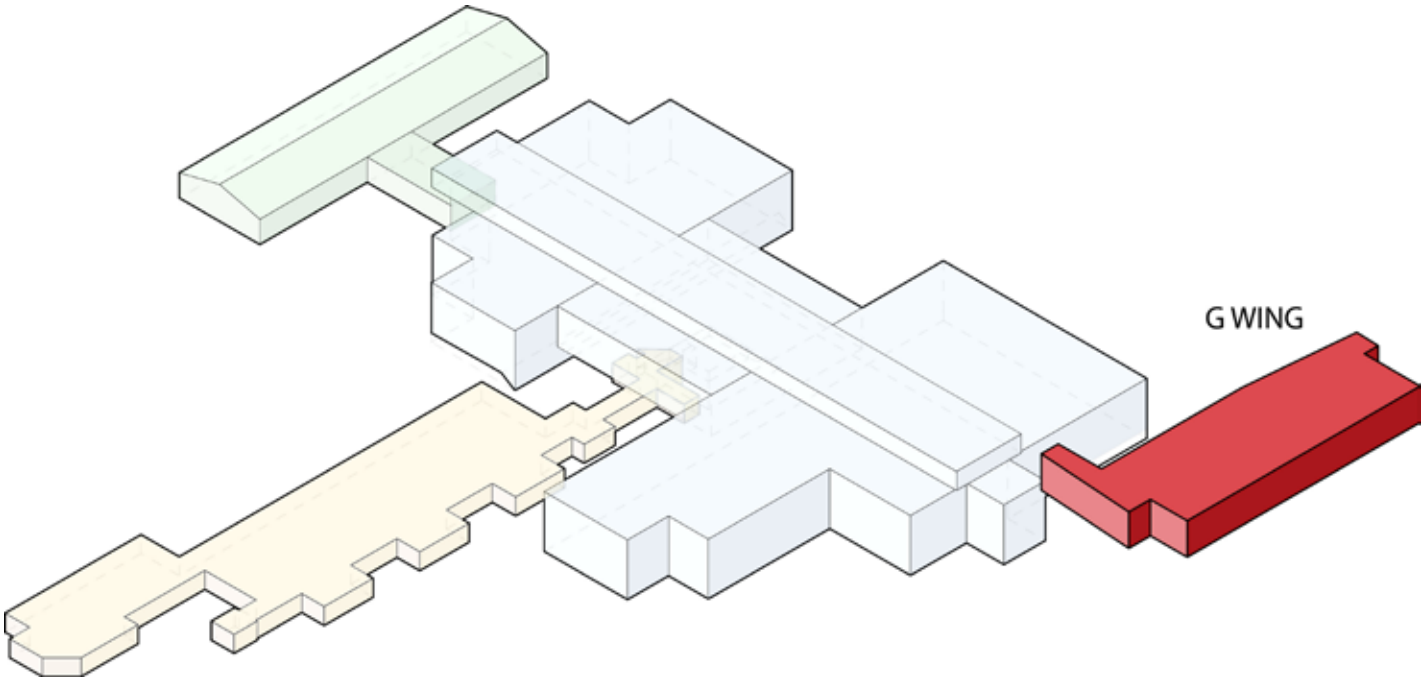
d. Replace existing lighting and circuit panel boards as part of any significant architectural renovations.



G WING

(Science)

G WING (Science) ASSESSMENT



Life Safety / Structural Review

The 2005 building addition was filed with the State of Michigan and was designed per the 2003 Michigan Building Code for Type IIIB construction. The G Wing is divided into a separate building from the original building by a two-hour fire separation. The building does not contain any automatic fire sprinklers. No notable deficiencies were observed regarding the life safety components of the G Wing.

Building Envelope

Cracked Panel

Shifted Panel

Joint Concerns

Exterior Wall Materials and Systems

Fiber Cement Wall Panels

Many fiber cement panels have cracked within the vicinity or in close proximity to fasteners. This could be a result of overtightening the fasteners or not providing an oversized hole. Either one would restrict the movement of the panel due to thermal changes and cause the cracking to occur.

The fiber cement panel over the parapet is completely cracked in half and shifted out of plane. This location needs to allow for some movement and probably should have a control joint to prevent future cracking.

A few of the fiber cement panels have faces that are spalling and delaminating. This could be a result of the water infiltration through the failed sealant joints and penetrating the cut edges of the panels. Damaged panels should be replaced and joints corrected to ensure further damage is not done to panels that are in good condition.

All the sealant at fiber cement board wall panels has failed. In many locations the sealant has pulled away entirely revealing the degraded backer rod and substrate behind. In other joint locations the sealant has not been installed in the correct width to depth ratio causing cohesive failures. All joints to be routed out and replaced to new backer rod and sealant.

Cracking of the foundation wall is prevalent on north side of Wing G. These do not appear to be structural but should be monitored. Larger cracks should be routed out and patched to prevent water infiltration.

Roof Systems

Fully adhered EPDM Roofing

Wing G building area has a fully adhered black EPDM rubber roofing system which was installed around 2005 and should still be under warranty. Access to this roof level is via a portable extension ladder staged on either the north or south side of the building. The use of a portable extension ladder is code compliant since the eave height along the southern edge of the expansion where all the roof top equipment is located is less than the maximum 16'-0" height requirement allowed by the building code. Above 16'-0" feet high a

permanent means of access such as an interior ladder and roof hatch would be required.

No issues were observed regarding the installation of the roof membrane itself, however the through-wall overflow scupper on the high roof does not meet code due to its small through wall opening size. Per section 1503.4.2 of the IBC, scupper dimensions shall not have an opening dimension of less than 4 inches in any direction. The scupper on the high roof is less than 3" tall. It is recommended that the scupper opening be modified to minimize the potential for this opening becoming obstructed, especially since this scupper opening is the primary outlet to drain this roof level.

Ponding water was observed on the north portion of the lower roof. It appears the primary roof drains are partially clogged since dripping water was observed coming from the through wall overflow discharge piping along the north side of the building at finish grade. Periodic evaluation of the drains is recommended to ensure the primary drains are kept clear.

Obstruction Potential

Ponding

Building Interiors & Finishes

Metal Panel on Ceiling

Seam Separation

Ceilings

The G Wing contains a combination of lay-in acoustical tile ceilings, exposed acoustical metal deck, and corrugated metal panel. The science labs and offices have lay-in acoustical tile ceilings that are in good condition, no visible water damage was observed. The classrooms along the north have acoustical metal deck.

The main lobby space has exposed structure and deck. The main circulation spine has corrugated metal panel on the ceiling. There are mostly hard surfaces in the hallway which could be noisy based on the occupancy. If excess noise becomes a concerned acoustical wall panels could be added to the upper part of the south red wall. These would help absorb the sound diffused by the metal ceiling.

Walls

Most walls have been framed with drywall partitions and contain a painted finish. The restrooms have ceramic wall tile. No notable deficiencies were observed regarding wall finishes.

Floors

Flooring in the 2005 science addition is in good condition. The hallways are sealed concrete with the lobby space having a combination of sealed concrete and carpet. The classrooms and offices have carpet flooring. The science labs have resilient sheet flooring. There are a few locations in the science labs where the resilient flooring seams are starting to separate.

Accessibility

Missing Handrail and Clearance

The ramp on the southwest side of the building leading up to G Wing appears to have a slope greater than 1:20 which would officially classify it as a ramp and not a sloped walkway. By code ramps are required to have handrails on both sides. If slope is steeper that 1:20 handrails need to be added for code compliance.

Clearances at the strike side of door to office G212 does not meet current requirements. A minimum of 12" is required on the push side of door. Additionally, the sloped office wall encroaches on the door access clearance for front approach.

The accessible restroom stalls are missing the 18" vertical grab bar.

Heating Plants

This area of the building was set up with independent heating plants from the rest of the building. There is a 1440 MBH Lochinvar Copper-Fin II boiler in the mechanical room that provides heat for the entire addition. The flues route through the roof and the combustion air enters from the sidewall. This boiler provides hot water for the air handler, hydronic VAV terminal units, and miscellaneous unit heaters and also for the indirect domestic water tank. The boiler is a copper fin style boiler that has a maximum efficiency of 83%. Most boilers installed today are condensing style boilers, similar to what is in the main boiler room of the Core building. The condensing style boilers have a maximum efficiency of 95%, which would allow tremendous energy savings. They can also allow the hot water temperatures to be set lower and provide re-heat capacities in the warmer months with low temp heating water, typically around 120 degrees.

There is no redundancy with this system. The single stand-alone boiler is the only heating device for the HVAC in this wing of the building and a single failure of this piece of equipment results in losing heat for the entire wing.

Cooling Plants

Cooling for this wing of the building is achieved through a remote condensing unit located on the ground outside of the mechanical room. This unit has a capacity of 62 tons and is outfitted with scroll compressors that have sound attenuating jackets installed.

Refrigerant piping routes from this condensing unit to the air handler located on the roof above the mechanical room. The refrigerant piping has flexible elastomeric insulation installed on the suction and hot gas piping, but this insulation is starting to degrade from UV light penetration. This piping should have the insulation repaired and a new jacket installed over the insulation to help improve efficiency and keep the insulation from degrading even further.

Hydronic Infrastructure

The heating plant distributes the heating energy through hot water pumps and piping to the air handler, VAV terminal boxes and unit heaters throughout the space. The hot water is circulated throughout the area by two inline hot water pumps hung in the mechanical room overhead. These pumps are redundant so that in the event one of the pumps fails, the other pump can turn on and circulate the hot water. It appears that one of these pumps had a motor failure in the past as the motor on the pump is not the original.

The hot water piping is primarily steel on the larger sizes and copper on sizes 2" and smaller. The piping is also insulated with fiberglass insulation and appears to be in good shape. A glycol fill package filled with 30% propylene glycol is connected to the hot water fill to prevent freezing of the hot water piping if flow would stop. This is critical because air handler on the roof has hot water feeding up to an


Boiler


Remote Condensing Unit


Insulation Degrading


Hot Water Pumps

VAV terminal Units

Air Modulator

Air Handling System


Terminal Units

unheated pipe chase on the air handler to connect to the heating coil. This design is not unusual, but can cause problems if the pipe chase gets too cold and flow of the hot water stops.

All piping to the VAV terminal units is with a circuit setter balancing valve to allow specific flow to each unit. Each of the pumps have power provided through a combination starter. This starter turns on the pumps and then they operate at full speed. To save energy, these pumps should have Variable Frequency Drives (VFD) installed on them to allow the hot water pumps to slow down when the demand is lower from the terminal devices. It was noticed that the outlet valves on the pumps were partially shut which indicated that the pumps are oversized for the flow of water needed at the terminal devices. This is another energy consumer that could be eliminated with VFD's installed.

Air Handling Systems

The main heating and cooling delivery is from a large York 16,000 cfm variable air volume air handler located on the roof above the mechanical room. This air handler provides 55-60°F air all year and heats up or cools the return and ventilation air to this temperature.

The air handler has a direct expansion (DX) cooling coil and a hot water heating coil. The unit is capable of providing up to 9,000 cfm of outside air at any time of year to make up the exhaust from the laboratory fume hood and restroom exhaust. The unit has a 62 ton remote split condensing unit on the ground that it will reject the heat to when cooling is needed. This unit has a supply and return fan to allow good balancing of the airflow in the building, and these fans have remote VFD's installed in the mechanical room down below.

There are two large Strobic lab exhaust fans located on the roof. These fans exhaust the fume hood located in the science labs and direct the exhaust straight up at very high velocities to get the fumes far from the building into the atmosphere. These fans total about 8,200 cfm of exhaust from the building if all the hoods were in use at the same time.

It should be noted that there is not good access to the air handling unit and fans from the ground. No permanent access ladder is installed for maintenance to get filters and do routine maintenance on the unit.

Terminal Devices, Sheet Metal and Air Terminals

The VAV terminal units are located above the ceilings in the plenums of the rooms. These terminal units modulate the incoming air and reheat it when needed to keep the room space to the correct temperature. There are a combination of single duct VAV's in the classrooms and parallel fan VAV's in the offices.

There are fume hoods in each science lab with Phoenix brand controls on each fume hood. These Phoenix control systems are top of the line laboratory systems. They monitor the incoming supply air to the room, the exhaust air from the room and the sash position of the fume hood and modulate all in sequence to keep correct pressurization of

the room and the correct air velocity over the face of the fume hood. This system appeared to be working well when some sashes were opened on the hoods. It was very responsive.

Perforated metal covers protect and hide the supply and return ducts that pass across the hallway. It appeared that all ductwork was insulated and installed per SMACNA standards.

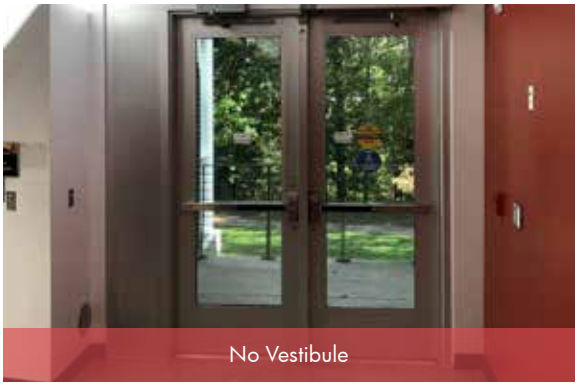
It should be noted that there were no vestibules installed at the main entrances and that there were also no cabinet heaters to offset the loss of heat when the doors open.

Building Management System

The area has a Johnson Controls direct digital control system (DDC) installed and it appears to be operating properly. No visible defects were apparent. The software should be continuously checked to make sure updates are installed to have current security patches installed.

The Phoenix control system for the lab spaces appeared to be working well. There should be a plug in to get this system integrated with the campus Johnson control system. [IMG_2117] [IMG_2147]

Fume Hood



No Vestibule

Phoenix Control System

Plumbing Systems

Gravity Drain to a Sump Pump

Seam Separation

Air Compressor

Emergency Shut-Off Valve

Storm

The majority of the storm systems for this area of the building take the rain water through internal roof drains and route the storm down to below grade. These storm lines route underground to the west end of the building. From this location the storm routes to surface drainage and eventually to water bodies.

There are multiple stained ceiling tiles throughout this area of the building that may due to roof leaks.

Sanitary

The sanitary for this section of the building is all gravity drain to a sump pump in the mechanical room. This sewage ejector then pumps the sanitary overhead through the space to the existing core building where it ties into the existing gravity system. The sewage ejector has a duplex control panel, so there is redundancy in the system, however this design is less than desirable as there is a large amount of pressurized sanitary piping that could be punctured or fail and release under pressure a large amount of raw sewage.

Part of the sanitary system from the labs comes in to the mechanical room underground and has an acid neutralizer tank. This unit keeps the downstream piping from getting corroded from chemicals used in the science labs.

Domestic Water

Domestic water comes in from the existing core building along with the pumped sanitary piping. This water feeds all the fixture in this wing of the building. There is corrosion on the hot and hot water return piping in the mechanical room.

There is also a laboratory air compressor in the room that feeds each of the labs with compressed air. The unit has an air dryer on it and is used solely for the purpose of lab usage.

Natural Gas

Outside the mechanical room there is a natural gas meter. This addition is completely separate from the rest with this meter. The natural gas feeds the boiler, water heater and routes out to the lab spaces to provide gas for lab usage.

The gas that feeds the labs have emergency shut-off valves that are accessible in the hallways. These valves have a manual valve as well as a push button emergency off in each lab space.

Water Heaters

The water is heated with and indirect storage tank coupled to the hydronic heating boiler. It uses hot water the boiler produces to heat the water in the tank to 140°F. There is a Lawler thermostatic mixing valve that meets today's code requirements to prevent scalding of the public on a loss of cold water.

In the main mechanical room, there is also a Noritz instantaneous water heater. The usage of this heater is not known at this time, but futher investigation will be done to determine its need.

Fixtures

Plumbing fixtures in this area of the building meet the requirements of ADA. These fixtures are a mixture of specialty lab fixtures and standard restroom fixtures. The fixtures in the lab have all the appropriate safety devices installed which include vacuum breakers on all the lab faucets and emergency eye wash stations in each lab.

Thermostatic Mixing Valve


Instantaneous Water Heater


Plumbing Fixtures

Fire Protection Systems

Fire Protection Systems

This wing of the building does not have fire protection installed.

Electrical Systems

Pad Mount Transformer

Branch Panel

Fluorescent Lighting

Ceiling Mounted Occupancy Sensor

Electrical Service and Distribution

Electrical distribution in the 2005 G wing is fed from a separate pad mount transformer mounted on the south side of the building. The 4800 volt primary of the transformer is fed from the medium voltage switchgear outside of Wing B, and the 480 volt secondary of the transformer feeds a 600 amp switchboard in the electrical room inside the building. Based on the square footage of the building, the 600 amp service is more than adequate to handle the current building load, and could likely handle an addition or expansion 2-3 time the size of the current wing.

The 480 volt switchgear in the electrical room is used to feed HVAC equipment and a 100 amp, 480 volt branch panel for branch circuits to light fixtures. The 480 volt switchgear also feeds (4) 75 kva stepdown transformers, which in turn feed (2) 208 volt branch circuit panelboards for individual 20 amp, 120 volt circuits to convenience outlets and other similar loads.

The electrical distribution equipment is all in very good condition, has more than enough capacity for now and the future, and should last for the next 30-40 years or more.

Branch Circuiting

There is a 100 amp, 480 volt branch panel, and (4) 225 amp, 208 volt branch panels in the electrical room that provide branch circuits for lights, convenience outlets and other loads. The equipment is all relatively new (2005), and in very good condition. Branch circuit wiring has THHN thermoplastic insulation and should last indefinitely.

During our survey however we did notice that a light switch in Lab #129 is not working properly, and sounds like it may be arcing behind the coverplate. Maintenance staff should investigate this to make sure it is not a safety hazard.

Lighting

Lighting in the G Wing is primary fluorescent. In classrooms, pendant mounted linear fixtures provide direct/indirect lighting in the spaces. With white painted ceilings, the light levels are very uniform and provide good illumination.

Ceiling mounted occupancy sensors have been installed in classrooms and similar spaces. These are typically wired in series with the light switch at the door so that the lights must be manually turned on, but will automatically turn off by the sensor.

Fire Alarm

The G Wing has a separate Edwards Technology EST-2 fire alarm system that was installed at the time of construction and just covers the G Wing. It appears that the panel and peripheral devices meet all current codes, including speaker/strobes in classroom, corridors and other areas. It may be possible to expand this panel to provide

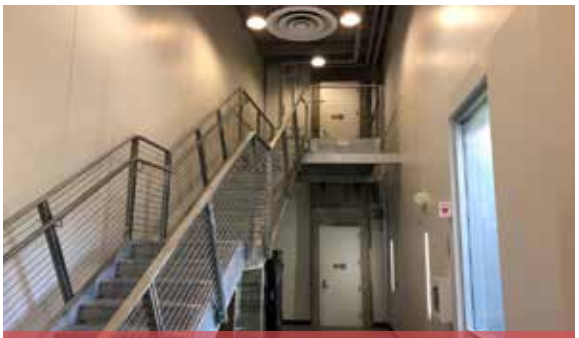
new fire alarm coverage throughout the remainder of campus. If that is not possible, it still may be beneficial to provide another Edwards Technology panel to cover the remainder of campus, so that the two panels can talk to each other.

Life Safety/Emergency Power

In the G Wing, emergency egress lighting is accomplished through a combination of wall mounted, battery powered emergency fixtures, and through battery units installed in the ballast compartment of selected corridor fluorescent fixtures. If working properly, these appear to provide adequate egress lighting, however the quantity of units and accessing them will continue to be a maintenance issue. In addition, there does not appear to be any emergency egress lighting on the exterior of the building. This is not an immediate safety issue, but it should be addressed as part of any building renovation.

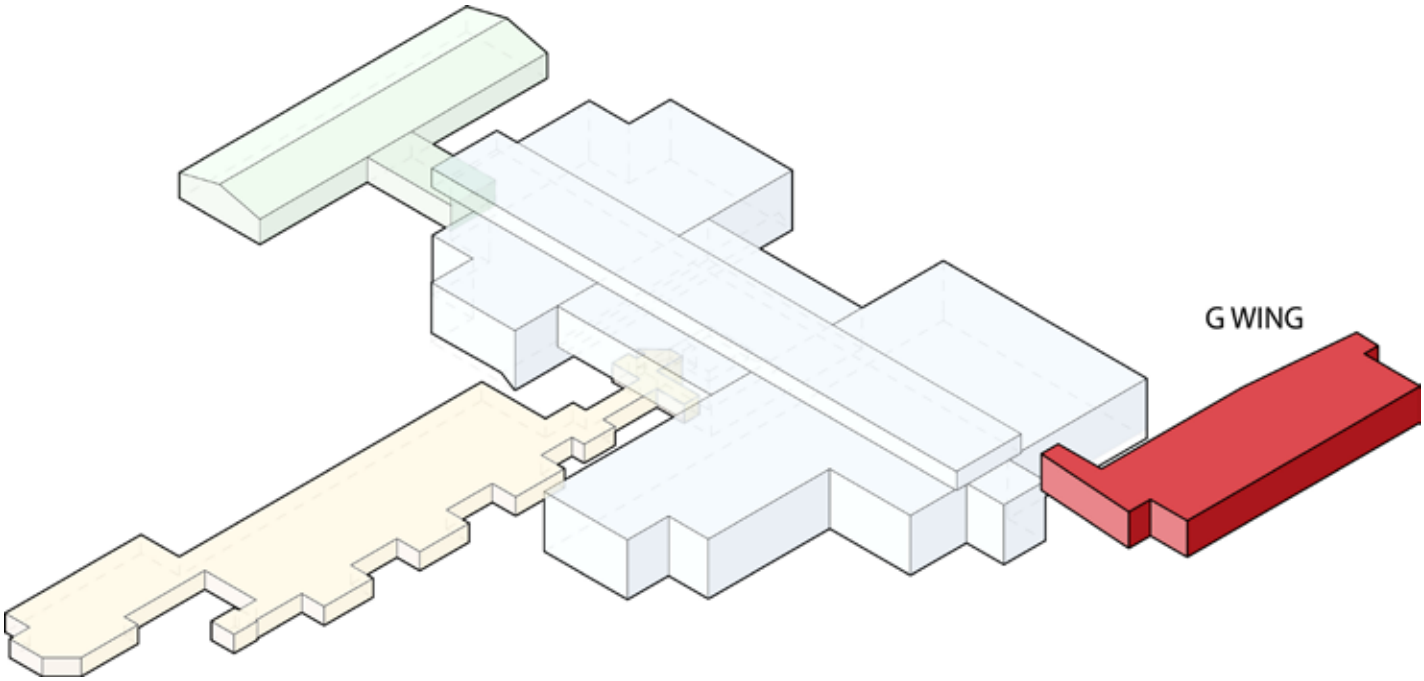
Edwards Technology Fire Alarm System

Emergency Egress Lighting



Emergency Egress Lighting

G WING (Science) RECOMMENDATIONS



Life Safety and Structural

a. None

Building Envelope

a. Replace cracked and damaged fiber cement wall panels.

b. Re-caulk all fiber cement panel joints. Provide new backer rod and sealant.

c. Monitor cracking in foundation wall and epoxy repair larger cracks.

d. Modify size of high roof scupper to meet code.

e. Clear debris from roof drains and scope leader piping.

f. Perform annual inspections on all remaining roof areas to identify minor damage and repair items.

g. Pressure wash north side of building to remove dirt and debris from corrugated metal panel and trim.

Building Interiors & Finishes

a. Repair seams in resilient sheet flooring in science lab.

Accessibility

a. Provide handrails on exterior ramp to the west if slope is greater than 1:20.

b. Install 18" vertical grab bars in accessible restroom stalls.

Mechanical Systems

a. Add redundant condensing boiler to eliminate single point of failure and increase efficiency

b. Repair refrigerant piping insulation and jacket over the insulation on the exterior of the building

c. Install VFD on hot water pumps with premium efficiency motors on pumps to reduce energy

d. Close bypass valves on 3 way valves at terminal boxes

e. Install air curtain heaters at main doors to prevent cold air from entering building in winter and losing energy

f. Install key security patches for the Johnson Controls system

Plumbing

a. None

Fire Protection

a. None

Electrical Systems

a. None

Major Campus Improvements Since 1995

Glen Oaks Community College has made changes and upgrades in numerous areas.

Listed below are the major capital improvements over the last 28 years.

1995 Construction of a Wing

2007 Construction of the G Wing

2009 Nursing Lab Renovation

2011 Bookstore Renovation

2012 Honeywell Project

2008-2017 roof repairs

2014 A Wing Skylight Repairs

2017 Devier Student Suites

2019 Wastewater Lagoon Upgrades

2020 Concourse Renovation

2020 Parking Lot Repaving

2020 Electric Line Relocation for Housing Wells

2021 Renovation of the Technology Building

2021 Restoration of the Existing Maintenance Building

2022 Restoration of the Dresser Business Development Center

2022 Construction of the Transportation Center

2023 Renovation of A Wing Restrooms

Construction of A Wing-1995 Construction began on the A wing in 1995 for the A wing as well as the Dresser Business Development Area. The Dresser section includes a large meeting room for conferences or large meetings, a kitchen, two computer labs, and an HVAC room. A wing houses the administrative offices, student services, including the cashier, the bookstore, and HVAC and lift station controls. The building has a green roof with a skylight, emergency egress, and a small storage building. The bookstore was renovated in 2011 and is also located in the A Wing. The exterior stairs to the green area were redone in 2021.

Construction of G Wing-2007 A Capital Outlay Project The G-wing houses the sciences, including 3 laboratories, 3 classrooms, faculty offices, restrooms, a conference room, and an HVAC room. There is also a student lounge area with a staircase to the second floor of the D wing. The wing helps students get hands-on science experience, whether it is in biology, chemistry, or physics. These programs are critical to preparing our nursing and allied health students' progress into their chosen fields.

Nursing Lab Renovations: 2009 The nursing program needed major upgrades as technological changes had occurred. The labs were converted to include simulations for several procedures and a better classroom experience. Simulated mannequins were acquired for a man, woman, and baby to provide the optimal learning experience.

Bookstore renovation: 2011 Prior to outsourcing the college bookstore operation, it was determined that the area needed a complete overhaul. The area was made more inviting and also included office space for the business office. In 2016, the Glen Oaks outsourced the bookstore operations to Follett.

Honeywell Project-2012 The college contracted with the Honeywell Corporation to upgrade the energy efficiency of the physical plant. This involved major upgrades to the HVAC system, the installation of energy-efficient lighting, and lighting controls. A complete electronic monitoring system of air flow and temperature control was installed, allowing for energy savings when the building was not occupied.

Roof Repairs: 2008-2017 Flat roofs are a challenge in any environment. We have repaired and reconstructed our main building, in addition to all the wings except G-wing. As roofing materials have improved, we have put the latest roofing products into service to ensure the best environment for staff and students. The Green Roof over A wing required major repairs as numerous leaks had occurred and was completed in 2013. Total costs for these projects was $2.000,000.

A Wing Skylight Repairs: 2014 The skylights that cover the 1995 A Wing wall way had deteriorated to the point that major leaks were causing significant leakage and damage. The repairs required a complete replacement of all the seals surrounding the windows and contacts with the structure. These repairs took six months and cost a total of $350,000.

Devier Suites Student Housing-2017 Using a loan from the USDA, Glen Oaks constructed a 106-bed apartment-type student housing facility. It includes a full apartment for a live-in residential director and 2- and 4-bedroom suites that include a full kitchen and a private bathroom for every two residents. There are laundry facilities, elevators, study lounges, and two common gathering areas. In addition, the college had to provide new wells and a well house with a nitrate filter. Wastewater Lagoon Upgrade: 2019 Glen Oaks functions as its own little village with several wells, a lift station, and wastewater lagoons. As such, the college must comply with the regulations and standards set forth by the state of Michigan. The college relined both wastewater lagoons, upgraded the piping and pump system, and cleaned the discharge field. This was close to a million-dollar investment by the college.

Concourse Renovation 2019 The old concourse was a dark, unattractive concrete space that served as the hub of the college. After the renovation, there is a bright, inviting area for students

to congregate. The renovation included moving the food service operation and modernizing the offerings to reflect the desires of the students. New flooring, windows, and lighting were added. Three group study areas were created so students could study with peers, insulated from outside distractions. New furniture, televisions, and gaming devices were installed for student relaxation. An art gallery was created to display the work of our students. The restrooms were completely remodeled, with modern fixtures installed. This is now a well-utilized central meeting point for all students and staff.

Wastewater Lagoon Upgrades 2019 The fifty-year-old wastewater lagoons were completely upgraded at a cost of $200,000 each. These improvements were required by the state and federal agencies to bring the system up to standards. The two main lagoons were lined with membranes, and the whole area was enclosed for safety.

Resurfacing of Parking Lots and Campus Landscape Improvements 2020 Glen Oaks completely resurfaced all the parking lots. This involved removing all the old asphalt and replacing the lots with a new asphalt surface. Additional parking was created next to the Tech Wing after removing old exit mounds and placing new fire escapes on the building.

Electric relocation for student housing in 2020 Along with being its own little village, the college is served by two power companies. One company provides service to the housing, and another to the well house for the housing. After numerous power outages by one provider while the second provider-maintained service, it was determined that we needed to be on one system for housing. We then had to run power 1200 feet to the housing water pumps to guarantee a consistent power supply. In addition to the major improvements, the college has installed new carpet in numerous areas, upgraded furniture in the classrooms, and upgraded the WIFI and IT infrastructure. The gymnasium has new bleachers and a new playing surface, along with large fans for better air circulation. New skylights were installed over the A wing to replace leaky and energy-inefficient windows. The college continues to invest in the physical plant as the facility ages to provide a quality educational environment for our students.

The renovation of the Technology Building in 2021 In the summer and early fall of 2021, the college spent $350,000 on the renovation of the 1971 Technology Building. This consisted of constructing two new classrooms, one for automotive and one for welding. There was a completely new welding lab built with 20 welding booths and state-of-the-art exhaust systems. The automotive lab was completely revamped and pained, with several new auto lifts installed. The full exterior of the steel-engineered building was re-skinned with metal to match the new metal system on the north half of the building being completed during the same time frame. These labs are used during the school day by the SJC CTE programs and the college in the evenings.

Restoration of the Existing Maintenance Building 2021 A wind storm in August 2021 blew a large tree from the west side of the existing maintenance building, crashing through the roof. This led to an insurance claim that was applied to not only the roof restoration but a complete new exterior metal wall system that increased the insulation and vastly improved the appearance. The electrical system, including new LED lights, was installed as part of the restoration. The total cost of the project was $80,000.

Restoration of the Dresser Business Center 2022 The Dresser Business Development Center is attached to A Wing at the front of the campus. In February 2022, the heating system froze, and there was significant water damage to the main conference room and the two computer labs. The mechanical contractor who had serviced the HVAC units had installed the vents incorrectly, which led to the damage. This repair was funded by the contractor's insurance and resulted in a complete refurbishment of the walls, ceilings, floors, and fabrics. The total cost was $110,000.

Construction of a new transportation center in 2022 In the summer of 2022, a new 10,000-square-foot steel-engineered building was built to house all the college rolling stock, including the 15 passenger vans, autos, tractors, lawn mowers, and other rolling equipment that was here to be parked outside or in the small existing maintenance building. The building cost $550,000 plus an additional $60,000 for excavation of the site and expansion of the parking lot that serves the building.

Renovation of the A Wing Restrooms 2023 In the summer of 2023, the college completely renovated the restrooms in A Wing. These were 1995 vintages when the wing was built, and they were in worn condition. Since they are the restrooms just inside the main entrance, their condition was a concern as the public would be using them as they arrived on campus. This project cost a total of $156,000.

South Campus Renovation 2023 The 7.7-million-dollar south campus renovation is beginning, as this plan is written. It is being financed by a USDA RD loan at 3.25% for 30 years. This project is projected to take twelve months and will complete the total renovation of the 1969 building. Included in this project are the gym and locker rooms, the fitness center, the allied health laboratories, many offices, and related spaces. As well as the complete recladding of the exterior of the building to match the work completed on the north side. This project had been outlined in the Capital Outlay Plan for last year, but the state reported that because it contains so much space dedicated to athletics, it could not be covered with a capital outlay project. This drove the decision to pursue the USDA loan to fund the project.

V. Implementation Plan

a. Prioritize major capital projects requested from the State, including a brief project description and estimated cost, in the format provided. (Adjust previously developed or prior year's figures utilizing industry standard CPI indexed where appropriate).

PRIOITY ONE:

b. If applicable, provide an estimate relative to the instruction's current deferred maintenance backlog. Define the impact of addressing deterred maintenance and structural repairs, including programming impact, immediately versus over the next five years.

c. Include the status of on-going projects financed with State Building Authority resources and explain how completion coincides with the overall Five-year Capital Outlay Plan

d. Identify to the extent possible, a rate of return on planned expenditures. This could be expresses as operational "savings that a planned capital expenditure would yield in future years. With each planned expenditure the College strives to improve overall operations, either by enhancing the student environment, decreasing operational costs, and/or addressing issues in timely, scheduled

manner. The continual goal is to replace or restore infrastructure as planned, versus incurring the additional costs inherent with emergency repairs.

e. Where applicable, consider alternatives to new infrastructure, such as distance learning. The College continually examines the means and methods for delivering instruction, seeking effectiveness and efficiency. In general, the intent is to renovate current facilities rather than build new. While distance learning can be highly effective, many forms of instruction require or are enhanced with the environment of the College facilities.

f. Identify a maintenance schedule for major maintenance items more than $1,000,000 for fiscal year 2024 through fiscal year 2028. Please refer to Section IV Facility Assessment

g. Identify the amount of non-routine maintenance institution has budgeted for in its current fiscal year and relevant sources of funding. The College utilizes capital reserves accumulated over several budget years. Current reserves ensure the college will meet the portion of the proposed capital outlay project and be able to support the $1,150,000 50% match requirement for this proposed $2,300,000 request.

FY 2024-28 CAPITAL OUTLAY PROJECT REQUEST

Institution name:	Glen Oaks Community College
Capital Outlay Code:	Request Code:
Project title:	Center for Rural Sustainability
Project Focus:	Academic/Upgrades
Approximate Square Foot:	7,500
Total Estimated Cost	$2,300,000
Estimated Duration of Project:	Six months
Is the Five---Year Plan posted on the institution's public internet site?	Yes
Is the requested project the top priority in the Five---Year Capital Outlay Plan?	Yes

Please provide detailed, yet appropriately concise responses to the following questions that will enhance our understanding of the requested project:

1.0 Project Purpose: This project will construct a new facility that will house the Ag Equipment Technology program as well as portions of the Center for Rural Satiability. This will allow for the Ag Tech program to be located on campus instead of in the New Holland dealership fifteen miles to the north of campus. It also create specialized Rural Sustainability.

2.0 Center for Rural Stainability Project Synopsis Scope of the Project:
Glen Oaks Community College (GOCC) is seeking CDS funding to expand the offerings available. through its successful agricultural equipment technology program to create the Center of Rural Sustainability. The proposed facility will meet a critical need in the region, where agriculture is a central economic driver. The Center for Rural Sustainability will provide unparalleled support to the regional agricultural industry and rural community in meeting its workforce needs, advancing agricultural technology, and serving as a cross-disciplinary hub for agricultural research and related activities. Specifically, this expansion will allow GOCC to expand from agricultural equipment technologies into the related areas of water irrigation and treatment. This additional layer will complement the use of the Hagen farm, a fully operational on-campus farmstead, and help address the critical need for sustainable agricultural practices that promote environmental stewardship and water quality, social responsibility, and economic profitability.

The Center for Rural Sustainability will include a 75 by 100-foot steel frame structure with 20 foot-side walls. Due to the tremendous size of modern agricultural equipment, the structure must be tall with oversize garage doors and significant floor square footage. The proposed structure would serve the current program needs and provide for additional offerings to serve the training needs of the vast agricultural industry throughout the region. The building will be self-contained. in that it will have a fixed classroom, restrooms, a breakroom, and a tool crib. All exterior walls will be insulated, and the facility will include HVAC systems to provide a year-round climate. control, as well as heavy-duty electrical service, exhaust fume control, and fixed lifts. The building

will be located near the farmstead on the east side of the campus, approximately a third of a mile from the main campus building. Adequate parking for students and staff, as well as Machinery is also included in the project scope. An estimate of the cost per square foot for such a structure is $300 per sq. ft.

Glen Oaks Community College (GOCC) has the only agricultural equipment technology program in all western Michigan and northern Indiana. This program produces highly trained technicians for the vast agricultural industry throughout the region. The agricultural equipment dealerships for all major brands have a widespread dealer network of no fewer than fifty individual sites in the region. The only other institutions that provide such specialized training are in Ohio, some three to four hours away from the needs of this area. This void is the reason that GOCC launched the program four years ago.

The program is currently housed in a New Holland dealership north of Three Rivers, Michigan. While it is a benefit to have the students work within an actual operating dealership, the limitations are such that there is not an opportunity to expand the offerings into broader areas of agricultural training, including irrigation, precision farming, drone survey operations, and more. Additionally, the location of the current program is problematic for students due to the significant distance from campus (14 miles). One of the most unique features of housing GOCC's agriculture programs on campus is that the Students will help farm the 67 tillable acres associated with the east side of the GOCC campus. Expanding current offerings to include a focus on water irrigation and treatment will provide real world learning experiences to address critical practices such as reductions in agricultural nonpoint source of pollution and water contamination. Agricultural nonpoint source pollution can have significant impacts on water quality. Nutrients and pesticides can enter waterways. through runoff from fields or through leaching into groundwater. As Michigan continues its efforts to ensure the availability of safe drinking water for all residents, the GOCC Center for Rural sustainability will provide unparalleled support to the regional agricultural industry in meeting not only the region's workforce needs but also the need in the community for more sustainable practices.

ARCHITECTURAL

Lighting: The lighting will be LED-type fixtures. Light levels will meet today's IES standards. The light fixtures specified will have a minimum five-year warranty and be DLC-certified to qualify for utility rebates. Emergency lighting will be connected to the new generator system per NFPA and NEC requirements.

Lighting Controls: Lighting controls will be provided to increase the learning environment and to meet today's energy code. Daylight harvesting will be provided where required by code. Occupancy sensors, low-voltage switches, and associated wiring will be provided for all spaces. Each area will be controlled separately with low-voltage dimmers. Daylight sensors will be provided to meet the energy code.

Fire Alarm: Provide new fire alarm devices to meet NFPA requirements. All fire alarms will be connected to a new main fire alarm control panel located in Unit D.

Technology: provide technology systems as noted below:

Fiber Optical Cabling: Fiber Optical Cabling shall be installed from the Data Center TR to each of the TRs. The fiber cable shall be OM4, 24 strand, plenum-rated, and armored. New fiber enclosures shall be installed in each TR. All strands are to be terminated by fusion splicing with LC connectors. All existing fiber optic cabling shall be removed after the new fiber optic cable is functional.

Network Cabling There will be access control systems provided as the basis for designing a Lenel S2 enterprise or genetic system. The new access control platform will have access controllers located in the nearest electrical room with wall space closet to each of the following tech rooms. Each controller will have a Cat16 cable run.

AV Systems Classrooms shall be equipped with an AV system for projectors, audio, computer inputs, controllers, etc. Audio systems shall be integrated with a projector with a wall touchscreen control. A wireless microphone will be part of the system.

Network Gear All telecommunication rooms shall have a minimum of three Cisco Layer 3 switches with dual power supplies, PoE+, 1 u, and 48 ports. New wireless access points shall be deployed throughout campus; each wireless access point shall serve approximately 900 sq ft. The wireless access point shall be Cisco or Meraki and work with a wireless controller.

Safety and security Cabling and devices will be installed at the following locations: exterior doors, entry/exit.

3. Program Focus of Occupants: This facility will focus on the Ag Equipment Technology Curriculum, which requires one large open laboratory for work on large farm machinery as well as an instructional lab area with work tables and stools, a tool crib, and faculty and staff office spaces. Due to its proximity to the G Wing, restrooms and normal instructional classrooms will not be required as students and faculty will enter the G Wing for these spaces. There is significant capacity within G Wing to accommodate these students.

4. How does the project support Michigan’s talent enhancement, job creation, and economic growth initiatives on a local, regional, and/or statewide basis? The GOCC Center for Rural Sustainability will provide students with the full picture of how to start and sustain practices that are vital for rural development and contribute to the improvement of environmental and economic needs. An investment in GOCC’s program will address future workforce development needs and further support the critical agriculture industry in Michigan. According to the Michigan Department of Agriculture and Rural Development, there are just under 10 million acres of farmland in Michigan, and the state is home to roughly 47,600 farms. Michigan agriculture contributes more than $104.7 billion annually to our state’s economy, second in diversity only to California. Michigan's food and agriculture system is a large portion of this state's workforce. Total employment resulting from this sector is approximately 805,000, which accounts for about 17 percent of the state's employment. Every $1 in export activity generates another $2.87 in economic activity, meaning Michigan's total agriculture exports of $1.98 billion have a local impact of an additional $5.6 billion. By creating a stronger regional education pipeline with sustainable promotion practices, this initiative will strengthen a critical economic driver for the state.

5. How does the project enhance the core academic and/or research mission of the institution?

6. Is the requested project focused on a single, stand-alone facility? Yes, a stand-alone 7,500-square-foot facility adjacent to the east side of the main instructional building.

7. Does the project support investment in or adaptive repurposing of existing facilities and infrastructure? Yes, to the extent required to create a new technical laboratory.

8. Does the project address or mitigate any current health or safety deficiencies relative to existing facilities? Yes, as the renovation efforts are underway. Glen Oaks Community College will address lab safety by utilizing and implementing best practices and standards (eye-wash stations, ventilation, and current building codes). Current classrooms and lab areas are out-of-date, and newer safety standards exist that will be integrated during the building process. Gender-neutral and barrier-free restrooms will be added to facilitate the requirements of our students and employees. Access and accommodations for entrance and egress will also be addressed. Interior door locks and phones will be installed in all classrooms and labs to address potential safety deficiencies. Fire suppression and life safety systems will be examined and upgraded as necessary.

9. How does the institution measure the utilization of its existing facilities, and how does it compare relative to established benchmarks for educational facilities? How does the project help to improve the utilization of existing space and infrastructure, or conversely, how does the current utilization support the need for additional space and infrastructure? BUILDING AND CLASSROOM UTILIZATION RATES The following chart contains building and classroom utilization rates for each teaching space at GOCC's Main Campus, identifying classroom and lab usage rates. The following data reflects course use only, though many of the spaces on campus not listed here are utilized for student or employee-related events, lab activities, student services, community meetings, and many other items. Not all the utilized space is electronically tracked and/or reportable. Fall 2019 semester data were utilized as a typical example, since the Winter 2020 semester and beyond, up to the present time, have been affected by COVID-19 adjustments.

SPACE UTILIZATION AVERAGE: Fall 2019 Semester (08/26/19–12/13/19)

Building/Wing	10:00am.-3pm	8am-10am	3pm-5pm	5pm-10pm	Weekend
D Wing	28.2%	54.4%	4.4%	11.3%	0.0%
E Wing	35.4%	35.6%	12.2%	36.0%	0.0%
F Wing	23.4%	21.7%	4.2%	19.7%	0.0%
G Wing	38.0%	25.0%	31.7%	7.3%	0.0%

10. How does the institution intend to integrate sustainable design principles to enhance the efficiency and operations of the facility? Glen Oaks Community College recognizes the importance of its environmental impact. The college is committed to incorporating energy-efficient systems and sustainable building practices. This includes automated controls, light sensors, and the use of recyclable materials. Glen Oaks intends to ensure the building's

mechanical, electrical, and plumbing systems work and interact efficiently to promote optimal performance.

11. Are matching resources currently available for the project? If yes, what is the source for the matching resources? If not, identify the intended source and the estimated timeline for securing said resources. Yes, the matching requirements of this project will be funded by college reserves. All financial resources will be available prior to the start of the project. The college has allocated resources to fund at least two-thirds of the project cost.

12. If authorized for construction, the state typically provides a maximum of 50% of the total cost for community college projects. Does the institution intend to commit additional resources that would reduce the state share from the amounts indicated? If so, by what amount? No, the college currently does not plan to fund more than 50% of the project.

13. Will the completed project increase operating costs for the institution? If yes, please provide an estimated cost (annually and over a five-year period) and indicate whether the institution has identified available funds to support the additional costs. Yes, there will be operational costs anticipated as part of this project. These costs will be minimal due to the size of the building and the energy efficiency of the design.

14. What impact, if any, will the project have on tuition costs? We do not anticipate the project having any impact on future tuition costs. Glen Oaks is currently proud to have nearly the lowest in-district tuition and the most affordable community college in the State of Michigan. It is our desire to continue providing affordable tuition and, with the assistance of the capital outlay funding, provide state-of-the-art facilities for our students.

15. If this project is not authorized, what are the impacts on the institution and its students? The Ag Tech program and the potential new rural sustainability offerings will be held off campus at the local New Holland dealership, making it difficult for students to get back and forth to the campus. The potential new water science and irrigation offerings will be delegated to current spaces that are not as well suited for this instruction as this new building will provide.

16. What alternatives to the project were considered? Why is the requested project preferable to those alternatives? Without state capital outlay support, Glen Oaks will pursue the alternative solution of a phased renovation approach. This approach will be disruptive to our students and costlier for the college; in addition, it will not adequately address the current skilled workforce needs of area businesses and industries. The safety, security, and academic potential of our Construct a new steel-engineered building to house the Ag Equipment Technology program on campus. The program is currently housed off campus at a New Holland dealership north of Three Rivers, MI, approximately fifteen miles from campus.