

# ***Michigan Tech***

**Michigan Technological University®**

## FACILITIES ASSESSMENT AND DEFERRED MAINTENANCE CAPITAL PLANNING REPORT

2011

SHWGROUP



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## Introduction

### **Assessment Scope**

SHW Group, in conjunction with the Michigan Technological University Facilities staff, performed a high-level facility condition assessment of all campus buildings in May 2011.

This assessment included interviews with campus facility staff and building engineers, visual inspections of each assessed facility and a review of previously developed reports. The assessment focused on buildings only, without invasive or destructive testing, and did not include campus land, parking lots, roadways or infrastructure between buildings. Existing conditions, maintenance history, potential problems, and projected life expectancy of systems and components (including structural, mechanical, and electrical systems) were recorded.

Collected information was analyzed to develop estimates of repair and replacement costs in a database format for record-keeping, long-range planning, prioritizing and cost projection.

This report contains the printed version of that database.

## Report Components

In addition to the executive summary, this report is comprised of the following information:

### **Condition Reports**

Highlights of this data are presented in the Condition Reports section to provide an overview of the condition of the University's major building facilities and major campus systems.

of the condition of the entire University, each facility, and major campus systems. Funding recommendations, both immediate and long term, are provided along with recommendations for low-cost, high-impact improvements.

### **Database Report Pages**

The underlying data used to develop this report and the budgeting recommendations are included in Appendix A. This is the detailed assessment data for use and regular updating by facilities staff. This information is also useful as a permanent

record of often unrecorded conditions, only known by those working in a particular building or on a particular system, and as an "owner's manual" for new employees.

The database Report Pages include additional details, including a breakdown of costs by project classification and priority (see the Reported Information Page for more details).

### **Karr Tuckpointing Report**

Completed in 2008, this report details the condition of the exterior masonry and envelope of the Engineering Mechanics Building.

### **Central Energy Plan Request for Critical Maintenance Funding Report**

The report, updated with new values in 2011, explains and quantifies the critical maintenance needs for continued successful operation of the Central Energy Plant, with a focus on reliability, safety, maintenance costs and energy conservation.

### **BAS-DDC Upgrade Report**

This report, developed by Johnson Controls, proposes recommended updates and associated costs for upgrade of the campus-wide building control system to a modern, integrated digital system.

### **Elevator Report**

This report lists the current condition, priorities, problems and approximate repair cost for maintaining and replacing elevators throughout campus.

## Purpose of the Study

This Facilities Assessment and Project Total Planning Study, developed through a combination of personnel interviews, facility walk-throughs and building system analysis, was performed to accomplish the following objectives:

- Provide an inventory of the University's facilities in a database format, updateable and maintainable by university personnel, allowing quick access to facilities information.
- Determine the general condition of the buildings and grounds of the university and provide the data in a concise format, allowing quick determination of the current replacement value and condition of each facility.
- Determine a Facilities Condition Needs Index (FCNI) for each building and the University as a whole. The FCNI is a benchmark index that rates the condition of existing University buildings and is used by facilities managers to quantify and prioritize project totals for capital planning purposes.
- Assist the University in meeting the goals of its Mission Statement through timely maintenance of the physical backbone of the University – the campus buildings.

## A Brief Background

The problem of Project Totals at colleges and universities has been studied and better understood over the last two decades. From an article by Dan Hounsell, in the magazine Maintenance Solutions, discussing how colleges and universities are addressing the issue of deferred maintenance:

***“Maintenance management professionals, who once seemed to be one of the few parties giving serious thought to the issue, now have been joined in the debate by growing numbers of sympathetic voters and far-sighted facility decision makers.”***

The Association of Higher Education Facilities Officers (APPA) concluded in a 1995 report titled “A Foundation to Uphold: A Preliminary Report” that the national backlog of deferred maintenance at Universities exceeds \$26 billion, up 27 percent from estimates made in a similar report from 1988.

\$5.7 billion of that \$26 billion backlog is classified as “urgent project totals” – projects that require immediate attention and that will cost far more if they are not completed within a year. Although spending this sum will eliminate current urgent needs, in only a few years there will be a new roster of items to replace them – if future budget planning is not undertaken. According to the APPA report, the current backlog “represents a threat to the capability of higher education facilities to support University and university missions.”

Other conclusions from the report include:

- More than 50 percent of all university types reported that project totals increased or stayed the same since 1988; only 25 percent reported decreases.
- 20 percent of the universities in the study accounted for nearly 60 percent of the accumulated project totals.

- Public universities typically have a greater project totals backlog than private universities, with 78 percent of the public research universities reporting an increase in project total backlogs.
- By assuming that infrastructure project totals – site repairs, road and parking lot maintenance, exterior lighting, etc. – was not included in the figures provided by the campuses in the study, the estimated cost to eliminate accumulated project totals increases to \$32.5 billion – with urgent needs increasing to \$7.1 billion.
- When senior school administrators made project totals a priority, the institution made progress in reducing its backlog.

The most important point to remember is that even if colleges and universities spend these amounts, this will only eliminate the existing project totals backlog. There needs to be a coordinated, funded plan put into place at universities to maintain the condition of the facilities once they have been repaired – or time will again take its toll.

## Important Definitions

### Current Replacement Value (CRV)

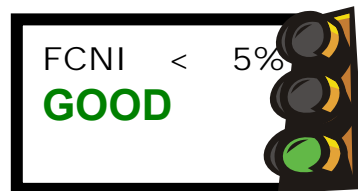
The cost to construct a typical replacement building in today's dollars, based on the square footage of the current facility and the estimated current construction cost for that type of building. Buildings comprised of significantly different uses, such as a library with a theater component, will have the CRV based on a blend of costs for each use type.

### Facilities Condition Needs Index (FCNI)

Simply put, the FCNI is total estimate to resolve maintenance issues in a building divided by the Current Replacement Value (CRV). The resulting percentage is compared against industry standards and used to determine the condition of the building, campus or University.

The Association of Higher Education Facilities Officers (APPA) recommends that the FCNI for any given building should not exceed 5% for the building to be considered in "Good" condition. The rating of "Fair" indicates that the building requires some attention to bring it up to standard, with some problems areas potentially requiring immediate attention. The rating of "Poor" indicates that the building needs urgent attention to prevent the existing problems from affecting other building systems and compounding future repair costs.

The APPA FCNI Ratings, indicating the general condition of the building, are shown here along with the corresponding "traffic signals" that give a quick visual indication of the FCNI rating.



The FCNI also varies over time. When looking at critical items only (those items currently in need of repair or replacement), the FCNI is frequently in the Good range because few high-value systems (structure, HVAC, etc.) are in immediate danger of failure.

When looking forward, however, the FCNI can increase considerably, driven by major systems that are past the end of their useful service life, common on buildings with HVAC, electrical or window systems over 40 years old.

### Projected Annual Maintenance Budget

The projected annual maintenance budget is the estimated cost to maintain the current FCNI in a stable state, regardless of the current condition of the building.

The number is based on a reinvestment range of 2% to 4% of a reduced value CRV (at 80%), assumes that building components have a 50-year renewal cycle and depreciate along a straight line. The assumptions were made to simplify calculations; in reality, building components DO NOT expire according to straight-line depreciation, and many components require replacement within 30-40 years (excluding structure and foundation).

To restate – this annual investment will only maintain the existing FCNI and do little or nothing to reduce any existing backlog.

### End of Useful Service Life

This term is used throughout the report to indicate when a system has reached its expected life span, regardless of whether it is operating as designed. All building systems have a life span which varies greatly depending on the system and how it is used. For example, a building structure can last several hundred years, while door hardware or HVAC systems last 25-40 years depending on quality and type. A rubber roof might have a 15-20 year lifespan, while carpet in high traffic areas seldom survives 10 years.

## Information Recorded

Information recorded by the assessing teams includes the following data and is used in database calculations, including the Current Replacement Value and Facility Condition Index for each building and the entire institution.

### General Building Information

- Building Name
- Building Number
- Campus Name
- Year Built
- Building Area (in square feet)
- Number of Floors
- Building Engineer Name
- General Building Notes (building description, special circumstances, etc.)
- Major Renovations/Additions (year and brief description)

### Building Use Types

Each building is comprised of one or more use types with a unique per-square-foot cost. This information is used to develop a Current Replacement Value (CRV) for each building. Most buildings are a single use type, but buildings comprised of significantly different uses, such as a library with a theater component, will have the CRV based on a blend of costs for each use type.

The table below shows building use types and their respective current construction costs per square foot used to develop this database. As some of these use types are not found on all campuses, not all use types are used in the database. These costs are for typical construction quality buildings and derived from regionally weighted, preliminary construction cost data provided by contractors, SHW historical cost databases and data from RS Means.

Building Use Types	
Description	Cost per SQFT
Administration	\$190
Athletics (non-recreation)	\$225
Auxiliary	\$190
Classroom	\$200
Greenhouse	\$150
Health Facility	\$315
Hotel/Conference Center	\$210
Laboratory/Research	\$370
Library	\$230
Physical Plant/Utility	\$1000
Police Station	\$230
Recreation/Gym	\$225
Student Life/Residential Housing	\$190
Storage	\$110
Theatre	\$270
Food Service	\$250

## Building Systems

Details about each major building system, including construction, system type, current operation and general condition are recorded from the interviews and observations.

These building systems are the basic components having a major influence on the replacement value of a building.

Category	Component Name
Structure	Structure
Shell	Roof
	Glazing
	Cladding
HVAC System	HVAC
	Stream Production Equipment
	HVAC Controls
Electrical System	Electrical Power
	Standby Power
	Lighting
	Clock System
	Data/Telecom System
Plumbing System	Domestic Water/Plumbing
Interior Construction	Interior Partitions
	Doors
Interior Finishes	Floors
	Ceilings
Code Compliance	Code/Life Safety
Safety	Sprinklers
	Emergency Lighting
	Fire Alarm
Conveying Systems	Elevators
Adjacent Site	Immediate Site

## Building System Rating

Each building system is given a number rating indicating its general condition and to assist in database calculations. These ratings are:

Rating	Description	
0	Missing and Needed / ADA-not compliant	System missing, but required in facility. For accessibility, does comply with current codes
1	Unreliable	System needs to be fixed.
2	Poor	System barely operating. Repair/replace in next renovation.
3	Adequate ADA-compliant when built	System functioning, but review for repair/replacement in next renovation. For ADA accessibility, was compliant when constructed, review compliance for next renovation
4	Functional / ADA compliant	System functioning well and maintained as intended, no major reported issues. For accessibility, item complies with current codes.
5	Excellent	System in excellent operating condition. No reported issues.
NA	Not Needed	System not required for this facility.



### Observed Issues

Beyond reviewing the general condition of each building system, when specific issues are observed, details regarding the particular issue for that system are recorded. Each is also prioritized, classified by project type and an order-of-magnitude resolution cost estimate was made.

### Priority

Each Observed Issue is given a priority to record how critical it is and to group work into time frames. This information is used to calculate the Facility Condition Index for each time frame. Priorities used are as follows:

Priority	Description
1	Currently Critical (Current Year)
2	Potentially Critical (Year 1)
3	Not yet Critical (Year 2-5)
4	Watch List (Year 6-10)
5	Long Term (Year 11+)

Certain systems, such as structure or HVAC are seldom listed as currently critical as they are seldom in imminent danger of immediate failure. When a system is replaced, the priority should be changed to reflect that change (a new roof should be listed at Priority 5).

Items that are typically listed as Currently Critical include systems that are failed or those that could cause collateral damage, such as a leaking roof that is damaging ceilings, floors and electrical system.

### Project Classification

Each observed issue is classified by type of project to determine if it is Deferred Maintenance, Planned Maintenance or Facility Adaptation. This report does not track ongoing maintenance costs, as that is budgeted out of general operating funds.

Classification	Description
Deferred Maintenance	Refers to expenditures for repairs which were not accomplished as a part of normal maintenance or capital repair which have accumulated to the point that facility deterioration is evident and could impair the proper functioning of the facility. Costs estimated for deferred maintenance projects should include compliance with applicable codes even if such compliance requires expenditures beyond those essential to effect the needed repairs. Deferred maintenance projects represent catch up expenses.
Planned Maint/Capital Renewal	A subset of regular or normal facility maintenance which refers to major repairs or the replacement / rebuilding of major facility components (e.g., roof replacement at the end of its normal useful life is capital repair; roof replacement several years after its normal useful life is deferred maintenance).
Facility Adaptation	Expenditures required to adapt the physical plant to the evolving needs of the institution and to changing codes or standards. These are expenditures beyond normal maintenance. Examples include compliance with changing codes (e.g. accessibility), facility alterations required by changed teaching or research methods, and improvements occasioned by the adoption of modern technology.

**Special Note Regarding Facility Adaptation**

*Facility Adaptation issues are a unique situation, often including accessibility and code compliance issues. While full accessibility for all occupants is important, it is understood that existing buildings, especially historic buildings, are challenging and costly to update. Typically, updating the building to meet current standards is only expected when significant renovations occur.*

*These issues and their associated costs are recorded in the database to assist the institution in budgeting for these costs. While they are part of the calculation of FCNI, they are given a low priority (typically Priority 5) to place them in the distant future. This is why the "All Priorities FCNI" is sometimes significantly higher than the "Priority 1 FCNI".*

**Resolution Budget**

Each observed issue is evaluated to determine an order-of-magnitude cost to resolve the issue, whether through repair or replacement. For each building system, all Resolution Budget amounts are totaled to determine the resolution cost for that system.

If projects are already funded, they are checked off as so, removing that cost from the calculation of the FCNI.

When an issue is resolved, it can be checked off for completion, including date and actual cost.

## Information Reported

The report is separated into two sections. This front section is the executive summary

### Vital Statistics

Basic building information– building use types (classroom, library, administration, etc.), year built, building area in square feet, and number of floors.

### Observation Highlights

A partial list of field observations, highlighting major repair/replacement items and recently completed work are included in the Conditions Report. A more complete list of observations and recommendations are found in the database report.

### Current Replacement Value (CRV)

The cost to construct a typical replacement building in today's dollars, based on the square footage of the current facility and the estimated current construction cost for that type of building. Refer to the Definitions Page for additional information.

### Projected Annual Maintenance Budget

The projected annual maintenance budget is the estimated cost to maintain the current FCNI in a stable state, regardless of the current condition of the building. Refer to the Definitions Page for additional information.

### Priority 1 Project Total (Current Year)

Project Totals are the value of all maintenance issues that are deferred or projected to require addressing immediately in order to safely maintain facilities and related infrastructure for their current use. The Priority One amounts shown are for items requiring immediate attention to fix critical problems. ***A long-term investment strategy should also include items that require repair or replacement within 5 years, thus avoiding the increased repair costs resulting from deferred repairs (i.e. leaky roof damaging interior finishes).***

### Priority 1 FCNI (Current Year)

The Facility Condition Needs Index is reported separately for the total of all Priority One items to indicate the immediate condition of the building. This number is usually much lower than the FCNI for later priority classes, as costly systems seldom are in danger of immediate failure.

### Priorities 1-3 Cumulative Project Total and FCNI (0-5 Years)

The Priority 1-3 Cumulative Project represents the total value of projects, in today's dollars, that will require attention within the next five years, including those that fall under the Priority 1 Project Total. This value is included to help determine the investment required over the next five years to resolve issues before they become critical.

***The Zero-Five Year is often more telling of a buildings' condition than the One Year DMB, since the first year number focuses primarily on life safety, code compliance and collateral damage. Most maintenance issues are not so critical as to fall into this category but often become so within 5 years.***

For example, if the building condition survey indicated \$100,000 in immediate issues and an additional \$250,000 in repairs from years 1-5, then the 0-5 Year would total \$350,000 (including \$100,000 from the first year).

### All Priorities Cumulative Project Total and FCNI (0-11 Years+)

The All Priorities value combines all potential issues the institution should be concerned with to ensure proper functioning of their facilities, and includes items projected to reach the end of their useful life beyond the five year window.

**Special note regarding All Priority Cumulative Project Totals and FCNI**

These numbers are often high as they include major systems and building infrastructure projected to reach the end of their expected useful service life and are projected to need replacement. HVAC systems, for example, can be maintained to operate well beyond their expected life of 25-40 years, but usually at an increasing cost with reduced effectiveness. Replacement of these systems should be budgeted to maintain safe, efficient and reliable use of campus buildings.

Some systems, like roofing, can also be included in this category even if new, as their projected lifespan is within 20 years. These will be listed as Priority 5 (long term) and Planned Maintenance, indicating they are in good condition, but should be budget for regular replacement.

**Database Report – Institution Summary Page**

This report collects all the basic building data and calculations on a single page, allowing the reader to compare multiple buildings at once, determining which buildings are contributing more to the institutional FCNI than their size or age would dictate.

**Database Report - Building Pages**

The database report provides additional information, including a matrix of project totals broken down by Project Priority and Project Classification. This additional detail will allow the reader to determine separate upcoming project totals for Deferred Maintenance, Planned Maintenance and Facility Adaptation.

The adjacent table is an example of a Project Total Matrix from the database report.

Project Priority	Project Classification			Subtotal	
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation		
1 Currently Critical (Current Year)	\$102,000	\$7,500		\$109,500	
2 Potentially Critical (Year 1)	\$295,250	\$580,000	\$307,000	\$1,182,250	
3 Not yet Critical (Year 2-5)	\$192,000	\$80,000		\$272,000	
4 Watch List (Year 6-10)	\$6,500			\$6,500	
5 Long Term (Year 11+)	\$10,000	\$60,000		\$70,000	
	Subtotal	\$605,750	\$727,500	\$307,000	<b>\$1,640,250</b> Total of Projects

## Vital Statistics:

Michigan Technological University (Michigan Tech), established in 1885, is located in the Keweenaw Peninsula of Michigan in the town of Houghton. Michigan Tech comprises thirty four major buildings and several small outbuildings (not included in this report) on 925 acres overlooking Portage Lake. The thirty seven properties included in this report total approximately 3,135,000 square feet with a total current replacement value estimated at over \$766,000,000. Currently, the general condition of the facilities at Michigan Tech varies greatly, ranging from good to poor, depending on age and original construction type/quality.

In many cases, the useful life expectancy of building materials and systems has been reached, but solid construction and good maintenance practices have helped to keep those materials (e.g., brick exteriors, doors, and HVAC systems) in as good condition as can be expected. Several original systems including roofs, windows, doors, and HVAC system components are beginning to reach the end of useful service life and are being addressed by the University in a timely manner.

Several areas of concern, including fire alarm, fire suppression and egress system issues are currently being addressed with approximately half of the campus already reaping the benefits of these upgrades.

Significant issues to be addressed include: the entire window system at the R. L. Smith Building ME-EM; various roofing issues; HVAC issues in the Memorial Union Building, the Academic Offices Building, the Student Development Complex; and modernization of systems and finishes in significant buildings and general classroom facilities that are not current with respect to supporting modern instructional teaching methods.

Accessibility and life safety issues are generally being addressed as part of ongoing campus project work.

The 0-5 year cumulative project totals and FCNI at Michigan Tech is projected to exceed approximately 10%, above the national average of 7%. This represents a need to increase capital investment over the next several years to maintain the facilities through repair and replacement of major systems. Most

of these projected expenses at Michigan Tech fall into the category of planned maintenance items. As stated in the Project Totals Background, the investment solution has two facets:

- The funds needed for immediate repair projects – repairs and/or replacements that will prevent further deterioration of the buildings and infrastructure.
- The funds required to maintain and/or improve the condition of the buildings prior to system failure. These funds need to be budgeted in advance to allow for repairs at the appropriate time - before items become critical or cause additional damage.

This data, when compared to the APPA benchmark, shows that while Michigan Tech is currently in good condition, the issues predicted to become critical in the next five years will potentially move the institution's facilities out of "good" condition and just into the edge of the APPA range of "poor". This is not a unique situation on campuses of this age, and institutions that set aside adequate funding to address these problems before system failure have been making noticeable improvements in their Facility Condition Index.

The next section of this report breaks this data down into a building-by-building review to clarify where attention is needed.

## Priority areas:

**Roofing:** Several roofing replacements are not functioning as intended. Areas of concern include adhesion problems and billowing of the roofing membrane in a number of facilities. Some of these issues are on roofs still under warranty and should be addressed by the manufacturer.

**Window Systems:** In general many glazing systems are failing in part or in whole. Gaskets and seals are at or past the end of useful service life and require attention, repair or replacement. A number of facilities with double paned glass assemblies have failed seals, resulting in windows that are 'fogged'. The entire original single paned window system in ME-EM is due for replacement in order to control moisture infiltration as well as allowing better operation of the HVAC system. This area will become more critical as the institution begins to cool spaces as opposed to the heating-only philosophy that has been the policy to date.

The large full-height windows at McNair Hall appear to be plate glass and not tempered glass as current building codes would require. If one were to break, the glass would not shatter into small, safe pieces, but potentially break in large, sharp sections that could be a safety hazard.

**HVAC:** The most critical HVAC challenge noted on campus is the Memorial Union Building. This building includes guest facilities, meeting and event spaces, bookstore, and the campus food court. The only air-conditioned space is the Ballroom, leaving a majority of the building uncomfortable. In addition, the existing HVAC systems lack economizer function, making them inefficient. The result is an uncomfortable building. While these issues are not related to Deferred Maintenance, the HVAC system in Memorial Union will reach the End of Useful Service Life within the next five years. Combined with the architectural deficiencies from the previous addition/renovation, the report data indicates that the building should be considered for replacement.

**Electrical:** The most critical issue noted is the Central Heating Plant generator. This 38-year-old generator was recently refitted with new dual starters when both failed to start the engine. This generator serves two critical functions:

- Providing emergency power for the Dow Building for life safety equipment. Other building systems are not supported.
- Providing switching power to the campus primary substation; allowing it to disconnect from the local power company (UPPCO).

When the primary breakers and campus feeder breakers do not open, campus generators are prevented from starting. These breakers can be manually opened by a service electrician, but this results in a one to two hour delay.

The above scenario can be prevented by installation of an uninterrupted power supply (UPS) to provide switching power at the Primary Substation. Faster and more reliable switching can be provided for approximately \$10,000.

There were no critical issues noted from the building-level interview and observation standpoint. However, the knob-and-tube wiring in the ROTC Building attic should be replaced with modern wiring and light fixtures.

**Plumbing:** While not an issue per se for the City of Houghton, roof drain piping on many buildings on campus are connected directly to the sanitary connection from the building to the street with a single gravity drainage pipe. Referred to as a “combined system”, most authorities having jurisdiction prohibit these. The issue is excess rainwater and snowmelt that challenges the rate of flow in the city sanitary system. When excessive flow to the sanitary connection occurs, the result is water backing up into the building. All sanitary plumbing systems are effectively “open” systems, such that when the water level backs up into the building there is a direct path through floor drains, sinks, and bathroom fixtures that allow water to flow backward into the building space. Future building changes should include a separate connection for roof drain piping to the city sanitary connection at the street.

**Accessibility:** The facilities at Michigan Tech were built to the standards and codes of the time of their design and construction. Many of these facilities do not meet the increased regulations of today’s standards. Providing universal access to facility entrances and internal spaces can be a critical element to manage for any institution. While not outside of compliance relative to grandfathering, many Universities are establishing compliance budgets to begin the process of upgrading areas where accessibility is restricted or eliminated due to any number of circumstances. It is also a general practice to upgrade and provide full compliance to all spaces in and serving areas scheduled for renovation, with reasonable consideration being given to hardships (e.g., ratio of total project cost to compliance cost, structural interference, etc.). The approach taken by Michigan Tech is to work with handicapped individuals to address each of their specific access problems, changing programs and/or facilities as needed to provide equal access as well as updating facilities undergoing substantial renovation.

**Central Heating Plant:** The Central Heating Plant provides high-pressure steam to most campus buildings. This in turn provides thermal heating of building air, radiant heat along windows and stairwells, domestic water heating for bathrooms and maintenance, and a variety of other uses in laboratory buildings. It is the heart of the campus-wide heat system.

Originally built in 1951, the boiler ages are 1950, 1957, 1964, and 1970. A recent study indicates that approximately 90% of the system’s condensate returns to the plant, with the remaining 10% lost to minor leaks and consumption that does not return to the plant. Associated with the plant is the campus-wide, centrally located Building Automation Control (BAC) System. The Appendix contains a Michigan Tech internal report related to costs for operational, energy efficiency, safety, on-going maintenance, and replacement issues.

## Summary:

Improved maintenance and timely replacement practices are recommended to improve the overall FCNI for the University, resulting in a reduced “0-5 Year FCNI” below the projected 10.1% and closer to the current FCNI of 1.7%

Many systems will require replacement or upgraded in the near future. Year 0-5 FCNI issues are spread out over the entire University facility portfolio and will require attention across a number of systems throughout the campus. The building detail pages highlight the handful of issues greatly affecting this number.

**As stated in the Project Totals Backlog background, the investment solution has two facets:**

- The funds needed for immediate repair projects – repairs and/or replacements that will prevent further deterioration of the buildings and infrastructure and help the University stay ahead of life-safety concerns.
- The funds required to maintain and/or improve the condition of the buildings. These funds need to be budgeted in advance to allow for repairs at the appropriate time - before items become critical or cause additional damage.

The following pages of this report break this data down into a building-by-building review to clarify where attention is most needed.

## Recommendations:

### Short Term Recommendation

The University should review the items that comprise the Priority One Project Totals of approximately \$13,295,000 and address those affecting life/safety issues, those having the greatest potential for future damage to other building components, and those that are code compliance issues.

In addition to the first year issues that will carry over into the next five years, the University should also emphasize budgeting for the projected \$77 million in predicted project totals issues over the next five years and evaluate alternative solutions where the cost outweighs the benefit of repair.

## Long Term Recommendation

The University should develop a plan to set aside as much as possible of the annual CRV maintenance fund of \$18 million for resolution of upcoming issues and ongoing repairs to maintain the buildings. While this benchmark is difficult for most institutions to attain, the goal of setting aside this amount annually is to ensure the buildings remain in stable condition and that funds are available in advance when systems reach the End of Useful Service Life.

	Current Replacement Value	Projected Annual Maintenance Budget
	<b>\$766,243,398</b>	<b>\$18,389,841</b>

PRIORITY	PROJECT TOTALS	FCNI
<b>1</b> (year 0)	<b>\$13,295,400</b>	<b>1.7%</b>
<b>1-3</b> (years 0-5)	<b>\$77,850,450</b>	<b>10.2%</b>
<b>All</b>	<b>\$127,120,200</b>	<b>16.6%</b>



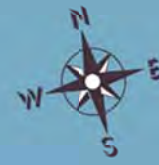
1 YEAR



5 YEAR



- |   |  |  |   |  |
|---|--|--|---|--|
| 1 Administration Building   | 12 Minerals & Materials Engineering Building<br>Materials Science & Engineering, College of Engineering, Institute of Materials Processing, Biomedical Engineering | 18 U. J. Noblet Forestry Building<br>School of Forest Resources & Environmental Science    | 34 Memorial Union Building<br>Campus Bookstore                                  | 100 Future site of GreatLakes Research Center<br>103 A. E. Seaman Mineral Museum (opening Summer 2011)   |
| 4 ROTC Building   | 13 Kamar House<br>Center for Diversity & Inclusion   | 19 Chemical Sciences & Engineering Building<br>Chemical Engineering, Chemistry, Psychology | 37 Wadsworth Hall   | Not appearing on map:<br>Ford Center, Alberta<br>IMP Storage, Houghton<br>Keweenaw Research Center, Houghton County Memorial Airport<br>Citizen's Bank Building, Hancock<br>Michigan Tech Lakeshore Center, Houghton<br>Outdoor Adventure Program, 207 East St., Houghton<br>As of Fall 2010 |
| 5 Academic Office Building<br>Cognitive and Learning Sciences, School of Business & Economics, Social Sciences  | 14 Grover C. Dillman Hall<br>Engineering Fundamentals  | 20 R. L. Smith Building<br>Mechanical Engineering-Engineering Mechanics                    | 38 West McHair Hall   |  |
| 7 Electrical Energy Resources Center<br>Electrical & Computer Engineering, School of Technology   | 15 Fisher Hall<br>Physics, Mathematical Sciences   | 24 Student Development Complex<br>Exercise Science, Health & Physical Education            | 40 East McHair Hall   |  |
| 8 Dow Environmental Sciences & Engineering Building<br>Biological Sciences, Civil & Environmental Engineering, Geological & Mining Engineering & Sciences | 16 Widemaker House<br>Public Safety & Police Services  | 25 Sherman Field Press Box   | 41 Central Heating Plant  |  |
| 9 Alumni House<br>Alumni Relations  | 17 J. R. Van Pelt Library and John & Ruanne Opie Library<br>Archives, Center for Teaching, Learning & Faculty Development  | 28 Kanwal & Ans Rekhi Hall<br>Computer Science   | 42 Facilities Management Storage  |  |
| 10 Rozsa Center for Performing Arts   |  | 30 Little Huskies Child Development Center   | 43 Facilities Management Storage  |  |
| 11 Walker Arts & Humanities Center<br>College of Sciences & Arts, Humanities, Visual & Performing Arts  |  | 31 Douglass Houghton Hall (DHH)  | 44 Facilities Management Offices<br>Fleet Services                              |  |
|   |  | 32 Daniell Heights Apartments  | 48 Hillside Place   |  |
|   |  |  | 50 Gates Tennis Center  |  |
|   |  |  | 84 Harold Mese Center<br>Career Services  |  |
|   |  |  | 95 Advanced Technology Development Complex<br>Technology & Economic Development |  |



Keweenaw Waterway



Facility: **Administration Building (1)**

Use Type(s): Administration

Built: 1969

Area: 73,389 SF

Floors: 6, plus penthouse

**Observation Highlights:**

- Building is not sprinkled and not air-conditioned. The occupancy of the building is 12 months continuous. Floor to floor height is short. The air to the Administration Building occupied spaces is supplied by ceiling ducts. The return air is removed from the spaces via return air registers in the walls, which feed into a return air plenum in the space above the ceiling below.
- 9"x9" floor tile reported to have A.C.M. as well as A.C.M. fire proofing on steel at deck, which has been partially encapsulated above 1st and 2nd floor ceilings. The plenum space between the lay-in ceiling and the steel deck is being used as air supply and return. Mastic containing A.C.M. reported at 9"x9" vinyl tile. A.C.M. reported on elbows on piping and tees. Lead paint throughout building reported.
- Toilet partitions due for replacement – most likely original. Toilet fixtures are original and have no automatic flush.
- Minor coping repairs needed.
- Tuck-pointing needed.
- Sealant joints are at End of Useful Service Life.
- Aluminum east entry doors on ground floor are at End of Useful Service Life.
- Dover elevator no. 1 and 2: controls relay logic and dc generators are reaching the End of Useful Service Life. Modernization is required for improved reliability and energy efficiency.
- Water and air infiltration at window frames. Sealant at frames is failing. Seals at glazing are not functioning. Entire glazing system is at End of Useful Service Life.
- Reheat coils are plugged – both air-side and water-side should be inspected and cleaned if needed.
- Fire Alarm system is old, does not meet today's code-should be replaced.
- Transformer is dust covered-needs cleaning; breakers have not been tested in 20 years, need testing and replacement of trip mechanism.



<b>Current Replacement Value</b>	<b>Projected Annual Maintenance Budget</b>
<b>\$13,943,910</b>	<b>\$334,654</b>

PRIORITY	PROJECT TOTALS	FCNI
<b>1</b> (year 0)	<b>\$0</b>	<b>0.0%</b>
<b>1-3</b> (years 0-5)	<b>\$2,294,800</b>	<b>16.5%</b>
<b>All</b>	<b>\$5,829,800</b>	<b>41.8%</b>



1 YEAR



5 YEAR

**ADMINISTRATION BUILDING**

Facility: **Michigan Tech Lakeshore Center (3)**

Use Type(s): Administration

Built: 1991

Area: 61,365 SF

Floors: 3

**Observation Highlights:**

- Original building dates from early 1900's as a warehouse use.
- Building was extensively remodeled in 2009, inside and out.
- Sealant joints between EIFS and stone sills are at End of Useful Service Life. EIFS building joints are at End of Useful Service Life
- Damage to EIFS observed, repair.
- Exterior doors at rooms 114 and 121 are missing thresholds. Replace thresholds.
- Areas observed where sections of perimeter concrete walkway have heaved upward. Remove and replace heaved concrete.
- Geo-thermal system installed in 1991. The ground water temperature has begun to increase within the system and may need to be dealt with in the future. ASHRAE life expectancy for water-to-air heat pumps is 20 - 25 years. The ground water temperature increase should be evaluated by an engineer.



1 YEAR



5 YEAR

Current Replacement Value	Projected Annual Maintenance Budget
<b>\$11,659,350</b>	<b>\$279,824</b>

PRIORITY	PROJECT TOTALS	FCNI
<b>1</b> (year 0)	<b>\$53,000</b>	<b>0.5%</b>
<b>1-3</b> (years 0-5)	<b>\$614,000</b>	<b>5.3%</b>
<b>All</b>	<b>\$920,000</b>	<b>7.9%</b>

**MICHIGAN TECH LAKESHORE CENTER**

Facility: **ROTC Building (4)**

Use Type(s): Administration, Student Union

Built: 1904

Area: 21,584 SF

Floors: 2, plus basement

**Observation Highlights:**

- No ventilation at building.
- Building steam pipe goes directly thru the basement rooms (B006 Conference Room). Recommend to add additional insulation on piping.
- Windows are near the End of Useful Service Life.
- Some deterioration at brick observed. Tuckpointing is required.
- Some deterioration of Jacobsville Sandstone at grade level. Repair individual units.
- EIFS at north entry (loading area) is showing some damage, repair.
- Replace sealant joints.
- Wood on running track is aging predictably, due for repair and refinish.
- Carpet over wood is at the End of Useful Service Life.
- VCT near end the End of Useful Service Life.
- 2x2 suspended ceiling at the End of Useful Service Life.
- Old cable bus panel found at stairs going to attic. This is not energized but could potentially be re-energized.
- Original knob and tube lighting is still being used in attic and should be replaced.
- Reheat coils are plugged. Provide air and water side inspection.
- Replace attic AHU – at end of useful service life.



1 YEAR



5 YEAR

Current Replacement Value	Projected Annual Maintenance Budget
<b>\$4,289,820</b>	<b>\$102,956</b>

PRIORITY	PROJECT TOTALS	FCNI
<b>1</b> (year 0)	<b>\$109,500</b>	<b>2.6%</b>
<b>1-3</b> (years 0-5)	<b>\$1,256,750</b>	<b>29.3%</b>
<b>All</b>	<b>\$1,650,250</b>	<b>38.5%</b>

**ROTC BUILDING**

**Facility:** Academic Offices Building (5)

**Use Type(s):** Administration

**Built:** 1908

**Area:** 27,405 SF

**Floors:** 2, plus basement

**Observation Highlights:**

- No ventilation at south entry lobby.
- Building not ventilated – overheating in Spring/Fall. Basement level needs cooling (steam line goes thru vending area at West entry).
- Minor coping repairs need.
- Water and air infiltration due to gasketing issues. Gaskets at the End of Useful Service Life.
- Missing mortar and cracking at brick veneer and stone. Brick veneer and stone due for substantial tuck pointing.
- Water infiltration problems reported at basement level at grade.
- Some Jacobsville Stone deterioration observed at south entry and building façade.
- Exterior sealant joints are at the End of Useful Service Life.
- Otis freight elevator: controls, relay logic and dc generator are reaching the End of Useful Service Life. Modernization is required for improved reliability and energy efficiency.
- Piping is at End of Useful Service Life.
- Need to address control issues and zoning in North wing. AHUs need to be replaced in next 5 years.



1 YEAR



5 YEAR

Current Replacement Value	Projected Annual Maintenance Budget
<b>\$5,206,950</b>	<b>\$124,967</b>

PRIORITY	PROJECT TOTALS	FCNI
<b>1</b> (year 0)	<b>\$885,000</b>	<b>17.0%</b>
<b>1-3</b> (years 0-5)	<b>\$2,424,000</b>	<b>46.6%</b>
<b>All</b>	<b>\$2,964,000</b>	<b>56.9%</b>

**ACADEMIC OFFICES BUILDING**

Facility: **Annex Building (6)**

Use Type(s): Administration, Library

Built: 1936

Area: 10,956 SF

Floors: 2, plus basement

**Observation Highlights:**

- No air conditioning at the basement – air conditioning is critical given basement is used for archives and archeology samples storage. A dehumidifier and a gas-heater observed in the basement along with a sanitary line that drains into the sump pump. The sump pump was not functioning.
- Humidity issues reported. New bathroom, kitchen, and barrier free unisex toilet room is planned for the second floor level. Existing cabinetry will be reorganized. Radiators along the perimeter walls present.
- New fire escape constructed from second floor level.
- Many bad coping sections. Correct or replace.
- Some hardware is malfunctioning. Glazing and some window sills at End of Useful Service Life.
- Building sealant joints and some stone sills due for repair.
- Air and water infiltration at brick veneer on perimeter at line of ceiling. Extensive tuck-pointing required.
- Exterior hollow metal door is at End of Useful Service Life. Hollow metal frame is due for re-painting.
- Need to add additional exit signs for egress.
- Need to add strobes and replace Siemens FA panel with EST.
- Basement transformer and disconnects need to be replaced.
- No elevator.



Current Replacement Value	Projected Annual Maintenance Budget
<b>\$2,213,112</b>	<b>\$53,115</b>

PRIORITY	PROJECT TOTALS	FCNI
<b>1</b> (year 0)	<b>\$260,000</b>	<b>11.7%</b>
<b>1-3</b> (years 0-5)	<b>\$490,000</b>	<b>22.1%</b>
<b>All</b>	<b>\$734,000</b>	<b>33.2%</b>



1 YEAR



5 YEAR

**ANNEX BUILDING**

Facility: **Electrical Energy Resources Center (7)**

Use Type(s): Administration, Classrooms, Lab

Built: 1976

Area: 162,170 SF

Floors: 9, plus basement and sub-basement

**Observation Highlights:**

- Building in general is aging predictably and showing wear. Building is due for modernization.
- Classrooms are aging predictably and showing wear. Classrooms are due modernization to continue top instructional delivery.
- Active leak at northwest stairway. EPDM is beyond End of Useful Service Life.
- 2007 roofing membrane isn't adhering to roof.
- Water in pillbox of sub-basement.
- Glazing in classroom 427 has moisture @ sill.
- Rubber nosing is deteriorating under heavy use. Nosing at the End of Useful Service Life.
- Provide exit lighting in classrooms.
- Provide code compliant fire alarm system.
- Provide power operated door switch.
- Path of travel in SB34 exceeds code limits.
- Battery room for UPS should have ventilation with full exhaust.
- Duct-board ductwork is leaking air into ceiling spaces.
- Older Fisher Steam PRVs/controls need replacement.



Current Replacement Value	Projected Annual Maintenance Budget
<b>\$44,596,750</b>	<b>\$1,070,322</b>

PRIORITY	PROJECT TOTALS	FCNI
<b>1</b> (year 0)	<b>\$2,500</b>	<b>0.0%</b>
<b>1-3</b> (years 0-5)	<b>\$1,506,500</b>	<b>3.4%</b>
<b>All</b>	<b>\$10,901,500</b>	<b>24.4%</b>

**ELECTRICAL ENERGY  
RESOURCES CENTER**

**Facility: Dow Environmental Sciences & Engineering (8)**

**Use Type(s):** Administration, Lab, Auditorium  
**Built:** 1998  
**Area:** 167,100 SF  
**Floors:** 9

**Observation Highlights:**

- Building is functional and showing wear appropriate to age.
- Building is subject to water infiltration at window head on east façade and at exterior door thresholds. Maintenance efforts have been made to correct these issues, entire building window system should be reviewed for proper flashing details.
- Provide lighting protection.
- Flashing of roof terrace on north is failing at door threshold. Water infiltration was observed, further investigation is required to determine full scope of work required to remedy.
- Driving rain infiltration is observed on all levels, especially bad on level 9.
- Damage to copper coping on south elevation causing staining and water infiltration into wall. Repair coping.
- Staining on 9th floor at east elevation windows. Repair and paint.
- Water damage in north corridor near roof terrace entry. Repair and paint.
- Leaking at threshold of 9th floor east roof access door and north terrace access door.
- North entry on floor one showing excessive wear due to high volume of traffic, End of Useful Service Life.
- VCT cracking in auditorium where the slope of floor changes, End of Useful Service Life.
- Rubber nosing on stairs is at End of Useful Service Life.
- Provide power operated door switch.
- Medical-grade air compressors are at 10,000 run-time hour lifespan and require rebuild. Confirm with manufacturer's representative.



1 YEAR



5 YEAR

Current Replacement Value	Projected Annual Maintenance Budget
<b>\$52,970,700</b>	<b>\$1,271,297</b>

PRIORITY	PROJECT TOTALS	FCNI
<b>1</b> (year 0)	<b>\$45,000</b>	<b>0.1%</b>
<b>1-3</b> (years 0-5)	<b>\$252,500</b>	<b>0.5%</b>
<b>All</b>	<b>\$332,500</b>	<b>0.6%</b>

**DOW ENVIRONMENTAL SCIENCES AND ENGINEERING BUILDING**



Facility: **Rosza Performing Arts & Education Center (10)**

**Use Type(s):** Auditorium, Classroom, Administration

**Built:** 2000

**Area:** 80,000 SF

**Floors:** 4, plus basement

**Observation Highlights:**

- Settling of brick in south west corner near areaway.
- Recently replaced 26 - 27 insulated glass panels due to leaking gaskets.
- History of water damage in main lobby. Roof has been repaired.
- G002 finned tube radiation is not covered and has been damaged from objects placed against it.



1 YEAR

5 YEAR

Current Replacement Value	Projected Annual Maintenance Budget
<b>\$21,600,000</b>	<b>\$518,400</b>

PRIORITY	PROJECT TOTALS	FCNI
<b>1</b> (year 0)	<b>\$1,000</b>	<b>0.0%</b>
<b>1-3</b> (years 0-5)	<b>\$11,000</b>	<b>0.1%</b>
<b>All</b>	<b>\$636,000</b>	<b>2.9%</b>

**ROSZA PERFORMING ARTS AND EDUCATION CENTER**

Facility: **Walker Arts and Humanities Center (11)**

Use Type(s): Administration, Classroom, Auditorium

Built: 1986

Area: 87,094 SF

Floors: 3, plus basement

**Observation Highlights:**

- Porous brick selected for exterior of building. Degradation of brick in several areas near grade. Replace broken brick and tuck-point where necessary.
- 40% of 2x2 suspended ceiling system near End of Useful Service Life.
- VCT in south corridor on main floor is beyond End of Useful Service Life.
- Water fountains not compliant.
- Interior finishes on levels 2/3 are at End of Useful Service Life. Classrooms are due for modernization to continue top instructional delivery.
- De-watering sump pump cord is connected to convenience outlet. Permanent AC power connection for de-watering sump should be provided.



1 YEAR



5 YEAR

Current Replacement Value	Projected Annual Maintenance Budget
<b>\$18,812,304</b>	<b>\$451,495</b>

PRIORITY	PROJECT TOTALS	FCNI
<b>1</b> (year 0)	<b>\$3,500</b>	<b>0.0%</b>
<b>1-3</b> (years 0-5)	<b>\$3,070,500</b>	<b>16.3%</b>
<b>All</b>	<b>\$3,890,000</b>	<b>20.7%</b>

**WALKER ARTS AND HUMANITIES CENTER**

Facility: **Minerals & Materials Engineering Building (12)**

**Use Type(s):** Administration, Lab  
**Built:** 1955 (1991)  
**Area:** 172,800 SF  
**Floors:** 8

**Observation Highlights:**

- Original roofing leaking. End of Useful Service Life.
- Membrane at parapet is not adhering and causing membrane to billow in many areas.
- Some windows are leaking.
- Degradation of sand stone coping.
- Excessive staining of sand stone on south elevation below windows.
- Exterior sealant joints at stone and brick are near End of Useful Service Life.
- Collision damage of sand stone at south east entry. Replace or repair damaged sand stone.
- VCT is not adhering well to corridors. Several chips in tile caused by high foot traffic and movement of lab equipment. Consider alternative material for floor covering. End of Useful Service Life.
- Smoke purge fan for stair and atrium needed.
- New sock drain put in place at foundation wall on east to reduce water infiltration (appears ok now).



Current Replacement Value	Projected Annual Maintenance Budget
<b>\$59,270,400</b>	<b>\$1,422,490</b>

PRIORITY	PROJECT TOTALS	FCNI
<b>1</b> (year 0)	<b>\$75,000</b>	<b>0.1%</b>
<b>1-3</b> (years 0-5)	<b>\$725,000</b>	<b>1.2%</b>
<b>All</b>	<b>\$2,385,000</b>	<b>4.0%</b>

**MINERALS AND MATERIALS ENGINEERING BUILDING**

Facility: **Minerals and Materials Undergrad Building (13)**

**Use Type(s):** Classroom, Lab, Auditorium

**Built:** 1955

**Area:** 44,400 SF

**Floors:** 2, plus basement

**Observation Highlights:**

- Seating in U113 at End of Useful Service Life. Seating in U115 in poor condition.
- Rooms U113 & U115 are at End of Useful Service Life to maintain curriculum distribution at modern level.
- Provide lightning protection.
- Degradation of sand stone coping.
- Exterior sealant joints at stone and brick are near End of Useful Service Life.



1 YEAR



5 YEAR

<b>Current Replacement Value</b>	<b>Projected Annual Maintenance Budget</b>
<b>\$11,877,000</b>	<b>\$285,048</b>

<b>PRIORITY</b>	<b>PROJECT TOTALS</b>	<b>FCNI</b>
<b>1</b> (year 0)	<b>\$500</b>	<b>0.0%</b>
<b>1-3</b> (years 0-5)	<b>\$302,500</b>	<b>2.5%</b>
<b>All</b>	<b>\$457,500</b>	<b>3.9%</b>

**MINERALS AND MATERIALS UNDERGRAD BUILDING**

Facility: **Grover Dillman Hall (14)**

Use Type(s): Administration, Classrooms, Lab

Built: 1957

Area: 86,300 SF

Floors: 3, plus basement

**Observation Highlights:**

- Some settling of brick in NE corner above steam tunnel.
- Few leaks reported but nothing of concern.
- Air infiltration at frames throughout. End of Useful Service Life.
- Air and water infiltration at stairwells. End of Useful Service Life.
- Minimal re-pointing needed.
- Egress doors into stairwell open into the door closure of adjacent door. Provide alternate solution.
- Provide code compliant fire alarm system.
- Classrooms are due for modernization to continue top instructional delivery.
- Fire Alarm no horns or strobes.
- Large AHU is at End of Useful Service Life.
- Replace steam PRV station. Life expectancy per ASHRAE is 25 to 35 years.



1 YEAR



5 YEAR

Current Replacement Value	Projected Annual Maintenance Budget
<b>\$23,732,500</b>	<b>\$569,580</b>

PRIORITY	PROJECT TOTALS	FCNI
<b>1</b> (year 0)	<b>\$1,610,000</b>	<b>6.8%</b>
<b>1-3</b> (years 0-5)	<b>\$2,948,000</b>	<b>12.4%</b>
<b>All</b>	<b>\$4,258,000</b>	<b>17.9%</b>

**GROVER DILLMAN HALL**

Facility: **Fisher Hall (15)**

Use Type(s): Administration, Classroom, Auditorium

Built: 1964

Area: 112,100 SF

Floors: 3, plus basement

**Observation Highlights:**

- Multiple renovations of classroom spaces has left building with a variety of finish conditions and hardware conditions. In general classrooms are in good condition.
- Office areas finishes are at End of Useful Service Life throughout.
- Assembly lecture halls are at End of Useful Service Life.
- North east corner of north stair at basement level is cracking and water infiltration is present.
- Substrate on roof is delaminating.
- Ponding water on main roof and north entry canopy.
- Concealed spline acoustic ceiling system is at End of Useful Service Life.
- Hollow metal door at connection to Reki does not close properly. Replace rated assembly to meet code compliancy.
- Carpets in auditorium and lecture halls are near End of Useful Service Life.
- Rubber nosing on stairs is failing. Incorrect installation. At End of Useful Service Life.
- Fire alarm system needs update.
- Provide code compliant horns and strobes.
- AHU units are at End of Useful Service Life. ASHRAE life expectancy is 25 to 35 years.



1 YEAR



5 YEAR

<b>Current Replacement Value</b>	<b>Projected Annual Maintenance Budget</b>
<b>\$22,251,850</b>	<b>\$534,044</b>

<b>PRIORITY</b>	<b>PROJECT TOTALS</b>	<b>FCNI</b>
<b>1</b> (year 0)	<b>\$75,000</b>	<b>0.3%</b>
<b>1-3</b> (years 0-5)	<b>\$6,181,500</b>	<b>27.8%</b>
<b>All</b>	<b>\$7,719,500</b>	<b>34.7%</b>

**FISHER HALL**

Facility: **J.R. Van Pelt Library (17)**

Use Type(s): Administration, Library

Built: 1966

Area: 130,031 SF

Floors: 4

**Observation Highlights:**

- Lighting in archival area is excessive in visible & UV spectrum. Shielding was funded and installed, but lighting still excess in those spectrums.
- Provide lightning protection.
- 20% of lamps have expired. Potential short in lighting fixtures is causing many fluorescent lamps to burn out prematurely.
- Overhead fire shutter on third floor is potentially dangerous. Shutter is located more than 3' from window and could potentially entrap someone in the event of emergency.
- Egress stair in original 1966 building is not code compliant, requires guardrail and compliant hand railing.
- Nosing on stair at loading dock is failing. End of Useful Service Life.
- Original Van Pelt electrical power substation, switchgear, transformers, etc. due for evaluation.
- Original PRVs for 15# steam should be replaced.
- Original Van Pelt AC-1 in basement MER is at End of Useful Service Life. ASHRAE life expectancy is 25 to 35 years.
- Original Van Pelt AC-2 and AC-3 in Penthouse MER are at End of Useful Service Life. ASHRAE life expectancy is 25 to 35 years.



Current Replacement Value	Projected Annual Maintenance Budget
<b>\$29,907,130</b>	<b>\$699,047</b>

PRIORITY	PROJECT TOTALS	FCNI
<b>1</b> (year 0)	<b>\$15,000</b>	<b>0.1%</b>
<b>1-3</b> (years 0-5)	<b>\$2,975,000</b>	<b>9.9%</b>
<b>All</b>	<b>\$3,402,250</b>	<b>11.4%</b>

**J.R. VAN PELT LIBRARY**

Facility: **U.J. Noblet Forestry Building (18)**

Use Type(s): Administration, Lab, Classroom

Built: 1967

Area: 95,337 SF

Floors: 2

**Observation Highlights:**

- Major addition and renovation in 2000.
- Building reported as having A.C.M.
- Most of the piping insulation with A.C.M. is reported as being removed.
- Water infiltration problem reported at ground level at rooms adjacent to G003 – due for repair.
- Parts of the building are air-conditioned.
- Roof leaks reported.
- All sealant joints and flashing must be inspected at the roof. Membrane flashing is loose in several locations. Repair as necessary.
- Reported water and air infiltration at 50% of original (1967) glazing. Original windows are at the End of Useful Service Life.
- All wood siding is due for regular maintenance and repair.
- Sealed wood siding on building addition is splitting in multiple locations. Some areas of siding is curling. Due for repair.
- Exterior sealant joints are at the End of Useful Service Life.
- 12x12 VCT over 9x9 tile at corridor along lab 143 is at the End of Useful Service Life. 9x9 tile must be removed as well.
- Need additional outlets on separate circuits.
- AHUs should be replaced in next 5 years in older part of the building. ASHRAE life expectancy is 25 to 35 years.



<b>Current Replacement Value</b>	<b>Projected Annual Maintenance Budget</b>
<b>\$26,932,703</b>	<b>\$646,385</b>

<b>PRIORITY</b>	<b>PROJECT TOTALS</b>	<b>FCNI</b>
<b>1</b> (year 0)	<b>\$7,500</b>	<b>0.0%</b>
<b>1-3</b> (years 0-5)	<b>\$3,967,500</b>	<b>14.7%</b>
<b>All</b>	<b>\$5,447,500</b>	<b>20.2%</b>



1 YEAR



5 YEAR

**U.J. NOBLET FORESTRY BUILDING**



**Facility: Chemical Sciences & Engineering Building (19)**

**Use Type(s):** Administration, Labs, Classrooms  
**Built:** 1968  
**Area:** 162,500 SF  
**Floors:** 7, plus basement and sub-basement

**Observation Highlights:**

- At east and south entry there are unit heaters at the ceiling which are difficult to access and maintain. Servicing the penthouse is also difficult.
- Millwork throughout the entire building in relatively fair condition w/ some minor problematic areas.
- Building has been reported to have A.C.M.
- Water infiltration at south stair at sub-basement level. Concrete basement wall due for repair.
- Air and water infiltration at glazing system. Glazing system at the End of Useful Service Life
- Most exterior building joints are failing. Joints are the End of Useful Service Life.
- VCT is at the End of Useful Service Life.
- Carpet is at the End of Useful Service Life.
- Otis freight elevator: original controls, motors and other mechanical and electrical components have not been replaced, modernization should be planned for.
- Renovation of the freight elevator cab recommended.
- Steam valves cannot be sealed and need to be replaced.
- Fire pump was found to be in manual position-needs to be in automatic.
- Need to replace Federal Pacific switchboards-switches starting to fail.
- Chiller should be replaced original. Humidifiers in penthouse need to be replaced-leaking, HV-3 needs to have filters installed, and cooling tower needs to be replaced.



1 YEAR



5 YEAR

Current Replacement Value	Projected Annual Maintenance Budget
<b>\$45,906,250</b>	<b>\$1,101,750</b>

PRIORITY	PROJECT TOTALS	FCNI
<b>1</b> (year 0)	<b>\$0</b>	<b>0.0%</b>
<b>1-3</b> (years 0-5)	<b>\$3,118,000</b>	<b>6.8%</b>
<b>All</b>	<b>\$4,773,000</b>	<b>10.4%</b>

**CHEMICAL SCIENCES AND ENGINEERING BUILDING**

Facility: **R.L. Smith Building (MEEM) (20)**

Use Type(s): Administration, Classroom, Lab

Built: 1971

Area: 162,500 SF

Floors: 12, plus basement and sub-basement

### Observation Highlights:

- Windows on the east and west elevations leak with driving rain. Window system near End of Useful Service Life.
- KARR report on exterior façade maintenance recommendations is attached for reference.
- Some tuck pointing necessary.
- Bottom of overhead door freezes to the floor in winter. Provide alternative solution.
- Replace T12 fixture with T8. Re-ballast and add lamps.
- SF-2 belts were loose and belt guard not in place.



1 YEAR



5 YEAR

Current Replacement Value	Projected Annual Maintenance Budget
<b>\$51,350,000</b>	<b>\$1,232,400</b>

PRIORITY	PROJECT TOTALS	FCNI
<b>1</b> (year 0)	<b>\$693,900</b>	<b>1.4%</b>
<b>1-3</b> (years 0-5)	<b>\$2,026,900</b>	<b>3.9%</b>
<b>All</b>	<b>\$10,058,400</b>	<b>19.6%</b>

**R.L. SMITH BUILDING**

Facility: **Student Development Complex (24)**

Use Type(s): Athletic, Classrooms, Natatorium, Administration

Built: 1972

Area: 313,690 SF

Floors: 3

**Observation Highlights:**

- Most roof areas at the End of Useful Service Life.
- Some glazing is failing, fogging is present. Sealant around windows is at the End of Useful Service Life. Glazing is at the End of Useful Service Life.
- Exterior plaster at entry soffit is damaged and stained. Due for repair.
- Minor damage to brick veneer at entry. Brick due for repair.
- Building joints at the End of Useful Service Life.
- Extensive deterioration of ceramic tile at pool due to elevated humidity levels and chlorine. Replace.
- Interior sealant joints in Natatorium are at the End of Useful Service Life.
- Stained carpet near the End of Useful Service Life.
- VCT tile in corridors and gym at the End of Useful Service Life.
- Remove and replace some exterior concrete slabs.
- 4 HV units in arena should be replaced at End of Useful Service Life.
- Replace exhaust fans for toilet rooms, increase ventilation.
- Replace condensate pumps.
- Provide additional lights on generator to get 1 fc minimum.
- Replace panel boards and distribution boards.
- Over haul both generators.
- Lighting and ceiling in Natatorium are in poor shape and need replacement.
- The existing pool equipment is 15 years old and is near the End of Useful Service Life.
- The ice arena concrete slab and the refrigeration system, at the End of Useful Service Life.



1 YEAR



5 YEAR

Current Replacement Value	Projected Annual Maintenance Budget
<b>\$69,796,025</b>	<b>\$1,430,426</b>

PRIORITY	PROJECT TOTALS	FCNI
<b>1</b> (year 0)	<b>\$6,157,000</b>	<b>8.8%</b>
<b>1-3</b> (years 0-5)	<b>\$16,374,500</b>	<b>23.5%</b>
<b>All</b>	<b>\$19,266,500</b>	<b>27.6%</b>

**STUDENT DEVELOPMENT COMPLEX**

Facility: **Kanwal and Ann Rekhi Hall (28)**

Use Type(s): Administration, Classroom

Built: 2005

Area: 51,439 SF

Floors: 3, plus basement

**Observation Highlights:**

- Hollow metal door at connection to Fisher does not close properly. Replace rated assembly to meet code compliancy.
- Solid core doors with hollow metal frame in entry lobby leading to office suite are not rated assemblies.
- Overhead fire shutter on third floor is potentially dangerous. Shutter is located more than 3' from window and could potentially entrap someone in event of emergency.
- VCT over raised floor in server rooms is delaminating and may become tripping hazard. Provide alternative floor cover system in server rooms. System at the End of Useful Service Life.
- Doors at 100A are not code compliant.
- Door into office suites from corridor 100, 200 or 300 are not code compliant.
- Basement VAVs in main corridor were never balanced or commissioned properly due to inaccessibility. This may contribute to noise problem in the Distance Learning space.



1 YEAR



5 YEAR

Current Replacement Value	Projected Annual Maintenance Budget
<b>\$10,133,483</b>	<b>\$243,204</b>

PRIORITY	PROJECT TOTALS	FCNI
<b>1</b> (year 0)	<b>\$46,000</b>	<b>0.5%</b>
<b>1-3</b> (years 0-5)	<b>\$56,000</b>	<b>0.6%</b>
<b>All</b>	<b>\$189,000</b>	<b>1.9%</b>

**KANWAL AND ANN REKHI HALL**

Facility: **Douglas Houghton Hall (31)**

Use Type(s): Student Housing, Administration

Built: 1938

Area: 92,500 SF

Floors: 3, plus basement

**Observation Highlights:**

- Addition built in 1946 (east wing) and another in 1966 (food service).
- Original piping throughout building showing excessive leakage.
- Building is not air-conditioned, except in one office. Full kitchen, with a make-up air unit, not air conditioned.
- Building has been reported to contain A.C.M.
- Ice dams reported at eaves - damaged copper roofing. Repair roofing and correct ice dam condition. 1980 Asphalt shingles @ main roof due for replacement.
- Broken window seals causing clouding in many areas of building. Window assembly at the End of Useful Service Life.
- Brick veneer damage observed. Water infiltration observed on exterior wall of G30. Brick veneer is due for repair.
- Mold has been present inside dorm rooms due to water infiltration (ice damming at roof).
- 25% of wood doors splitting down the middle of the door edge. Replace damaged doors. 25% of wood frames reported being loose. Provide additional blocking at jambs and re-anchor door frames.
- Bull nose tile at stairwell is chipping away. Tile at the End of Useful Service Life.
- Quarry tile at laundry room is deteriorating. Quarry tile is at the End of Useful Service Life.
- Otis and Heller elevators: controls relay logic and dc generator are reaching the End of Useful Service Life. Modernization is required for improved reliability and energy efficiency.
- Replace old Square D panels and switches.
- Weight room has no ventilation.
- DW and sanitary are in poor shape and need to be replaced, storm sewer tied into sanitary, backflow preventers used.



1 YEAR



5 YEAR

Current Replacement Value	Projected Annual Maintenance Budget
<b>\$17,575,000</b>	<b>\$421,800</b>

PRIORITY	PROJECT TOTALS	FCNI
<b>1</b> (year 0)	<b>\$285,000</b>	<b>1.6%</b>
<b>1-3</b> (years 0-5)	<b>\$5,582,000</b>	<b>31.8%</b>
<b>All</b>	<b>\$7,367,000</b>	<b>41.9%</b>

**DOUGLAS HOUGHTON HALL**

**Facility:** **Memorial Union Building (34)**

**Use Type:** Student Union, Administration, Kitchen/Food Service

**Built:** 1952

**Area:** 89,791 SF

**Floors:** 4, plus basement

**Observation Highlights:**

- Building cannot be repurposed or renovated in current configuration; while most of the building is aging predictably due to resilient nature of materials (CMU walls) it does not serve the current needs of contemporary students. Renovation is difficult or impossible without a complete gut requiring full upgrade to M/P system and much of the E.
- Bowling alley is underused, slated for demo.
- The original HVAC units are at End of Useful Service Life. ASHRAE life expectancy is 25 to 35 years.
- Provide lightning protection.
- Several ceiling tiles from 1987 renovation at End of Useful Service Life.
- Broken handle on operable partition wall at ball room needs replacement.
- VCT in cafeteria cracking near columns. At the End of Useful Service Life
- Water fountain not compliant.
- T12s should be replaced with T8s in most fixtures.
- 1/3 – 2/3 PRV steam piping needs re-insulation.
- City water back flow preventer is leaking to floor drain.



1 YEAR



5 YEAR

Current Replacement Value	Projected Annual Maintenance Budget
<b>\$19,327,513</b>	<b>\$463,860</b>

PRIORITY	PROJECT TOTALS	FCNI
<b>1</b> (year 0)	<b>\$49,500</b>	<b>0.3%</b>
<b>1-3</b> (years 0-5)	<b>\$4,548,500</b>	<b>23.5%</b>
<b>All</b>	<b>\$4,734,000</b>	<b>24.5%</b>

**MEMORIAL UNION BUILDING**

**Facility:** **Wadsworth Hall (37)**  
**Use Type(s):** Student Housing, Student Union  
**Built:** 1955  
**Area:** 300,239 SF  
**Floors:** 5, plus basement

**Observation Highlights:**

- Built in 1955, new addition in 1957 and then another one in 1966-67. Building remodeled in 2005-2006.
- Reported settlement - windows at west wing would crack due to movement, even though expansion joints are present.
- Ice damming reported at the roof of the 2nd floor roof monitor over the main lobby entrance stair.
- Settlement cracks observed in brick at south elevation.
- Most exterior building joints are failing. Beyond the End of Useful Service Life.
- Limestone panels are damaged, repair.
- Grout at ceramic tile showers is failing causing water damage to gypsum board ceiling and walls below. At the End of Useful Service Life.
- Otis elevator no. 1: original equipment is reaching the End of Useful Service Life. Otis elevator no. 2, 3, 4: controls relay logic and machine external gear are reaching the End of Useful Service Life. Modernization is required for improved reliability and energy efficiency.
- Replace original Square D panel boards.
- Remove lights over stairs and replace with pendant fixtures with lower devices.
- Hot water heating main zone valve needed, no shut off valves installed to isolate system.



Current Replacement Value	Projected Annual Maintenance Budget
<b>\$57,045,410</b>	<b>\$1,369,090</b>

PRIORITY	PROJECT TOTALS	FCNI
<b>1</b> (year 0)	<b>\$76,000</b>	<b>0.1%</b>
<b>1-3</b> (years 0-5)	<b>\$1,288,000</b>	<b>2.3%</b>
<b>All</b>	<b>\$5,418,000</b>	<b>9.5%</b>

**WADSWORTH HALL**

**Facility:** **West McNair Hall (38)**  
**Use Type(s):** Student Housing, Student Union  
**Built:** 1966  
**Area:** 54,000 SF  
**Floors:** 3

**Observation Highlights:**

- Large-sized non-tempered insulated and single glazed units are safety hazard. Replace all non-tempered glazing units (Activities Area).
- Original plumbing.
- No ventilation in restrooms at levels 1 and 2.
- Open coping joints due for repair.
- Water infiltration at single glazed windows reported. Window system at the End of Useful Service Life.
- Architectural repair in (40) stall showers for replacement of mixing valves.
- Site re-grading necessary to the south to divert water away from the building.
- Unsafe trash chute.
- Labeling of electrical panels is bad. Check loads in panel and label with correct loads.
- Need to replace and increase size of exhaust fans for gang toilets.
- Pneumatic system has leaks.



1 YEAR



5 YEAR

<b>Current Replacement Value</b>	<b>Projected Annual Maintenance Budget</b>
<b>\$10,260,000</b>	<b>\$246,240</b>

PRIORITY	PROJECT TOTALS	FCNI
1 (year 0)	<b>\$11,000</b>	<b>0.1%</b>
1-3 (years 0-5)	<b>\$3,031,000</b>	<b>29.5%</b>
<b>All</b>	<b>\$4,396,000</b>	<b>42.8%</b>

**WEST MCNAIR HALL**



**Facility:** **McNair Hall Food Services (39)**  
**Use Type(s):** Kitchen/Food Service, Student Union  
**Built:** 1966  
**Area:** 18,000 SF  
**Floors:** 2

**Observation Highlights:**

- Large-sized non-tempered insulated and single glazed units are safety hazard. Replace all non-tempered glazing units.
- Aluminum window with glazed units at the End of Useful Service Life.
- In general, poor flashing details at the roof/glazing systems allows for water infiltration. Repair/replace flashings.
- Plumbing is original and leaks. Reported A.C.M. present at piping insulation. Kitchen was remodeled 8 years ago and has an exhaust hood.
- Dining room is air conditioned. However, dining feels cold during winter (due to non-insulated glazing). Replace with insulated glazing. Flush radiation water piping and inspect convectors. System may be undersized.
- Entrance heater at West vestibule does not heat the entrance; instead it heats the kitchen – due for repair.
- Water infiltration through ceiling reported due to leaking pipes.
- Door at aluminum storefront system at west vestibule to dining room does not close properly. Replace door closer.
- Dover kitchen elevator: elevator controls are reaching the End of Useful Service Life. Modernization is required for improved reliability and energy efficiency.
- Provide GFCI outlets for all outlets without ground wires.
- Refrigeration piping above ceiling in Dining is leaking.



<b>Current Replacement Value</b>	<b>Projected Annual Maintenance Budget</b>
<b>\$4,500,000</b>	<b>\$108,000</b>

<b>PRIORITY</b>	<b>PROJECT TOTALS</b>	<b>FCNI</b>
<b>1</b> (year 0)	<b>\$0</b>	<b>0.0%</b>
<b>1-3</b> (years 0-5)	<b>\$972,500</b>	<b>21.6%</b>
<b>All</b>	<b>\$1,315,500</b>	<b>29.2%</b>



1 YEAR



5 YEAR

**M McNAIR HALL FOOD SERVICES**

**Facility:** East McNair Hall (40)  
**Use Type(s):** Student Housing, Student Union  
**Built:** 1968  
**Area:** 71,300 SF  
**Floors:** 6

**Observation Highlights:**

- Original plumbing.
- Toilet rooms along main corridors are quite tight (non-accessible) and overused with inadequate ventilation.
- Radiators along perimeter walls typical at residential units.
- Glazing system at the End of Useful Service Life.
- Large spans of non-tempered glazing, potential safety hazard.
- Damage observed at brick veneer. Repair as needed.
- Gypsum board ceiling is delaminating in restrooms due to humidity.
- 2x2 suspended ceiling system at activities room and lounge is near End of Useful Service Life.
- Unsafe trash chute.
- Labeling of panels is bad.
- Check loads in panel and label with correct loads.
- Replace all shower mixing valves, replace DW piping and sanitary.
- Gang toilet room humidity problem.
- Need to replace and increase size of exhaust fans for gang toilet.



<b>Current Replacement Value</b>	<b>Projected Annual Maintenance Budget</b>
<b>\$13,547,000</b>	<b>\$325,128</b>

<b>PRIORITY</b>	<b>PROJECT TOTALS</b>	<b>FCNI</b>
<b>1</b> (year 0)	<b>\$699,000</b>	<b>5.2%</b>
<b>1-3</b> (years 0-5)	<b>\$3,784,000</b>	<b>27.9%</b>
<b>All</b>	<b>\$5,819,000</b>	<b>43.0%</b>

**EAST MCNAIR HALL**

**Facility:** Central Heating Plant (41)  
**Use Type(s):** Maintenance  
**Built:** 1951  
**Area:** 11,900 SF  
**Floors:** 4, plus basement

**Observation Highlights:**

- 1 million gallon oil tank is too large and not necessary. Current location of tank would make for ideal future expansion for campus. Place new above ground @ location of building to the west of central heating plant (remove existing).
- Some settling of brick in south west corner above steam tunnel.
- Roof drains potentially emptying into main sewer. May be causing back flow of drains in floor of plant.
- No overflow drains.
- Water infiltration at sills of original 1951 windows causing damage to brick. Past End of Useful Service Life.
- Water and air infiltration at 70% of 1964 alum hopper windows. Many windows do not close securely. At End of Useful Service Life.
- Some degradation at soil line of brick veneer. Water damage at sills. Minimal re-pointing needed.
- 20% of vertical metal trim is due for replacement. Existing metal siding is due for replacement.
- Aluminum storefront doors at east loading dock near End of Useful Service Life.
- Fire suppression needed for boiler and oil tank.
- Provide code compliant fire alarm system.
- Emergency lights are at End of Useful Service Life. Heat at plant ruins battery. Provide alternative solution.
- Poor drainage in steam tunnel and remote vaults. Rusty ladders with broken rungs pose dangerous working conditions.
- Upgrade and add code compliant horns and strobes.
- **Operational efficiency, reliability, and safety issues are noted in an internal Michigan Tech report provided in the Appendix.**



<b>Current Replacement Value</b>	<b>Projected Annual Maintenance Budget</b>
<b>\$11,900,000</b>	<b>\$285,600</b>

PRIORITY	PROJECT TOTALS	FCNI
<b>1</b> (year 0)	<b>\$5,000</b>	<b>0.0%</b>
<b>1-3</b> (years 0-5)	<b>\$853,000</b>	<b>7.2%</b>
<b>All</b>	<b>\$1,027,000</b>	<b>8.6%</b>



**CENTRAL HEATING PLANT**

**Facility:** Facilities Building (44)  
**Use Type(s):** Maintenance  
**Built:** 1952  
**Area:** 21,176 SF  
**Floors:** 1

**Observation Highlights:**

- 50% of roof is not draining properly.
- 30% of roof drains clogged. Clean drains.
- Steel window frames at End of Useful Service Life.
- All sealant at steel window frames is beyond End of Useful Service Life.
- Minimal re-pointing needed in brick.
- Sealant at expansion joints on exterior cladding is beyond End of Useful Service Life.
- Overhead door into 105 is beyond End of Useful Service Life.
- Provide code compliant fire alarm system.
- Wood framed mezzanine may not be compliant.
- Water flowing toward overhead door on east elevation. Re-grade slope to repel water.
- Upgrade and add code compliant horns and strobes.
- Heat exchanger in Car Wash area should be insulated.



1 YEAR



5 YEAR

Current Replacement Value	Projected Annual Maintenance Budget
<b>\$2,668,176</b>	<b>\$64,036</b>

PRIORITY	PROJECT TOTALS	FCNI
<b>1</b> (year 0)	<b>\$3,500</b>	<b>0.1%</b>
<b>1-3</b> (years 0-5)	<b>\$594,500</b>	<b>22.3%</b>
<b>All</b>	<b>\$940,500</b>	<b>35.2%</b>

**FACILITIES BUILDING**

**Facility:** Hillside Place (48)  
**Use Type(s):** Student Housing, Student Union  
**Built:** 2010  
**Area:** 77,926 SF  
**Floors:** 7

**Observation Highlights:**

- Building is fully air-conditioned.
- At similar areas around the building, the through wall metal flashing appears to be improperly installed. i.e. the drip edge is bent at non-constant angle between floors 3 & 4 at the north elevation. The flashing does not extend far enough out beyond the face of the brick veneer. Repair is required.
- Some exterior building joints are improperly installed at south elevation at precast window sills. Repair and replace as necessary.



Current Replacement Value	Projected Annual Maintenance Budget
<b>\$14,805,940</b>	<b>\$355,343</b>

PRIORITY	PROJECT TOTALS	FCNI
<b>1</b> (year 0)	<b>\$20,000</b>	<b>0.1%</b>
<b>1-3</b> (years 0-5)	<b>\$20,000</b>	<b>0.1%</b>
<b>All</b>	<b>\$20,000</b>	<b>0.1%</b>

**HILLSIDE PLACE**

**Facility:** Gates Tennis Center (50)  
**Use Type(s):** Athletic  
**Built:** 1975  
**Area:** 29,610 SF  
**Floors:** 1

**Observation Highlights:**

- Water penetration at NE exterior wall.
- Provide lightning protection.
- Where brick slopes away from building, water infiltration is causing sprawling and brick failure. Provide alternate solution.
- Some collision damage in brick. Replace and repair large openings and broken brick.
- Corrugated metal leaks with driving rain.
- Sagging suspended ceiling tiles in locker rooms and showers. At End of Useful Service Life. Replace with hard ceiling.
- Due for re-painting.
- Carpet is dirty. Near End of Useful Service Life.
- Water infiltration at west elevation. Re-grade to redirect flow of water.
- Add additional Egress lights.
- Add horns and strobes.
- Heating hot water pumps and piping are missing insulation.
- Insulation on PRV valve and piping is missing



Current Replacement Value	Projected Annual Maintenance Budget
<b>\$6,662,250</b>	<b>\$159,894</b>

PRIORITY	PROJECT TOTALS	FCNI
<b>1</b> (year 0)	<b>\$12,000</b>	<b>0.2%</b>
<b>1-3</b> (years 0-5)	<b>\$1,218,000</b>	<b>18.3%</b>
<b>All</b>	<b>\$1,737,500</b>	<b>26.1%</b>



1 YEAR



5 YEAR

**GATES TENNIS CENTER**

**Facility:** KRC Engineering Design Center (69)  
**Use Type(s):** Administration, Voc-Tech  
**Built:** 2010  
**Area:** 10,100 SF  
**Floors:** 1

**Observation Highlights:**

- No overflow drains at flat roof.
- The hollow metal door with hollow metal frame at the high bay space needs sealant around frame at CMU. Provide sealant where necessary.
- Piping through janitor's closet and receiving dock office ceiling is not fire sealed. Remediate.



1 YEAR



5 YEAR

Current Replacement Value	Projected Annual Maintenance Budget
<b>\$2,100,800</b>	<b>\$50,419</b>

PRIORITY	PROJECT TOTALS	FCNI
<b>1</b> (year 0)	<b>\$1,000</b>	<b>0.0%</b>
<b>1-3</b> (years 0-5)	<b>\$2,000</b>	<b>0.1%</b>
<b>All</b>	<b>\$7,000</b>	<b>0.3%</b>

**KRC ENGINEERING DESIGN CENTER**

**Facility:** Harold Meese Center (84)  
**Use Type(s):** Administration  
**Built:** 1973  
**Area:** 15,020 SF  
**Floors:** 2, plus basement

**Observation Highlights:**

- Extensively remodeled and completely repurposed in 1996.
- It was reported that sprinklers discharged (in the past) and the carpet was not dried. Carpet is damaged. There is a “foreign” smell throughout the building.
- No ventilation at entry (Feels excessively hot).
- Window hardware is malfunctioning, due for repair.
- EIFS deterioration, damage and cracking observed around the perimeter of the building. Open sealant joints between panels. Due for repair.
- Multiple EIFS panels are damaged probably due to sprinkler discharge near north west corner. Due for Replacement.
- Carpet at offices and corridor on second level is End of Useful Service Life.
- Make-up air units 15 years old and due for replacement.



1 YEAR



5 YEAR

Current Replacement Value	Projected Annual Maintenance Budget
<b>\$2,853,800</b>	<b>\$68,491</b>

PRIORITY	PROJECT TOTALS	FCNI
<b>1</b> (year 0)	<b>\$0</b>	<b>0.0%</b>
<b>1-3</b> (years 0-5)	<b>\$512,000</b>	<b>17.9%</b>
<b>All</b>	<b>\$680,000</b>	<b>23.8%</b>

**HAROLD MEESE CENTER**



**Facility:** Sands Pilot Plant (90)  
**Use Type(s):** Voc-Tech  
**Built:** 1975  
**Area:** 11,520 SF  
**Floors:** 1

**Observation Highlights:**

- Pre-engineered buildings typically have a life expectancy in the range of 40-years. Structure is approaching the End of Useful Service Life.
- Damaged panels observed. No flashing at base of metal siding. Due for repair.
- All exterior sealant joints are at End of Useful Service Life. Some fasteners at metal siding are deteriorating.
- Hollow metal doors with hollow metal frames due for re-painting.
- Composite sectional overhead doors at End of Useful Service Life.
- Provide fire alarm system.
- Replace fixture with T8 HO strips.



<b>Current Replacement Value</b>	<b>Projected Annual Maintenance Budget</b>
<b>\$4,262,400</b>	<b>\$102,298</b>

PRIORITY	PROJECT TOTALS	FCNI
1 (year 0)	<b>\$0</b>	<b>0.0%</b>
1-3 (years 0-5)	<b>\$264,000</b>	<b>6.2%</b>
<b>All</b>	<b>\$701,000</b>	<b>16.4%</b>

**SANDS PILOT PLANT**

Facility: **Advanced Technology Development Complex (95)**

Use Type(s): Voc-Tech, Lab, Administration

Built: 2004

Area: 24,000 SF

Floors: 1

**Observation Highlights:**

- Concrete plank system missing fire sealant at expansion joint. Provide proper fire blocking.
- Fire blocking missing at top of CMU wall and roof deck between offices and mechanical chase. Provide proper fire blocking.
- Provide lightning protection.
- Some leaking at exhaust penetrations. Repair.
- Roof not fully adhered.
- Weather stripping between individual metal panels is falling out at joints. Provide alternative solution.
- Operable partition walls in conference room when closed don't allow for required means of egress.
- Overhead door at offices and corridor does not act as a means of egress. Provide second compliant means of egress.
- Means of egress in high bay space to be verified during each subsequent interior renovation/fit out.
- Security gate between 217 and GH1 corridor makes space non-compliant when closed.
- No fire protection or fire stopping in storage rooms.
- Update exit signage and emergency lighting per code requirements.
- Piping and ductwork through mezzanine walls into tenant spaces are not fire sealed. Remediate



1 YEAR



5 YEAR

<b>Current Replacement Value</b>	<b>Projected Annual Maintenance Budget</b>
<b>\$7,584,000</b>	<b>\$182,016</b>

<b>PRIORITY</b>	<b>PROJECT TOTALS</b>	<b>FCNI</b>
<b>1</b> (year 0)	<b>\$14,000</b>	<b>0.2%</b>
<b>1-3</b> (years 0-5)	<b>\$122,000</b>	<b>1.6%</b>
<b>All</b>	<b>\$382,000</b>	<b>5.0%</b>

**ADVANCED TECHNOLOGY DEVELOPMENT COMPLEX**

**Facility:** **Blizzard Building (102)**  
**Use Type(s):** Voc-Tech, Lab  
**Built:** 1999  
**Area:** 68,231 SF  
**Floors:** 1, with mezzanine

**Observation Highlights:**

- In general warehouse is aging predictably.
- All finishes in 101A are at End of Useful Service Life.
- Most office finishes are aging predictably.
- Non insulated CMU in warehouse causing thermal bridging, moisture infiltration, and deterioration of block especially at horizontal bond beam.
- Flashing on warehouse at parapet is coming loose.
- VCT in break room is stained and cracking. Beyond End of Useful Service Life.
- Travel distance to means of egress in warehouse is compromised with addition. Provide compliant means of egress.
- Non complaint exiting in warehouse, new exit doors required.
- Doors from mezzanine to warehouse have no fall protection.
- Windows between original warehouse and new addition are not rated.
- Internal access from office to warehouse is non-compliant.
- No horns or strobes noted.
- Add strobes and horns.



Current Replacement Value	Projected Annual Maintenance Budget
<b>\$23,403,233</b>	<b>\$561,678</b>

PRIORITY	PROJECT TOTALS	FCNI
<b>1</b> (year 0)	<b>\$0</b>	<b>0.0%</b>
<b>1-3</b> (years 0-5)	<b>\$288,500</b>	<b>1.2%</b>
<b>All</b>	<b>\$385,500</b>	<b>1.6%</b>

**BLIZZARD BUILDING**

**Facility: Daniel Heights Apartments (Lower Heights) (32)**

**Use Type(s):** Student Housing  
**Built:** 1960  
**Area:** 87,650 SF  
**Floors:** 2

**Observation Highlights:**

- Daniel Heights Apartments (Lower Heights) consists of 25 Duplexes.
- The storage space at each building houses the boilers, which is a safety concern. Moreover, if during the winter months the storage door is left open, the domestic water heaters freeze.
- Domestic water valves do not close due to high city water pressure.
- Replace 50% of kitchen cabinets (metal) with new plastic laminate cabinets and plastic laminate countertops (both base cabs and wall cabs).
- Exterior doors showing heavy wear and damage. Doors are at End of Useful Service Life.
- Damage of tile at Lower Daniel Heights observed at bathrooms. Tile is at End of Useful Service Life.
- Provide egress lighting outside of units.
- Remove and replace deteriorated exterior metal stairs and railings. End of Useful Service Life.
- Asphalt shingles at End of Useful Service Life.
- The existing 4" sanitary running from the building to the main line is in poor shape and should be replaced.



1 YEAR



5 YEAR

Current Replacement Value	Projected Annual Maintenance Budget
<b>\$16,653,500</b>	<b>\$399,684</b>

PRIORITY	PROJECT TOTALS	FCNI
<b>1</b> (year 0)	<b>\$550,000</b>	<b>3.3%</b>
<b>1-3</b> (years 0-5)	<b>\$1,454,500</b>	<b>8.7%</b>
<b>All</b>	<b>\$2,654,500</b>	<b>15.9%</b>

**DANIEL HEIGHTS APARTMENTS  
LOWER HEIGHTS**

Facility: **Daniel Heights Apartments (Upper Heights) (32-1)**

Use Type(s): Student Housing

Built: 1968

Area: 66,352 SF

Floors: 2

**Observation Highlights:**

- Daniel Heights Apartments (Upper Heights) consists of 13 Duplexes.
- The storage space at each building houses the boilers which is a safety concern. Moreover, if during the winter months the storage door is left open, the domestic water heaters freeze.
- Original (1968) double pane operable awning aluminum frame windows at End of Useful Service Life. Aluminum frame is falling apart, showing condensation and the lack of thermal break.
- Replace 50% of kitchen cabinets (metal) with new plastic laminate cabinets and plastic laminate countertops (both base cabs and wall cabs).
- Exterior doors showing heavy wear and damage. Doors are at End of Useful Service Life.
- Provide egress lighting outside of units.
- The existing 4" sanitary running from the building to the main line is in poor shape and should be replaced.



1 YEAR



5 YEAR

Current Replacement Value	Projected Annual Maintenance Budget
<b>\$12,606,880</b>	<b>\$302,565</b>

PRIORITY	PROJECT TOTALS	FCNI
<b>1</b> (year 0)	<b>\$765,000</b>	<b>6.1%</b>
<b>1-3</b> (years 0-5)	<b>\$1,308,000</b>	<b>10.4%</b>
<b>All</b>	<b>\$1,587,000</b>	<b>12.6%</b>

**DANIEL HEIGHTS APARTMENTS  
UPPER HEIGHTS**

Facility: **Daniel Heights Apts. (Upper Heights–Ad) (32-2)**

Use Type(s): Student Housing

Built: 1969

Area: 63,354 SF

Floors: 2

**Observation Highlights:**

- Daniel Heights Apartments (Upper Heights - Addition) consists of 13 Duplexes.
- The storage space at each building houses the boilers which is a safety concern. Moreover, if during the winter months the storage door is left open, the domestic water heaters freeze.
- Original (1968) double pane operable awning aluminum frame windows at End of Useful Service Life. Aluminum frame is falling apart, showing condensation and the lack of thermal break.
- Replace 50% of kitchen cabinets (metal) with new plastic laminate cabinets and plastic laminate countertops (both base cabs and wall cabs).
- Exterior doors showing heavy wear and damage. Doors are at End of Useful Service Life.
- Provide egress lighting outside of units.
- The existing 4" sanitary running from the building to the main line is in poor shape and should be replaced.



1 YEAR



5 YEAR

Current Replacement Value	Projected Annual Maintenance Budget
<b>\$12,037,260</b>	<b>\$288,894</b>

PRIORITY	PROJECT TOTALS	FCNI
<b>1</b> (year 0)	<b>\$765,000</b>	<b>6.4%</b>
<b>1-3</b> (years 0-5)	<b>\$1,313,000</b>	<b>10.9%</b>
<b>All</b>	<b>\$1,943,000</b>	<b>16.1%</b>

**DANIEL HEIGHTS APARTMENTS  
UPPER HEIGHTS**





# Institution Assessment Summary Report

Building Name	Year Built	Building Area	% of Total Area	CRV	% of Total CRV	Priority 1 (current year) Issues				Priority 1-3 (year 0-5) Issues				Priority 1-5 (all years) Issues			
						Project Totals	% of All Project Totals	FCNI	Rating	Project Totals	% of All Project Totals	FCNI	Rating	Project Totals	% of All Project Totals	FCNI	Rating
<b>All Assessed Facilities</b>		<b>3,134,829</b>		<b>\$766,243,398</b>		<b>\$13,295,400</b>		<b>1.7%</b>		<b>\$77,750,450</b>		<b>10.1%</b>		<b>\$126,930,200</b>		<b>16.6%</b>	
<b>Downtown Houghton</b>		<b>61,365</b>		<b>\$11,659,350</b>		<b>\$53,000</b>		<b>0.5%</b>		<b>\$614,000</b>		<b>5.3%</b>		<b>\$920,000</b>		<b>7.9%</b>	
Michigan Tech Lakeshore Center	1991	61,365	2.0%	\$11,659,350	1.5%	\$53,000	0.4%	0.5%	Good	\$614,000	0.8%	5.3%	Fair	\$920,000	0.7%	7.9%	Fair
<b>Houghton County Memorial Airport</b>		<b>78,331</b>		<b>\$25,504,033</b>		<b>\$1,000</b>		<b>0.0%</b>		<b>\$290,500</b>		<b>1.1%</b>		<b>\$392,500</b>		<b>1.5%</b>	
KRC Engineering Design Center	2010	10,100	0.3%	\$2,100,800	0.3%	\$1,000	0.0%	0.0%	Good	\$2,000	0.0%	0.1%	Good	\$7,000	0.0%	0.3%	Good
Blizzard Building	1999	68,231	2.2%	\$23,403,233	3.1%	\$0	0.0%	0.0%	Good	\$288,500	0.4%	1.2%	Good	\$385,500	0.3%	1.6%	Good
<b>Main Campus</b>		<b>2,983,613</b>		<b>\$724,817,615</b>		<b>\$13,241,400</b>		<b>1.8%</b>		<b>\$76,581,950</b>		<b>10.6%</b>		<b>\$124,916,700</b>		<b>17.2%</b>	
Administration Building	1969	73,389	2.3%	\$13,943,910	1.8%	\$0	0.0%	0.0%	Good	\$2,294,800	3.0%	16.5%	Poor	\$5,829,800	4.6%	41.8%	Poor
ROTC Building	1904	21,584	0.7%	\$4,289,820	0.6%	\$109,500	0.8%	2.6%	Good	\$1,256,750	1.6%	29.3%	Poor	\$1,650,250	1.3%	38.5%	Poor
Academic Offices Building	1908	27,405	0.9%	\$5,206,950	0.7%	\$885,000	6.7%	17.0%	Poor	\$2,424,000	3.1%	46.6%	Poor	\$2,964,000	2.3%	56.9%	Poor
Annex Building	1936	10,956	0.3%	\$2,213,112	0.3%	\$260,000	2.0%	11.7%	Poor	\$490,000	0.6%	22.1%	Poor	\$735,000	0.6%	33.2%	Poor
Electrical Energy Resources Center	1976	162,170	5.2%	\$44,596,750	5.8%	\$2,500	0.0%	0.0%	Good	\$1,506,500	1.9%	3.4%	Good	\$10,901,500	8.6%	24.4%	Poor
Dow Environmental Sciences and Engineering Building	1998	167,100	5.3%	\$52,970,700	6.9%	\$45,000	0.3%	0.1%	Good	\$252,500	0.3%	0.5%	Good	\$332,500	0.3%	0.6%	Good
Rozsa Performing Arts and Education Center	2000	80,000	2.6%	\$21,600,000	2.8%	\$1,000	0.0%	0.0%	Good	\$11,000	0.0%	0.1%	Good	\$636,000	0.5%	2.9%	Good
Walker Arts and Humanities Center	1986	87,094	2.8%	\$18,812,304	2.5%	\$3,500	0.0%	0.0%	Good	\$3,070,500	3.9%	16.3%	Poor	\$3,890,000	3.1%	20.7%	Poor
Minerals and Materials Engineering Building	1991	172,800	5.5%	\$59,270,400	7.7%	\$75,000	0.6%	0.1%	Good	\$725,000	0.9%	1.2%	Good	\$2,385,000	1.9%	4.0%	Good
Minerals and Materials Undergrad Building	1955	44,400	1.4%	\$11,877,000	1.6%	\$500	0.0%	0.0%	Good	\$302,500	0.4%	2.5%	Good	\$457,500	0.4%	3.9%	Good
Grover Dillman Hall	1957	86,300	2.8%	\$23,732,500	3.1%	\$1,610,000	12.1%	6.8%	Fair	\$2,948,000	3.8%	12.4%	Poor	\$4,258,000	3.4%	17.9%	Poor
Fisher Hall	1964	112,100	3.6%	\$22,251,850	2.9%	\$75,000	0.6%	0.3%	Good	\$6,181,500	8.0%	27.8%	Poor	\$7,719,500	6.1%	34.7%	Poor
J.R. Van Pelt Library	1966	130,031	4.1%	\$29,907,130	3.9%	\$15,000	0.1%	0.1%	Good	\$2,975,000	3.8%	9.9%	Fair	\$3,402,250	2.7%	11.4%	Poor
U.J. Noblet Forestry Building	1967	95,337	3.0%	\$26,932,703	3.5%	\$7,500	0.1%	0.0%	Good	\$3,967,500	5.1%	14.7%	Poor	\$5,447,500	4.3%	20.2%	Poor
Chemical Sciences and Engineering Building	1968	162,500	5.2%	\$45,906,250	6.0%	\$0	0.0%	0.0%	Good	\$3,118,000	4.0%	6.8%	Fair	\$4,773,000	3.8%	10.4%	Poor
R.L. Smith Building	1971	162,500	5.2%	\$51,350,000	6.7%	\$693,900	5.2%	1.4%	Good	\$2,026,900	2.6%	3.9%	Good	\$10,058,400	7.9%	19.6%	Poor
Student Development Complex	1972	313,690	10.0%	\$69,796,025	9.1%	\$6,157,000	46.3%	8.8%	Fair	\$16,374,500	21.1%	23.5%	Poor	\$19,266,500	15.2%	27.6%	Poor
Kanwal and Ann Rekhi Hall	2005	51,439	1.6%	\$10,133,483	1.3%	\$46,000	0.3%	0.5%	Good	\$56,000	0.1%	0.6%	Good	\$189,000	0.1%	1.9%	Good
Douglas Houghton Hall	1938	92,500	3.0%	\$17,575,000	2.3%	\$285,000	2.1%	1.6%	Good	\$5,582,000	7.2%	31.8%	Poor	\$7,367,000	5.8%	41.9%	Poor
Daniell Heights Apartments (Lower Heights)	1960	87,650	2.8%	\$16,653,500	2.2%	\$550,000	4.1%	3.3%	Good	\$1,454,500	1.9%	8.7%	Fair	\$2,654,500	2.1%	15.9%	Poor
Daniell Heights Apartments (Upper Heights)	1968	66,352	2.1%	\$12,606,880	1.6%	\$765,000	5.8%	6.1%	Fair	\$1,308,000	1.7%	10.4%	Poor	\$1,587,000	1.3%	12.6%	Poor
Daniell Heights Apartments (Upper Heights - Addition)	1969	63,354	2.0%	\$12,037,260	1.6%	\$765,000	5.8%	6.4%	Fair	\$1,313,000	1.7%	10.9%	Poor	\$1,943,000	1.5%	16.1%	Poor
Memorial Union Building	1952	89,791	2.9%	\$19,327,513	2.5%	\$49,500	0.4%	0.3%	Good	\$4,548,500	5.9%	23.5%	Poor	\$4,734,000	3.7%	24.5%	Poor
Wadsworth Hall	1955	300,239	9.6%	\$57,045,410	7.4%	\$76,000	0.6%	0.1%	Good	\$1,288,000	1.7%	2.3%	Good	\$5,418,000	4.3%	9.5%	Fair
West McNair Hall	1966	54,000	1.7%	\$10,260,000	1.3%	\$11,000	0.1%	0.1%	Good	\$3,031,000	3.9%	29.5%	Poor	\$4,396,000	3.5%	42.8%	Poor
McNair Hall Food Services	1966	18,000	0.6%	\$4,500,000	0.6%	\$0	0.0%	0.0%	Good	\$972,500	1.3%	21.6%	Poor	\$1,315,500	1.0%	29.2%	Poor
East McNair Hall	1968	71,300	2.3%	\$13,547,000	1.8%	\$699,000	5.3%	5.2%	Fair	\$3,784,000	4.9%	27.9%	Poor	\$5,819,000	4.6%	43.0%	Poor
Central Heating Plant	1951	11,900	0.4%	\$11,900,000	1.6%	\$5,000	0.0%	0.0%	Good	\$853,000	1.1%	7.2%	Fair	\$1,027,000	0.8%	8.6%	Fair
Facilities Building	1952	21,176	0.7%	\$2,668,176	0.3%	\$3,500	0.0%	0.1%	Good	\$594,500	0.8%	22.3%	Poor	\$940,500	0.7%	35.2%	Poor
Hillside Place	2010	77,926	2.5%	\$14,805,940	1.9%	\$20,000	0.2%	0.1%	Good	\$20,000	0.0%	0.1%	Good	\$20,000	0.0%	0.1%	Good
Gates Tennis Center	1975	29,610	0.9%	\$6,662,250	0.9%	\$12,000	0.1%	0.2%	Good	\$1,218,000	1.6%	18.3%	Poor	\$1,737,500	1.4%	26.1%	Poor
Harold Meese Center	1973	15,020	0.5%	\$2,853,800	0.4%	\$0	0.0%	0.0%	Good	\$512,000	0.7%	17.9%	Poor	\$680,000	0.5%	23.8%	Poor
Advanced Technology Development Complex	2004	24,000	0.8%	\$7,584,000	1.0%	\$14,000	0.1%	0.2%	Good	\$122,000	0.2%	1.6%	Good	\$382,000	0.3%	5.0%	Fair
<b>Sands Pilot Site</b>		<b>11,520</b>		<b>\$4,262,400</b>		<b>\$0</b>		<b>0.0%</b>		<b>\$264,000</b>		<b>6.2%</b>		<b>\$701,000</b>		<b>16.4%</b>	
Sands Pilot Plant	1975	11,520	0.4%	\$4,262,400	0.6%	\$0	0.0%	0.0%	Good	\$264,000	0.3%	6.2%	Fair	\$701,000	0.6%	16.4%	Poor



**Building Information**

Year Built 1969 Building Area (sf) 73,389 Floors 6 Building Engineer James Schultz

**Building Notes:**

Building is not sprinkled and not air-conditioned. The occupancy of the building is 12 months continuous. Floor to floor height is short. The mechanical system is not a common system (air to the administration building occupied spaces is supplied by ceiling ducts, with return air removed from the spaces via return air registers in the walls, which feed into a return air plenum in the space above the ceiling below).

9"x9" floor tile was reported to have A.C.M. A.C.M. fire proofing was also reported on the structural steel structure, which has been partially encapsulated above 1st and 2nd floor ceilings. The plenum space between the lay-in ceiling and the steel deck is being used as air supply and return. Mastic containing A.C.M. was reported at 9"x9" vinyl tile. A.C.M. was reported on elbows on piping and tees. Lead paint throughout building was reported.

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**Building Use Types**

Use Type %	Use Type
100%	Administrative

**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	41.81%	Poor	<b>CRV</b>	\$13,943,910	<b>Annual Maint and Capital Renewal Budget</b>	\$334,654
						3% of CRV x 80%

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	16.46%	Poor
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**Priority 1 (current year only)**

<b>FCNI</b>	0.00%	Good
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation	
1 Currently Critical (Current Year)	\$0			\$0
2 Potentially Critical (Year 1)	\$583,300			\$583,300
3 Not yet Critical (Year 2-5)	\$1,614,000	\$97,500		\$1,711,500
4 Watch List (Year 6-10)		\$2,535,000	\$840,000	\$3,375,000
5 Long Term (Year 11+)	\$10,000	\$150,000		\$160,000
Subtotal	\$2,207,300	\$2,782,500	\$840,000	<b>\$5,829,800</b>
				<b>Total of Projects</b>

<b>Structure: Structure</b>	<b>System Rating: 5</b>	<b>System Subtotal: \$</b> (unresolved issues)
<i>Steel structure. Metal roof deck.</i>		

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Y	No Reported Problems	Deferred Maintenance	\$0	<input type="checkbox"/>	<input type="checkbox"/>	

<b>Shell: Roof</b>	<b>System Rating: 5</b>	<b>System Subtotal: \$155,000</b> (unresolved issues)
<i>(2007) EPDM single-ply ballasted. No overflow drains present.</i>		

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Minor coping damage. Replace and repair as needed.	Deferred Maintenance	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	2007 EPDM single-ply	Planned Maint/Capital Renewal	\$150,000	<input type="checkbox"/>	<input type="checkbox"/>	

<b>Shell: Glazing</b>	<b>System Rating: 2</b>	<b>System Subtotal: \$300,000</b> (unresolved issues)
<i>Insulated glazing, aluminum window frames, operable casement windows.</i>		

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Water and air infiltration at window frames. Sealant at frames is failing. Seals at glazing are not functioning. Entire glazing system at End of Useful Service Life.	Deferred Maintenance	\$300,000	<input type="checkbox"/>	<input type="checkbox"/>	

<b>Shell: Cladding</b>	<b>System Rating: 4</b>	<b>System Subtotal: \$81,000</b> (unresolved issues)
<i>Brick veneer with CMU backup. Cementitious panel at penthouse. Metal fascia and soffit.</i>		

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Cementitious panel at penthouse due for repainting.	Deferred Maintenance	\$6,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Tuck-pointing needed.	Deferred Maintenance	\$40,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Sealant Joints at End of Useful Service Life.	Deferred Maintenance	\$35,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Interior Partitions System Rating: 4 System Subtotal: \$75,000** (unresolved issues)

*Vinyl wrapped gypsum board on metal stud in north/south corridors and west entry. Gypsum board on metal stud at newly renovated areas. Painted CMU typical in corridor. Ceramic tile at bathrooms.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Paint interior partitions.	Deferred Maintenance	\$75,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors System Rating: 4 System Subtotal: \$455,000** (unresolved issues)

*Solid core wood doors with hollow metal frames. Accessible door hardware at first floor. Aluminum storefront at vestibules. Recently updated east entry in 2010.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	75% of solid core wood doors at End of Useful Service Life.	Deferred Maintenance	\$325,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Aluminum east entry doors on ground floor are at End of Useful Service Life. Provide power operated door switch at exterior entry.	Deferred Maintenance	\$20,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Remaining 25% of solid core wood doors near End of Useful Service Life.	Planned Maint/Capital Renewal	\$110,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors System Rating: 4 System Subtotal: \$270,000** (unresolved issues)

*Carpet. Ceramic tile in bathrooms. Quarry tile. VCT. 9x9 floor tile. Unfilled travertine tile at first floor lobby. Wood flooring. Rubber nosing at stair.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	VCT at End of Useful Service Life.	Deferred Maintenance	\$90,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Carpet at End of Useful Service Life.	Deferred Maintenance	\$180,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Ceilings System Rating: 4 System Subtotal: \$270,000** (unresolved issues)

*Mix of 2x2 and 2x4 suspended ceiling systems throughout balance of building. Original 1x1 concealed spline acoustic ceiling system in some areas.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Suspended ceiling system in mail room, west entry, and corridors at End of Useful Service Life.	Deferred Maintenance	\$270,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Conveying System: Elevators System Rating: 3 System Subtotal: \$530,000** (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Renovate cab interiors.	Deferred Maintenance	\$30,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Dover elevator no. 1: controls, relay logic and dc generator are reaching End of Useful Service Life. Modernization is required for improved reliability and energy efficiency.	Deferred Maintenance	\$250,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Dover elevator no. 2: controls, relay logic and dc generator are reaching the End of Useful Service Life. Modernization is required for improved reliability and energy efficiency.	Deferred Maintenance	\$250,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Plumbing System: Domestic Water/Plumbing System Rating: 3 System Subtotal: \$282,000** (unresolved issues)

*Ok shape, faucets can not be replaced.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace sinks and faucets.	Deferred Maintenance	\$2,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Replace domestic water plumbing.	Planned Maint/Capital Renewal	\$280,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC System Rating: 4 System Subtotal: \$2,028,300** (unresolved issues)

*HW pumps and heat exchanger are old(original) but working, 3rd floor and penthouse AHUs, Reheat coils are HW, No overall A/C, 2nd floor has some split systems, low in wall returns, some original motors.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Replace HW pumps and heat exchanger.	Deferred Maintenance	\$75,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Replace original motors with high efficiency motors.	Deferred Maintenance	\$3,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Reheat coils are plugged.	Deferred Maintenance	\$300	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Replace HVAC system.	Planned Maint/Capital Renewal	\$1,950,000	<input type="checkbox"/>	<input type="checkbox"/>	

**BUILDING REPORT Administration Building****BUILDING No.****1**

Michigan Technological University

CAMPUS Main Campus

**HVAC System: Steam Production Equip.****System Rating: 3****System Subtotal: \$195,000** (unresolved issues)*Campus steam.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Replace steam piping/condensate, PRV system	Planned Maint/Capital Renewal	\$195,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls****System Rating: 3****System Subtotal: \$208,500** (unresolved issues)*Pneumatic*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Replace with DDC.	Deferred Maintenance	\$200,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Tie-in DCC to central control.	Planned Maint/Capital Renewal	\$7,500	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Leak in Johnson valves.	Deferred Maintenance	\$1,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Sprinklers****System Rating: 5****System Subtotal:** (unresolved issues)*No sprinklers.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Emergency Lighting****System Rating: 4****System Subtotal:** (unresolved issues)*Lights are tied to generator.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Fire Alarm****System Rating: 3****System Subtotal: \$90,000** (unresolved issues)*Zoned system- only pull stations/ duct smoke, no strobes.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	System is old, does not meet todays code- should be replaced.	Planned Maint/Capital Renewal	\$90,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Electrical Power System Rating: 3 System Subtotal: \$40,000** (unresolved issues)

*500 KVA dry type transformer, draw out breakers Federal Pacific , one emergency panel, original GE panelboards*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	transformer is dust covered-needs cleaning, breakers have not been tested in 20 years-need testing and replacement of trip mechanism.	Deferred Maintenance	\$40,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Standby Power System Rating: 5 System Subtotal:** (unresolved issues)

*Campus system.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Lighting System Rating: 4 System Subtotal: \$10,000** (unresolved issues)

*Most lights are T8, mechanical rooms with T12, fixtures have supply boots, Admissions has 2 X 4 parabolic, RT5 fixtures in renovated second floor area, upper floors have 1 X 4 with opal lens*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	1 X 4 opal fixtures on upper floors not efficient- replace with prismatic.	Deferred Maintenance	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Clock System System Rating: 4 System Subtotal:** (unresolved issues)

*NA*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Data/Telecom System System Rating: 5 System Subtotal:** (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**BUILDING REPORT Administration Building****BUILDING No.****1**

Michigan Technological University

CAMPUS Main Campus

**Code Compliance: Code/Life Safety****System Rating: 3****System Subtotal: \$840,000** (unresolved issues)*Fire alarm system - Not up to date.**Not sprinkled.**Emergency lighting tied to generator.**Ground floor is accessible including new west entry.**Dead-end corridor at ground floor, room G05.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Railings at stairs are not code compliant. Provide code compliant hand rail.	Facility Adaptation	\$100,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Non accessible restrooms. Provide accessible facilities.	Facility Adaptation	\$700,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Door hardware in balance of building is not compliant. Provide accessible hardware.	Facility Adaptation	\$40,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Adjacent Site: Immediate Site****System Rating: 5****System Subtotal:** (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

End of Building Report for: **Administration Building**



### Building Information

Year Built 1991 Building Area (sf) 61,365 Floors 3 Building Engineer James Schultz

#### Building Notes:

Original building dates from early 1900's as a warehouse use.  
Building was extensively remodeled in 2009, inside and out.

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### Building Use Types

Use Type %	Use Type
100%	Administrative

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**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	7.89%	Fair	<b>CRV</b>	\$11,659,350	<b>Annual Maint and Capital Renewal Budget</b>	\$279,824
						3% of CRV x 80%

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	5.27%	Fair
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**Priority 1 (current year only)**

<b>FCNI</b>	0.45%	Good
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation	
1 Currently Critical (Current Year)	\$53,000			\$53,000
2 Potentially Critical (Year 1)	\$56,000			\$56,000
3 Not yet Critical (Year 2-5)		\$505,000		\$505,000
5 Long Term (Year 11+)		\$306,000		\$306,000
Subtotal	\$109,000	\$811,000		<b>\$920,000</b>
				<b>Total of Projects</b>

**Structure: Structure** **System Rating: 5** **System Subtotal:** (unresolved issues)  
*Steel structure. Metal roof deck. Concrete slab on grade.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Roof** **System Rating: 5** **System Subtotal: \$230,000** (unresolved issues)  
*(2010) PVC single ply adhered.  
Standing seam metal roof system at main entry, with gutter and downspouts.  
Roof has overflow drains.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	PVC single ply adhered.	Planned Maint/Capital Renewal	\$230,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Glazing** **System Rating: 5** **System Subtotal:** (unresolved issues)  
*(2009) Insulated glazing, aluminum window frames, fixed windows typical.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Cladding** **System Rating: 4** **System Subtotal: \$45,000** (unresolved issues)  
*EIFS on CMU backup. Stone veneer base.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Damage to EIFS observed. EIFS is due for repair.	Deferred Maintenance	\$30,000	<input type="checkbox"/>	<input type="checkbox"/>	
1: Currently Critical (Current Year)	Sealant joints between EIFS and stone sills are at End of Useful Service Life. EIFS building joints are at End of Useful Service Life.	Deferred Maintenance	\$15,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Interior Partitions**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

*Gypsum board along main corridors. Vinyl wall covering on gypsum board at lobby, community room, student center, and restrooms. Ceramic tile at restrooms. Painted parging on existing masonry wall and painted CMU at room 114.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors**

**System Rating: 5**

**System Subtotal: \$3,000** (unresolved issues)

*Accessible solid core wood door (hardware) with solid wood frames typical in balance of building. Solid core wood doors with hollow metal frames at egress. Aluminum storefront system at entry vestibules. Hollow metal door with hollow metal frame at loading dock 118.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Exterior doors at rooms 114 and 121 are missing thresholds. Replace thresholds.	Deferred Maintenance	\$3,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

*Ceramic tile at main lobby, along main corridors, and in restrooms. Sealed concrete. Carpet typical at second level.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Ceilings**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

*Mix of 2x2 and 2x4 suspended ceiling system. Plaster board. Vinyl coated ceiling in kitchen. Wood, tongue and groove. Open to deck in basement.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Plumbing System: Domestic Water/Plumbing**

**System Rating: 3**

**System Subtotal: \$240,000** (unresolved issues)

*Some of the DW heaters are beginning to leak.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Y	Replace DW heaters.	Deferred Maintenance	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Replace DW plumbing.	Planned Maint/Capital Renewal	\$235,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC** System Rating: **3** System Subtotal: **\$270,000** (unresolved issues)

*Ground water heat pump system- temperature has been rising, new mechanical systems except pumps, 73 heat pumps above the ceiling, 42 vertical wells.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace 73 heat pumps and thermostats.	Planned Maint/Capital Renewal	\$270,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: Steam Production Equip.** System Rating: **NA** System Subtotal: (unresolved issues)

*Not on campus steam.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls** System Rating: System Subtotal: (unresolved issues)

*DDC*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Sprinklers** System Rating: **4** System Subtotal: (unresolved issues)

*Fully sprinklered.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Emergency Lighting** System Rating: **3** System Subtotal: **\$31,000** (unresolved issues)

*Lighting on generator and exits.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Need additional egress lighting and exit signs.	Deferred Maintenance	\$31,000	<input type="checkbox"/>	<input type="checkbox"/>	

<b>Safety: Fire Alarm</b>	<b>System Rating: 4</b>	<b>System Subtotal: \$76,000</b> (unresolved issues)
<i>Pyrotronics FA system.</i>		

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	System is functional but not MTU standard.	Planned Maint/Capital Renewal	\$76,000	<input type="checkbox"/>	<input type="checkbox"/>	

<b>Electrical System: Electrical Power</b>	<b>System Rating: 5</b>	<b>System Subtotal:</b> (unresolved issues)
<i>Pad mounted 500 KVA transformer, Square D switchgear in good shape with auto transfer switch on main.</i>		

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

<b>Electrical System: Standby Power</b>	<b>System Rating: 5</b>	<b>System Subtotal:</b> (unresolved issues)
<i>2 -250KW generators to power entire building.</i>		

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

<b>Electrical System: Lighting</b>	<b>System Rating: 4</b>	<b>System Subtotal:</b> (unresolved issues)
<i>T8 lay in fixtures, some RT5 fixtures in Community Room</i>		

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

<b>Electrical System: Clock System</b>	<b>System Rating: NA</b>	<b>System Subtotal:</b> (unresolved issues)
<i>NA</i>		

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No reported problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**BUILDING REPORT Michigan Tech Lakeshore Center****BUILDING No.****3**

Michigan Technological University

CAMPUS Downtown Houghton

**Code Compliance: Code/Life Safety****System Rating: 5****System Subtotal:** (unresolved issues)*Fire alarm system - operational.**Sprinkled.**Elevator.**Accessible restrooms in balance of building.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Adjacent Site: Immediate Site****System Rating: 4****System Subtotal: \$25,000** (unresolved issues)*Exterior lighting is adequate.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Areas observed where sections of perimeter concrete walkway have heaved upward. Remove and replace heaved concrete.	Deferred Maintenance	\$25,000	<input type="checkbox"/>	<input type="checkbox"/>	

End of Building Report for: **Michigan Tech Lakeshore Center**

**Building Information**

Year Built 1904      Building Area (sf) 21,584      Floors 3      Building Engineer James Schultz

**Building Notes:**

No ventilation in building. Building steam pipe goes directly thru the basement rooms (B006 Conference Room).

**Building Use Types**

Use Type %	Use Type
25%	Recreation/Gym
75%	Administrative



**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	38.47%	Poor	<b>CRV</b>	\$4,289,820	<b>Annual Maint and Capital Renewal Budget</b>	\$102,956
						3% of CRV x 80%

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	29.30%	Poor
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**Priority 1 (current year only)**

<b>FCNI</b>	2.55%	Good
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation	
1 Currently Critical (Current Year)	\$102,000	\$7,500		\$109,500
2 Potentially Critical (Year 1)	\$145,250	\$580,000		\$725,250
3 Not yet Critical (Year 2-5)	\$342,000	\$80,000		\$422,000
4 Watch List (Year 6-10)	\$16,500		\$307,000	\$323,500
5 Long Term (Year 11+)	\$10,000	\$60,000		\$70,000
Subtotal	\$615,750	\$727,500	\$307,000	<b>\$1,650,250</b> <b>Total of Projects</b>

**Structure: Structure** **System Rating: 5** **System Subtotal:** (unresolved issues)  
*Heavy timber structure. Wood roof deck. Stone/CMU basement walls.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Roof** **System Rating: 5** **System Subtotal: \$60,000** (unresolved issues)  
*(2007) Asphalt shingles.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	2007 Asphalt shingles.	Planned Maint/Capital Renewal	\$60,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Glazing** **System Rating: 3** **System Subtotal: \$150,000** (unresolved issues)  
*(1987) Insulated glazing, wood window frames, fixed and operable double hung windows.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Windows at End of Useful Service Life.	Deferred Maintenance	\$150,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Cladding** **System Rating: 4** **System Subtotal: \$102,000** (unresolved issues)  
*Brick veneer on CMU backup grouted solid. Jacobsville Sandstone rusticated base. Plaster and wood timber. EIFS at north entry.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	EIFS at north entry (loading area) is showing some damage. Due for repair.	Deferred Maintenance	\$2,000	<input type="checkbox"/>	<input type="checkbox"/>	
1: Currently Critical (Current Y	Replace sealant joints.	Deferred Maintenance	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Some deterioration at brick observed. Tuck pointing is required.	Deferred Maintenance	\$15,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Some deterioration of Jacobsville Sandstone at grade level, repair individual units.	Deferred Maintenance	\$75,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Interior Partitions System Rating: 4 System Subtotal: \$25,000** (unresolved issues)

*Gypsum board typical throughout balance of building. Ceramic tile typical in bathrooms. Painted CMU. Plaster walls in corridor on second floor.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Interior partitions due for re-paint.	Deferred Maintenance	\$25,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors System Rating: 4 System Subtotal: \$1,500** (unresolved issues)

*Hollow metal doors with hollow metal frames on first level. Original solid core wood door with wood frames typical on second level.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	West entry doors at ground floor due for repainting.	Deferred Maintenance	\$1,500	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors System Rating: 4 System Subtotal: \$85,000** (unresolved issues)

*Quarry tile in bathrooms. VCT in corridors and lobby. Carpet over wood floor in offices, lounge, and meeting room. Wood floor at track.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	VCT near End of Useful Service Life.	Deferred Maintenance	\$25,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Wood on track is aging predictably, due for repair and refinish.	Deferred Maintenance	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Carpet over wood is at End of Useful Service Life.	Deferred Maintenance	\$55,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Ceilings System Rating: 3 System Subtotal: \$80,000** (unresolved issues)

*Plaster ceiling in balance of building. 2x2 suspended ceiling systems at conference rooms and some corridors. Wood ceiling in gymnasium.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	2x2 suspended ceiling at End of Useful Service Life.	Deferred Maintenance	\$80,000	<input type="checkbox"/>	<input type="checkbox"/>	

**BUILDING REPORT ROTC Building****BUILDING No.****4**

Michigan Technological University

CAMPUS Main Campus

**Plumbing System: Domestic Water/Plumbing****System Rating: 2****System Subtotal: \$90,000** (unresolved issues)*Electric HW Heater.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Plumbing is original 1904. Having problems, should be replaced.	Deferred Maintenance	\$90,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC****System Rating: 2****System Subtotal: \$580,250** (unresolved issues)*Mixture of some radiators, finned tube, and AHU units in attic space. Ventilation mainly from windows.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Reheat coils are plugged.	Deferred Maintenance	\$250	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Replace HVAC system.	Planned Maint/Capital Renewal	\$580,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: Steam Production Equip.****System Rating: 2****System Subtotal: \$80,000** (unresolved issues)*Campus steam, steam tunnel enters.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Steam piping is original. Replace steam piping/condensate, PRV system.	Planned Maint/Capital Renewal	\$80,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls****System Rating: 3****System Subtotal: \$62,500** (unresolved issues)*Pneumatic.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Y	Tie-in DDC to Central Control.	Planned Maint/Capital Renewal	\$7,500	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Replace with DDC.	Deferred Maintenance	\$55,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Sprinklers****System Rating: 5****System Subtotal:** (unresolved issues)*Fully sprinklered, stand pipes.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Emergency Lighting** **System Rating: 4** **System Subtotal: \$10,000** (unresolved issues)  
*New EBUs thru out.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Egress path covered.	Deferred Maintenance	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Fire Alarm** **System Rating: 4** **System Subtotal: \$10,000** (unresolved issues)  
*Newer EST3 system, pull stations only.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	Need more notification devices.	Deferred Maintenance	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Electrical Power** **System Rating: 3** **System Subtotal: \$2,000** (unresolved issues)  
*480V coming in changes to 120/208V transformer in basement, DP-1 distribution panel, Square D panels in good shape, old cable bus panel found at stairs going to attic (not energized).*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Cable bus panel should be removed.	Deferred Maintenance	\$2,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Standby Power** **System Rating: 5** **System Subtotal:** (unresolved issues)  
*NA*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	Not tied to campus.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Lighting** **System Rating: 4** **System Subtotal: \$5,000** (unresolved issues)  
*Fluorescent lighting in most spaces, surface mounted 1 X mostly T8 and CFL, original knob and tube lighting in attic.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Replace lighting in Attic with CFL and replace all knob and tube.	Deferred Maintenance	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	

<b>Electrical System: Clock System</b>	<b>System Rating: NA</b>	<b>System Subtotal:</b> (unresolved issues)
NA		

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

<b>Code Compliance: Code/Life Safety</b>	<b>System Rating: 3</b>	<b>System Subtotal: \$307,000</b> (unresolved issues)
<i>Fire alarm system - operational.                  Sprinkled.                  Emergency lighting is battery operated.                  Non accessible entries.                  No elevator.                  Handrail at main stair is not code compliant.</i>		

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Door hardware non compliant. Provide accessible door hardware.	Facility Adaptation	\$30,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Non compliant handrail at stairs. Provide code compliant handrail at stairs.	Facility Adaptation	\$12,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Non accessible entries. Provide wheelchair lift.	Facility Adaptation	\$40,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Non compliant restrooms. Provide accessible restrooms.	Facility Adaptation	\$150,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Building entry non compliant. Provide accessible ramp into building.	Facility Adaptation	\$75,000	<input type="checkbox"/>	<input type="checkbox"/>	

<b>Adjacent Site: Immediate Site</b>	<b>System Rating: 5</b>	<b>System Subtotal:</b> (unresolved issues)
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Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

End of Building Report for: **ROTC Building**

### Building Information

Year Built   1908     Building Area (sf)   27,405     Floors   3     Building Engineer   James Schultz

#### Building Notes:

No ventilation at south entry lobby – overheating in Spring/Fall. Basement level needs cooling system (steam line goes thru vending area at West entry).

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### Building Use Types

Use Type %	Use Type
100%	Administrative

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**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	56.92%	Poor	<b>CRV</b>	\$5,206,950	<b>Annual Maint and Capital Renewal Budget</b>	\$124,967
	3% of CRV x 80%					

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	46.55%	Poor
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**Priority 1 (current year only)**

<b>FCNI</b>	17.00%	Poor
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation	
1 Currently Critical (Current Year)		\$885,000		\$885,000
2 Potentially Critical (Year 1)	\$260,000	\$87,000		\$347,000
3 Not yet Critical (Year 2-5)	\$1,192,000			\$1,192,000
4 Watch List (Year 6-10)	\$10,000		\$435,000	\$445,000
5 Long Term (Year 11+)		\$95,000		\$95,000
Subtotal	\$1,462,000	\$1,067,000	\$435,000	<b>\$2,964,000</b> <b>Total of Projects</b>



**Structure: Structure**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

*Concrete structure. Concrete roof deck. Cast in place concrete basement walls and tunnel.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Roof**

**System Rating: 5**

**System Subtotal: \$100,000** (unresolved issues)

*(2006) PVC single-ply, adhered.  
No overflow drains present.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Minor coping repairs need.	Deferred Maintenance	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	2006 PVC single-ply.	Planned Maint/Capital Renewal	\$95,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Glazing**

**System Rating: 3**

**System Subtotal: \$415,000** (unresolved issues)

*(1986) Insulated glazing, aluminum window frames, operable windows. Windows at end of useful service life.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Water and air infiltration due to gasketing issues. Gaskets at End of Useful Service Life.	Deferred Maintenance	\$415,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Cladding**

**System Rating: 4**

**System Subtotal: \$477,000** (unresolved issues)

*Brick veneer on CMU backup on Jacobsville Sandstone rusticated base.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Water infiltration problems reported at basement level at grade.	Deferred Maintenance	\$175,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Missing mortar and cracking at brick veneer and stone. Brick veneer and stone due for substantial tuck pointing.	Deferred Maintenance	\$40,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Exterior sealant joints at End of Useful Service Life.	Deferred Maintenance	\$12,000	<input type="checkbox"/>	<input type="checkbox"/>	

**BUILDING REPORT****Academic Offices Building****BUILDING No.****5**

Michigan Technological University

CAMPUS Main Campus

**Shell: Cladding****System Rating: 4****System Subtotal: \$477,000** (unresolved issues)*Brick veneer on CMU backup on Jacobsville Sandstone rusticated base.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Some Jacobsville Stone deterioration observed at east entry and building façade.	Deferred Maintenance	\$250,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Interior Partitions****System Rating: 4****System Subtotal: \$25,000** (unresolved issues)*Gypsum board typical throughout balance of building. Ceramic tile typical in bathrooms. Painted CMU. Plaster walls in corridor on second floor.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Due for repainting.	Deferred Maintenance	\$25,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors****System Rating: 4****System Subtotal: \$250,000** (unresolved issues)*Original solid core wood doors with wood frames typical in balance of building. Hollow metal doors with hollow metal frames. Aluminum doors at entry vestibule.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Original solid core wood doors on interior are not compliant. Provide accessible frames, doors, and hardware.	Facility Adaptation	\$210,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Aluminum doors at entry are not compliant. Provide accessible hardware.	Facility Adaptation	\$40,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors****System Rating: 4****System Subtotal: \$100,000** (unresolved issues)*Marble at east and west entry areas. Carpet in offices, elevator and corridor on second level. Vinyl tile typical in corridors. Quarry tile in bathrooms. Terrazzo stair treads at grand stair.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	VCT at balance of building at End of Useful Service Life.	Deferred Maintenance	\$35,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Carpet beyond End of Useful Service Life.	Deferred Maintenance	\$65,000	<input type="checkbox"/>	<input type="checkbox"/>	

**BUILDING REPORT****Academic Offices Building****BUILDING No.****5**

Michigan Technological University

CAMPUS Main Campus

**Interior Finishes: Ceilings****System Rating: 3****System Subtotal: \$100,000** (unresolved issues)*2x2 suspended ceiling systems throughout balance of building. Coffered ceiling system at first floor main lobby.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	2x2 ceilings in corridors are at End of Useful Service Life.	Deferred Maintenance	\$100,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Conveying System: Elevators****System Rating: 5****System Subtotal: \$250,000** (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
:				<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Otis freight elevator: controls, relay logic and dc generator are reaching the End of Useful Service Life. Modernization is required for improved reliability and energy efficiency.	Deferred Maintenance	\$250,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Plumbing System: Domestic Water/Plumbing****System Rating: 2****System Subtotal: \$115,000** (unresolved issues)*Original piping but no issues (1908).*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Y	Piping is at End of Useful Service Life.	Planned Maint/Capital Renewal	\$115,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC****System Rating: 2****System Subtotal: \$770,000** (unresolved issues)*Overheating issues in spring and fall- controls issue; no leaking pipes; North wing only has natural ventilation and radiators/convectors, East wing first floor has AHU, Some A/C on basement floor with ground mounted DX unit for computer classroom G002 thru G010, found AHU with split condenser in attic for second floor.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Need to address control issues and zoning in North wing. AHUs need to be replaced in next 5 years.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	
1: Currently Critical (Current Y	Replace HVAC systems.	Planned Maint/Capital Renewal	\$770,000	<input type="checkbox"/>	<input type="checkbox"/>	

**BUILDING REPORT**

Academic Offices Building

**BUILDING No.****5**

Michigan Technological University

CAMPUS Main Campus

**HVAC System: Steam Production Equip.****System Rating: 2****System Subtotal: \$80,000** (unresolved issues)*Campus steam.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Replace steam piping/condensate, PRV system.	Planned Maint/Capital Renewal	\$80,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls****System Rating: 2****System Subtotal: \$87,000** (unresolved issues)*Pneumatic controls, North wing is zoned as one zone-issues with comfort. Newer Quincy vertical simplex air compressor for control.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Tie-in DDC to Central Control.	Planned Maint/Capital Renewal	\$7,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Replace with DDC	Deferred Maintenance	\$80,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Sprinklers****System Rating: 5****System Subtotal:** (unresolved issues)*No sprinklers.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Emergency Lighting****System Rating: 4****System Subtotal:** (unresolved issues)*Egress lighting by EBUs and exits.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Fire Alarm****System Rating: 4****System Subtotal: \$10,000** (unresolved issues)*FA is minimum.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Need to add strobes.	Deferred Maintenance	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	

**BUILDING REPORT**

**Academic Offices Building**

**BUILDING No.**

**5**

Michigan Technological University

CAMPUS Main Campus

**Electrical System: Electrical Power**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*Electrical has been updated, GE panelboards.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Standby Power**

**System Rating: NA**

**System Subtotal:** (unresolved issues)

*No generator power.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Lighting**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*T8 fluorescent, some surface some recessed.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Clock System**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

NA

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Code Compliance: Code/Life Safety**

**System Rating: 4**

**System Subtotal: \$185,000** (unresolved issues)

*Fire alarm system - operational. Not sprinkle. Some Dead-end corridor condition Non accessible entries. Non fire rated window at elevator shaft.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
:				<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Handrails at stairs and ramps are not code compliant. Provide code compliant hand-rails.	Facility Adaptation	\$35,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Toilets rooms at basement level are not accessible. Provide accessible toilet rooms.	Facility Adaptation	\$150,000	<input type="checkbox"/>	<input type="checkbox"/>	

**BUILDING REPORT****Academic Offices Building****BUILDING No.****5**

Michigan Technological University

CAMPUS Main Campus

**Adjacent Site: Immediate Site****System Rating: 5****System Subtotal:** (unresolved issues)

<b>Priority</b>	<b>Observed Issue</b>	<b>Project Classification</b>	<b>Resolution Budget</b>	<b>Funded</b>	<b>Resolved</b>	<b>Year Resolved</b>
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

End of Building Report for: **Academic Offices Building**

**Building Information**

Year Built 1936     Building Area (sf) 10,956     Floors 3     Building Engineer James Schultz

**Building Notes:**

No air conditioning at the basement – air conditioning is critical given basement is used for archives and archeology samples storage. A dehumidifier and a gas-heater observed in the basement along with a sanitary line that drains into the sump pump. The sump pump was not functioning.

Humidity issues reported. New bathroom, kitchen, an accessible unisex toilet room is planned for the second floor level. Existing cabinetry will be reorganized. Radiators along the perimeter walls present.

New fire escape constructed from second floor level.

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**Building Use Types**

Use Type %	Use Type
30%	Library
70%	Administrative

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**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	33.21%	Poor	<b>CRV</b>	\$2,213,112	<b>Annual Maint and Capital Renewal Budget</b>	\$53,115
						3% of CRV x 80%

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	22.14%	Poor
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**Priority 1 (current year only)**

<b>FCNI</b>	11.75%	Poor
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation	
1 Currently Critical (Current Year)		\$260,000		\$260,000
2 Potentially Critical (Year 1)	\$48,000	\$13,000		\$61,000
3 Not yet Critical (Year 2-5)	\$109,000	\$60,000		\$169,000
4 Watch List (Year 6-10)			\$120,000	\$120,000
5 Long Term (Year 11+)	\$50,000	\$75,000		\$125,000
	Subtotal	\$207,000	\$120,000	<b>\$735,000</b>
				<b>Total of Projects</b>



**Structure: Structure**     **System Rating: 5**     **System Subtotal:** (unresolved issues)  
*Concrete structure. Concrete roof deck. Stone basement walls.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Roof**     **System Rating: 5**     **System Subtotal: \$37,000** (unresolved issues)  
*(2006) PVC single-ply adhered.  
 No overflow drains present.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Many bad coping sections. Correct or replace.	Deferred Maintenance	\$2,000	<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	2006 PVC single-ply.	Planned Maint/Capital Renewal	\$35,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Glazing**     **System Rating: 3**     **System Subtotal: \$10,000** (unresolved issues)  
*Insulated glazing, aluminum window frames, operable hopper windows.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Some hardware is malfunctioning. Glazing and window sills at End of Useful Service Life. Due for re-seal.	Deferred Maintenance	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Cladding**     **System Rating: 4**     **System Subtotal: \$40,000** (unresolved issues)  
*Brick veneer on structural masonry tile units backup and CMU.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Building sealant joints and some stone sills due for repair.	Deferred Maintenance	\$15,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Air and water infiltration at brick veneer on perimeter at line of ceiling. Extensive tuck-pointing required.	Deferred Maintenance	\$25,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Interior Partitions**                      **System Rating: 4**                      **System Subtotal: \$10,000** (unresolved issues)

*Lath and Plaster and painted plywood in basement at exterior walls. Painted brick. Painted CMU. Gypsum board. Structural masonry tile units.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Repaint needed.	Deferred Maintenance	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors**                                      **System Rating: 4**                                      **System Subtotal: \$61,000** (unresolved issues)

*Original solid core wood doors with wood frames typical in balance of building. Exterior hollow metal doors with hollow metal frames.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Exterior hollow metal doors at End of Useful Service Life. Hollow metal frames are due for re-painting.	Deferred Maintenance	\$6,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Original solid core wood doors on interior are not compliant. Provide accessible hardware.	Facility Adaptation	\$55,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors**    **System Rating: 4**    **System Subtotal: \$53,000** (unresolved issues)

*Concrete slab on grade at basement. Rubber flooring at level 2. Carpet at level 1.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Carpet flooring is at End of Useful Service Life.	Deferred Maintenance	\$18,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Rubber flooring is at End of Useful Service Life.	Deferred Maintenance	\$35,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Ceilings**    **System Rating: 5**    **System Subtotal:** (unresolved issues)

*2x2 suspended ceiling systems at level 1. Gypsum board typical at level 2. Open to deck in level 1 and basement.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Plumbing System: Domestic Water/Plumbing**    **System Rating: 3**    **System Subtotal: \$40,000** (unresolved issues)

*Some plumbing has been replaced.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	Replace DW/Plumbing	Planned Maint/Capital Renewal	\$40,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC**    **System Rating: 3**    **System Subtotal: \$260,000** (unresolved issues)

*Forced air unit on first and second floor- ducted to different offices, radiators at windows, no A/C, basement is storage with unit heaters. Hood for archeology*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Y	Replace HVAC systems.	Planned Maint/Capital Renewal	\$260,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Radiators to be replaced. Provide make up air for hood on first floor.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: Steam Production Equip.**    **System Rating: 3**    **System Subtotal: \$31,000** (unresolved issues)

*Plant steam in basement.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace radiators at windows.	Deferred Maintenance	\$1,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Replace steam piping/condensate, PRV system	Planned Maint/Capital Renewal	\$30,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls**    **System Rating: 3**    **System Subtotal: \$37,000** (unresolved issues)

*Pneumatic controls for radiators, thermostat for forced air units.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Tie-in DDC to Central Control	Planned Maint/Capital Renewal	\$7,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Replace with DDC.	Deferred Maintenance	\$30,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Sprinklers**    **System Rating: NA**    **System Subtotal:** (unresolved issues)

*No sprinklers.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	Add sprinkler system.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Emergency Lighting****System Rating: 3****System Subtotal: \$6,000** (unresolved issues)*EBUs and exits.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Need to add additional exit signs for egress.	Planned Maint/Capital Renewal	\$6,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Fire Alarm****System Rating: 3****System Subtotal: \$15,000** (unresolved issues)*Fire alarm - pull stations.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Need to add strobes and replace Siemens FA panel with EST.	Planned Maint/Capital Renewal	\$15,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Electrical Power****System Rating: 3****System Subtotal: \$15,000** (unresolved issues)*First and second floor power panels have been replaced, basement has an original transformer (1936).*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Basement transformer and disconnects needs to be replaced.	Planned Maint/Capital Renewal	\$15,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Standby Power****System Rating: NA****System Subtotal: \$50,000** (unresolved issues)*NA*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	Not tied to campus emergency generator	Deferred Maintenance	\$50,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Lighting****System Rating: 4****System Subtotal: \$5,000** (unresolved issues)*T8 lamps first and second floor, T12 in basement.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Retrofit existing T12 lamps with T8.	Deferred Maintenance	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	

<b>Electrical System: Clock System</b>	<b>System Rating:</b>	<b>System Subtotal:</b> (unresolved issues)
NA		

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

<b>Code Compliance: Code/Life Safety</b>	<b>System Rating: 3</b>	<b>System Subtotal: \$65,000</b> (unresolved issues)
<i>Fire alarm system - Not up to date.</i> <i>Not sprinkled.</i> <i>No elevator (non-accessible to second floor).</i> <i>No exit lights, just signage.</i>		

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Accessible unisex restroom needed.	Facility Adaptation	\$25,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Accessible wheelchair lift needed.	Facility Adaptation	\$40,000	<input type="checkbox"/>	<input type="checkbox"/>	

<b>Adjacent Site: Immediate Site</b>	<b>System Rating: 5</b>	<b>System Subtotal:</b> (unresolved issues)
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Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

End of Building Report for:     **Annex Building**

**Building Information**

Year Built 1976      Building Area (sf) 162,170      Floors 8      Building Engineer Gregg Richards

**Building Notes:**

Building in general is aging predictably showing wear. Building due for complete overhaul.

IT area security precluded assessment of area.

Classrooms are aging predictably showing wear. Classrooms are due for complete overhaul to continue top instructional delivery.

Recent \$500K renovation to entire 5th floor w/ new AHU.

**Major Renovations/Additions**

Year	Add'n.	Reno.	Description
2011		X	Fifth floor renovation excluding the core.
2008		X	Renovation of plaza to the West.

**Building Use Types**

Use Type %	Use Type
45%	Laboratory, Research
40%	Classroom
15%	Administrative

**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	24.44%	Poor	<b>CRV</b>	\$44,596,750	<b>Annual Maint and Capital Renewal Budget</b>	\$1,070,322
						3% of CRV x 80%

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	3.38%	Good
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**Priority 1 (current year only)**

<b>FCNI</b>	0.01%	Good
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation	
1 Currently Critical (Current Year)	\$2,500			\$2,500
2 Potentially Critical (Year 1)	\$584,000			\$584,000
3 Not yet Critical (Year 2-5)	\$920,000			\$920,000
4 Watch List (Year 6-10)	\$580,000	\$6,870,000	\$1,665,000	\$9,115,000
5 Long Term (Year 11+)	\$140,000	\$140,000		\$280,000
Subtotal	\$2,226,500	\$7,010,000	\$1,665,000	<b>\$10,901,500</b>
				<b>Total of Projects</b>

**Structure: Structure**      **System Rating: 5**      **System Subtotal:** (unresolved issues)  
*Steel Structure. Metal roof deck. Cast in place basement walls. Cast in place sub-basement walls.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	Water in pillbox of sub-basement.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Roof**      **System Rating: 3**      **System Subtotal: \$400,000** (unresolved issues)  
*(2008) Built-up asphalt on Styrofoam deckmate over Plaza.  
 (2007) PVC single-ply on Styrofoam insulation.  
 (1994) EPDM single-ply on Styrofoam over lecture hall.  
 (1991) Celo-1 EPDM single-ply on Styrofoam at overhangs.  
 (1989) EPDM single-ply on perlite over northwest stairway entrance.  
 No overflow drains.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	1994 EPDM Single-Ply on Styrofoam.	Deferred Maintenance	\$45,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	1989 EPDM single-ply on perlite roofing over stair at End of Useful Service Life. Active leak at northwest stairway.	Deferred Maintenance	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	1991 Celo-1 EPDM Single-Ply on	Deferred Maintenance	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	2007 EPDM roofing membrane isn't adhering to roof.	Deferred Maintenance	\$60,000	<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	2008 Built-Up asphalt on styrofoam deckmate.	Planned Maint/Capital Renewal	\$140,000	<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	2007 PVC single-ply on styrofoam insulation.	Deferred Maintenance	\$140,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Glazing**      **System Rating: 4**      **System Subtotal: \$397,000** (unresolved issues)  
*Insulated glass, alum window frames with operable hopper windows.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Glazing throughout facility is original. End of Useful Service Life.	Deferred Maintenance	\$392,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Glazing in classroom 427 has moisture at sill.	Deferred Maintenance	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	



**Shell: Cladding**      **System Rating: 4**      **System Subtotal:** (unresolved issues)

*Original brick veneer typical, sealed in 1990. Cast in place concrete at plaza.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Interior Partitions**      **System Rating: 3**      **System Subtotal: \$125,000** (unresolved issues)

*Painted CMU in classrooms and corridors, typical in balance of building. Ceramic tile in bathrooms. Demountable vinyl clad gyp partition walls on metal stud in offices.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	CMU due for re-paint.	Deferred Maintenance	\$125,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors**      **System Rating: 2**      **System Subtotal: \$240,000** (unresolved issues)

*Interior - Hollow metal door with hollow metal frame grouted. Exterior - Aluminum storefront.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Replace knobs with levers at all floors except 5th floor for accessibility.	Facility Adaptation	\$240,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors**      **System Rating:**      **System Subtotal: \$500,000** (unresolved issues)

*VCT typical in classrooms. Ceramic tile typical in bathrooms. Carpet typical in 2011 5th floor renovation. Raised floor typical in server rooms. Rubber nosing typical in stairwell.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Rubber tread and riser is deteriorating under heavy use. Nosing at End of Useful Service Life.	Deferred Maintenance	\$55,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Carpet at End of Useful Service Life.	Deferred Maintenance	\$155,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	VCT at End of Useful Service Life.	Deferred Maintenance	\$290,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Ceilings**      **System Rating:**      **System Subtotal: \$580,000** (unresolved issues)

*2x5 suspended ceiling system typical in classrooms. Linear metal suspended ceiling system in corridors, auditorium, and lobby. Open to deck in high bay spaces.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Original ceiling at End of Useful Service Life.	Deferred Maintenance	\$580,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Conveying System: Elevators**
**System Rating: 3**
**System Subtotal: \$255,000** (unresolved issues)

*Traction elevators with many problems.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Dover Elevator 3 Key components, selectors, door operators, fixtures and cab interiors are reaching the End of Useful Service Life. Modernization is required for improved reliability appearances.	Deferred Maintenance	\$85,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Dover Elevator 2 Key components, selectors, door operators, fixtures and cab interiors are reaching the End of Useful Service Life. Modernization is required for improved reliability appearances.	Deferred Maintenance	\$85,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Dover Elevator 1 Key components, selectors, door operators, fixtures and cab interiors are reaching the End of Useful Service Life. Modernization is required for improved reliability appearances.	Deferred Maintenance	\$85,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Plumbing System: Domestic Water/Plumbing**
**System Rating: 4**
**System Subtotal: \$671,000** (unresolved issues)

*Sewage by gravity to municipal connection.*
*DHW steam heater in sub-basement and one in penthouse.*
*Condensate is pumped to Central Plant.*
*Duplex de-watering sump.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Sub-basement should have water level detection and alarming.	Deferred Maintenance	\$1,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Replace domestic water and plumbing.	Planned Maint/Capital Renewal	\$670,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC**      **System Rating: 4**      **System Subtotal: \$5,758,500** (unresolved issues)

*AHU-1 (penthouse) serves Basement through 8th floor - steam heat with CHW AC, steam humidifiers and VFD fans.  
 Sub-basement SF1/SF2 serves Computer Science in basement - steam heat with CHW AC.  
 Two AHUs (one each for Lecture Rooms) with steam heat and DX AC.  
 Separate AC-3 for the 5th floor - steam heat with CHW AC.  
 Added one fan coil with CHW for Computer Science space in basement.  
 2006 - Chiller/pumps replaced but 2nd chiller removed, two new EVAPCO cooling towers installed on roof.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Duct-board ductwork is leaking air into ceiling spaces. Remediate as needed.	Deferred Maintenance	\$1,500	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	SF1/SF2 cannot run economizer due to OA intake sizes. This would provide energy savings.	Deferred Maintenance	\$17,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Replace HVAC system.	Planned Maint/Capital Renewal	\$5,740,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: Steam Production Equip.**      **System Rating: 4**      **System Subtotal: \$470,000** (unresolved issues)

*Central Plant Steam - PR station with dual PRVs provide low pressure steam for building.  
 Duplex steam to hot water exchangers for heating water.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Older Fisher Steam PRVs/controls need replacement evaluation.	Deferred Maintenance	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Replace steam piping/condensate, PRV system.	Planned Maint/Capital Renewal	\$460,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls**      **System Rating: 4**      **System Subtotal:** (unresolved issues)

*Pneumatic air compressor for large valve/damper actuators. System is JCI DDC.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Sprinklers**      **System Rating: 4**      **System Subtotal:** (unresolved issues)  
*Wet system with fire pump in place. Pre-action system for Computer Science located in CS basement closet.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Emergency Lighting**      **System Rating: 4**      **System Subtotal:** (unresolved issues)  
*Provided by emergency fixtures/exit lighting on emergency generator.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Fire Alarm**      **System Rating: 4**      **System Subtotal: \$80,000** (unresolved issues)  
*New Fire Alarm System in 2006 but no strobes.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Upgrade and add code compliant horns/strobes.	Deferred Maintenance	\$80,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Electrical Power**      **System Rating: 3**      **System Subtotal:** (unresolved issues)  
*Original GE substation and panelboards with newer Cutler-Hammer MCC's.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Standby Power**      **System Rating: 4**      **System Subtotal: \$10,000** (unresolved issues)  
*Natural gas engine-generator installed in 2006 - 100kW for life safety/elevators.  
 Two UPS systems; one flywheel and one battery powered.  
 Separate engine-generator for Computer Science located on grade at rear of building not serviced by MTU facilities staff.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Battery room for UPS should have ventilation with full exhaust - no return air.	Facility Adaptation	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Lighting**      **System Rating: 4**      **System Subtotal:** (unresolved issues)

*(2006) Re-lamped fluorescent lights with T8's and new electronic ballasts in offices and classrooms.  
Classrooms 2x4 lay-in with 4 T8s.  
5th floor renovation - some existing re-used and re-lamped with T8s, some new with T8s.  
Updated LED exit lighting.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Clock System**      **System Rating: NA**      **System Subtotal:** (unresolved issues)

NA

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Data/Telecom System**      **System Rating: 5**      **System Subtotal:** (unresolved issues)

*Fiber to each building. CAT5/CAT6 Cabling. VOIP System (Phones).*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Code Compliance: Code/Life Safety**      **System Rating: 3**      **System Subtotal: \$1,415,000** (unresolved issues)

*Fire alarm system - updated horns and strobes in 2006.  
Sprinkler system.  
Missing exit lighting in classrooms.  
Original bathroom fixtures and partitions not accessible.  
No guard rail at stairs  
Drinking fountain not code compliant.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Path of travel in SB34 exceeds code limits.	Facility Adaptation		<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Provide exit lighting in classrooms.	Facility Adaptation		<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Provide power operated door switch.	Facility Adaptation		<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Provide accessible restrooms.	Facility Adaptation	\$1,250,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Code Compliance: Code/Life Safety**      **System Rating: 3**      **System Subtotal: \$1,415,000** (unresolved issues)

*Fire alarm system - updated horns and strobes in 2006.  
 Sprinkler system.  
 Missing exit lighting in classrooms.  
 Original bathroom fixtures and partitions not accessible.  
 No guard rail at stairs  
 Drinking fountain not code compliant.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Non code compliant hand rail at stairs. Provide code compliant railing on all stairs.	Facility Adaptation	\$150,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Provide code compliant drinking fountains through out balance of building.	Facility Adaptation	\$15,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Adjacent Site: Immediate Site**      **System Rating:**      **System Subtotal:** (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

End of Building Report for:      **Electrical Energy Resources Center**

**Building Information**

Year Built 1998      Building Area (sf) 167,100      Floors 9      Building Engineer Gregg Richards

**Building Notes:**

Building is functional and showing wear appropriate to age.

Building is subject to water infiltration at window head on east façade and at exterior door threshold's. maintenance efforts have been made to correct these issues, entire building window system should be reviewed for proper flashing details.

Some recent lab and infrastructure renovations.

**Building Use Types**

Use Type %	Use Type
70%	Laboratory, Research
10%	Classroom
20%	Administrative

**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	0.63%	Good	<b>CRV</b>	\$52,970,700	<b>Annual Maint and Capital Renewal Budget</b>	\$1,271,297
						3% of CRV x 80%

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	0.48%	Good
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**Priority 1 (current year only)**

<b>FCNI</b>	0.08%	Good
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation	
1 Currently Critical (Current Year)	\$45,000			\$45,000
2 Potentially Critical (Year 1)	\$27,500			\$27,500
3 Not yet Critical (Year 2-5)	\$10,000	\$170,000		\$180,000
4 Watch List (Year 6-10)	\$30,000			\$30,000
5 Long Term (Year 11+)			\$50,000	\$50,000
Subtotal	\$112,500	\$170,000	\$50,000	<b>\$332,500</b>
				<b>Total of Projects</b>



**Structure: Structure**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

*Steel Structure. Metal and concrete roof deck. Slab on grade and cast in place concrete crawl space.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Roof**

**System Rating: 4**

**System Subtotal: \$188,000** (unresolved issues)

*(1998) Original PVC single-ply on extruded polystyrene insulation.  
(1998) Copper standing seam.  
No overflow drains.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Flashing of roof terrace on north is failing at door threshold. Water infiltration was observed further investigation is required to determine full scope of work required to remedy.	Deferred Maintenance	\$8,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	(1998) Original PVC single-ply on extruded polystyrene insulation.	Planned Maint/Capital Renewal	\$170,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Provide lightning protection.	Deferred Maintenance	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Glazing**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*Original insulated glass, alum frames with operable casement windows.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Driving rain infiltration is observed on all levels.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Cladding**

**System Rating: 4**

**System Subtotal: \$15,000** (unresolved issues)

*Brick veneer and copper shingle siding.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Damage to copper coping on south elevation causing staining and water infiltration into wall. Repair coping.	Deferred Maintenance	\$15,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Interior Partitions**

**System Rating:**

**System Subtotal: \$4,000** (unresolved issues)

*Gypsum board on metal studs typical in classrooms, offices, and corridors. Painted CMU typical in labs and bathrooms.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Water damage in north corridor near roof terrace entry. Repair and paint.	Deferred Maintenance	\$2,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Staining on 9th floor at east elevation windows. Repair and paint.	Deferred Maintenance	\$2,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors**

**System Rating: 5**

**System Subtotal: \$2,500** (unresolved issues)

*Interior - Solid core wood door with hollow metal frames typical in offices and classrooms. Hollow metal door with hollow metal frames at egress stairs.  
Exterior - Aluminum storefront.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Leaking at threshold of 9th floor east roof access door and north terrace access door.	Deferred Maintenance	\$2,500	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors**

**System Rating: 5**

**System Subtotal: \$53,000** (unresolved issues)

*Concrete typical in high bay space. VCT typical in offices and corridors. Polished concrete typical in labs. Ceramic tile typical in bathrooms. Terrazzo typical in main lobby.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Rubber tread and riser on stairs are at End of Useful Service Life.	Deferred Maintenance	\$45,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	North entry on floor one showing excessive wear due to high volume of traffic, at End of Useful Service Life.	Deferred Maintenance	\$2,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors**

**System Rating: 5**

**System Subtotal: \$53,000** (unresolved issues)

*Concrete typical in high bay space. VCT typical in offices and corridors. Polished concrete typical in labs. Ceramic tile typical in bathrooms. Terrazzo typical in main lobby.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	VCT cracking in auditorium where the slope of floor changes, at End of Useful Service Life.	Deferred Maintenance	\$6,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Ceilings**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

*2x2 suspended ceiling system typical throughout. 2x4 suspended ceiling system in auditorium. Open to deck in labs and high bay spaces.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Plumbing System: Domestic Water/Plumbing**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

*Steam-fired domestic hot water.  
Toilets are 2-3 gpf, urinals 1 gpf.  
Steam-fired water distiller for labs.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

VAV air handlers and exhaust fans for Labs with steam heat and chilled water cooling. Some labs do not have AC.  
 AHU-8 in 9th floor attic for south lobby atrium only; heat only with economizer.  
 Chilled water for AHU-7 serving Lecture is from EERC Building.  
 York 160-ton chiller for building with recently replaced inside BAC tower.  
 Separate York 160-ton chiller with recently replaced inside BAC tower for Process Chilled Water with free cooling plate/frame HX. (Also serves M&M Bldg.)  
 Phoenix VAV fume hoods and lab supply/exhaust VAV.  
 3 Lab Exhaust Fans have heat recovery coils and pumps.  
 Labs have hoods, canopies, snorkels, and one de-activated perchloric hood. Hoods, canopies, and snorkels served with individual exhaust fans.  
 Radiant ceiling panel heat in offices and perimeter corridor ceilings.  
 Smoke exhaust fans for stairwells.  
 Penthouse MER floor is original epoxy coated.

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No reported problems.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: Steam Production Equip.**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

Central Plant Steam - single pressure reducing valve medium pressure and 1/3 - 2/3 PRVs for low pressure steam.  
 Pumped CRU on 1st floor up to 7th floor, then gravity drained to Dillman Hall.

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

Pneumatic air compressor for large valve/damper actuators. JCI DDC system for controls.

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Sprinklers**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

Wet sprinkler system with fire pump and ATS to emergency power.

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**BUILDING REPORT****Dow Environmental Sciences and Engineering Building****BUILDING No.****8**

Michigan Technological University

CAMPUS Main Campus

**Safety: Emergency Lighting****System Rating: 4****System Subtotal:** (unresolved issues)*Emergency lighting with individual battery backup.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Fire Alarm****System Rating: 4****System Subtotal:** (unresolved issues)*Fire alarm existing.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Electrical Power****System Rating: 4****System Subtotal:** (unresolved issues)*Cutler-Hammer substation, tie-line, panelboards, and MCC's all original.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Standby Power****System Rating: 4****System Subtotal: \$50,000** (unresolved issues)*Emergency power is provided from Central Heating Plant.**UPS for critical functions.**One ATS for Life Safety and elevator.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	Central Plant gen-set is 38 years old, consider providing Dow Bldg. with its own 200 kw generator.	Facility Adaptation	\$50,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Lighting****System Rating: 4****System Subtotal:** (unresolved issues)*Updated T8s throughout. Lecture Room has 6"x4-foot direct pendant with two T8s each.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**BUILDING REPORT****Dow Environmental Sciences and Engineering Building****BUILDING No.****8**

Michigan Technological University

CAMPUS Main Campus

**Electrical System: Clock System****System Rating: NA****System Subtotal:** (unresolved issues)

NA

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Data/Telecom System****System Rating: 5****System Subtotal:** (unresolved issues)*Fiber to each building. CAT5/CAT6 Cabling. VOIP System (Phones).*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Code Compliance: Code/Life Safety****System Rating: 5****System Subtotal: \$20,000** (unresolved issues)*Accessible bathrooms.**Sprinkler system.**Emergency lighting with individual battery backup.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Provide power operated door switches at north and south vestibules.	Deferred Maintenance	\$20,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Adjacent Site: Immediate Site****System Rating: 5****System Subtotal:** (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

End of Building Report for: **Dow Environmental Sciences and Engineering Building**

**Building Information**

Year Built    2000                      Building Area (sf)    80,000                      Floors    4                      Building Engineer    Michael Wilmers

**Building Notes:**

Relatively new building in excellent condition.

Some history of roof damage recently repaired.

Stage rigging has safety concerns that need to be addressed on a regular basis.

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**Building Use Types**

Use Type %	Use Type
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100%	Theater
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**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	2.94%	Good	<b>CRV</b>	\$21,600,000	<b>Annual Maint and Capital Renewal Budget</b>	\$518,400
						3% of CRV x 80%

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	0.05%	Good
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**Priority 1 (current year only)**

<b>FCNI</b>	0.00%	Good
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation	
1 Currently Critical (Current Year)	\$1,000			\$1,000
2 Potentially Critical (Year 1)			\$10,000	\$10,000
3 Not yet Critical (Year 2-5)				
4 Watch List (Year 6-10)				
5 Long Term (Year 11+)	\$300,000	\$325,000		\$625,000
Subtotal	\$301,000	\$325,000	\$10,000	<b>\$636,000</b>
				<b>Total of Projects</b>



**Structure: Structure**      **System Rating: 5**      **System Subtotal:** (unresolved issues)  
*Steel Structure. Metal roof deck. Cast in place basement walls.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	Settling of brick in south west corner near areaway.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Roof**      **System Rating: 5**      **System Subtotal: \$335,000** (unresolved issues)  
*(2000) EPDM single-ply over Styrofoam insulation.  
 (2000) Standing seam metal.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Add snow guard on standing seam metal roof.	Facility Adaptation	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	2000 Standing seam metal.	Planned Maint/Capital Renewal	\$210,000	<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	2000 EPDM single-ply over styrofoam insulation.	Planned Maint/Capital Renewal	\$115,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Glazing**      **System Rating: 3**      **System Subtotal: \$300,000** (unresolved issues)  
*Insulated glass, alum curtain wall system, no operable windows.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	Replace insulated glass panels due to leaking gaskets.	Deferred Maintenance	\$300,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Cladding**      **System Rating: 5**      **System Subtotal:** (unresolved issues)  
*Brick veneer. Metal panel.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Interior Partitions**      **System Rating: 5**      **System Subtotal:** (unresolved issues)

*Gypsum board on metal stud at entry lobby, corridors, classrooms, and offices. Ceramic tile in bathrooms. Gypsum with acoustic cover in main theatre and stage. Wood paneling over gypsum board in main lobby.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors**      **System Rating: 5**      **System Subtotal:** (unresolved issues)

*Interior - Solid core wood doors with hollow metal frame typical in balance of building. Compliant door hardware. Hollow metal door with hollow metal frame at egress.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors**      **System Rating: 5**      **System Subtotal:** (unresolved issues)

*Carpet typical in main entry, corridors, main theatre, and offices. Ceramic tile typical in bathrooms. Polished concrete in back of house areas. Wood floor in music room.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Ceilings**      **System Rating: 5**      **System Subtotal:** (unresolved issues)

*2x2 suspended ceiling system in classrooms, offices, and back of house corridors. Gypsum in vestibule, main lobby, and bathrooms. Custom acoustic paneling in music room and theatre. Open to deck above fly, mechanical, and storage spaces.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	History of water damage in main lobby. Roof has been repaired.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Conveying System: Elevators**      **System Rating:**      **System Subtotal:** (unresolved issues)

*Hydraulic elevator.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Redundant stage lift has problems with safety sensors that activate unnecessarily.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Plumbing System: Domestic Water/Plumbing**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

*Steam fired domestic hot water heater.  
Duplex sewage ejector sump.  
Duplex de-watering sump.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC**

**System Rating: 5**

**System Subtotal: \$1,000** (unresolved issues)

*Multiple Trane VAV air handlers headered into large volume ductwork for noise reduction. Silencers noted in ductwork. variable freq. drives, steam heat, chilled water cooling coils for AC, and steam humidifiers.  
Air-cooled chiller on roof.  
Theatre Lobby has 25' to 30' glass curtain wall facing NE, linear slot diffusers at ceiling wash glass, banquet seats at floor perimeter have finned tube radiation behind them.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	G002 finned tube radiation is not covered and has been damaged from objects placed against it. Remediation required.	Deferred Maintenance	\$1,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: Steam Production Equip.**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

*Steam from Central Heating Plant.  
Single pressure reducing valve for 15# steam.  
Duplex condensate receiver unit in floor pit.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

*JCI DDC system with pneumatic actuators for large valves and dampers.  
Duplex Quincy air compressor for controls.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Sprinklers**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

*Multi-zone wet sprinkler system.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Emergency Lighting**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*Emergency lighting with individual battery backup ballasts in fixtures.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Fire Alarm**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*Fire Alarm in place is Simplex w/voice annunciation - smoke detectors and manual pull stations, horns or strobes.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Electrical Power**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*Cutler-Hammer substation, 2-line switchgear, transformers, distribution panelboards, C-H Eaton Power Panels, Lighting Panels.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Standby Power**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*Natural gas engine-generator rated 100kW located on 1st floor; shared with Walker Building*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Lighting**      **System Rating: 4**      **System Subtotal:** (unresolved issues)

*Can-lights in Lobby ceiling appear to be unique - could not identify.  
Fluorescent lay-in lighting on offices, corridors, back of house, classrooms with T8 lamps.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Clock System**      **System Rating: NA**      **System Subtotal:** (unresolved issues)

NA

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Data/Telecom System**      **System Rating: 5**      **System Subtotal:** (unresolved issues)

*Fiber to each building. CAT5/CAT6 Cabling. VOIP System (Phones).*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Code Compliance: Code/Life Safety**      **System Rating: 5**      **System Subtotal:** (unresolved issues)

*Fire alarm system - smoke detectors and manual pull stations, horns or strobes.  
Sprinkler system.  
Emergency lighting with individual battery backup.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Adjacent Site: Immediate Site**      **System Rating: 5**      **System Subtotal:** (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

End of Building Report for:      **Rozsa Performing Arts and Education Center**

### Building Information

Year Built 1986      Building Area (sf) 87,094      Floors 4      Building Engineer Michael Wilmers

#### Building Notes:

Building was originally a gymnasium and pool. Construction date is unknown. Comprehensive renovation in 1986.

Classrooms are due for modernization to continue top instructional delivery.

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### Building Use Types

Use Type %	Use Type
25%	Theater
60%	Classroom
15%	Administrative

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**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	20.68%	Poor	<b>CRV</b>	\$18,812,304	<b>Annual Maint and Capital Renewal Budget</b>	\$451,495
						3% of CRV x 80%

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	16.32%	Poor
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**Priority 1 (current year only)**

<b>FCNI</b>	0.02%	Good
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation	
1 Currently Critical (Current Year)	\$3,500			\$3,500
2 Potentially Critical (Year 1)	\$255,000			\$255,000
3 Not yet Critical (Year 2-5)	\$320,000	\$2,492,000		\$2,812,000
4 Watch List (Year 6-10)		\$605,000	\$4,500	\$609,500
5 Long Term (Year 11+)		\$210,000		\$210,000
Subtotal	\$578,500	\$3,307,000	\$4,500	<b>\$3,890,000</b>
				<b>Total of Projects</b>

**Structure: Structure** **System Rating: 5** **System Subtotal:** (unresolved issues)

*Concrete Structure with steel structure infill. Metal roof deck. Cast in place basement walls.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Roof** **System Rating: 5** **System Subtotal: \$210,000** (unresolved issues)

*(2006) PVC single-ply over Styrofoam insulation.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	2006 PVC single-ply over styrofoam insulation.	Planned Maint/Capital Renewal	\$210,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Glazing** **System Rating: 5** **System Subtotal:** (unresolved issues)

*Insulated glass, alum window frames, operable casement windows.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Cladding** **System Rating: 3** **System Subtotal: \$95,000** (unresolved issues)

*Brick veneer. Plaster at soffit and spandrel.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Replace brick at canted/sloped sill.	Deferred Maintenance	\$15,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Porous brick selected for exterior of building. Degradation of brick in several areas near grade. Replace broken brick and tuck-point where necessary.	Deferred Maintenance	\$55,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Seal entire exterior envelope.	Deferred Maintenance	\$25,000	<input type="checkbox"/>	<input type="checkbox"/>	



**Interior Construction: Interior Partitions System Rating: 5 System Subtotal: (unresolved issues)**

*Gypsum board on metal stud at corridors, classrooms, and offices. Painted CMU in stairwell and bathroom. Brick at entry vestibule.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors System Rating: 4 System Subtotal: (unresolved issues)**

*Interior - Solid core wood doors with hollow metal frame in newly renovated areas of building with compliant door hardware. Hollow metal door with hollow metal frame in balance of building.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No reported problems.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors System Rating: 3 System Subtotal: \$243,000 (unresolved issues)**

*Carpet typical in main entry, corridors, classrooms, and offices. Ceramic tile typical in bathrooms. Wood floor in black box. VCT in Corridor on south.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	VCT in south corridor on main floor is beyond End of Useful Service Life.	Deferred Maintenance	\$3,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Carpet through out balance of building is near End of Useful Service Life.	Deferred Maintenance	\$240,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Ceilings System Rating: 3 System Subtotal: \$225,000 (unresolved issues)**

*2x2 suspended ceiling system of various ages and styles typical throughout balance of building. Updated 2x4 suspended ceiling system in first floor media lab. Gypsum in vestibule and stairwell.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	40% of 2x2 suspended ceiling system near End of Useful Service Life.	Deferred Maintenance	\$225,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Conveying System: Elevators System Rating: 4 System Subtotal: \$15,000 (unresolved issues)**

*Hydraulic elevator.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Renovate interior of passenger cab.	Deferred Maintenance	\$15,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Plumbing System: Domestic Water/Plumbing System Rating: 5 System Subtotal: \$355,500 (unresolved issues)**

*Steam-fired domestic water heater with self-contained valve. De-watering sump is cord connected to convenience outlet.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Permanent AC power connection for de-watering sump should be provided.	Deferred Maintenance	\$500	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Replace DW/Plumbing.	Planned Maint/Capital Renewal	\$355,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC System Rating: 3 System Subtotal: \$2,485,000 (unresolved issues)**

*Multiple AHUs - some renovated/added when building was re-purposed Arts from gymnasium. Constant volume, steam heating, and humidification. AC-1 has DX cooling. One packaged AC for AC-6.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace HVAC system.	Planned Maint/Capital Renewal	\$2,485,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: Steam Production Equip. System Rating: 4 System Subtotal: \$250,000 (unresolved issues)**

*Steam provided by the Central Heating Plant. Single Fisher pneumatic pressure reducing valve station for 15# steam. Duplex pumped condensate receiver.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Replace steam piping/condensate, PRV system.	Planned Maint/Capital Renewal	\$250,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls** **System Rating: 4** **System Subtotal: \$7,000** (unresolved issues)

*Honeywell pneumatics predominantly.  
Duplex Honeywell air compressor for controls.  
JCI DDC added during renovation.  
Pneumatics used for large valve and damper actuators.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Tie-in DDC to Central Control.	Planned Maint/Capital Renewal	\$7,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Sprinklers** **System Rating: 5** **System Subtotal:** (unresolved issues)

*Wet sprinkler system.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Emergency Lighting** **System Rating: 4** **System Subtotal:** (unresolved issues)

*Emergency fixtures have battery backup ballasts.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Fire Alarm** **System Rating: 4** **System Subtotal:** (unresolved issues)

*Fire alarm system - smoke detectors and manual pull stations, horns or strobes.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Electrical Power** **System Rating: 4** **System Subtotal:** (unresolved issues)

*GE 8000 substation, 2-line switchgear, transformers, GE circuit breaker panels.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Standby Power** **System Rating: 4** **System Subtotal:** (unresolved issues)  
*Shared with Rozsa Building*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Lighting** **System Rating: 4** **System Subtotal:** (unresolved issues)  
*(2006) Re-lamped Fluorescent lights with T8's and new electronic ballasts in in balance of building.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Clock System** **System Rating: NA** **System Subtotal:** (unresolved issues)  
*NA*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Data/Telecom System** **System Rating: 5** **System Subtotal:** (unresolved issues)  
*Fiber to each building. CAT5/CAT6 Cabling. VOIP System (Phones).*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Code Compliance: Code/Life Safety** **System Rating: 4** **System Subtotal: \$4,500** (unresolved issues)  
*Fire alarm system - smoke detectors and manual pull stations, horns or strobes.  
 Sprinkler system.  
 Emergency lighting with individual battery backup.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Water fountains not code compliant.	Facility Adaptation	\$4,500	<input type="checkbox"/>	<input type="checkbox"/>	

**BUILDING REPORT Walker Arts and Humanities Center****BUILDING No.****11**

Michigan Technological University

CAMPUS Main Campus

**Adjacent Site: Immediate Site****System Rating:****System Subtotal:** (unresolved issues)

<b>Priority</b>	<b>Observed Issue</b>	<b>Project Classification</b>	<b>Resolution Budget</b>	<b>Funded</b>	<b>Resolved</b>	<b>Year Resolved</b>
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

End of Building Report for: **Walker Arts and Humanities Center**

**Building Information**

Year Built 1991      Building Area (sf) 172,800      Floors      Building Engineer Gregg Richards

**Building Notes:**

Built in 1991. Building is aging predictably on interior though showing heavy wear at stone on exterior façade.

**Major Renovations/Additions**

Year	Add'n.	Reno.	Description
1990	X		

**Building Use Types**

Use Type %	Use Type
85%	Laboratory, Research
15%	Administrative

**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	4.02%	Good	<b>CRV</b>	\$59,270,400	<b>Annual Maint and Capital Renewal Budget</b>	\$1,422,490
						3% of CRV x 80%

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	1.22%	Good
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**Priority 1 (current year only)**

<b>FCNI</b>	0.13%	Good
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation	
1 Currently Critical (Current Year)	\$75,000			\$75,000
2 Potentially Critical (Year 1)	\$360,000			\$360,000
3 Not yet Critical (Year 2-5)	\$290,000			\$290,000
4 Watch List (Year 6-10)	\$90,000		\$1,120,000	\$1,210,000
5 Long Term (Year 11+)	\$450,000			\$450,000
Subtotal	\$1,265,000		\$1,120,000	<b>\$2,385,000</b>
				<b>Total of Projects</b>

**Structure: Structure**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

*Steel Structure. Pre-cast concrete plank system for floors and roof. Cast in place basement walls.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No reported problems.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Roof**

**System Rating: 3**

**System Subtotal: \$240,000** (unresolved issues)

*(1991) CPE single-ply on Foamular insulation. No overflow drains.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Original roofing leaking. End of Useful Service Life.	Deferred Maintenance	\$240,000	<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	Membrane at parapet is not adhering and causing membrane to billow in many areas.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Glazing**

**System Rating: 3**

**System Subtotal:** (unresolved issues)

*(1991) Insulated glass, alum window frames with operable hopper windows.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Some windows are leaking.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Cladding**

**System Rating: 4**

**System Subtotal: \$160,000** (unresolved issues)

*Brick veneer typical. Sand stone veneer accent panels. Cast terracotta accent panels.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Degradation of sand stone coping. Remove and replace.	Deferred Maintenance	\$120,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Excessive staining of sand stone on south elevation below windows. Repair and clean staining.	Deferred Maintenance	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Exterior sealant at stone and brick is near End of Useful Service Life.	Deferred Maintenance	\$25,000	<input type="checkbox"/>	<input type="checkbox"/>	



**Shell: Cladding** **System Rating: 4** **System Subtotal: \$160,000** (unresolved issues)  
*Brick veneer typical. Sand stone veneer accent panels. Cast terracotta accent panels.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Collision damage of sand stone at south west entry. Replace or repair damaged sand stone.	Deferred Maintenance	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Interior Partitions** **System Rating: 4** **System Subtotal:** (unresolved issues)  
*Painted CMU in bathrooms, corridors, labs and high bay spaces. Gypsum on metal stud in offices.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors** **System Rating: 4** **System Subtotal: \$320,000** (unresolved issues)  
*Interior - Hollow metal door with hollow metal frames at egress stair. Solid core wood door with hollow metal frames typical throughout building. Exterior - Aluminum storefront.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Door hardware not accessible. Provide accessible hardware.	Facility Adaptation	\$320,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors** **System Rating: 3** **System Subtotal: \$75,000** (unresolved issues)  
*Concrete typical in high bay and laboratory spaces. VCT typical in corridor. Carpet typical in offices. Ceramic tile typical in bathrooms and main entry.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	VCT is not adhering well to corridors. Several chips in tile caused by high foot traffic and movement of heavy lab equipment. Consider alternative material for floor covering. At End of Useful Service Life.	Deferred Maintenance	\$75,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Ceilings**

**System Rating: 4**

**System Subtotal: \$90,000** (unresolved issues)

*2x2 suspended ceiling system typical in offices and corridors. Linear metal ceilings in main lobby spaces. Open to deck in high bay and laboratory spaces.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance	\$90,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Conveying System: Elevators**

**System Rating: 4**

**System Subtotal: \$700,000** (unresolved issues)

*Traction elevator.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Detroit Elevator North Controls, relay logic and DC Generator are reaching the End of Useful Service Life. Modernization is required for improved reliability and energy efficiency.	Deferred Maintenance	\$250,000	<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	Dover North 1 Replace controls with solid state equipment	Deferred Maintenance	\$100,000	<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	Dover Car w/future hatch Replace controls with solid state equipment	Deferred Maintenance	\$175,000	<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	Dover North 2 Replace controls with solid state equipment	Deferred Maintenance	\$175,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Plumbing System: Domestic Water/Plumbing**

**System Rating:**

**System Subtotal:** (unresolved issues)

*Steam fired Patterson/Kelly instantaneous domestic water heater.  
 Steam fired distiller for labs.  
 De-ionized water for labs.  
 Process chilled water from Dow.  
 Sullair air compressor for lab air.  
 Gaseous nitrogen generator for labs.  
 Natural gas piped to labs.  
 No acid neutralization tank - all goes to city sewer.  
 Clean room has neutralizing tank.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*AHU-1 SF/RF vane axial fans, steam heat, humidifier, no AC. Uses Staefa VCV2500 pneumatic VAV box controllers.  
 Eight other AHUs use centrifugal fans; AHU-4 & 9 have chilled water AC, all have steam heat and humidifier.  
 Stairwell pressurizations fans.  
 Trane 110-ton reciprocal water chiller.  
 Process chilled water from Dow Environmental Science Bldg.  
 Miscellaneous laboratory systems in penthouse that are unique or sophisticated.  
 Labs use Hamilton hoods, canopies, snorkels, and California hoods. Hoods have individual exhaust fans.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: Steam Production Equip.**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*Central Heating Plant provides steam.  
 55# Medium Pressure single pressure reducing valve is Fisher.  
 Low pressure is 1/3 - 2/3 Fisher PRVs.  
 Condensate is pumped.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*JCI DDC with pneumatic valve and damper operators. Ingersoll-Rand air compressor.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Sprinklers**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*Sprinkler system - no pump.  
Halon fire protection.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Halon fire protection is obsolete.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Emergency Lighting**

**System Rating: 3**

**System Subtotal:** (unresolved issues)

*Emergency lighting is in process of update.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Fire Alarm**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*Fire Alarm system is in place with horns/strobes.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Electrical Power**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*Siemens ITE switchboard for 2-lines.  
Siemens emergency power distribution panel.  
Siemens motor control centers.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Standby Power** **System Rating: 4** **System Subtotal:** (unresolved issues)

*Onan 100kW , 8-cyl., natural gas engine-generator for life safety and elevators. One Onan ATS.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Lighting** **System Rating: 4** **System Subtotal:** (unresolved issues)

*(2006) Re-lamped Fluorescent lights with T8's and new electronic ballasts in offices and classrooms. Fluorescent down lights in main lobby/corridor.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Clock System** **System Rating: NA** **System Subtotal:** (unresolved issues)

NA

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Data/Telecom System** **System Rating: 5** **System Subtotal:** (unresolved issues)

*Fiber to each building. CAT5/CAT6 Cabling. VOIP System (Phones).*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Code Compliance: Code/Life Safety** **System Rating: 4** **System Subtotal: \$800,000** (unresolved issues)

*Fire alarm system - smoke detectors and manual pull stations, horns or strobes.*

*Sprinkler system.*

*Emergency lighting with individual battery backup.*

*In the process of updating emergency lighting.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Restrooms are not accessible. Update restrooms to be accessible.	Facility Adaptation	\$800,000	<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	Smoke purge fan for stair and atrium needed.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**BUILDING REPORT****Minerals and Materials Engineering Building****BUILDING No.****12**

Michigan Technological University

CAMPUS Main Campus

**Adjacent Site: Immediate Site****System Rating: 5****System Subtotal:** (unresolved issues)*Water infiltration at east foundation wall.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	New sock drain put in place at foundation wall on east (seems ok now).	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

End of Building Report for: **Minerals and Materials Engineering Building**

**Building Information**

Year Built 1955      Building Area (sf) 44,400      Floors      Building Engineer Gregg Richards

**Building Notes:**

Comprehensive renovation in 1991.

Rooms U113 & U115 are at end of useful service life, due for replacement to maintain curriculum distribution at modern level.

**Major Renovations/Additions**

Year	Add'n.	Reno.	Description
1991	X	X	

**Building Use Types**

Use Type %	Use Type
40%	Laboratory, Research
55%	Classroom
5%	Administrative

**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	3.85%	Good	<b>CRV</b>	\$11,877,000	<b>Annual Maint and Capital Renewal Budget</b>	\$285,048
						3% of CRV x 80%

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	2.55%	Good
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**Priority 1 (current year only)**

<b>FCNI</b>	0.00%	Good
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation	
1 Currently Critical (Current Year)	\$500			\$500
2 Potentially Critical (Year 1)	\$145,000			\$145,000
3 Not yet Critical (Year 2-5)	\$150,000	\$7,000		\$157,000
4 Watch List (Year 6-10)	\$10,000	\$70,000	\$75,000	\$155,000
5 Long Term (Year 11+)				
Subtotal	\$305,500	\$77,000	\$75,000	<b>\$457,500</b>
				<b>Total of Projects</b>



**Structure: Structure** **System Rating: 5** **System Subtotal:** (unresolved issues)  
*Concrete structure. Cast in place basement and sub-basement. Cast in place roof deck.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Roof** **System Rating: 3** **System Subtotal: \$265,000** (unresolved issues)  
*(1982) Roof D - EPDM Single-ply on Urethane  
 (1992) Roof A & C - EPDM Single-ply on Extruded Poly  
 (2007) PVC single-ply Durolast on Styrofoam  
 (2007) Ben Lab/Plant - PVC single-ply on Extruded Poly  
 No overflow drains.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	1982 Roof D - EPDM Single-ply on Urethane.	Deferred Maintenance	\$45,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	1992 Roof A & C - EPDM Single-ply on Extruded Poly.	Deferred Maintenance	\$140,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	2007 Ben Lab/Plant - PVC single-ply on Extruded Poly.	Planned Maint/Capital Renewal	\$35,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	2007 PVC single-ply Durolast on Styrofoam.	Planned Maint/Capital Renewal	\$35,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Provide lightning protection.	Deferred Maintenance	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Glazing** **System Rating: 4** **System Subtotal:** (unresolved issues)  
*(1991) Insulated glass, alum window frames with operable hopper windows.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Cladding System Rating: 4 System Subtotal: \$110,000** (unresolved issues)

*Brick veneer typical. Sand stone veneer accent panels. Cast terracotta accent panels.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Degradation of sand stone coping. Repair and replace.	Deferred Maintenance	\$100,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Exterior sealant at stone and brick is near End of Useful Service Life.	Deferred Maintenance	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Interior Partitions System Rating: 4 System Subtotal:** (unresolved issues)

*Original glazed block in high bay space. Painted CMU in bathrooms, classrooms, and auditorium. Brick veneer in auditorium. Gypsum board on metal stud in corridor, offices, and classrooms.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors System Rating: 4 System Subtotal: \$50,000** (unresolved issues)

*Interior - Hollow metal door with hollow metal frames at egress stair. Solid core wood door with hollow metal frames typical throughout building. Exterior - Aluminum storefront.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Door hardware not accessible. Provide accessible hardware.	Facility Adaptation	\$50,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors System Rating: 4 System Subtotal:** (unresolved issues)

*Concrete typical in high bay and laboratory spaces. VCT typical in corridor. Carpet typical in offices. Ceramic tile typical in bathrooms and main entry.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Ceilings** **System Rating: 4** **System Subtotal:** (unresolved issues)  
*2x2 suspended ceiling system typical in offices and corridors. Linear metal ceilings in main lobby spaces. Open to deck in high bay spaces. Gypsum in laboratory, vestibule, and auditorium spaces.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Conveying System: Elevators** **System Rating: 4** **System Subtotal:** (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)				<input type="checkbox"/>	<input type="checkbox"/>	

**Plumbing System: Domestic Water/Plumbing** **System Rating: 4** **System Subtotal: \$500** (unresolved issues)  
*Original and maintained. Instantaneous steam-fired domestic water heater. Compressed air for labs provided from M&M Research.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Y	Provide permanent AC power for sump.	Deferred Maintenance	\$500	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC** **System Rating: 4** **System Subtotal:** (unresolved issues)  
*Six (6) AHUs with steam heat, steam humidifiers, no DX or CHW AC. No chilled water system for building or process water. No distilled water system. Teaching labs with three (3) hoods, snorkels, and a dust collector..*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: Steam Production Equip.** **System Rating: 4** **System Subtotal:** (unresolved issues)  
*Steam provided by Central Heating Plant. 1/3 - 2/3 duplex pressure reducing valve station reduces for 15# supply to building.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**BUILDING REPORT Minerals and Materials Undergrad Building****BUILDING No.****12a**

Michigan Technological University

CAMPUS Main Campus

**HVAC System: HVAC Controls****System Rating: 4****System Subtotal: \$7,000** (unresolved issues)

JCI DDC with pneumatic actuators for large valves and dampers.  
Control air from duplex air compressor.

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Tie-in DDC to Central Control.	Planned Maint/Capital Renewal	\$7,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Sprinklers****System Rating: 4****System Subtotal:** (unresolved issues)

Wet sprinkler system throughout building.

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Emergency Lighting****System Rating: 3****System Subtotal:** (unresolved issues)

In process of being updated.

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Fire Alarm****System Rating: 4****System Subtotal:** (unresolved issues)

Fire alarm system - smoke detectors and manual pull stations, horns or strobes.

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Electrical Power****System Rating: 4****System Subtotal:** (unresolved issues)

All electrical power equipment - substation, transformers, panelboards, power panel, lighting panels, receptacle panels replaced in 1991 renovation.

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Standby Power** **System Rating: 4** **System Subtotal:** (unresolved issues)  
*Emergency power provided from engine-generator at M&M Research. Two ATSS.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Lighting** **System Rating: 4** **System Subtotal:** (unresolved issues)  
*(2006) Re-lamped Fluorescent lights with T8's and new electronic ballasts in offices and classrooms. Fluorescent downlights in main lobby/corridor Offices and corridors use 2x2 lay-in fixtures.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Clock System** **System Rating: NA** **System Subtotal:** (unresolved issues)  
*NA*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Data/Telecom System** **System Rating: 5** **System Subtotal:** (unresolved issues)  
*Fiber to each building. CAT5/CAT6 Cabling. VOIP System (Phones).*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**BUILDING REPORT Minerals and Materials Undergrad Building****BUILDING No.****12a**

Michigan Technological University

CAMPUS Main Campus

**Code Compliance: Code/Life Safety****System Rating: 4****System Subtotal: \$25,000** (unresolved issues)*Fire alarm system - smoke detectors and manual pull stations, horns or strobes.**Sprinkler system.**Emergency lighting with individual battery backup.**In the process of updating emergency lighting.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Seating in auditorium failing. Remove and replace with new chair with tablet arm and carpet.	Facility Adaptation	\$25,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Adjacent Site: Immediate Site****System Rating: 5****System Subtotal:** (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

End of Building Report for: **Minerals and Materials Undergrad Building**

### Building Information

Year Built 1957      Building Area (sf) 86,300      Floors 6      Building Engineer Gregg Richards

Building Notes:

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### Building Use Types

Use Type %	Use Type
45%	Laboratory, Research
40%	Classroom
15%	Administrative

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**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	17.94%	Poor	<b>CRV</b>	\$23,732,500	<b>Annual Maint and Capital Renewal Budget</b>	\$569,580
						3% of CRV x 80%

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	12.42%	Poor
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**Priority 1 (current year only)**

<b>FCNI</b>	6.78%	Fair
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation	
1 Currently Critical (Current Year)	\$30,000	\$1,580,000		\$1,610,000
2 Potentially Critical (Year 1)	\$550,000		\$60,000	\$610,000
3 Not yet Critical (Year 2-5)	\$251,000	\$477,000		\$728,000
4 Watch List (Year 6-10)	\$95,000		\$575,000	\$670,000
5 Long Term (Year 11+)	\$440,000	\$160,000	\$40,000	\$640,000
Subtotal	\$1,366,000	\$2,217,000	\$675,000	<b>\$4,258,000</b>
				<b>Total of Projects</b>



**Structure: Structure**      **System Rating: 5**      **System Subtotal: \$25,000** (unresolved issues)

*Concrete Structure. Concrete roof deck. Cast in place concrete basement with sub basement.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Some settling of brick in NE corner above steam tunnel.	Deferred Maintenance	\$25,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Roof**      **System Rating: 5**      **System Subtotal: \$160,000** (unresolved issues)

*(2004) EPDM Single-ply on extruded-polystyrene.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	2004 EPDM Single-ply on extruded-polystyrene with Few leaks reported. Repair as needed.	Planned Maint/Capital Renewal	\$160,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Glazing**      **System Rating: 2**      **System Subtotal: \$770,000** (unresolved issues)

*(1957) Original single pane glass, in alum storefront with glass block infill and operable hopper windows.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Air and water infiltration at curtain wall. End of Useful Service Life.	Deferred Maintenance	\$330,000	<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	Air and water infiltration at operable window frames throughout. End of Useful Service Life.	Deferred Maintenance	\$440,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Cladding**      **System Rating: 4**      **System Subtotal: \$70,000** (unresolved issues)

*Brick veneer typical. EPDM over brick at penthouse.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Minimal re-pointing needed. Seal exterior brick.	Deferred Maintenance	\$70,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Interior Partitions** **System Rating: 4** **System Subtotal:** (unresolved issues)

*Wet plaster in offices. Glazed block in bathrooms. Painted CMU in classrooms and corridors.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors** **System Rating: 4** **System Subtotal: \$130,000** (unresolved issues)

*Interior - Solid core wood door with hollow metal frames typical in balance of building. Hollow metal doors with hollow metal frames at egress stairs.  
Exterior - Aluminum storefront.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Egress doors into stairwell open into the door closure of adjacent door. Provide alternate solution.	Deferred Maintenance	\$30,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Provide accessible hardware in balance of building.	Facility Adaptation	\$100,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors** **System Rating: 4** **System Subtotal:** (unresolved issues)

*Concrete typical in high bay and laboratory spaces. 9x9 tile observed in corridors and stairwells. Ceramic tile in bathrooms. Newly installed VCT in auditorium space.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Ceilings** **System Rating: 4** **System Subtotal:** (unresolved issues)

*2x2 suspended ceiling system typical in offices, corridors, and classrooms. Recently updated 2x2 in corridors. Open to deck in high bay spaces. Gypsum board in bathrooms.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Conveying System: Elevators**

**System Rating: 3**

**System Subtotal: \$250,000** (unresolved issues)

*Traction elevator.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Shepard- Warner freight elevator Controls, relay logic and DC Generator are reaching the End of Useful Service Life. Modernization is required for improved reliability and energy efficiency.	Deferred Maintenance	\$250,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Plumbing System: Domestic Water/Plumbing**

**System Rating: 3**

**System Subtotal: \$351,000** (unresolved issues)

*Steam fired domestic water heater - shell and tube with self-contained control valve.*

*Other plumbing/fixtures original.*

*Steam condensate is pumped.*

*Condensate Return Unit at basement AHU replaced in 2011.*

*Sewage by gravity.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Sub-basement should have water detection and alarming.	Deferred Maintenance	\$1,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Replace DW/Plumbing.	Planned Maint/Capital Renewal	\$350,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC**

**System Rating: 3**

**System Subtotal: \$1,580,000** (unresolved issues)

*One large AHU using plenums for supply and return air in basement; steam heat, humidifiers, variable speed by hand control. Classrooms have in-wall low returns and supplies up high. Covered steam finned tube radiation on perimeter walls.*

*Additional AHU for computer room has DX AC and condenser on roof.*

*Compressed air for labs from M&M Bldg.*

*Small vacuum pump for labs.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Although maintained, large AHU is at End of Useful Service Life, and needs replacement.	Planned Maint/Capital Renewal	\$1,580,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: Steam Production Equip.**      **System Rating: 3**      **System Subtotal: \$120,000** (unresolved issues)

*Central Heating Plant provides steam.  
 Older Spence-type 1/3 - 2/3 pressure reducing valve station for low pressure steam use.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace steam PRV station.	Planned Maint/Capital Renewal	\$120,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls**      **System Rating: 3**      **System Subtotal: \$227,000** (unresolved issues)

*Predominantly pneumatic although not all is original.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Replace pneumatic controls with DDC - large valve and damper actuators could remain pneumatic to save cost.	Deferred Maintenance	\$220,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Tie-in DDC to Central Control	Planned Maint/Capital Renewal	\$7,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Sprinklers**      **System Rating:**      **System Subtotal:** (unresolved issues)

*Only in one laboratory - none in building.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Emergency Lighting**      **System Rating: 4**      **System Subtotal:** (unresolved issues)

*Egress lighting provided by natural gas emergency generator - approx. 12kW.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Fire Alarm**      **System Rating: 4**      **System Subtotal: \$40,000** (unresolved issues)

*Fire Alarm system in place; no horns or strobes.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	Provide code compliant horns/strobes.	Facility Adaptation	\$40,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Electrical Power**      **System Rating: 4**      **System Subtotal:** (unresolved issues)  
*GE 2-line tie-in, Westinghouse primary switchgear with newer National Industry and OLSUN dry-transformers.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Standby Power**      **System Rating: 4**      **System Subtotal:** (unresolved issues)  
*Natural gas emergency generator for exits only.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Lighting**      **System Rating: 4**      **System Subtotal:** (unresolved issues)  
*(2006) Re-lamped fluorescent lights with T8's and new electronic ballasts in offices and classrooms. New T8 fluorescent lighting in corridors. 2x4 lay-in-type w/3 T8 lamps in classrooms.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Clock System**      **System Rating: NA**      **System Subtotal:** (unresolved issues)  
 NA

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Data/Telecom System**      **System Rating: 5**      **System Subtotal:** (unresolved issues)  
*Fiber to each building. CAT5/CAT6 Cabling. VOIP System (Phones).*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Code Compliance: Code/Life Safety**                      **System Rating: 4**                      **System Subtotal: \$535,000** (unresolved issues)

*Fire alarm system - smoke detectors and manual pull stations only, no horns or strobes.  
 Sprinkler system in B009. Not sprinkled throughout .  
 Accessible bathrooms on first floor only.  
 Original stair lacking guardrail.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Provide code compliant guard rail at all stairs.	Facility Adaptation	\$60,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Restrooms are not accessible throughout. Provide accessible restrooms at all levels.	Facility Adaptation	\$475,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Entry is not accessible. Provide accessible entry.	Facility Adaptation		<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Provide code compliant fire alarm system.	Facility Adaptation		<input type="checkbox"/>	<input type="checkbox"/>	

**Adjacent Site: Immediate Site**                      **System Rating: 5**                      **System Subtotal:** (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

End of Building Report for: **Grover Dillman Hall**

**Building Information**

Year Built 1964     Building Area (sf) 112,100     Floors     Building Engineer Michael Wilmers

**Building Notes:**

Renovated in 2007.

Piecemeal renovation of classroom spaces has left building with a variety of finish conditions and hardware conditions. In general classrooms are in good condition but public spaces serving those rooms are typically at end of useful service life.

Office areas are at end of useful service life, due for replacement throughout.

Assembly lecture halls are at end of useful service life.

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**Building Use Types**

Use Type %	Use Type
85%	Classroom
15%	Administrative

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**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	34.69%	Poor	<b>CRV</b>	\$22,251,850	<b>Annual Maint and Capital Renewal Budget</b>	\$534,044
						3% of CRV x 80%

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	27.78%	Poor
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**Priority 1 (current year only)**

<b>FCNI</b>	0.34%	Good
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation	
1 Currently Critical (Current Year)	\$75,000			\$75,000
2 Potentially Critical (Year 1)	\$401,500	\$3,200,000		\$3,601,500
3 Not yet Critical (Year 2-5)	\$2,495,000		\$10,000	\$2,505,000
4 Watch List (Year 6-10)	\$5,000	\$787,000	\$746,000	\$1,538,000
5 Long Term (Year 11+)				
Subtotal	\$2,976,500	\$3,987,000	\$756,000	<b>\$7,719,500</b> Total of Projects



**Structure: Structure**     **System Rating: 5**     **System Subtotal: \$5,000** (unresolved issues)

*Concrete frame. Concrete roof deck. Cast in place concrete basement with sub-basement.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	North east corner of north stair at basement level is cracking and allowing water in.	Deferred Maintenance	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Roof**     **System Rating: 4**     **System Subtotal: \$290,000** (unresolved issues)

*(2005)CPA Thermoplastic single-ply over Existing Styrofoam (insulation not replaced in 2005).*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Replace 2005 thermoplastic single-ply roof due to existing styrofoam failure.	Deferred Maintenance	\$280,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Ponding water on main roof and north entry canopy.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Provide lightning protection.	Facility Adaptation	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Glazing**     **System Rating: 3**     **System Subtotal: \$2,160,000** (unresolved issues)

*Single glazing, alum window frames, operable hopper windows.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace curtainwall and storefront.	Deferred Maintenance	\$2,160,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Cladding**     **System Rating: 4**     **System Subtotal:** (unresolved issues)

*Brick veneer. Slate infill at spandrel with recently replaced sealant at joints. Sandstone veneer.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Interior Partitions**     **System Rating: 4**     **System Subtotal:** (unresolved issues)

*Painted CMU in corridors and classrooms. Gypsum board in offices.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors**     **System Rating: 3**     **System Subtotal: \$140,000** (unresolved issues)

*Interior - Solid core wood door with hollow metal frame and hollow metal door with hollow metal frame.  
 Exterior - Hollow metal door with hollow metal frame.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Egress door hardware is failing. End of Useful Service Life.	Deferred Maintenance	\$40,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Provide accessible door hardware on remaining non accessible doors.	Facility Adaptation	\$100,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors**     **System Rating: 4**     **System Subtotal: \$40,000** (unresolved issues)

*New VCT in corridors and lecture hall. Carpet typical in classrooms and isle of auditorium. Painted concrete in large auditorium. Raised floor system in old server rooms.  
 Ceramic tile typical in bathrooms. 9x9 tile observed in some classrooms. Rubber nosing on stairs.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Rubber tread on stairs is failing. Incorrect installation. At End of Useful Service Life.	Deferred Maintenance	\$32,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Carpets in auditorium and lecture halls are near End of Useful Service Life.	Deferred Maintenance	\$8,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Ceilings**     **System Rating: 2**     **System Subtotal: \$100,000** (unresolved issues)

*Mix of newer 2x2 and 2x4 suspended ceiling systems throughout balance of building. Original gypsum in bathrooms and auditorium. Original 1x1 concealed spline acoustic ceiling system in offices.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Replace 75% of acoustic lay in ceiling.	Deferred Maintenance	\$100,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Concealed spline acoustic ceiling system is at End of Useful Service Life.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Conveying System: Elevators**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

*Freight elevator - hydraulic  
 Passenger elevator - cable*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Plumbing System: Domestic Water/Plumbing**

**System Rating: 3**

**System Subtotal: \$461,500** (unresolved issues)

*Steam-fired domestic hot water heater.  
 De-watering duplex system with tanks in sub-basement.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Steam-fired domestic hot water heater and some piping stripped of insulation. Re-insulate where needed.	Deferred Maintenance	\$1,500	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Replace DW/Plumbing	Planned Maint/Capital Renewal	\$460,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC**

**System Rating: 3**

**System Subtotal: \$3,201,500** (unresolved issues)

*HV-1 in penthouse for 1st, 2nd, and 3rd floors.  
 HV-2 in sub-basement for sub-basement, basement, main building areas.  
 Separate AHUs (2) for the two Lecture Hall wings with steam heat and humidifiers.  
 IT area on 2nd floor has 4 packaged fan coil AC units, steam heat, with three condensers on the roof. AC-4 is a Trane and used for standby only and condenser air is forced into ceiling plenum.  
 Cabinet unit heaters at entries.  
 Finned tube radiation on perimeter walls and windows.  
 Two compressed air systems for lab spaces.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Y	HV-2 belts were slapping. Tighten or replace.	Deferred Maintenance	\$1,500	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Replace HVAC system.	Planned Maint/Capital Renewal	\$3,200,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: Steam Production Equip.**                      **System Rating: 3**                      **System Subtotal: \$323,500** (unresolved issues)

*Steam provided by the Central Heating Plant.*

*1/3 - 2/3 duplex pressure reducing valve station for 15# steam is older.*

*Condensate is pumped by varieties of DCUs and CRUs, one unit is a Vacuum Condensate Unit whereby the vacuum side is inoperable.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	1/3 - 2/3 duplex PRV station for 15# steam is older and should be replaced.	Deferred Maintenance	\$3,500	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Replace steam piping/condensate, PRV systems.	Planned Maint/Capital Renewal	\$320,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls**                                      **System Rating: 3**                                      **System Subtotal: \$337,000** (unresolved issues)

*Duplex Quincy air compressor appears to be newer model.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace pneumatic controls with DDC.	Deferred Maintenance	\$330,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Tie-in DDC to Central Control	Planned Maint/Capital Renewal	\$7,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Sprinklers**    **System Rating:**    **System Subtotal:** (unresolved issues)

*No sprinklers.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Emergency Lighting**    **System Rating: 4**    **System Subtotal: \$10,000** (unresolved issues)

*Emergency lighting with individual battery backup ballast in fixtures.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	No Reported Problems	Deferred Maintenance	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Fire Alarm**

**System Rating: 4**

**System Subtotal: \$60,000** (unresolved issues)

*EST3 Fire Alarm system in place. No horns/strobes noticed.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Provide code compliant horns/strobes.	Facility Adaptation	\$60,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Electrical Power**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*Original General Electric substation, switchgear, newer National Industry dry transformer, distribution panelboards.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Standby Power**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*Shares emergency power from Van Pelt Library.  
Cutler-Hammer Eaton ATS (2) for emergency power.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Lighting**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*In renovated main corridor, 1x4 lay-in fixtures with two T8 lamps.  
Classrooms have 2x4 lay-in with T8 lamps.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Clock System**

**System Rating: NA**

**System Subtotal:** (unresolved issues)

NA

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Data/Telecom System**     **System Rating: 5**     **System Subtotal:** (unresolved issues)

*Fiber to each building. CAT5/CAT6 Cabling. VOIP System (Phones).*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Code Compliance: Code/Life Safety**     **System Rating: 3**     **System Subtotal: \$591,000** (unresolved issues)

*Fire alarm system - smoke detectors and manual pull stations, horns and some strobes.  
 No sprinkler system.  
 Emergency lighting with individual battery backup.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Roof hatch is less than 10 ft. from edge of roof and poses a potential hazard. Railing needed near roof hatch.	Deferred Maintenance	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Non accessible restrooms. Door into restroom is too narrow. Provide accessible restrooms.	Facility Adaptation	\$500,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	No guardrail on stair. Provide code compliant guardrail.	Facility Adaptation	\$80,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Drinking fountain non accessible. Provide accessible fountain.	Facility Adaptation	\$6,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Adjacent Site: Immediate Site**     **System Rating: 5**     **System Subtotal:** (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

End of Building Report for: **Fisher Hall**

### Building Information

Year Built 1966     Building Area (sf) 130,031     Floors 4     Building Engineer Michael Wilmers

#### Building Notes:

Comprehensive renovation in 2005.

Lighting in archival area is excessive in visible & UV spectrum/shielding was funded and installed. Lighting still excess in those spectrums.

### Major Renovations/Additions

Year	Add'n.	Reno.	Description
2005	X	X	

### Building Use Types

Use Type %	Use Type
100%	Library

**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	11.38%	Poor	<b>CRV</b>	\$29,907,130	<b>Annual Maint and Capital Renewal Budget</b>	\$717,771
						3% of CRV x 80%

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	9.95%	Fair
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**Priority 1 (current year only)**

<b>FCNI</b>	0.05%	Good
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal	
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation		
1 Currently Critical (Current Year)	\$15,000			\$15,000	
3 Not yet Critical (Year 2-5)	\$2,660,000	\$300,000		\$2,960,000	
4 Watch List (Year 6-10)	\$10,000	\$371,250	\$46,000	\$427,250	
5 Long Term (Year 11+)					
	Subtotal	\$2,685,000	\$671,250	\$46,000	<b>\$3,402,250</b>
					<b>Total of Projects</b>



**Structure: Structure**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

*1966 original - Concrete Structure. Concrete roof Deck. Cast in place basement walls.*

*2005 addition - Steel Structure. Metal roof deck. Cast in place basement walls.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Moisture in the archive spaces of lower level.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Roof**

**System Rating: 5**

**System Subtotal: \$381,250** (unresolved issues)

*(2005) Thermoplastic PVC single-ply on Foamular insulation.*

*(2005) Standing seam copper.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Provide lightning protection.	Facility Adaptation	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	2005 Thermoplastic PVC single-ply on Foamular insulation.	Planned Maint/Capital Renewal	\$371,250	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Glazing**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*(2005) Replaced 1966 glazing with insulated glass, alum window frames, no operable windows.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Cladding**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*(1966 Original) Painted concrete. Sand stone veneer panel.*

*(2005 Addition) Slate veneer. Standing seam copper. Architectural cast stone veneer panel.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Interior Partitions**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*Gypsum board on metal stud typical in balance of building. Ceramic tile in bathrooms.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors**

**System Rating: 4**

**System Subtotal: \$10,000** (unresolved issues)

*Interior - Solid core wood doors with hollow metal frame typical in balance of building. Many rooms with card readers. Accessible door hardware. Hollow metal door with hollow metal frame at egress stairs. Overhead fire shutter at bridge on second floor and window looking east on first and third floors.  
Exterior - Aluminum storefront.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Over head fire shutter on third floor is potentially dangerous. Shutter is located more than 3' from window and could potentially entrap someone in event of emergency.	Deferred Maintenance	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors**

**System Rating: 4**

**System Subtotal: \$5,000** (unresolved issues)

*VCT typical in corridors. Carpet typical in classrooms and offices. Ceramic tile typical in bathrooms and entry vestibule.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Y	Nosing at End of Useful Service Life.	Deferred Maintenance	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Ceilings**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*2x2 suspended ceiling system typical throughout balance of building. Gypsum in vestibule and bathrooms.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Conveying System: Elevators**

**System Rating: 3**

**System Subtotal: \$250,000** (unresolved issues)

*Hydraulic elevator.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Otis Staff Elevator Controls, relay logic and controls are reaching the End of Useful Service Life. Modernization is required for improved reliability and energy efficiency.	Deferred Maintenance	\$250,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Plumbing System: Domestic Water/Plumbing**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

*2005 update - steam-fired domestic water heater.*

*Bathroom fixtures are low flow.*

*2005 duplex sewage ejector sump.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC**

**System Rating: 5**

**System Subtotal: \$2,200,000** (unresolved issues)

*Van Pelt Addition HVAC (2005)*

*Two (2) medium sized VAV AHUs with variable freq. drives, chilled water from Van Pelt Library, steam heat, and steam humidifiers.*

*VAV air supply throughout.*

*Secondary chilled water pump for AHUs.*

*Original Van Pelt Basement HVAC*

*One large AHU in basement MER supplies/returns air in concrete plenum. Supplies basement and 1st floor.*

*Original Van Pelt Penthouse MER HVAC*

*2005 renovation - new 500-ton Trane Absorption Chiller, new twin cooling towers (controlled as one) and condenser pump. Refurbished primary chilled water pump. Chiller provides CHW for Rekh Addition to Fisher Hall.*

*Original two (2) AHUs AC-2 and AC-3 serve 2nd through 4th floor.*

*Original Van Pelt New Basement MER*

*Needed for steam/hot water service.*

<b>Priority</b>	<b>Observed Issue</b>	<b>Project Classification</b>	<b>Resolution Budget</b>	<b>Funded</b>	<b>Resolved</b>	<b>Year Resolved</b>
3: Not yet Critical (Year 2-5)	Original Van Pelt AC-1 in Basement MER is at End of Useful Service Life. Pneumatic control should be updated to DDC.  Original Van Pelt AC-2 and AC-3 in Penthouse MER are at End of Useful Service Life. Pneumatic control should be updated to DDC.	Deferred Maintenance	\$2,200,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: Steam Production Equip.**

**System Rating: 5**

**System Subtotal: \$10,000** (unresolved issues)

*Steam provided by Central Heating Plant.  
Pumped condensate from all MERs.  
Steam to hot water heat exchangers in both basement MERs.*

*Van Pelt Old MER  
Older dual Fisher PRVs for 15# steam.  
Condensate receiver pump replaced.  
2005 - Steam to hot water heat exchangers replaced with new pumps.  
New steam-fired domestic water heater in 2005.*

*Van Pelt New MER  
Single pressure reducing valve for 15# steam for heating/reheat hot water.  
Pumped CRU.  
Duplex perimeter hot water pumps.  
Duplex heating hot water pumps.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Van Pelt Old MER - Older dual Fisher PRVs for 15# steam should be replaced.	Deferred Maintenance	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls**

**System Rating: 5**

**System Subtotal: \$200,000** (unresolved issues)

*2005 JCI DDC with pneumatic actuators for large valves and dampers.  
Addition - Electronic DDC for VAV boxes and perimeter heat electronic valves.  
Duplex Quincy air compressor replaced in 2010 located in Original Van Pelt Basement MER.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace pneumatic controls with DDC for Van Pelt AHUs.	Deferred Maintenance	\$200,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Sprinklers**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

*Wet sprinkler system throughout building.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Emergency Lighting**

**System Rating: 4**

**System Subtotal: \$10,000** (unresolved issues)

*Emergency lighting with individual battery backup ballast in fixtures.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Replace battery.	Deferred Maintenance	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Fire Alarm**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*EST3 Fire Alarm in place with horns/strobes from 2005 renovation.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Electrical Power**

**System Rating: 4**

**System Subtotal: \$300,000** (unresolved issues)

*2005 addition has Square D HVL 2-line switchgear, substation, transformers, distribution panelboards, motor control centers, LPs, PPs.*

*Original Van Pelt served by original power system.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Original Van Pelt electrical power substation, switchgear, transformers, etc. due for evaluation.	Planned Maint/Capital Renewal	\$300,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Standby Power**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*Emergency power provided from 2005 Caterpillar, 12 cyl., natural gas, engine-generator rated 450 kW.*

*Two ASCO ATSS.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Lighting**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*2x2 T8 Fluorescent lighting typical throughout building in addition. 1x4 T8 Fluorescent lighting with electronic ballasts typical throughout balance of building. Lutron dimming system.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**BUILDING REPORT****J.R. Van Pelt Library****BUILDING No.****17**

Michigan Technological University

CAMPUS Main Campus

**Electrical System: Clock System****System Rating: 4****System Subtotal:** (unresolved issues)

NA

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Data/Telecom System****System Rating: 5****System Subtotal:** (unresolved issues)*Fiber to each building. CAT5/CAT6 Cabling. VOIP System (Phones).*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Code Compliance: Code/Life Safety****System Rating:****System Subtotal: \$36,000** (unresolved issues)*Fire alarm system - smoke detectors and manual pull stations, horns or strobes.**Sprinkler system.**Emergency lighting with individual battery backup.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Egress stair in original 1966 building is not code compliant. Provide code compliant guardrail and handrail.	Facility Adaptation	\$36,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Adjacent Site: Immediate Site****System Rating: 5****System Subtotal:** (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	Nosing on stair at loading dock is failing. End of Useful Service Life.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

End of Building Report for: **J.R. Van Pelt Library**

### Building Information

Year Built 1967      Building Area (sf) 95,337      Floors 2      Building Engineer James Schultz

#### Building Notes:

Major additions and renovations in 2000, the central atrium and Horner Hall.

Building reported as having A.C.M. Most of the piping insulation with A.C.M. is reported as being removed.

New part of the building is air-conditioned (atrium and Horner Hall).

### Major Renovations/Additions

Year	Add'n.	Reno.	Description
2000	X	X	

### Building Use Types

Use Type %	Use Type
50%	Laboratory, Research
25%	Classroom
25%	Administrative



**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	20.23%	Poor	<b>CRV</b>	\$26,932,703	<b>Annual Maint and Capital Renewal Budget</b>	\$646,385
						3% of CRV x 80%

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	14.73%	Poor
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**Priority 1 (current year only)**

<b>FCNI</b>	0.03%	Good
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation	
1 Currently Critical (Current Year)	\$7,500			\$7,500
2 Potentially Critical (Year 1)	\$715,000			\$715,000
3 Not yet Critical (Year 2-5)	\$3,245,000			\$3,245,000
4 Watch List (Year 6-10)		\$560,000	\$610,000	\$1,170,000
5 Long Term (Year 11+)		\$310,000		\$310,000
Subtotal	\$3,967,500	\$870,000	\$610,000	<b>\$5,447,500</b>
				<b>Total of Projects</b>

**Structure: Structure**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

*Heavy timber/steel frame structure. Tectum and metal roof deck. Cast-in-place concrete with partial floor below grade.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Roof**

**System Rating: 4**

**System Subtotal: \$605,000** (unresolved issues)

*(2000) Roofs A, C, F, G, H, I, J, K, & L - EPDM single ply adhered.*

*(2006) Roofs B, D, & E - PVC single ply adhered.*

*Some overflow roof drains are present.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	All sealant joints and flashing must be inspected at the roof. Membrane flashing is loose in some locations. Repair as necessary.	Deferred Maintenance	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Roof leaks reported. Replace at areas A, C, and G.	Deferred Maintenance	\$140,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Roof leaks reported. Replace at areas F, H, I, J, K, and L.	Deferred Maintenance	\$270,000	<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	No reported problems at B, D, and E.	Planned Maint/Capital Renewal	\$190,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Glazing**

**System Rating: 3**

**System Subtotal: \$55,000** (unresolved issues)

*(1967) Original single glazing, wood window frames, with operable windows.*

*(2000) Insulated glazing, wood window frames, with operable windows.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Reported water and air infiltration at 50% of original (1967) glazing. Original windows are at End of Useful Service Life.	Deferred Maintenance	\$55,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Cladding**      **System Rating: 4**      **System Subtotal: \$75,000** (unresolved issues)  
*Painted horizontal wood siding on original building. Sealed horizontal wood siding on building addition. Plaster at soffits. Exposed cast-in-place concrete walls.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	All wood siding is due for regular maintenance and repair.	Deferred Maintenance	\$50,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Sealed wood siding on building addition is splitting in multiple locations. Some areas of siding is curling. Due for repair.	Deferred Maintenance	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Exterior sealant joint at End of Useful Service Life.	Deferred Maintenance	\$20,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Interior Partitions**      **System Rating: 5**      **System Subtotal:** (unresolved issues)  
*Wood paneling at high bay atrium, south entry vestibule, typical offices, and corridors along 123. Gypsum board at high bay atrium, corridors, restrooms, labs, and computer labs. Painted CMU at microbiology lab. Floor mounted metal toilet partitions and ceramic tile in restrooms.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors**      **System Rating: 4**      **System Subtotal: \$12,500** (unresolved issues)  
*Interior - Solid core wood doors with wood frames at corridor along offices 111 through 120 and corridor adjacent to 147, labs, and restrooms. Solid core wood doors with hollow metal frames at corridors near 101 through 104 and adjacent to room 160. Exterior - Hollow metal doors with hollow metal frames at balance of building egress. Solid core wood doors with wood frames at end of corridor between offices 111 - 120 and at ground level of original building. Aluminum storefront system at south entry vestibule.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Exterior Solid core wood door at ground floor. (west) at End of Useful Service Life.	Deferred Maintenance	\$7,500	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Threshold of aluminum storefront system at south entry vestibule is deteriorating. Misc. hardware and threshold at End of Useful Service Life.	Deferred Maintenance	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors**     **System Rating: 4**     **System Subtotal: \$330,000** (unresolved issues)

*Ceramic tile at high bay atrium and restrooms. Wood flooring at offices 111 through 120 and corridor along 123. Carpet at offices (typ) and computer lab 139 and 144. VCT over 9x9 tile at corridor along lab 143. VCT at corridor along offices 111 through 120, corridor along room 160, and at labs 108 and 102. 9x9 tile observed at lab 103, 143, 148, and 146. Sealed concrete at south entry vestibule.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	12x12 VCT over 9x9 tile at corridor along lab 143 is at End of Useful Service Life. 9x9 tile must be removed as well.	Deferred Maintenance	\$60,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Wood flooring at offices 111 through 120 is due for re-finishing.	Deferred Maintenance	\$155,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Carpet over 9x9 tile at computer lab 144 is at End of Useful Service Life. 9x9 tile should be removed as well.	Deferred Maintenance	\$115,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Ceilings**     **System Rating: 3**     **System Subtotal: \$275,000** (unresolved issues)

*2x2 suspended ceiling system at high bay atrium, labs, restrooms, and corridors. Painted gypsum board at high bay atrium and lab 103. 1x1 concealed spline at corridor along offices 111 through 120, corridors along rooms 101 through 104 and near 143, and at stairwell. Exposed tectum deck and heavy timber framing at offices 111 through 120, computer labs, south entry vestibule, and corridor along room 123.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	All 1x1 concealed spline throughout building is at End of Useful Service Life.	Deferred Maintenance	\$275,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Conveying System: Elevators**     **System Rating: 5**     **System Subtotal:** (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Plumbing System: Domestic Water/Plumbing System Rating: 4 System Subtotal: \$360,000** (unresolved issues)

*Manual flush valves, tank type HW Heater.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace tank type HW Heater with Instantaneous.	Deferred Maintenance	\$30,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Replace DW/Plumbing.	Planned Maint/Capital Renewal	\$330,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC System Rating: 4 System Subtotal: \$2,280,000** (unresolved issues)

*Only certain parts are AC with split systems in existing building, circulating HW, New portion is fully AC, dust collector is in fair shape, hoods are in fair shape, side wall distribution in office in old building.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	AHUs should be replace in next 5 years in older part of building.	Deferred Maintenance	\$2,280,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: Steam Production Equip. System Rating: 4 System Subtotal: \$230,000** (unresolved issues)

*Campus steam.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Replace steam piping/condensate, PRV system.	Planned Maint/Capital Renewal	\$230,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls System Rating: 4 System Subtotal: \$200,000** (unresolved issues)

*Mix of pneumatic in old and DDC in addition.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Convert old building to DDC.	Deferred Maintenance	\$200,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Sprinklers System Rating: 5 System Subtotal:** (unresolved issues)

*Mostly sprinklered (original building needs some sprinklers), no fire pump.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Emergency Lighting**      **System Rating: 4**      **System Subtotal:** (unresolved issues)  
*On generator.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Fire Alarm**      **System Rating: 4**      **System Subtotal: \$120,000** (unresolved issues)  
*Siemens, Evac speakers have been installed, area of refuge call buttons installed.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	System called out to be replaced.	Planned Maint/Capital Renewal	\$120,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Electrical Power**      **System Rating: 3**      **System Subtotal: \$275,000** (unresolved issues)  
*Distribution system is old. Too many items on each circuit. 750 and 500 KVA transformer.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Need additional outlets on separate circuits. Replace distribution system.	Deferred Maintenance	\$275,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Standby Power**      **System Rating: 4**      **System Subtotal:** (unresolved issues)  
*100 KW Generator-exit lights/ -80 freezer/circulating pumps/condensate pumps/ egress lighting.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Lighting**      **System Rating: 4**      **System Subtotal: \$20,000** (unresolved issues)  
*All lighting is T8, most surface mounted, lens are yellowing in old part of building, In main gathering area can not reach some of the downlights.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace yellow lens and replace down lights with lowerable fixtures.	Deferred Maintenance	\$20,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Clock System**

**System Rating: NA**

**System Subtotal:** (unresolved issues)

NA

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Code Compliance: Code/Life Safety**

**System Rating: 4**

**System Subtotal: \$610,000** (unresolved issues)

*Fire alarm system - original alarm system is operational though dated. Sprinkled (original building partially sprinkled). Tow elevators. Accessible restrooms in new addition. on accessible restrooms in original building. Non code compliant stairwells in original building. Compliant stairwells at addition. Non accessible entry at south vestibule.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Provide accessible door hardware.	Facility Adaptation	\$125,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Non code compliant handrails at stairs. Provide code compliant handrails.	Facility Adaptation	\$35,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Non compliant restrooms. Provide accessible restrooms.	Facility Adaptation	\$450,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Adjacent Site: Immediate Site**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

*Security lighting at entrances is adequate.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

End of Building Report for: **U.J. Noblet Forestry Building**

**Building Information**

Year Built 1968      Building Area (sf) 162,500      Floors      Building Engineer James Schultz

**Building Notes:**

Mechanical systems are noted as being difficult to access and maintain, including in the penthouse.

Millwork throughout the entire building in relatively fair condition.

Building has been reported to have A.C.M.

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**Building Use Types**

Use Type %	Use Type
50%	Laboratory, Research
25%	Classroom
25%	Administrative

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**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	10.40%	Poor	<b>CRV</b>	\$45,906,250	<b>Annual Maint and Capital Renewal Budget</b>	\$1,101,750
						3% of CRV x 80%

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	6.79%	Fair
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**Priority 1 (current year only)**

<b>FCNI</b>	0.00%	Good
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal	
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation		
1 Currently Critical (Current Year)	\$0			\$0	
2 Potentially Critical (Year 1)	\$1,863,000			\$1,863,000	
3 Not yet Critical (Year 2-5)	\$935,000	\$320,000		\$1,255,000	
4 Watch List (Year 6-10)	\$60,000	\$465,000	\$1,130,000	\$1,655,000	
5 Long Term (Year 11+)					
	Subtotal	\$2,858,000	\$785,000	\$1,130,000	<b>\$4,773,000</b> <b>Total of Projects</b>

**Structure: Structure**      **System Rating: 4**      **System Subtotal: \$30,000** (unresolved issues)

*Concrete structure. Concrete deck. Cast in place concrete basement with sub-basement.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Water infiltration at south stair at sub-basement level. Concrete basement wall due for repair.	Deferred Maintenance	\$30,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Roof**      **System Rating: 5**      **System Subtotal: \$160,000** (unresolved issues)

*(2001)EPDM single ply adhered. No overflow roof drains present.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	2001 EPDM single ply	Planned Maint/Capital Renewal	\$160,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Glazing**      **System Rating: 2**      **System Subtotal: \$1,250,000** (unresolved issues)

*Original single glazing, aluminum window frames, casement operable windows in balance of building. Handles removed from operable windows in corridor.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Air and water infiltration at glazing system. Glazing system at End of Useful Service Life.	Deferred Maintenance	\$1,250,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Cladding**      **System Rating: 4**      **System Subtotal: \$80,000** (unresolved issues)

*Brick veneer on CMU backup. Exposed aggregate concrete panels. Plaster soffits. Exposed concrete base.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Cracking observed in exposed aggregate concrete panel, due for repair.	Deferred Maintenance	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Most exterior building joints are failing. Joints are at End of Useful Service Life.	Deferred Maintenance	\$75,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Interior Partitions**      **System Rating: 4**      **System Subtotal: \$150,000** (unresolved issues)

*Ceramic tile in restrooms. Painted CMU at corridors, laboratories, offices, restrooms, and stairwell. Acoustical fabric over gypsum board at lecture hall.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Interior partitions due for re-painting.	Deferred Maintenance	\$150,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors**      **System Rating: 4**      **System Subtotal: \$** (unresolved issues)

*Solid core wood doors with hollow metal frames typical in balance of building. Accessible aluminum storefront system at entry vestibules.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Y	No reported problems.	Deferred Maintenance	\$0	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors**      **System Rating: 4**      **System Subtotal: \$465,000** (unresolved issues)

*Carpet at computer labs, conference rooms, office suites, and office suites. Ceramic tile at restrooms. 9x9 observed at corridors, under carpet in corridors, and office suites. VCT at main corridor, wood shop, stairwell landings, and polymer lab. Rubber nosing at stair treads. Sealed concrete at labs.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	VCT is at End of Useful Service Life.	Deferred Maintenance	\$250,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Carpet is at End of Useful Service Life.	Deferred Maintenance	\$215,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Ceilings**      **System Rating: 4**      **System Subtotal: \$460,000** (unresolved issues)

*2x2 suspended ceiling system typical in balance of building. Gypsum board typical in restrooms. Open to deck in labs.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Paint exposed ceilings.	Deferred Maintenance	\$50,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	2x2 suspended ceiling system at main corridor, level 7 corridor, and office 510A at End of Useful Service Life.	Deferred Maintenance	\$410,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Conveying System: Elevators**      **System Rating: 4**      **System Subtotal: \$245,000** (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Otis freight elevator: original controls, motors and other mechanical and electrical components have not been replaced, modernization should be planned for.	Deferred Maintenance	\$200,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Renovation of freight elevator cab recommended.	Deferred Maintenance	\$45,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Plumbing System: Domestic Water/Plumbing**      **System Rating: 3**      **System Subtotal: \$13,000** (unresolved issues)

*Glass pipe for waste in labs, DW piping in good shape, Large HW storage tank- would like to see instantaneous HW, distilled water unit in Penthouse is leaking.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Replace storage tank with instantaneous HW Heater, replace distilled water system.	Deferred Maintenance	\$13,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC**      **System Rating: 3**      **System Subtotal: \$154,000** (unresolved issues)

*Chiller is original, humidifiers are old and need to be replaced, Penthouse houses exhaust fans, heat exchangers in sub-basement are old, cooling tower on roof, roll filters in most units, non insulated duct in some areas that AC(condensation problem) , AC in some areas (labs), building is 100% fresh air now.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Humidifiers in penthouse need to be replaced-leaking.	Deferred Maintenance	\$3,500	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	HV-3 needs to have filters installed.	Deferred Maintenance	\$500	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Chiller is at End of Useful Service Life.	Deferred Maintenance	\$100,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Exhaust ducts thru penthouse roof are beginning to rust.	Deferred Maintenance	\$50,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	1st floor cabinet unit heaters are covered over and can not be maintained (east and south).	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

<b>HVAC System: Steam Production Equip.</b>		<b>System Rating: 3</b>	<b>System Subtotal: \$465,000</b> (unresolved issues)			
<i>Campus steam.</i>						

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Replace steam piping/condensate, PRV system.	Planned Maint/Capital Renewal	\$465,000	<input type="checkbox"/>	<input type="checkbox"/>	

<b>HVAC System: HVAC Controls</b>		<b>System Rating: 3</b>	<b>System Subtotal: \$1,000</b> (unresolved issues)			
<i>Johnson control valves are leaking.</i>						

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Control valves can not be sealed, at End of Useful Service Life.	Deferred Maintenance	\$1,000	<input type="checkbox"/>	<input type="checkbox"/>	

<b>Safety: Sprinklers</b>		<b>System Rating:</b>	<b>System Subtotal:</b> (unresolved issues)			
<i>Sprinklered.</i>						

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	Fire pump was found to be in manual position-needs to be in automatic.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

<b>Safety: Emergency Lighting</b>		<b>System Rating: 4</b>	<b>System Subtotal:</b> (unresolved issues)			
<i>On generator.</i>						

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

<b>Safety: Fire Alarm</b>		<b>System Rating: 4</b>	<b>System Subtotal:</b> (unresolved issues)			
<i>FA system is new EST-3.</i>						

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Electrical Power**      **System Rating: 3**      **System Subtotal: \$160,000** (unresolved issues)

*Westinghouse, Federal Pacific fusible switches, two substations - 500 kVA and 1000 Kva*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Need to replace Federal Pacific switch boards-switches starting to fail	Planned Maint/Capital Renewal	\$160,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Standby Power**      **System Rating: 4**      **System Subtotal:** (unresolved issues)

*Emergency generator-serves emergency lights, condensate return unit, circ pumps*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Lighting**      **System Rating: 4**      **System Subtotal: \$10,000** (unresolved issues)

*Fluorescents in all areas except penthouse, Occupancy sensors are being installed at renovated areas.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Penthouse has incandescent should be changed to fluorescent	Deferred Maintenance	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Clock System**      **System Rating:**      **System Subtotal:** (unresolved issues)

*Battery clocks.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Data/Telecom System**      **System Rating: 5**      **System Subtotal:** (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No reported problems.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Code Compliance: Code/Life Safety**

**System Rating: 4**

**System Subtotal: \$1,130,000** (unresolved issues)

*Fire alarm system - operational.  
 Sprinkled at first level, basement mechanical room, and sub basement.  
 Emergency lighting is tied to generator.  
 Three recently renovated traction elevators.  
 One freight elevator.  
 Accessible restrooms at seventh level and basement level for men and fifth level for women.  
 Non code compliant stairwells.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Hand rail at stairwells are not code compliant. Provide code compliant hand rail.	Facility Adaptation	\$60,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Provide accessible restrooms.	Facility Adaptation	\$850,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Provide accessible door hardware.	Facility Adaptation	\$220,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Adjacent Site: Immediate Site**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

End of Building Report for: **Chemical Sciences and Engineering Building**

**Building Information**

Year Built 1971     Building Area (sf) 162,500     Floors     Building Engineer James Schultz

Building Notes:

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**Building Use Types**

Use Type %	Use Type
70%	Laboratory, Research
30%	Administrative

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**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	19.59%	Poor	<b>CRV</b>	\$51,350,000	<b>Annual Maint and Capital Renewal Budget</b>	\$1,232,400
						3% of CRV x 80%

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	3.95%	Good
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**Priority 1 (current year only)**

<b>FCNI</b>	1.35%	Good
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation	
1 Currently Critical (Current Year)	\$433,900		\$260,000	\$693,900
2 Potentially Critical (Year 1)	\$8,000			\$8,000
3 Not yet Critical (Year 2-5)	\$735,000	\$590,000		\$1,325,000
4 Watch List (Year 6-10)	\$10,000	\$6,915,000	\$1,031,500	\$7,956,500
5 Long Term (Year 11+)	\$75,000			\$75,000
Subtotal	\$1,261,900	\$7,505,000	\$1,291,500	<b>\$10,058,400</b>
				<b>Total of Projects</b>

**Structure: Structure**     **System Rating: 4**     **System Subtotal:** (unresolved issues)  
*Steel frame. metal roof deck. Cast in place concrete basement.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No reported problems.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Roof**     **System Rating: 3**     **System Subtotal: \$165,000** (unresolved issues)  
*(1994) C, D, E, F, & G - EPDM single-ply over Styrofoam.  
 (1998) A & B - EPDM single-ply over Styrofoam.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	1998 EPDM roof over A and B at End of Useful Service Life.	Deferred Maintenance	\$75,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	1994 EPDM single-ply over styrofoam. roofs at C, D, E, F, & G at End of Useful Service Life.	Deferred Maintenance	\$90,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Glazing**     **System Rating: 1**     **System Subtotal: \$432,900** (unresolved issues)  
*Single glazing, alum window frames, operable hopper windows.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Windows on the east and west elevations leak with driving rain. All window system near End of Useful Service Life.	Deferred Maintenance	\$432,900	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Cladding**     **System Rating: 4**     **System Subtotal: \$40,000** (unresolved issues)  
*Brick veneer. KARR on exterior facade maintenance recommendations is attached to facility assessment report for reference.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Tuck pointing necessary at brick precast outcropping/overhang as needed though out building.	Deferred Maintenance	\$40,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Interior Partitions**     **System Rating: 3**     **System Subtotal: \$135,000** (unresolved issues)

*Painted CMU in classrooms and corridors, typical in balance of building. Ceramic tile in bathrooms. Demountable gyp partition walls on metal stud in offices. Brick and wood in lecture halls. Operable partitions in some classrooms (rarely used).*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Re-paint interior partitions.	Deferred Maintenance	\$135,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors**     **System Rating: 4**     **System Subtotal: \$268,000** (unresolved issues)

*Interior - Solid core wood door with hollow metal frame in balance of building and hollow metal door with new push bar hardware with hollow metal frame at egress stairs. Exterior - Aluminum storefront system. Overhead door.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Knobs on most doors. Provide accessible door hardware.	Facility Adaptation	\$260,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Overhead door freezes in winter. Provide alternative solution.	Deferred Maintenance	\$8,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors**     **System Rating: 4**     **System Subtotal: \$50,000** (unresolved issues)

*VCT in corridors and isles of lecture halls. Carpet typical in classrooms. Polished concrete in labs. Ceramic tile typical in bathrooms. Rubber nosing on stairs.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace VCT in corridors.	Deferred Maintenance	\$50,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Ceilings**     **System Rating: 3**     **System Subtotal: \$310,000** (unresolved issues)

*Mix of new and original 2x2 suspended ceiling systems throughout balance of building. Original gypsum board in bathrooms. Original 1x1 concealed spline acoustic ceiling system in labs. Acoustic wood ceilings in lecture halls. Open to deck in high bay spaces.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Suspended ceiling system near End of Useful Service Life.	Deferred Maintenance	\$310,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Conveying System: Elevators**     **System Rating: 5**     **System Subtotal: \$75,000** (unresolved issues)  
*Traction elevator.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	Dover Elevator 3 Replace signal fixtures for improved reliability and maintenance.	Deferred Maintenance	\$25,000	<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	Dover Elevator 2 Replace signal fixtures for improved reliability and maintenance.	Deferred Maintenance	\$25,000	<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	Dover Elevator 1 Replace signal fixtures for improved reliability and maintenance.	Deferred Maintenance	\$25,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Plumbing System: Domestic Water/Plumbing**     **System Rating: 3**     **System Subtotal: \$660,000** (unresolved issues)  
*Two large steam-fired domestic water heaters.*  
*Glass acid water piping.*  
*Steam fired distiller for labs.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Replace DW/Plumbing.	Planned Maint/Capital Renewal	\$660,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC**

**System Rating: 3**

**System Subtotal: \$5,811,000** (unresolved issues)

*Two large built-up air handling units in the penthouse serve the building. Units are two-speed fans, steam heat coils with face and bypass dampers, humidifiers, chilled water AC.*

*AC-1 serves the Lecture Hall.*

*AC-2 in the penthouse serves the 7th floor and biology.*

*AC-3 serves the "fishbowl".*

*HV-3 serves the dyno labs.*

*Added stairwell pressurizations fans on 2010.*

*Trane CG60D R-22 chiller original with inside tower.*

*In the 1980s, 30 to 40 lab exhaust fans were added for hoods.*

*Make-up air unit was added for the dynamometer room.*

*Liquid nitrogen tank outside on grade.*

*Labs have compressed air, natural gas, nitrogen, cold water, and distilled water.*

*Some mini-splits added to 1st floor rooms for student computing.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	SF-2 belts were loose and belt guard not in place.	Deferred Maintenance	\$1,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Phase 1 of the phase-out of R-22 started in the US as of 1/1/2010. Production and import of R-22 is halted except for service work. Ultimately in 2030, all use is prohibited. Develop a phased plan for refrigerant phase-out.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Pressurization issues with the building are ongoing. May be caused by addition of 30 to 40 exhaust fans. Building often very negative. Engineering study needed.	Deferred Maintenance	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Replace HVAC system.	Planned Maint/Capital Renewal	\$5,800,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: Steam Production Equip.**     **System Rating: 3**     **System Subtotal: \$455,000** (unresolved issues)

*Steam is provided by the Central Heating Plant.  
 1/3 2/3 duplex Fisher steam pressure reducing valve station.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Replace steam piping/condensate, PRV system.	Planned Maint/Capital Renewal	\$455,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls**     **System Rating: 3**     **System Subtotal: \$590,000** (unresolved issues)

*JCI DDC controls with pneumatic actuators for large valve and dampers.  
 Simplex air compressor for control system.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace HVAC DDC controls.	Planned Maint/Capital Renewal	\$590,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Sprinklers**     **System Rating:**     **System Subtotal:** (unresolved issues)

*Wet sprinkler system with fire pump.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Emergency Lighting**     **System Rating: 4**     **System Subtotal: \$20,000** (unresolved issues)

*Emergency lighting with individual battery backup ballast in fixtures.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace batteries.	Deferred Maintenance	\$20,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Fire Alarm**     **System Rating: 4**     **System Subtotal:** (unresolved issues)

*Newer GE EST3 Fire alarm system provided. Newer horn/strobes and amber alert noted in areas.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Electrical Power**     **System Rating: 4**     **System Subtotal:** (unresolved issues)  
*Original General Electric 2-line switchgear, panelboards, transformers, etc.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Standby Power**     **System Rating: 4**     **System Subtotal:** (unresolved issues)  
*Cummins 125kW, natural gas, engine-generator with one GE Zenith ATS.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Lighting**     **System Rating: 4**     **System Subtotal: \$15,000** (unresolved issues)  
*Lecture Room has 1x4 2-lamp fixtures, some T8 and some T12. 3rd floor area had 1x4 on spline ceiling with two (2) T12 lamps each.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace T12 fixture with T8. Re-ballast and add lamps.	Deferred Maintenance	\$15,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Clock System**     **System Rating: NA**     **System Subtotal:** (unresolved issues)  
 NA

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Data/Telecom System**     **System Rating: 5**     **System Subtotal:** (unresolved issues)  
*Fiber to each building. CAT5/CAT6 Cabling. VOIP System (Phones).*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Code Compliance: Code/Life Safety**     **System Rating: 4**     **System Subtotal: \$1,031,500** (unresolved issues)

*Fire alarm system - recently updated smoke detectors and manual pull stations, dual horns and strobes.  
 Some areas have sprinkler system.  
 Emergency lighting runs on built in backup generator.  
 Recently added smoke evac system.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Provide fire suppression system throughout 60% of building.	Facility Adaptation		<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Non accessible seating in lecture hall. Provide accessible seating.	Facility Adaptation	\$15,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Restrooms are not accessible. Provide accessible restrooms.	Facility Adaptation	\$1,000,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Drinking fountain not accessible. Provide accessible fountain.	Facility Adaptation	\$16,500	<input type="checkbox"/>	<input type="checkbox"/>	

**Adjacent Site: Immediate Site**     **System Rating: 5**     **System Subtotal:** (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

End of Building Report for:     **R.L. Smith Building**



### Building Information

Year Built 1972     Building Area (sf) 313,690     Floors 3     Building Engineer Michael Wilmers

Building Notes:

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### Building Use Types

Use Type %	Use Type
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50%	Recreation/Gym
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10%	Classroom
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40%	Athletics (non-recreation)
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**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	27.60%	Poor	<b>CRV</b>	\$69,796,025	<b>Annual Maint and Capital Renewal Budget</b>	\$1,675,105
						3% of CRV x 80%

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	23.46%	Poor
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**Priority 1 (current year only)**

<b>FCNI</b>	8.82%	Fair
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation	
1 Currently Critical (Current Year)	\$6,157,000			\$6,157,000
2 Potentially Critical (Year 1)	\$1,177,500	\$35,000		\$1,212,500
3 Not yet Critical (Year 2-5)	\$1,455,000	\$7,050,000	\$500,000	\$9,005,000
4 Watch List (Year 6-10)	\$40,000	\$1,705,000	\$1,140,000	\$2,885,000
5 Long Term (Year 11+)		\$7,000		\$7,000
Subtotal	\$8,829,500	\$8,797,000	\$1,640,000	<b>\$19,266,500</b>
				<b>Total of Projects</b>

**Structure: Structure**     **System Rating: 5**     **System Subtotal: \$235,000** (unresolved issues)  
*Steel structure. Metal roof deck. CMU basement walls.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	At Natatorium, remove and replace existing ceiling system. Includes: 4'x4' vinyl-faced ACT, assumes re-using existing lighting, adding new grilles and diffusers.	Deferred Maintenance	\$235,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Roof**     **System Rating: 1**     **System Subtotal: \$2,200,000** (unresolved issues)  
*(1991) Ice arena and roof A - EPDM single-ply ballasted.*  
*(1979) Roof B thru N - EPDM single-ply ballasted.*  
*No overflow drains present.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Y	1979 Roof B thru N - EPDM single-ply	Deferred Maintenance	\$1,600,000	<input type="checkbox"/>	<input type="checkbox"/>	
1: Currently Critical (Current Y	1991 Ice arena and roof A - EPDM single-ply.	Deferred Maintenance	\$600,000	<input type="checkbox"/>	<input type="checkbox"/>	
1: Currently Critical (Current Year)	Roof north of room 157 at level one has loose coping and the railing is at End of Useful Service Life.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	
1: Currently Critical (Current Year)	Water infiltration through roof and some exterior soffit issues reported at entries. Roof at End of Useful Service Life.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	
1: Currently Critical (Current Year)	Roof above B016, B015, and BE2 collects water, vegetation is present, roof drains are missing cages, coping needs repair in some areas, and slope issues observed. Roof at End of Useful Service Life.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Glazing**      **System Rating: 2**      **System Subtotal: \$150,000** (unresolved issues)  
*Insulated glazing, aluminum window frames, operable awning windows.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Some glazing is failing, some fogging is present. Sealant around windows is at End of Useful Service Life. Glazing is at End of Useful Service Life.	Deferred Maintenance	\$150,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Cladding**      **System Rating: 4**      **System Subtotal: \$240,000** (unresolved issues)  
*Brick veneer with CMU backup. Plaster at entry soffits. Precast concrete panels at top of exterior wall.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Building joints at End of Useful Service Life.	Deferred Maintenance	\$75,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Exterior plaster at entry soffit is damaged and stained. Due for repair.	Deferred Maintenance	\$115,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Minor damage to brick veneer at entry. Brick due for repair.	Deferred Maintenance	\$50,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Interior Partitions**      **System Rating: 4**      **System Subtotal: \$37,500** (unresolved issues)  
*Painted CMU and brick veneer at corridors and in balance of building. Ceramic tile at pool room. Gypsum board in offices.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Interior sealant joints in natatorium are at End of Useful Service Life.	Deferred Maintenance	\$7,500	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Extensive deterioration of ceramic tile at natatorium due to elevated humidity levels and chlorine. Ceramic tile at End of Useful Service Life.	Deferred Maintenance	\$30,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*Solid core wood doors with hollow metal frames at interior. Aluminum storefront at vestibules. Hollow metal doors with hollow metal frames at exterior.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Some doors at stairs lack fire rated door label. Provide rated door and hardware where necessary.	Facility Adaptation		<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Door hardware not Compliant. Provide accessible hardware.	Facility Adaptation		<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Provide power operated door switch at entry.	Facility Adaptation		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors**

**System Rating: 4**

**System Subtotal: \$485,000** (unresolved issues)

*Carpet. Rubber tile in locker rooms. Hardwood flooring in gymnasium and dance studio. VCT. Ceramic tile in bathrooms. Quarry tile at hockey education area. Brick pavers in main corridors.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Ceramic tile in Natatorium needs to be replaced/repared.	Deferred Maintenance	\$30,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Damaged quarry tile at stair treads.	Deferred Maintenance	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Floor in the ice arena beyond End of Useful Service Life.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Stained carpet near End of Useful Service Life.	Deferred Maintenance	\$300,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	VCT tile in corridors and gym at End of Useful Service Life.	Deferred Maintenance	\$150,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Ceilings**      **System Rating: 4**      **System Subtotal: \$45,000** (unresolved issues)  
*2x2 suspended ceiling system throughout balance of building. Gypsum board ceiling at reception desk and bathrooms. Open to deck in in high bay spaces, ice arena, gymnasium, and basement.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Water damage and deterioration of 2x2 suspended ceiling system in bookstore and room 221 observed. Ceiling at End of Useful Service Life.	Deferred Maintenance	\$45,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Conveying System: Elevators**      **System Rating: 5**      **System Subtotal: \$45,000** (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Renovate interior finishes in (3) elevator cabs.	Deferred Maintenance	\$45,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Plumbing System: Domestic Water/Plumbing**      **System Rating: 3**      **System Subtotal: \$2,480,000** (unresolved issues)  
*Ice making equipment is at End of Useful Service Life, wall mounted toilets with auto flush valves, pool equipment is 15 years old.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Replace pool equipment. End of Useful Service Life.	Deferred Maintenance	\$300,000	<input type="checkbox"/>	<input type="checkbox"/>	
1: Currently Critical (Current Year)	Replace ice making equipment. End of Useful Service Life. Includes new concrete slab, dis-assemble and re-assemble boards.	Deferred Maintenance	\$900,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Replace DW/Plumbing.	Planned Maint/Capital Renewal	\$1,280,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC**      **System Rating: 3**      **System Subtotal: \$9,625,000** (unresolved issues)  
*HV units in penthouses, Roof mounted DX units for certain areas, 4 HV units in arena are at their age, the sound control room needs to have cooling, the pool area dehumidification system is not working, No ventilation on the racquet ball courts, and washer/dryer room. Inadequate ventilation in toilet room in arena.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	4 HV units in arena should be replaced, at End of Useful Service Life, provide cooling/ventilation for sound equipment room, provide new dehumidification unit for pool area, provide an HV unit to give ventilation to racquet ball courts. Replace exhaust fans for toilet rooms- increase ventilation.	Deferred Maintenance	\$2,500,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Replace pool HVAC.	Deferred Maintenance	\$675,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Replace HVAC system.	Planned Maint/Capital Renewal	\$6,450,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: Steam Production Equip.**      **System Rating: 3**      **System Subtotal: \$447,000** (unresolved issues)  
*Campus steam, condensate pumps are leaking.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Y	Replace condensate pumps.	Deferred Maintenance	\$22,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Replace steam piping/condensate, PRV system.	Planned Maint/Capital Renewal	\$425,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls**      **System Rating: 3**      **System Subtotal: \$917,000** (unresolved issues)  
*Pneumatic controls.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Replace with DDC.	Deferred Maintenance	\$910,000	<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	Tie-in DDC to Central Control.	Planned Maint/Capital Renewal	\$7,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Sprinklers**      **System Rating:**      **System Subtotal:** (unresolved issues)  
*The arena is not sprinklered.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Emergency Lighting**      **System Rating: 4**      **System Subtotal: \$150,000** (unresolved issues)  
*Mixture of EBUs and emergency lights.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Provide additional lights on the generator to get 1 fc minimum.	Facility Adaptation	\$150,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Fire Alarm**      **System Rating: 3**      **System Subtotal: \$300,000** (unresolved issues)  
*FA system is older with no evacuation.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace system with EST-3 with evacuation.	Facility Adaptation	\$300,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Electrical Power**      **System Rating: 3**      **System Subtotal: \$600,000** (unresolved issues)  
*GE panelboards are original and have not been exercised, some of the transformers in the arena are in small closets with no ventilation, dry type transformer (750 KVA double ended and 1000/1333 kVA single) substations are original and should be tested.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace panelboards and distribution boards	Planned Maint/Capital Renewal	\$600,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Standby Power**      **System Rating: 4**      **System Subtotal: \$40,000** (unresolved issues)  
*Two Small older generator for egress lighting (75KW and 115KW).*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Over haul both generators.	Deferred Maintenance	\$40,000	<input type="checkbox"/>	<input type="checkbox"/>	



**Electrical System: Lighting** System Rating: 3 System Subtotal: \$90,000 (unresolved issues)

*Arena lighting needs to be repositioned in order to provide vertical foot-candles to the playing surface, can't get at existing MH lights from cat walks, Gymnasium and track have newer lighting using fluorescent 6 tube fixtures, RT5 fixtures used in lobby of work out area. Natatorium lights are rusted.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Need to replace lights in natatorium.	Deferred Maintenance	\$40,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Provide MH light fixtures from edges to get vertical foot-candles.	Facility Adaptation	\$50,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Clock System** System Rating: NA System Subtotal: (unresolved issues)

NA

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Code Compliance: Code/Life Safety** System Rating: 3 System Subtotal: \$1,175,000 (unresolved issues)

*Fire alarm system - in the process of updating smoke detectors and manual pull stations, dual horns and strobes.  
 Has sprinkler system except at ice arena.  
 Emergency lighting runs on backup battery and generator.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Metal brackets/fasteners severely rusted on equipment at pool area.	Planned Maint/Capital Renewal	\$35,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Provide accessible door hardware throughout balance of building.	Facility Adaptation	\$260,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Stair railings do not comply with code. Provide compliant hand railings.	Facility Adaptation	\$80,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Non accessible stalls and hardware in restrooms. Provide accessible restrooms.	Facility Adaptation	\$800,000	<input type="checkbox"/>	<input type="checkbox"/>	

**BUILDING REPORT Student Development Complex****BUILDING No.****24**

Michigan Technological University

CAMPUS Main Campus

**Adjacent Site: Immediate Site****System Rating: 4****System Subtotal: \$5,000** (unresolved issues)*Exterior lighting is metal halite. All lighting to be replaced with LED.*

<b>Priority</b>	<b>Observed Issue</b>	<b>Project Classification</b>	<b>Resolution Budget</b>	<b>Funded</b>	<b>Resolved</b>	<b>Year Resolved</b>
2: Potentially Critical (Year 1)	Remove and replace some exterior concrete slabs.	Deferred Maintenance	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	

End of Building Report for: **Student Development Complex**

**Building Information**

Year Built   2005                      Building Area (sf)   51,439                      Floors   4                      Building Engineer   Michael Wilmers

Building Notes:

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**Building Use Types**

Use Type %	Use Type
70%	Classroom
30%	Administrative

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**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	1.87%	Good	<b>CRV</b>	\$10,133,483	<b>Annual Maint and Capital Renewal Budget</b>	\$243,204
						3% of CRV x 80%

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	0.55%	Good
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**Priority 1 (current year only)**

<b>FCNI</b>	0.45%	Good
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation	
1 Currently Critical (Current Year)	\$46,000			\$46,000
2 Potentially Critical (Year 1)				
3 Not yet Critical (Year 2-5)	\$10,000			\$10,000
4 Watch List (Year 6-10)	\$20,000			\$20,000
5 Long Term (Year 11+)	\$10,000	\$100,000	\$3,000	\$113,000
Subtotal	\$86,000	\$100,000	\$3,000	<b>\$189,000</b>
				<b>Total of Projects</b>

**Structure: Structure** **System Rating: 5** **System Subtotal:** (unresolved issues)  
*Steel Structure. Metal roof deck. Cast in place basement walls.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Roof** **System Rating:** **System Subtotal: \$110,000** (unresolved issues)  
*(2005) Thermoplastic PVC single-ply on Foamular insulation.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	Provide lightning protection.	Deferred Maintenance	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	2005 Thermoplastic PVC single-ply on Foamular insulation.	Planned Maint/Capital Renewal	\$100,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Glazing** **System Rating: 4** **System Subtotal:** (unresolved issues)  
*(2005) Original insulated glass, alum window frames, no operable window.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Cladding** **System Rating: 4** **System Subtotal:** (unresolved issues)  
*Slate veneer. Standing seam copper. Architectural cast stone veneer panel.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Interior Partitions** **System Rating: 4** **System Subtotal:** (unresolved issues)  
*Gypsum board on metal stud typical in balance of building. Painted CMU in stairwells.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors** **System Rating: 4** **System Subtotal: \$29,000** (unresolved issues)  
*Interior - Solid core wood doors with hollow metal frame typical in balance of building. Many rooms with card readers. Compliant door hardware. Hollow metal door with hollow metal frame at egress stairs as well as at the connector to Fisher. Overhead fire shutter at bridge on second floor and window looking west on third floor.  
 Exterior - Aluminum storefront.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Hollow metal door at connection to Fisher does not close properly. Replace rated assembly to meet code compliancy.	Deferred Maintenance	\$16,000	<input type="checkbox"/>	<input type="checkbox"/>	
1: Currently Critical (Current Year)	Over head fire shutter on third floor is potentially dangerous. Shutter is located more than 3' from window and could potentially entrap someone in event of emergency.	Deferred Maintenance	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	Solid core doors with hollow metal frame in entry lobby leading to office suite is not a rated assembly.	Facility Adaptation	\$3,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors** **System Rating: 4** **System Subtotal: \$20,000** (unresolved issues)  
*VCT typical in corridors. Perforated VCT over raised floor system in server rooms. Carpet over raised floor system typical in classrooms and offices. Ceramic tile typical in bathrooms.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	VCT over raised floor in server rooms is delaminating and may become tripping hazard. Provide alternative floor cover system in server rooms. System at End of Useful Service Life.	Deferred Maintenance	\$20,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Ceilings** **System Rating: 4** **System Subtotal: \$10,000** (unresolved issues)  
*2x2 suspended ceiling system throughout balance of building. Perforated 2x2 metal suspended ceiling system in server room. Custom suspended ceiling system in offices and lounge. Gypsum in vestibule and bathrooms.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Perforated metal lay-in-ceiling has staining. Replace ceiling.	Deferred Maintenance	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Conveying System: Elevators**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

*Hydraulic elevator.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Plumbing System: Domestic Water/Plumbing**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

*Steam-fired domestic water heater.  
Bathroom fixtures are low flow.  
Duplex sewage ejector sump.  
Duplex de-watering sump.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

*Two (2) medium sized VAV AHUs with variable freq. drives, chilled water AC from Van Pelt Library, steam heat, and steam humidifiers.  
VAV air supply throughout.  
Two (2) Liebert CRAC units in 2nd floor IT facility with DX coiling, electric heat, humidifiers, and roof-mounted glycol dry-coolers with water-side economizer.  
Secondary chilled water pump for AHUs.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Basement VAVs were never balanced or commissioned properly since they are 20 feet above floor. Airflow rate is too high and a noise nuisance especially in Distance Learning Rooms. Plan in place to provide accessibility to VAVs and perform remedial work.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: Steam Production Equip.**

**System Rating:**

**System Subtotal:** (unresolved issues)

*Steam provided by Central Heating Plant.  
 Single pressure reducing valve station for 15# low pressure steam.  
 Duplex steam to hot water heat exchangers for heating and reheat coils.  
 Duplex pumps for perimeter heating hot water - radiation, cabinet heaters, unit heaters.  
 Duplex pumps for VAV reheat hot water.  
 Pumped condensate return by CRU.  
 Pressure powered condensate traps at two AHUs.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

*2005 JCI DDC with pneumatic actuators for large valves and dampers.  
 Electronic DDC for VAV boxes and perimeter heat electronic valves.  
 Duplex Powerex air compressor for controls.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Sprinklers**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

*Wet sprinkler system throughout building.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Emergency Lighting**

**System Rating: 4**

**System Subtotal: \$15,000** (unresolved issues)

*Emergency lighting with individual battery backup ballast in fixtures. Generator from Van Pelt Library.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Replace batteries.	Deferred Maintenance	\$15,000	<input type="checkbox"/>	<input type="checkbox"/>	



**Safety: Fire Alarm** **System Rating: 4** **System Subtotal:** (unresolved issues)  
*EST3 Fire Alarm in place with horns/strobes.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Electrical Power** **System Rating: 4** **System Subtotal: \$5,000** (unresolved issues)  
*Square D HVL 2-line switchgear, substation, transformers, distribution panelboards, motor control centers, LPs, PPs.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems - although humming at transformer is so loud classroom next door can hear it. Shut down and check.	Deferred Maintenance	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Standby Power** **System Rating: 4** **System Subtotal:** (unresolved issues)  
*Emergency power provided from 2005 engine-generator at Van Pelt Library. Two ASCO ATSS.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Lighting** **System Rating: 4** **System Subtotal:** (unresolved issues)  
*1x4 T8 Fluorescent lighting typical throughout building.  
 Daylighting on 2nd and 3rd floor from skylight.  
 Most classrooms have occupant sensors for lighting.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Clock System** **System Rating: NA** **System Subtotal:** (unresolved issues)  
*NA*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Data/Telecom System** **System Rating: 5** **System Subtotal:** (unresolved issues)  
*Fiber to each building. CAT5/CAT6 Cabling. VOIP System (Phones).*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Code Compliance: Code/Life Safety** **System Rating: 4** **System Subtotal:** (unresolved issues)  
*Fire alarm system - smoke detectors and manual pull stations, horns or strobes.  
 Sprinkler system.  
 Emergency lighting with individual battery backup.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
:				<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	No reported problems.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Adjacent Site: Immediate Site** **System Rating:** **System Subtotal:** (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

End of Building Report for: **Kanwal and Ann Rekhi Hall**

**Building Information**

Year Built 1938     Building Area (sf) 92,500     Floors     Building Engineer James Schultz

**Building Notes:**

Addition built in 1946 (east wing) and another in 1966 (food service).  
  
Original piping throughout building showing excessive leakage.  
  
Building is not air-conditioned, except in one office. Full kitchen, with a make-up air unit, not air conditioned.  
  
Building has been reported to contain A.C.M.

**Major Renovations/Additions**

Year	Add'n.	Reno.	Description
1966	X		
1946	X		

**Building Use Types**

Use Type %	Use Type
80%	Student Life/Residential Housing
20%	Administrative

**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	41.92%	Poor	<b>CRV</b>	\$17,575,000	<b>Annual Maint and Capital Renewal Budget</b>	\$421,800
						3% of CRV x 80%

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	31.76%	Poor
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**Priority 1 (current year only)**

<b>FCNI</b>	1.62%	Good
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation	
1 Currently Critical (Current Year)		\$265,000	\$20,000	\$285,000
2 Potentially Critical (Year 1)	\$1,230,000			\$1,230,000
3 Not yet Critical (Year 2-5)	\$915,000	\$3,152,000		\$4,067,000
4 Watch List (Year 6-10)			\$1,725,000	\$1,725,000
5 Long Term (Year 11+)	\$30,000	\$30,000		\$60,000
Subtotal	\$2,175,000	\$3,447,000	\$1,745,000	<b>\$7,367,000</b>
				<b>Total of Projects</b>

**Structure: Structure**                                      **System Rating: 5**                                      **System Subtotal:** (unresolved issues)  
*Concrete structure. Metal deck over kitchen roof. Steel truss roof structure. Gypsum deck over main roof. Cast in place concrete basement.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No reported problems.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Roof**    **System Rating: 3**                                      **System Subtotal: \$290,000** (unresolved issues)  
*(1980) Asphalt shingles @ main roof.  
 (2009) PVC single ply adhered @ kitchen.  
 Copper standing seam @ dormers and eaves.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	1980 Asphalt shingles @ main roof.	Deferred Maintenance	\$145,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Ice dams reported at eaves - damaged copper roofing. Repair roofing and correct ice dam condition.	Deferred Maintenance	\$115,000	<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	2009 PVC single ply.	Planned Maint/Capital Renewal	\$30,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Glazing**    **System Rating: 2**                                      **System Subtotal: \$470,000** (unresolved issues)  
*(1994) Insulated glazing, aluminum window frames, double hung operable windows with storm windows.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Broken seals causing clouding in many areas of building. Window system at End of Useful Service Life.	Deferred Maintenance	\$470,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Cladding**    **System Rating: 4**                                      **System Subtotal: \$305,000** (unresolved issues)  
*Brick veneer. Stone veneer at entries and widow sills, jambs and heads.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Brick masonry requires tuck-pointing.	Deferred Maintenance	\$80,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Water infiltration at room G30, waterproof and repair.	Deferred Maintenance	\$100,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Cladding**     **System Rating: 4**     **System Subtotal: \$305,000** (unresolved issues)

*Brick veneer. Stone veneer at entries and widow sills, jambs and heads.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Degradation of stone at entries and at some windows. Stone due for repair.	Deferred Maintenance	\$100,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Most exterior sealant joints are beyond End of Useful Service Life.	Deferred Maintenance	\$25,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Interior Partitions**     **System Rating: 4**     **System Subtotal:** (unresolved issues)

*Painted CMU at laundry. Exposed brick at mechanical room. Painted terracotta block at corridors. Gypsum board typical at residential units and corridors. Structural face tile at kitchen. Painted wood siding at lounge. Single board, tongue and groove wood at lounge, stairwell to ballroom, and dining hall. Ceramic tile at restrooms. Carpet at piano room, G03B.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors**     **System Rating: 3**     **System Subtotal: \$255,000** (unresolved issues)

*Solid core wood doors with solid wood frames typical in balance of building. Aluminum storefront system at entry vestibules.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	25% of wood doors splitting down the middle of the door edge. Replace damaged doors. 25% of wood frames reported being loose. Provide additional blocking at jambs and re-anchor door frames.	Deferred Maintenance	\$255,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors**     **System Rating: 4**     **System Subtotal: \$12,000** (unresolved issues)

*Painted concrete at corridors in basement. Ceramic tile at restrooms, entry vestibule, and stairs. Carpet. 9x9 tile in corridors and in residential units. VCT at lounge and kitchenette. Terrazzo at stairs and ballroom. Carpet at dining room and over 9x9 tile at residential corridor and units. Wood at ballroom stage. Quarry tile at laundry.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Bull nose tile at stairwell is chipping away. Tiled due for repair.	Deferred Maintenance	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors**

**System Rating: 4**

**System Subtotal: \$12,000** (unresolved issues)

*Painted concrete at corridors in basement. Ceramic tile at restrooms, entry vestibule, and stairs. Carpet. 9x9 tile in corridors and in residential units. VCT at lounge and kitchenette. Terrazzo at stairs and ballroom. Carpet at dining room and over 9x9 tile at residential corridor and units. Wood at ballroom stage. Quarry tile at laundry.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	VCT at kitchenette is at End of Useful Service Life.	Deferred Maintenance	\$1,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Quarry tile at laundry room is deteriorating. Quarry tile is due for repair.	Deferred Maintenance	\$6,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Ceilings**

**System Rating: 4**

**System Subtotal: \$5,000** (unresolved issues)

*Mix of 2x2 and 2x4 suspended ceiling system. Plaster board. Vinyl coated ceiling in kitchen. Wood, tongue and groove. Open to deck in basement. 1x1 concealed spline at G32.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Suspended ceiling system in rooms G044 and G03A showing degradation. Ceiling at End of Useful Service Life.	Deferred Maintenance	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Conveying System: Elevators**

**System Rating: 3**

**System Subtotal: \$400,000** (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Heller service elevator: controls, relay logic and dc generator are reaching End of Useful Service Life. Modernization is required for improved reliability and energy efficiency.	Deferred Maintenance	\$150,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Otis freight elevator: controls, relay logic and dc generator are reaching the End of Useful Service Life. Modernization is required for improved reliability and energy efficiency.	Deferred Maintenance	\$250,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Plumbing System: Domestic Water/Plumbing**     **System Rating: 3**     **System Subtotal: \$405,000** (unresolved issues)

*Recently replaced mixing valves in showers, DW and sanitary are in poor shape and need to be replaced, storm sewer tied into sanitary-back flow preventors used.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Suggest separate roof drain duplex sump/ejector into separate sanitary connection.	Deferred Maintenance	\$25,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Replace DW/Plumbing.	Planned Maint/Capital Renewal	\$380,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC**     **System Rating: 3**     **System Subtotal: \$2,643,000** (unresolved issues)

*Existing operable fire places, Andre's office only area AC, steam heat thru out, 4 HV units in attic original 1939, EIFS in toilet room are in fair shape, kitchen hood and MUA unit are in fair shape, weight room has no ventilation*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Replace motors on MUA units in attic to more efficient motors, provide ventilation to weight room	Deferred Maintenance	\$3,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Replace HVAC system.	Planned Maint/Capital Renewal	\$2,640,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: Steam Production Equip.**     **System Rating: 3**     **System Subtotal: \$265,000** (unresolved issues)

*Campus steam- 8" leaking , going to replace with 4" line.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Replace steam piping/condensate, PRV system.	Planned Maint/Capital Renewal	\$265,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls**     **System Rating: 3**     **System Subtotal: \$237,000** (unresolved issues)

*Pneumatic controls- leaking badly.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Replace system with DDC.	Deferred Maintenance	\$230,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Tie-in DDC to Central Control.	Planned Maint/Capital Renewal	\$7,000	<input type="checkbox"/>	<input type="checkbox"/>	



**Safety: Sprinklers**     **System Rating: 4**     **System Subtotal:** (unresolved issues)  
*Sprinklered thru out.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Emergency Lighting**     **System Rating: 4**     **System Subtotal:** (unresolved issues)  
*On generator.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Fire Alarm**     **System Rating: 4**     **System Subtotal: \$125,000** (unresolved issues)  
*FA strobes in toilets, Siemens system.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace with EST-3 system.	Planned Maint/Capital Renewal	\$125,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Electrical Power**     **System Rating: 3**     **System Subtotal: \$180,000** (unresolved issues)  
*One circuit per two room was done 10 years age, no ground wires in outlets, old square D panels/switches in basement.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace old Square D panels and switches.	Deferred Maintenance	\$180,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Standby Power**     **System Rating: 4**     **System Subtotal:** (unresolved issues)  
*80 KW generator- lighting, security, condensate pumps.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Lighting**      **System Rating: 4**      **System Subtotal:** (unresolved issues)  
*Most lighting T8.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Clock System**      **System Rating: NA**      **System Subtotal:** (unresolved issues)  
 NA

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Code Compliance: Code/Life Safety**      **System Rating: 3**      **System Subtotal: \$1,745,000** (unresolved issues)  
*Fire alarm system - operational.  
 Sprinkled.  
 Emergency lighting is on generator.  
 One elevator and one dumb waiter.  
 Non accessible restrooms in balance of building.  
 Non accessible entries to building.  
 Stair handrails non-code compliant.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Trash chute is unsafe and at End of Useful Service Life. Trash chute is a life -safety concern.	Facility Adaptation	\$20,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Provide accessible door and hardware at entries.	Facility Adaptation	\$190,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Provide accessible restrooms.	Facility Adaptation	\$1,300,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Non code compliant handrails in balance of building. Provide code compliant handrails.	Facility Adaptation	\$145,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Provide closers on dorm doors.	Facility Adaptation	\$90,000	<input type="checkbox"/>	<input type="checkbox"/>	



### Building Information

Year Built 1952      Building Area (sf) 89,791      Floors 5      Building Engineer Michael Wilmers

#### Building Notes:

Comprehensive renovation in 1986-1987.

Building can not be repurposed or renovated in current configuration. The building IS durable and is aging predictably, but does not serve the current needs of contemporary students. Renovation will likely require a complete interior demolition, requiring a full upgrade of the Mechanical and plumbing systems, as well as much of the Electrical system.

Bowling alley is underused and slated for demo.

Difficult to navigate, several non comprehensive updates.

Mechanical issues are extensive, system does not serve facility well, at end of useful service life, due for replacement.

### Major Renovations/Additions

Year	Add'n.	Reno.	Description
1986		X	

### Building Use Types

Use Type %	Use Type
20%	Food Service
5%	Hotel/Conference Center
35%	Athletics (non-recreation)
40%	Administrative

**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	24.49%	Poor	<b>CRV</b>	\$19,327,513	<b>Annual Maint and Capital Renewal Budget</b>	\$463,860
						3% of CRV x 80%

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	23.53%	Poor
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**Priority 1 (current year only)**

<b>FCNI</b>	0.26%	Good
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation	
1 Currently Critical (Current Year)	\$49,500			\$49,500
2 Potentially Critical (Year 1)	\$625,000			\$625,000
3 Not yet Critical (Year 2-5)	\$657,000	\$3,207,000	\$10,000	\$3,874,000
4 Watch List (Year 6-10)	\$20,000			\$20,000
5 Long Term (Year 11+)	\$105,500	\$60,000		\$165,500
Subtotal	\$1,457,000	\$3,267,000	\$10,000	<b>\$4,734,000</b>
				<b>Total of Projects</b>

<b>Structure: Structure</b>		<b>System Rating: 4</b>	<b>System Subtotal:</b> (unresolved issues)			
<i>1952 original - Concrete Structure. Concrete roof Deck. Cast in place basement walls.</i>						
<i>1987 addition - Steel Structure. Metal roof deck. Cast in place basement walls.</i>						
Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No reported problems.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

<b>Shell: Roof</b>		<b>System Rating: 3</b>	<b>System Subtotal: \$280,000</b> (unresolved issues)			
<i>(2010) Ballroom A - PVC single-ply on extruded poly.</i>						
<i>(1989) EPDM single-ply over EPS insulation.</i>						
Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	1989 EPDM single-ply roofing at End of Useful Service Life.	Deferred Maintenance	\$210,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Provide lightning protection.	Facility Adaptation	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	2010 Ballroom A - PVC single-ply on extruded poly.	Planned Maint/Capital Renewal	\$60,000	<input type="checkbox"/>	<input type="checkbox"/>	

<b>Shell: Glazing</b>		<b>System Rating: 2</b>	<b>System Subtotal: \$195,000</b> (unresolved issues)			
<i>(1987) Replaced original glazing with insulated glass, alum window frames, operable hopper style windows.</i>						
Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Replace all glazing.	Deferred Maintenance	\$195,000	<input type="checkbox"/>	<input type="checkbox"/>	

<b>Shell: Cladding</b>		<b>System Rating: 3</b>	<b>System Subtotal: \$85,000</b> (unresolved issues)			
<i>(1952 Original) Brick veneer.</i>						
<i>(1987 Addition/renovation) Brick veneer to match original.</i>						
Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Tuck point and seal brick as needed.	Deferred Maintenance	\$85,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Interior Partitions**

**System Rating:**

**System Subtotal: \$1,000** (unresolved issues)

*Mixture of gypsum board on metal stud and painted CMU. Painted CMU and ceramic tile in bathrooms.  
Operable partitions in ballroom.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	Broken handle on operable partition wall needs replacement.	Deferred Maintenance	\$1,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors**

**System Rating: 4**

**System Subtotal: \$75,000** (unresolved issues)

*Interior - Mix of solid core wood doors with hollow metal frame and hollow metal doors with hollow metal frame.  
Exterior - Aluminum storefront.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Door hardware is with knobs only. Update hardware to be accessible.	Deferred Maintenance	\$75,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors**

**System Rating: 4**

**System Subtotal: \$40,000** (unresolved issues)

*VCT typical in corridors and cafeteria. Carpet typical in bookstore, ballroom, and offices. Ceramic tile typical in bathrooms, kitchen, and entry vestibule.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	VCT in cafeteria cracking near columns. At End of Useful Service Life.	Deferred Maintenance	\$40,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Ceilings**

**System Rating: 2**

**System Subtotal: \$220,000** (unresolved issues)

*Mix of 2x2 and 2x4 suspended ceiling system of various age typical throughout balance of building. Gypsum in vestibule, bathrooms, and loading dock. 1x1 concealed spline acoustic ceiling system in hotel rooms.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Several tiles from 1987 renovation at End of Useful Service Life.	Deferred Maintenance	\$220,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Conveying System: Elevators**

**System Rating: 4**

**System Subtotal: \$350,000** (unresolved issues)

*Original - hydraulic elevator.  
New - hydraulic elevator.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Detroit – GAL Freight Controls, relay logic and controls are reaching the End of Useful Service Life. Modernization is required for improved reliability and energy efficiency.	Deferred Maintenance	\$250,000	<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	Otis Passenger Replace controls with solid state equipment.	Deferred Maintenance	\$100,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Plumbing System: Domestic Water/Plumbing**

**System Rating: 3**

**System Subtotal: \$374,000** (unresolved issues)

*Steam-fired domestic water heater.  
De-watering duplex sump pumps were removed.  
Sewage ejection sump is original - one submersible pump, one vertical pump on grade.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Remediate City water back flow preventer is leaking to floor drain.	Deferred Maintenance	\$1,000	<input type="checkbox"/>	<input type="checkbox"/>	
1: Currently Critical (Current Year)	Remediate leaking 3-way DHW valve and P/T relief valve.	Deferred Maintenance	\$500	<input type="checkbox"/>	<input type="checkbox"/>	
1: Currently Critical (Current Year)	Remediate leaking 3-way heating hot water valve.	Deferred Maintenance	\$2,500	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Replace DW/Plumbing.	Planned Maint/Capital Renewal	\$370,000	<input type="checkbox"/>	<input type="checkbox"/>	



**HVAC System: HVAC**

**System Rating: 3**

**System Subtotal: \$2,571,500** (unresolved issues)

*Original constant volume AHUs in basement and penthouse MERs are steam Wing coil heat and humidification, use roll filters.  
 AHU for Ballroom has DX cooling for events with condenser on roof.  
 Hot water cabinet heaters at entries, unit heaters, perimeter and window finned tube, and radiant ceiling panels in bathrooms.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Perlite is being drawn into outdoor air intake tunnel from construction activities. Provide removal and prevention on further work by contractor.	Deferred Maintenance	\$1,000	<input type="checkbox"/>	<input type="checkbox"/>	
1: Currently Critical (Current Year)	Outdoor air intake screens in basement concrete tunnel require periodic cleaning. Result is from lawn mowing operation. Outdoor air is deficient to units.	Deferred Maintenance	\$500	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Replace HVAC system.	Planned Maint/Capital Renewal	\$2,570,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: Steam Production Equip.**

**System Rating: 3**

**System Subtotal: \$264,000** (unresolved issues)

*Steam provided by Central Heating Plant.  
 Duplex steam to hot water exchangers are original.  
 Duplex hot water pumps for heating systems.  
 Duplex hot water pumps for perimeter system.  
 Duplex 1/3 - 2/3 PRVs are original.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	1/3 - 2/3 PRV steam piping needs re-insulation.	Deferred Maintenance	\$4,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Replace steam piping/condensate, PRV system.	Planned Maint/Capital Renewal	\$260,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls**

**System Rating: 3**

**System Subtotal: \$232,000** (unresolved issues)

*Newer JCI DDC panels with pneumatic actuators for large valves and dampers. Duplex air compressor for controls has newer motors and compressors.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace pneumatic controls with DDC.	Deferred Maintenance	\$225,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls**      **System Rating: 3**      **System Subtotal: \$232,000** (unresolved issues)  
*Newer JCI DDC panels with pneumatic actuators for large valves and dampers. Duplex air compressor for controls has newer motors and compressors.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Tie-in DDC to Central Control.	Planned Maint/Capital Renewal	\$7,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Sprinklers**      **System Rating: 5**      **System Subtotal:** (unresolved issues)  
*Wet sprinkler system.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Emergency Lighting**      **System Rating: 4**      **System Subtotal: \$20,000** (unresolved issues)  
*Emergency lighting with individual battery backup.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Replace batteries.	Deferred Maintenance	\$20,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Fire Alarm**      **System Rating: 4**      **System Subtotal:** (unresolved issues)  
*Updated fire alarm system - smoke detectors and manual pull stations, horns or strobes.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Electrical Power**      **System Rating: 4**      **System Subtotal:** (unresolved issues)  
*Original Square D switchgear, transformers, substation, PPs and LPs.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Standby Power**      **System Rating: 4**      **System Subtotal:** (unresolved issues)

*Natural gas engine-generator rated 75 kW.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Lighting**      **System Rating: 4**      **System Subtotal: \$22,000** (unresolved issues)

*Some T8s were noted however most areas were T12s. Conference Room had 2x4 lay-in with T12 lamps.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	T12s should be replaced with T8s.	Deferred Maintenance	\$22,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Clock System**      **System Rating: NA**      **System Subtotal:** (unresolved issues)

*NA*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Data/Telecom System**      **System Rating: 5**      **System Subtotal:** (unresolved issues)

*Fiber to each building. CAT5/CAT6 Cabling. VOIP System (Phones).*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Code Compliance: Code/Life Safety**      **System Rating:**      **System Subtotal: \$4,500** (unresolved issues)

*Fire alarm system - smoke detectors and manual pull stations, horns or strobes.  
 Sprinkler system.  
 Emergency lighting with individual battery backup.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	Drinking fountains not accessible. Provide accessible fountain.	Deferred Maintenance	\$4,500	<input type="checkbox"/>	<input type="checkbox"/>	

**Adjacent Site:** Immediate Site

**System Rating:** 4

**System Subtotal:** (unresolved issues)

<b>Priority</b>	<b>Observed Issue</b>	<b>Project Classification</b>	<b>Resolution Budget</b>	<b>Funded</b>	<b>Resolved</b>	<b>Year Resolved</b>
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

End of Building Report for: **Memorial Union Building**

**Building Information**

Year Built 1955     Building Area (sf) 300,239     Floors     Building Engineer James Schultz

**Building Notes:**

Built in 1955, addition in 1957 and 1966-67. Building remodeled in 2005-2006.

Reported settlement - windows at west wing would crack due to movement, even though expansion joints are present.

Office space and dining room are air-conditioned. Students room and corridors are not air-conditioned.

**Major Renovations/Additions**

Year	Add'n.	Reno.	Description
		X	
2005		X	
1966	X		
1957	X		

**Building Use Types**

Use Type %	Use Type
100%	Student Life/Residential Housing

**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	9.50%	Fair	<b>CRV</b>	\$57,045,410	<b>Annual Maint and Capital Renewal Budget</b>	\$1,369,090
						3% of CRV x 80%

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	2.26%	Good
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**Priority 1 (current year only)**

<b>FCNI</b>	0.13%	Good
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation	
1 Currently Critical (Current Year)	\$76,000			\$76,000
2 Potentially Critical (Year 1)	\$770,000			\$770,000
3 Not yet Critical (Year 2-5)	\$435,000	\$7,000		\$442,000
4 Watch List (Year 6-10)	\$200,000	\$3,055,000	\$875,000	\$4,130,000
5 Long Term (Year 11+)				
Subtotal	\$1,481,000	\$3,062,000	\$875,000	<b>\$5,418,000</b> <b>Total of Projects</b>

**Structure: Structure**      **System Rating: 5**      **System Subtotal:** (unresolved issues)  
*Steel structure. Metal roof deck. Cast in place concrete basement with sub-basement.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Roof**      **System Rating: 4**      **System Subtotal: \$634,000** (unresolved issues)  
*(2005) EPDM single ply adhered.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Ice damming reported at the roof of the 2nd floor roof monitor over the main lobby entrance stair.	Deferred Maintenance	\$4,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	2005 EPDM single ply.	Planned Maint/Capital Renewal	\$630,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Glazing**      **System Rating: 5**      **System Subtotal:** (unresolved issues)  
*Argon insulated glazing, aluminum window frames, sliding operable windows. Plastic laminate window sills typical at student rooms.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Cladding**      **System Rating: 3**      **System Subtotal: \$160,000** (unresolved issues)  
*Brick veneer with PVC flashing and weep holes. Metal mechanical louvers at penthouse. EIFS. Limestone veneer.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Limestone panels are damaged, repair.	Deferred Maintenance	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Most exterior building joints are failing. Beyond End of Useful Service Life.	Deferred Maintenance	\$70,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Metal mechanical louvers on north fill with snow. Provide alternate solution.	Deferred Maintenance	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Settlement cracks observed in brick at south elevation. Due for repair.	Deferred Maintenance	\$75,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Interior Partitions**      **System Rating: 4**      **System Subtotal: \$590,000** (unresolved issues)  
*Gypsum board between suites, typical. Painted CMU. Plaster on lath. Plaster over fiberglass at corridors, typical. Glass block at restrooms. Ceramic tile in bathrooms. Exposed brick veneer at stair.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Grout at ceramic tile showers is failing causing water damage to gypsum board ceiling and walls below. At End of Useful Service Life.	Deferred Maintenance	\$590,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors**      **System Rating: 4**      **System Subtotal:** (unresolved issues)  
*Solid core wood doors with hollow metal frames typical. Aluminum storefront system at entry vestibules.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No reported problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors**      **System Rating: 4**      **System Subtotal: \$5,000** (unresolved issues)  
*Carpet typical in student rooms, lounges, and corridors. Ceramic tile at bathrooms, corridors, and on stair treads. Sheet vinyl at student lounges.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Ceramic tile cracking at treads. At End of Useful Service Life.	Deferred Maintenance	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Ceilings**      **System Rating: 5**      **System Subtotal:** (unresolved issues)  
*2x2 suspended ceiling system typical in corridor. Gypsum board typical in student rooms, lounges, and restrooms.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Conveying System: Elevators**      **System Rating: 3**      **System Subtotal: \$460,000** (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Otis elevator no. 1: original equipment is reaching the End of Useful Service Life.	Deferred Maintenance	\$50,000	<input type="checkbox"/>	<input type="checkbox"/>	



**Conveying System: Elevators**      **System Rating: 3**      **System Subtotal: \$460,000** (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Otis elevator no. 2: controls, relay logic and machine external gear are reaching the End of Useful Service Life. Modernization is required for improved reliability and energy efficiency.	Deferred Maintenance	\$250,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Otis elevator no. 3: original equipment is reaching the End of Useful Service Life.	Deferred Maintenance	\$50,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Otis elevator no. 4: original equipment is reaching the End of Useful Service Life.	Deferred Maintenance	\$50,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Renovate interior finishes in (4 of 5) elevator cabs.	Deferred Maintenance	\$60,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Plumbing System: Domestic Water/Plumbing**      **System Rating: 5**      **System Subtotal:** (unresolved issues)

*Domestic water replaced 5 years ago.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC**      **System Rating: 4**      **System Subtotal: \$1,525,000** (unresolved issues)

*Convection HW in rooms, 2 rooms on one thermostat, hot water heating main zone valve needed, no shut off valves installed to isolate system, covers on convectors are starting to fall apart - no replacement, constant volume , some coil issues-snow getting into intakes- filter issues with cardboard type.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Provide hot water heating main zone valves and isolation valves, replace cardboard filters with roll type,	Deferred Maintenance	\$25,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Replace HVAC system.	Planned Maint/Capital Renewal	\$1,500,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: Steam Production Equip.**                      **System Rating: 4**                      **System Subtotal: \$947,000** (unresolved issues)

*campus steam, steam piping in tunnels, condensate pumps in poor shape.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Y	Replace condensate pumps.	Deferred Maintenance	\$22,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Replace steam piping/condensate, PRV system.	Planned Maint/Capital Renewal	\$925,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls**                                      **System Rating: 4**                                      **System Subtotal: \$7,000** (unresolved issues)

*Pneumatic controls.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Replace pneumatic with DDC.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Replace HVAC DDC controls.	Planned Maint/Capital Renewal	\$7,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Sprinklers**    **System Rating: 4**    **System Subtotal:** (unresolved issues)

*Sprinklered throughout, Ansul in kitchen areas.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Emergency Lighting**    **System Rating: 4**    **System Subtotal:** (unresolved issues)

*Generator, good coverage.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Fire Alarm**    **System Rating: 4**    **System Subtotal:** (unresolved issues)

*Fire alarm system updated 5 years ago, no Evac on system, strobes in toilet rooms.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Electrical Power**      **System Rating: 4**      **System Subtotal: \$200,000** (unresolved issues)

*East and west transformers 1500/2000 kVA, gear is in good shape, some panel boards are old Square D.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Replace original Square D panel boards.	Deferred Maintenance	\$200,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Standby Power**      **System Rating: 4**      **System Subtotal:** (unresolved issues)

*150 KW generator- exit lights, circulating pumps, refrigerators.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Lighting**      **System Rating: 4**      **System Subtotal: \$20,000** (unresolved issues)

*Lights over stairs are not accessible to be changed at main entrance, occupancy sensors in all toilet rooms.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Remove lights over stairs and replace with pendant fixtures with lower devices.	Facility Adaptation	\$20,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Clock System**      **System Rating: NA**      **System Subtotal:** (unresolved issues)

NA

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Code Compliance: Code/Life Safety**      **System Rating: 3**      **System Subtotal: \$855,000** (unresolved issues)

*Fire alarm system - operational. Strobes in AVA room, bathrooms, and conference rooms. Localized strobes at student rooms. Smoke detectors inspected yearly. Sprinkled.*

*Emergency lighting connected to generator.*

*Traction elevators. East elevator remodeled 12-15 years ago.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Non accessible door hardware. Provide accessible door hardware.	Facility Adaptation	\$590,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Code Compliance: Code/Life Safety**      **System Rating: 3**      **System Subtotal: \$855,000** (unresolved issues)

*Fire alarm system - operational. Strobes in AVA room, bathrooms, and conference rooms. Localized strobes at student rooms. Smoke detectors inspected yearly. Sprinkled.*

*Emergency lighting connected to generator.*

*Traction elevators. East elevator remodeled 12-15 years ago.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Non code compliant handrails in balance of building. Provide code compliant handrails.	Facility Adaptation	\$265,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Adjacent Site: Immediate Site**      **System Rating: 4**      **System Subtotal: \$15,000** (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Concrete entry at stairs 3, level 1 steps are due for repair/replacement.	Deferred Maintenance	\$15,000	<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	Parking lots due for resurfacing.	Planned Maint/Capital Renewal		<input type="checkbox"/>	<input type="checkbox"/>	

End of Building Report for:      **Wadsworth Hall**

**Building Information**

Year Built 1966      Building Area (sf) 54,000      Floors      Building Engineer James Schultz

Building Notes:

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**Building Use Types**

Use Type %      Use Type

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100% Student Life/Residential Housing

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**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	42.85%	Poor	<b>CRV</b>	\$10,260,000	<b>Annual Maint and Capital Renewal Budget</b>	\$246,240
	3% of CRV x 80%					

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	29.54%	Poor
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**Priority 1 (current year only)**

<b>FCNI</b>	0.11%	Good
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation	
1 Currently Critical (Current Year)	\$11,000			\$11,000
2 Potentially Critical (Year 1)	\$1,006,000	\$155,000		\$1,161,000
3 Not yet Critical (Year 2-5)	\$27,000	\$1,832,000		\$1,859,000
4 Watch List (Year 6-10)	\$10,000	\$195,000	\$1,160,000	\$1,365,000
5 Long Term (Year 11+)				
Subtotal	\$1,054,000	\$2,182,000	\$1,160,000	<b>\$4,396,000</b> Total of Projects

**Structure: Structure**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

*Concrete structure. Concrete roof deck. Cast in place concrete basement.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No reported problems.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Roof**

**System Rating: 4**

**System Subtotal: \$198,000** (unresolved issues)

*(2004) PVC single ply adhered.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Open coping joints due for repair.	Deferred Maintenance	\$3,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	2004 PVC single ply.	Planned Maint/Capital Renewal	\$195,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Glazing**

**System Rating: 2**

**System Subtotal: \$675,000** (unresolved issues)

*Non tempered single glazing, aluminum window frames, fixed windows and operable units. Some glazing has been replaced in lounge area G001.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Water infiltration at single glazed windows reported. Window system at End of Useful Service Life.	Deferred Maintenance	\$510,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Non tempered insulated and single glazed units are safety hazard. Replace all non tempered glazing units (Activities Area), at End of Useful Service Life.	Facility Adaptation	\$165,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Cladding**

**System Rating: 4**

**System Subtotal: \$25,000** (unresolved issues)

*Brick veneer on CMU backup. Plaster soffits. Exposed cast in place concrete columns. Exposed concrete slab edge.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Engineer investigation for possible movement in the exterior wall at the west end.	Deferred Maintenance	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Replace deteriorated building joints, End of useful Service Life.	Deferred Maintenance	\$15,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Interior Partitions**      **System Rating: 4**      **System Subtotal: \$12,000** (unresolved issues)

*Exposed brick in activities room. Painted CMU at activities room, residential units, corridors, restrooms, laundry, and kitchenettes.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Architectural finish repair in (40) stall showers for replacement of mixing valves.	Deferred Maintenance	\$12,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors**      **System Rating: 4**      **System Subtotal: \$270,000** (unresolved issues)

*Solid core wood doors with hollow metal frames at activities area and residential units. Aluminum storefront system at entry vestibules.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Door edge splitting observed. Doors at End of Useful Service Life.	Deferred Maintenance	\$270,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors**      **System Rating: 4**      **System Subtotal: \$15,000** (unresolved issues)

*Ceramic tile at activities room, laundry room, and restroom. Carpet in residential units, corridors, and kitchenettes.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Ceramic tile damaged at restrooms. Tile due for repair.	Deferred Maintenance	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Carpet at all kitchenettes at End of Useful Service Life. Replace with VCT.	Deferred Maintenance	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Ceilings**      **System Rating: 4**      **System Subtotal: \$16,000** (unresolved issues)

*2x2 suspended ceiling system at activities room. Painted concrete at residential units, corridors, restrooms, laundry rooms, and kitchenettes.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	2x2 suspended ceiling system at activities room is at End of Useful Service Life.	Deferred Maintenance	\$16,000	<input type="checkbox"/>	<input type="checkbox"/>	



**Plumbing System: Domestic Water/Plumbing**      **System Rating: 3**      **System Subtotal: \$222,000** (unresolved issues)

*Original plumbing , mixing valves need to be replaced in the showers.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Replace all shower mixing valves, replace DW piping and sanitary.	Deferred Maintenance	\$2,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Replace DW/Plumbing.	Planned Maint/Capital Renewal	\$220,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC**      **System Rating: 3**      **System Subtotal: \$1,549,000** (unresolved issues)

*The area has bad exhaust in the gang toilet room-humidity problems, west area is cold around fireplace, steam heating in west area, heating piping in bad shape, No air supply to laundry rooms*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Need to replace and increase size of exhaust fans for gang toilets.	Deferred Maintenance	\$9,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Replace HVAC system.	Planned Maint/Capital Renewal	\$1,540,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: Steam Production Equip.**      **System Rating: 3**      **System Subtotal: \$155,000** (unresolved issues)

*Campus steam.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Replace steam piping/condensate, PRV system.	Planned Maint/Capital Renewal	\$155,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls**      **System Rating: 2**      **System Subtotal: \$142,000** (unresolved issues)

*Pneumatic system has leaks.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Replace pneumatic system with DDC.	Deferred Maintenance	\$135,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Tie-in DDC to Central Control.	Planned Maint/Capital Renewal	\$7,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Sprinklers** System Rating: System Subtotal: (unresolved issues)  
 Sprinklered thru out.

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Emergency Lighting** System Rating: 4 System Subtotal: (unresolved issues)  
 On generator.

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Fire Alarm** System Rating: 4 System Subtotal: \$65,000 (unresolved issues)  
 Siemens fire alarm system.

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace system with EST-3 system.	Planned Maint/Capital Renewal	\$65,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Electrical Power** System Rating: 4 System Subtotal: \$10,000 (unresolved issues)  
 Labeling of panels is bad.

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Check loads in panel and label with correct loads.	Deferred Maintenance	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Standby Power** System Rating: 4 System Subtotal: (unresolved issues)  
 Generators-lighting, card readers, condensate pumps.

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Lighting**      **System Rating: 4**      **System Subtotal: \$27,000** (unresolved issues)  
*T12 40%, T8 60%*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace remaining T12 lamps	Deferred Maintenance	\$27,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Clock System**      **System Rating: NA**      **System Subtotal:** (unresolved issues)  
 NA

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Code Compliance: Code/Life Safety**      **System Rating: 3**      **System Subtotal: \$995,000** (unresolved issues)  
*Fire alarm system - operational.  
 Sprinkled.  
 No elevator.  
 Non accessible restrooms.  
 Trash chute at G006 creates odors and life safety issues.  
 Non code compliant handrail at stairwells.  
 Doors at stairs do not have rated labels.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Door closers at door rooms are at End of Useful Service Life.	Facility Adaptation	\$55,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Non code compliant handrails at stair typical at balance of building. Provide code compliant handrails.	Facility Adaptation	\$75,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Replace unsafe trash chute.	Facility Adaptation	\$15,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Provide accessible restrooms.	Facility Adaptation	\$850,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Adjacent Site:** Immediate Site

**System Rating:** 4

**System Subtotal:** \$20,000 (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
:				<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Re-grading necessary to the south to divert water away from the building.	Deferred Maintenance	\$20,000	<input type="checkbox"/>	<input type="checkbox"/>	

End of Building Report for:    **West McNair Hall**

**Building Information**

Year Built 1966      Building Area (sf) 18,000      Floors      Building Engineer James Schultz

**Building Notes:**

Plumbing is original and leaks. Reported A.C.M. present at piping insulation. Kitchen was remodeled 8 years ago and has an exhaust hood.

Dining room is air conditioned. However, dining feels cold during winter (due to non-insulated glazing).

Extensive expanses of non-tempered glazing, which is a potential safety hazard.

Water infiltration through ceiling reported due to leaking pipes.

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**Building Use Types**

Use Type %      Use Type

100%      Food Service

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**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	29.23%	Poor	<b>CRV</b>	\$4,500,000	<b>Annual Maint and Capital Renewal Budget</b>	\$108,000
						3% of CRV x 80%

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	21.61%	Poor
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**Priority 1 (current year only)**

<b>FCNI</b>	0.00%	Good
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation	
1 Currently Critical (Current Year)	\$0			\$0
2 Potentially Critical (Year 1)	\$125,500			\$125,500
3 Not yet Critical (Year 2-5)	\$165,000	\$672,000	\$10,000	\$847,000
4 Watch List (Year 6-10)		\$90,000	\$253,000	\$343,000
5 Long Term (Year 11+)				
Subtotal	\$290,500	\$762,000	\$263,000	<b>\$1,315,500</b>
				<b>Total of Projects</b>

**Structure: Structure**

**System Rating: 5**

**System Subtotal: \$** (unresolved issues)

*Concrete structure. Concrete roof deck. Concrete slab on grade.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Y	No reported problems.	Deferred Maintenance	\$0	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Roof**

**System Rating: 4**

**System Subtotal: \$108,000** (unresolved issues)

*(2001) EPDM single ply adhered.No overflow roof drains present.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Coping repairs needed.	Deferred Maintenance	\$3,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	In general, poor flashing details at the roof/glazing systems allows for water infiltration. Repair/replace flashings.	Deferred Maintenance	\$15,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	2001 EPDM single ply adhered.	Planned Maint/Capital Renewal	\$90,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Glazing**

**System Rating: 2**

**System Subtotal: \$80,000** (unresolved issues)

*Non tempered single glazing, aluminum window frames, mostly fixed with some operable windows. Some fixed units have been replaced with insulated glazing.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Aluminum window with glazed units at End of Useful Service Life.	Deferred Maintenance	\$80,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Cladding**

**System Rating: 4**

**System Subtotal: \$5,000** (unresolved issues)

*Brick veneer on CMU backup. Plaster at soffits.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Plaster at soffits due for repair.	Deferred Maintenance	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Interior Partitions**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*Fiberglass reinforced panel (FRP) at dish-washing room. Painted CMU at kitchen, office space, receiving room, restrooms, locker rooms, and corridor to mechanical room. Exposed brick at receiving room, dining area, east entry stairway, and reception lounge. Single-board tongue and groove wood at kitchen.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No reported problems.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors**

**System Rating: 4**

**System Subtotal: \$2,500** (unresolved issues)

*Solid core wood doors with hollow metal frames at kitchen, restrooms, and corridor to mechanical room. Hollow metal doors with hollow metal frames at offices and receiving room. Aluminum storefront system at entry vestibules.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Door at aluminum storefront system at west vestibule to dining room does not close properly. Replace door closer.	Deferred Maintenance	\$1,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Exterior doors due for re-painting.	Deferred Maintenance	\$1,500	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*Ceramic tile at kitchen, east entry stairway, reception, and lounge. Quarry tile at dish-washing area. Sealed concrete at receiving room. Carpet at dining area. VCT at office space. 9x9 tile at locker rooms.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Ceilings**

**System Rating: 4**

**System Subtotal: \$30,000** (unresolved issues)

*2x2 suspended ceiling system in balance of building. Open to deck at receiving room. Gypsum board at restrooms and locker rooms.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	2x2 suspended ceiling system in dining area at End of Useful Service Life.	Deferred Maintenance	\$25,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	2x2 suspended ceiling system at dish-washing room at End of Useful Service Life. Replace with vinyl coated ceiling.	Deferred Maintenance	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	



**Conveying System: Elevators** **System Rating: 3** **System Subtotal: \$100,000** (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Dover kitchen elevator: elevator controls are reaching the End of Useful Service Life. Modernization is required for improved reliability and energy efficiency.	Deferred Maintenance	\$100,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Plumbing System: Domestic Water/Plumbing** **System Rating: 3** **System Subtotal: \$77,000** (unresolved issues)  
*Original plumbing , Instantaneous HW heater- steam to water, sensors on flush valves original fixtures.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Replace original toilet fixtures.	Deferred Maintenance	\$2,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Replace DW/Plumbing.	Planned Maint/Capital Renewal	\$75,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC** **System Rating: 3** **System Subtotal: \$518,000** (unresolved issues)  
*Dining area gets very cold. In ground HV at windows, penthouse above Dining area with HVAC unit- snow gets into AHUs and causes leaks, refrigeration piping above ceiling in Dining is leaking, Dining area has split systems.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Need to provide additional insulation on refrigeration lines above ceiling	Deferred Maintenance	\$3,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Replace HVAC system.	Planned Maint/Capital Renewal	\$515,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: Steam Production Equip.** **System Rating: 3** **System Subtotal: \$50,000** (unresolved issues)  
*Campus steam, original piping.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Replace steam piping.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Replace steam piping/condensate, PRV system.	Planned Maint/Capital Renewal	\$50,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls**

**System Rating: 3**

**System Subtotal: \$52,000** (unresolved issues)

*Pneumatic system has leaks.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Tie-in DDC to Central Control.	Planned Maint/Capital Renewal	\$7,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Replace pneumatic system with DDC.	Deferred Maintenance	\$45,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Sprinklers**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*Sprinklered thru out, Ansul in Kitchen area.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Emergency Lighting**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*On generator.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Fire Alarm**

**System Rating: 4**

**System Subtotal: \$25,000** (unresolved issues)

*Siemens fire alarm system.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace system with EST-3 system.	Planned Maint/Capital Renewal	\$25,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Electrical Power**

**System Rating: 4**

**System Subtotal: \$10,000** (unresolved issues)

*Original electrical system (distribution boards and panels), no ground wires in receptacle circuits.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Provide GFCI outlets for all outlets without ground wires.	Facility Adaptation	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Standby Power**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*Generators-lighting, card readers, condensate pumps.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Lighting**

**System Rating: 4**

**System Subtotal: \$5,000** (unresolved issues)

*Food service area has T12 lamps.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace remaining T12 lamps	Deferred Maintenance	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Clock System**

**System Rating: NA**

**System Subtotal:** (unresolved issues)

NA

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Code Compliance: Code/Life Safety**

**System Rating: 3**

**System Subtotal: \$253,000** (unresolved issues)

*Fire alarm system - operational.*

*Sprinkled.*

*Elevator.*

*Non accessible restrooms.*

*Non code compliant handrail in east and west vestibule stairwell.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Walkway along north elevation is elevated greater than 30" above grade. Handrail required.	Facility Adaptation	\$13,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Provide code compliant handrails.	Facility Adaptation	\$25,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Provide accessible restrooms.	Facility Adaptation	\$150,000	<input type="checkbox"/>	<input type="checkbox"/>	

**BUILDING REPORT****McNair Hall Food Services****BUILDING No.****39**

Michigan Technological University

CAMPUS Main Campus

**Code Compliance: Code/Life Safety****System Rating: 3****System Subtotal: \$253,000** (unresolved issues)*Fire alarm system - operational.**Sprinkled.**Elevator.**Non accessible restrooms.**Non code compliant handrail in east and west vestibule stairwell.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Non tempered single glazed units are safety hazard. Replace all non tempered glazing units. Glazing units at End of Useful Service Life.	Facility Adaptation	\$65,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Adjacent Site: Immediate Site****System Rating: 5****System Subtotal:** (unresolved issues)*Exterior lighting is adequate.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

End of Building Report for: **McNair Hall Food Services**

**Building Information**

Year Built   1968      Building Area (sf)   71,300      Floors      Building Engineer   James Schultz

**Building Notes:**

Original plumbing.  
Toilet rooms along main corridors are quite tight (non-accessible) and overused with no ventilation.

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**Building Use Types**

Use Type %	Use Type
100%	Student Life/Residential Housing

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**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	42.95%	Poor	<b>CRV</b>	\$13,547,000	<b>Annual Maint and Capital Renewal Budget</b>	\$325,128
						3% of CRV x 80%

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	27.93%	Poor
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**Priority 1 (current year only)**

<b>FCNI</b>	5.16%	Fair
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation	
1 Currently Critical (Current Year)	\$699,000			\$699,000
2 Potentially Critical (Year 1)	\$268,000			\$268,000
3 Not yet Critical (Year 2-5)	\$195,000	\$2,622,000		\$2,817,000
4 Watch List (Year 6-10)		\$110,000	\$1,925,000	\$2,035,000
5 Long Term (Year 11+)				
Subtotal	\$1,162,000	\$2,732,000	\$1,925,000	<b>\$5,819,000</b>
				<b>Total of Projects</b>

**Structure: Structure**      **System Rating: 5**      **System Subtotal:** (unresolved issues)  
*Concrete structure. Concrete roof deck. Cast in place concrete basement.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Roof**      **System Rating: 4**      **System Subtotal: \$113,000** (unresolved issues)  
*(2005) EPDM single ply adhered.No overflow roof drains present.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Loose coping due for repair.	Deferred Maintenance	\$3,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	2005 EPDM single ply adhered.	Planned Maint/Capital Renewal	\$110,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Glazing**      **System Rating: 2**      **System Subtotal: \$620,000** (unresolved issues)  
*Insulated glazing, aluminum window frames, with operable casement windows with screens typical at residential units.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Y	Glazing system at End of Useful Service Life.	Deferred Maintenance	\$620,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Cladding**      **System Rating: 4**      **System Subtotal: \$15,000** (unresolved issues)  
*Brick veneer on CMU backup. Plaster at soffits. Exposed cast in place concrete columns. Exposed concrete slab edge.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Damage observed at brick veneer. Repair as needed.	Deferred Maintenance	\$15,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Interior Partitions**      **System Rating: 4**      **System Subtotal: \$25,000** (unresolved issues)  
*Exposed brick in activities room. Exposed cast-in-place concrete columns. Gypsum board at residential units. Painted CMU at activities room, residential units, corridors, restrooms, stairwells, and kitchenettes. Cast-in-place wall at woodshop. Painted plaster at kitchenette and corridor at level 5.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Architectural finish repair in (66) stall showers for replacement of mixing valves.	Deferred Maintenance	\$25,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors**      **System Rating: 4**      **System Subtotal:** (unresolved issues)  
*Solid core wood doors with hollow metal frames at activities area and residential units. Aluminum storefront system at entry vestibules.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No reported problems.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors**      **System Rating: 4**      **System Subtotal:** (unresolved issues)  
*Ceramic tile at west vestibule, lounges, kitchenettes, restrooms, and corridors on level 5. Wood flooring at residence apartment kitchen. Carpet at living room, recreation area, corridor along residential units, kitchenettes, and in typical residential units. Rubber nosing at stair treads. VCT at kitchenettes. Quarry tile along balcony above recreation space.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Ceilings**      **System Rating: 4**      **System Subtotal: \$40,000** (unresolved issues)  
*2x2 suspended ceiling system at activities room, lounge, and wood shop. Painted concrete at residential units. Painted gypsum board at corridors and restrooms. 1x1 concealed spline at kitchenette and at elevator lobby.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Gypsum board ceiling is delaminating in restrooms due to humidity.	Deferred Maintenance	\$30,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	2x2 suspended ceiling system at activities room and lounge is near End of Useful Service Life.	Deferred Maintenance	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Conveying System: Elevators**      **System Rating: 3**      **System Subtotal: \$170,000** (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Montg. Building elevator no. 1: hoistway door equipment, door operations and cab interior are reaching the End of Useful Service Life. Modernization is required for improved reliability and energy efficiency.	Deferred Maintenance	\$85,000	<input type="checkbox"/>	<input type="checkbox"/>	



**Conveying System: Elevators**      **System Rating: 3**      **System Subtotal: \$170,000** (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Montg. Building elevator no. 2: hoistway door equipment, door operations and cab interior are reaching the End of Useful Service Life. Modernization is required for improved reliability and energy efficiency.	Deferred Maintenance	\$85,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Plumbing System: Domestic Water/Plumbing**      **System Rating: 3**      **System Subtotal: \$360,000** (unresolved issues)

*Original plumbing , mixing valves need to be replaced in the showers.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Replace all shower mixing valves, replace DW piping and sanitary.	Deferred Maintenance	\$70,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Replace DW/Plumbing.	Planned Maint/Capital Renewal	\$290,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC**      **System Rating: 3**      **System Subtotal: \$2,039,000** (unresolved issues)

*The area has bad exhaust in the gang toilet room-humidity problems, Hot water heating in east area, heating piping in bad shape, No air supply to laundry rooms.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Need to replace and increase size of exhaust fans for gang toilets.	Deferred Maintenance	\$9,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Replace HVAC system.	Planned Maint/Capital Renewal	\$2,030,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: Steam Production Equip.**      **System Rating: 3**      **System Subtotal: \$205,000** (unresolved issues)

*Campus steam.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace steam piping/condensate, PRV system.	Planned Maint/Capital Renewal	\$205,000	<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls**                      **System Rating: 3**                      **System Subtotal: \$187,000** (unresolved issues)

*Pneumatic system has leaks.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Replace pneumatic system with DDC.	Deferred Maintenance	\$180,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Tie-in DDC to Central Control.	Planned Maint/Capital Renewal	\$7,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Sprinklers**                                      **System Rating:**                                      **System Subtotal:** (unresolved issues)

*Sprinklered thru out.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Emergency Lighting**                      **System Rating: 4**                      **System Subtotal:** (unresolved issues)

*On generator.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Fire Alarm**                                      **System Rating: 4**                      **System Subtotal: \$90,000** (unresolved issues)

*Siemens fire alarm system.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace system with EST-3 system.	Planned Maint/Capital Renewal	\$90,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Electrical Power**                      **System Rating: 4**                      **System Subtotal: \$10,000** (unresolved issues)

*Labeling of panels is bad.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Check loads in panel and label with correct loads.	Deferred Maintenance	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Standby Power**      **System Rating: 4**      **System Subtotal:** (unresolved issues)  
*Generators-lighting, card readers, condensate pumps.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Lighting**      **System Rating: 4**      **System Subtotal: \$15,000** (unresolved issues)  
*T12 40%, T8 60%.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace remaining T12 lamps.	Deferred Maintenance	\$15,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Clock System**      **System Rating:**      **System Subtotal:** (unresolved issues)  
 NA

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Code Compliance: Code/Life Safety**      **System Rating: 3**      **System Subtotal: \$1,925,000** (unresolved issues)  
*Fire alarm system - operational.  
 Sprinkled.  
 Hydraulic elevator.  
 Non accessible restrooms.  
 Trash chute creates odors and life safety issues.  
 Non code compliant handrails at stairwells.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Non accessible door hardware. Provide accessible door hardware.	Facility Adaptation	\$125,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Large spans of non-safety glazing.	Facility Adaptation	\$40,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Non code compliant guard rails at stairs.	Facility Adaptation	\$80,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Replace unsafe trash chute.	Facility Adaptation	\$30,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Code Compliance: Code/Life Safety**      **System Rating: 3**      **System Subtotal: \$1,925,000** (unresolved issues)

*Fire alarm system - operational.  
 Sprinkled.  
 Hydraulic elevator.  
 Non accessible restrooms.  
 Trash chute creates odors and life safety issues.  
 Non code compliant handrails at stairwells.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Non accessible restrooms. Provide accessible restrooms.	Facility Adaptation	\$1,650,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Adjacent Site: Immediate Site**      **System Rating: 4**      **System Subtotal: \$5,000** (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Open cracks observed in concrete sidewalk and concrete steps immediately adjacent to the west entry. Sidewalk at End of Useful Service Life. Repair steps.	Deferred Maintenance	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	

End of Building Report for:      **East McNair Hall**

**Building Information**

Year Built 1951      Building Area (sf) 11,900      Floors 3      Building Engineer David Taivalkoski

**Building Notes:**

Steel Structure.

1 million gallon oil tank is too large and not necessary. Current location of tank would make for ideal future expansion for campus. Place new above ground at location of building to the west of central heating plant (tear down existing)

**Major Renovations/Additions**

Year	Add'n.	Reno.	Description
1964	X		

**Building Use Types**

Use Type %	Use Type
100%	Physical Plant/Utility

**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	8.63%	Fair	<b>CRV</b>	\$11,900,000	<b>Annual Maint and Capital Renewal Budget</b>	\$285,600
	3% of CRV x 80%					

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	7.17%	Fair
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**Priority 1 (current year only)**

<b>FCNI</b>	0.04%	Good
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation	
1 Currently Critical (Current Year)	\$5,000			\$5,000
2 Potentially Critical (Year 1)	\$127,000	\$15,000		\$142,000
3 Not yet Critical (Year 2-5)	\$104,000	\$602,000		\$706,000
4 Watch List (Year 6-10)	\$10,000		\$73,000	\$83,000
5 Long Term (Year 11+)		\$66,000	\$25,000	\$91,000
Subtotal	\$246,000	\$683,000	\$98,000	<b>\$1,027,000</b> <b>Total of Projects</b>

**Structure: Structure**      **System Rating: 4**      **System Subtotal: \$10,000** (unresolved issues)

*Steel Structure. Metal roof deck. Cast in place basement walls.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Some settling of brick in south west corner above steam tunnel.	Deferred Maintenance	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Roof**      **System Rating: 4**      **System Subtotal: \$141,000** (unresolved issues)

*(2007) PVC single-ply on 3 1/2" Foamular insulation. No overflow drains.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
:				<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Provide lightning protection.	Facility Adaptation	\$50,000	<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	2007 PVC single-ply.	Planned Maint/Capital Renewal	\$66,000	<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	Roof drains potentially emptying into main sewer. May be causing back flow of drains in floor of plant.	Facility Adaptation	\$25,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Glazing**      **System Rating: 2**      **System Subtotal: \$55,000** (unresolved issues)

*(1951) Original single pane glass, alum window frames.  
 (1964) Single pane glass, alum window frame with operable hopper.  
 (1990) Insulated glass, alum window frames installed on south elevation.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Water infiltration at sills of original 1951 windows causing damage to brick. Past End of Useful Service Life.	Deferred Maintenance	\$15,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Water and air infiltration at 70% of 1964 alum hopper windows. Many windows do not close securely. At End of Useful Service Life.	Deferred Maintenance	\$35,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Glazing**      **System Rating: 2**      **System Subtotal: \$55,000** (unresolved issues)

*(1951) Original single pane glass, alum window frames.*  
*(1964) Single pane glass, alum window frame with operable hopper.*  
*(1990) Insulated glass, alum window frames installed on south elevation.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Sealant between brick and frame of 1990's windows is deteriorating. Sealant is at End of Useful Service Life.	Deferred Maintenance	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Cladding**      **System Rating: 3**      **System Subtotal: \$90,000** (unresolved issues)

*Brick veneer and R19 metal siding.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Flashing required at west entry doors.	Deferred Maintenance	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Some degradation at soil line of brick veneer. Water damage at sills. Tuck-pointing needed.	Deferred Maintenance	\$30,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	20% of vertical metal trim is at End of Useful Service Life. Existing metal siding is at End of Useful Service Life.	Deferred Maintenance	\$55,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Interior Partitions**      **System Rating: 4**      **System Subtotal: \$2,000** (unresolved issues)

*Glazed block in high bay space. Painted CMU in offices and control room.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Re-paint interior partitions.	Deferred Maintenance	\$2,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors**      **System Rating: 4**      **System Subtotal: \$12,000** (unresolved issues)

*Interior - Hollow metal door with hollow metal frames.*  
*Exterior - Aluminum storefront.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Aluminum storefront doors at east loading dock near End of Useful Service Life.	Deferred Maintenance	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	



**BUILDING REPORT Central Heating Plant****BUILDING No.****41**

Michigan Technological University

CAMPUS Main Campus

**Interior Construction: Doors****System Rating: 4****System Subtotal: \$12,000** (unresolved issues)*Interior - Hollow metal door with hollow metal frames.**Exterior - Aluminum storefront.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	75% of door latches are not accessible. Provide accessible latches and hardware.	Facility Adaptation	\$7,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors****System Rating: 4****System Subtotal: \$5,000** (unresolved issues)*Concrete typical in high bay space. VCT typical in offices and control room.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Y	VCT in kitchen at End of Useful Service Life.	Deferred Maintenance	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Ceilings****System Rating: 2****System Subtotal: \$7,000** (unresolved issues)*2x2 and 2x4 suspended ceiling system typical in offices and control room. Open to deck in high bay spaces.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Suspended ceiling systems in Suite 100 and 200 have large areas of staining, degradation, and damage. Near End of Useful Service Life.	Deferred Maintenance	\$7,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Plumbing System: Domestic Water/Plumbing****System Rating: 3****System Subtotal: \$50,000** (unresolved issues)*Original and maintained. Water heater replaced recently.**Roof drains go to city sewer.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace DW/Plumbing.	Planned Maint/Capital Renewal	\$50,000	<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC**      **System Rating: 3**      **System Subtotal: \$310,000** (unresolved issues)

*Only the Steam Plant Operator's Room has AC in recirculation mode only. All other spaces are heating/ventilation AHU only.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace HVAC system.	Planned Maint/Capital Renewal	\$310,000	<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: Steam Production Equip.**      **System Rating: 3**      **System Subtotal: \$35,000** (unresolved issues)

1. Steam Boilers (state inspected) and Condensate Systems require continuous monitoring and upgrade/replace opportunities. Overall well maintained.
2. Boiler 1R - 1970 (Babcock - Wilcox)
3. Boiler 2 - 1950 (Wickes)
4. Boiler 3 - 1957 (Wickes)
5. Boiler 4 - 1964 (Wickes)
6. Boiler feed water Softening System replaced in 2006.
7. Study shows approx. 90% of condensate is returning.
8. One million gallon boiler fuel oil tank (1976) outside in containment dike.

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	1. Plan already exists for repair/replace scenarios including controls, refractory, breaching, etc. 2. Secondary steam feed to campus should be tested for integrity for future use as stand-by piping or valve removed and pipe blind-flanged. (Secondary has 2" less insulation on pipe than Primary.) 3. Fuel oil tank dike containment assessment - integrity issue has recommend plan. 4. Campus-wide steam trap assessment and continuing replacement program in place. 5. Boiler 1R (newest) can have capacity increased now for future needs.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Replace steam piping/condensate, PRV system.	Planned Maint/Capital Renewal	\$35,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls**      **System Rating: 3**      **System Subtotal: \$67,000** (unresolved issues)

*Plant Control Room houses BAS Front End, replaced with Tridium. JCI predominantly on campus.  
Heating plant controls are pneumatic.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Program has been recommended for replacement of older JCI controllers/network adaptors that are no longer supported by JCI. Other "legacy" JCI equipment also recommended for upgrade/replacement. Facilities using pneumatic controls at End-of-Life should be replaced with DDC during facility upgrades.	Deferred Maintenance	\$60,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Tie-in DDC to Central Control.	Planned Maint/Capital Renewal	\$7,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Sprinklers**      **System Rating:**      **System Subtotal:** (unresolved issues)

*No sprinkler system noted.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	Fire detection/suppression coverage not provided in key areas - boiler fronts, fuel (oil & gas) delivery/pump areas, emergency generator room.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Emergency Lighting**      **System Rating: 3**      **System Subtotal: \$15,000** (unresolved issues)

*Emergency lighting with individual battery backup.  
Batteries in heating plant fail early due to heat.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Consider replacing with LED lamps with inverter backup in conditioned room.	Planned Maint/Capital Renewal	\$15,000	<input type="checkbox"/>	<input type="checkbox"/>	

**BUILDING REPORT Central Heating Plant****BUILDING No.****41**

Michigan Technological University

CAMPUS Main Campus

**Safety: Fire Alarm****System Rating: 4****System Subtotal: \$16,000** (unresolved issues)*Fire alarm system in place; no horns or strobes.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Upgrade and add code compliant horns/strobes.	Facility Adaptation	\$16,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Electrical Power****System Rating: 4****System Subtotal:** (unresolved issues)*Original GE Panelboards and Motor Control Centers are maintained.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Standby Power****System Rating: 3****System Subtotal: \$200,000** (unresolved issues)*565 kW fuel oil engine-generator provides power to Bldg. 41, 42, 43, 44, and Dow Bldg. 8. New dual starters added recently. Caterpillar D348 with 275 gallon free-standing fuel oil tank.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Due to critical nature of Dow Environmental Sciences Bldg. 8, suggest a separate, local gen-set	Planned Maint/Capital Renewal	\$200,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Lighting****System Rating: 4****System Subtotal: \$12,000** (unresolved issues)*Heating plant has HID lighting in high bay.  
Older T12 fluorescent lighting for heating plant floor ways.  
Offices 2x4/Control Room 1x4 relamped with T8's.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Recommend replacement of heating plant fluorescent floor way fixtures with new w/T8's.	Deferred Maintenance	\$12,000	<input type="checkbox"/>	<input type="checkbox"/>	

**BUILDING REPORT Central Heating Plant****BUILDING No.****41**

Michigan Technological University

CAMPUS Main Campus

**Electrical System: Clock System****System Rating: NA****System Subtotal:** (unresolved issues)

NA

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Data/Telecom System****System Rating: 5****System Subtotal:** (unresolved issues)*Fiber to each building. CAT5/CAT6 Cabling. VOIP System (Phones).*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Code Compliance: Code/Life Safety****System Rating: 4****System Subtotal:** (unresolved issues)*Fire alarm system - smoke detectors and manual pull stations only, no horns or strobes.No sprinkler system.Emergency lighting with individual battery backup.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Emergency lights are at End of Useful Service Life. Heat at plant ruins battery. Provide alternative solution.	Facility Adaptation		<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Fire suppression needed for boiler and oil tank.	Facility Adaptation		<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Provide code compliant fire alarm system.	Facility Adaptation		<input type="checkbox"/>	<input type="checkbox"/>	

**Adjacent Site: Immediate Site****System Rating: 5****System Subtotal:** (unresolved issues)*Cast in place concrete steam tunnel. Wall mounted lights.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	Poor drainage in steam tunnel and remote vaults. Rusty ladders with broken rungs pose dangerous working conditions.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

End of Building Report for: **Central Heating Plant**

**Building Information**

Year Built 1952      Building Area (sf) 21,176      Floors      Building Engineer Gregg Richards

## Building Notes:

**Major Renovations/Additions**

Year	Add'n.	Reno.	Description
2005		X	

**Building Use Types**

Use Type %	Use Type
80%	Storage
20%	Administrative

**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	35.25%	Poor	<b>CRV</b>	\$2,668,176	<b>Annual Maint and Capital Renewal Budget</b>	\$64,036
						3% of CRV x 80%

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	22.28%	Poor
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**Priority 1 (current year only)**

<b>FCNI</b>	0.13%	Good
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation	
1 Currently Critical (Current Year)	\$3,500			\$3,500
2 Potentially Critical (Year 1)	\$74,000	\$50,000	\$5,000	\$129,000
3 Not yet Critical (Year 2-5)	\$45,000	\$417,000		\$462,000
4 Watch List (Year 6-10)	\$170,000	\$5,000	\$21,000	\$196,000
5 Long Term (Year 11+)		\$150,000		\$150,000
Subtotal	\$292,500	\$622,000	\$26,000	<b>\$940,500</b>
				<b>Total of Projects</b>

**Structure: Structure**      **System Rating: 5**      **System Subtotal:** (unresolved issues)  
*Steel Structure. Load bearing CMU. Bar joist roof construction.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Roof**      **System Rating:**      **System Subtotal: \$322,000** (unresolved issues)  
*(2007) - PVC - Single-ply Durolast on Styrofoam.  
 No overflow drain.  
 Parapet seam location is suspect.  
 Perimeter flashing on coping is questionable detail.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	30% of roof drains clogged. Clean drains.	Deferred Maintenance	\$2,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	50% Not properly draining. Re-slope roof to insure proper drainage.	Deferred Maintenance	\$160,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Provide lightning protection.	Deferred Maintenance	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	2007 PVC Single-ply.	Planned Maint/Capital Renewal	\$150,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Glazing**      **System Rating: 2**      **System Subtotal: \$60,000** (unresolved issues)  
*Original single pane glass, steel window frames.  
 (2005) Insulated glass, alum window frames installed on south elevation and east entry. No reported problems..*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Stone sills beyond End of Useful Service Life.	Deferred Maintenance	\$15,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Steel frames at End of Useful Service Life.	Deferred Maintenance	\$45,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Cladding**      **System Rating: 4**      **System Subtotal: \$2,500** (unresolved issues)  
*Brick veneer.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Sealant at expansion joints beyond End of Useful Service Life.	Deferred Maintenance	\$2,500	<input type="checkbox"/>	<input type="checkbox"/>	



**Shell: Cladding**      **System Rating: 4**      **System Subtotal: \$2,500** (unresolved issues)  
*Brick veneer.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	Minimal re-pointing needed.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Interior Partitions**      **System Rating: 4**      **System Subtotal:** (unresolved issues)  
*Painted CMU in high bay spaces. Gypsum on metal stud.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors**      **System Rating: 4**      **System Subtotal: \$13,000** (unresolved issues)  
*Interior - Solid core wood door with hollow metal frames.  
 Exterior - Aluminum storefront.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Overhead doors into 105 are beyond End of Useful Service Life.	Deferred Maintenance	\$12,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	East entry door into 108 not accessible. Provide accessible hardware.	Facility Adaptation	\$1,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors**      **System Rating: 4**      **System Subtotal:** (unresolved issues)  
*Concrete typical in high bay space. 9x9 tile typical in maintenance break room . Ceramic tile typical in bathrooms and lobby. VCT typical in offices.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Ceilings**      **System Rating: 3**      **System Subtotal: \$20,000** (unresolved issues)  
*2x2 and 2x4 suspended ceiling system typical in offices. Open to deck in high bay spaces.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Suspended ceiling system in break room at End of Useful Service Life.	Deferred Maintenance	\$20,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Plumbing System: Domestic Water/Plumbing**      **System Rating: 4**      **System Subtotal: \$51,000** (unresolved issues)

*Steam to hot water exchanger.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Heat exchanger in Car Wash area should be insulated.	Deferred Maintenance	\$1,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Replace DW/Plumbing for shop.	Planned Maint/Capital Renewal	\$50,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC**      **System Rating: 5**      **System Subtotal: \$340,000** (unresolved issues)

*One AHU for Offices with steam heat/DX cooling.  
Receiving Area, Vehicle Maintenance, and Skilled Trades Shops are heated/ventilated only.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Provide HVAC system for shop areas.	Planned Maint/Capital Renewal	\$340,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: Steam Production Equip.**      **System Rating: 5**      **System Subtotal: \$70,000** (unresolved issues)

*Central Plant Steam.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace steam piping/condensate, PRV system.	Planned Maint/Capital Renewal	\$70,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls**      **System Rating: 4**      **System Subtotal: \$7,000** (unresolved issues)

*DDC for Office AHU. Pneumatic controls/electric for Shops.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Tie-in DDC to Central Control.	Planned Maint/Capital Renewal	\$7,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Sprinklers**      **System Rating:**      **System Subtotal:** (unresolved issues)

*No sprinkler system.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Emergency Lighting**      **System Rating: 4**      **System Subtotal: \$5,000** (unresolved issues)  
*Battery powered lamps.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Replace batteries.	Planned Maint/Capital Renewal	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Fire Alarm**      **System Rating: 4**      **System Subtotal: \$20,000** (unresolved issues)  
*Fire alarm system in place - smoke detectors and manual pull stations only, no horns or strobes.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Upgrade and add code compliant horns/strobes.	Facility Adaptation	\$20,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Electrical Power**      **System Rating: 4**      **System Subtotal:** (unresolved issues)  
*Original.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Standby Power**      **System Rating: 4**      **System Subtotal:** (unresolved issues)  
*Provided from the Central Heating Plant generator.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Lighting**      **System Rating: 4**      **System Subtotal:** (unresolved issues)  
*Offices - 2x4 fixtures with T8 lamps installed during renovation.  
 All other areas have older HID or fluorescent lighting.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Clock System**

**System Rating: NA**

**System Subtotal:** (unresolved issues)

NA

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Data/Telecom System**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

*Fiber to each building. CAT5/CAT6 Cabling. VOIP System (Phones).*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Code Compliance: Code/Life Safety**

**System Rating:**

**System Subtotal: \$5,000** (unresolved issues)

*Fire alarm system - smoke detectors and manual pull stations only, no horns or strobes.*

*No sprinkler system.*

*Emergency lighting with individual battery backup.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
:	If hazardous materials are stored in room 108, door must swing out to maintain code compliance.			<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Door exiting to exterior in room 101 must swing out to maintain code compliance. Provide code compliant means of egress.	Facility Adaptation	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Provide code compliant fire alarm system.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Wood framed mezzanine may not be code compliant.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Break Room common path of travel distance is questionable. Verify.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**BUILDING REPORT Facilities Building****BUILDING No.****44**

Michigan Technological University

CAMPUS Main Campus

**Adjacent Site: Immediate Site****System Rating: 3****System Subtotal: \$25,000** (unresolved issues)

<b>Priority</b>	<b>Observed Issue</b>	<b>Project Classification</b>	<b>Resolution Budget</b>	<b>Funded</b>	<b>Resolved</b>	<b>Year Resolved</b>
3: Not yet Critical (Year 2-5)	Water flowing toward overhead door on east elevation. Re-grade slope and add drain. (Assume storm drain is with-in 50')	Deferred Maintenance	\$25,000	<input type="checkbox"/>	<input type="checkbox"/>	

End of Building Report for: **Facilities Building**

### Building Information

Year Built   2010     Building Area (sf)   77,926     Floors     Building Engineer   James Schultz

#### Building Notes:

Could not gain access to main roof. No roof report available.

Could not access a typical residential unit.

Building is air-conditioned.

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### Building Use Types

Use Type %     Use Type

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100%   Student Life/Residential Housing

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**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	0.14%	Good	<b>CRV</b>	\$14,805,940	<b>Annual Maint and Capital Renewal Budget</b>	\$355,343
						3% of CRV x 80%

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	0.14%	Good
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**Priority 1 (current year only)**

<b>FCNI</b>	0.14%	Good
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation	
1 Currently Critical (Current Year)	\$20,000			\$20,000
5 Long Term (Year 11+)				
Subtotal	\$20,000			<b>\$20,000</b>
				<b>Total of Projects</b>

<b>Structure: Structure</b>	<b>System Rating: 5</b>	<b>System Subtotal:</b> (unresolved issues)
<i>Steel structure and heavy timber.</i>		

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

<b>Shell: Roof</b>	<b>System Rating: 5</b>	<b>System Subtotal:</b> (unresolved issues)
<i>(2010) Standing seam metal at 122. (2010) Single ply PVC adhered at west entry. Over flow drains present (at lower roof area). Note: Assessment team was not able to access the surface of the roof.</i>		

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

<b>Shell: Glazing</b>	<b>System Rating: 5</b>	<b>System Subtotal:</b> (unresolved issues)
<i>Insulated glazing, aluminum window frames with operable windows at residential units.</i>		

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

<b>Shell: Cladding</b>	<b>System Rating: 5</b>	<b>System Subtotal: \$20,000</b> (unresolved issues)
<i>Brick veneer on CMU backup. Insulated corrugated metal siding. Stone veneer at fire place. Pre-cast stone accents at sills, lintels, and beltline. Aluminum panel fascia and plaster soffits at entries. Prefinished aluminum column enclosures at west entry.</i>		

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	At similar areas around the building, the through wall metal flashing appears to be improperly installed. i.e. the drip edge is bent at non-constant angle between floors 3 and 4 at the north elevation. The flashing does not extend far enough out beyond the face of the brick veneer. Repair is required.	Deferred Maintenance	\$20,000	<input type="checkbox"/>	<input type="checkbox"/>	



**Shell: Cladding** **System Rating: 5** **System Subtotal: \$20,000** (unresolved issues)  
*Brick veneer on CMU backup. Insulated corrugated metal siding. Stone veneer at fire place. Pre-cast stone accents at sills, lintels, and beltline. Aluminum panel fascia and plaster soffits at entries. Prefinished aluminum column enclosures at west entry.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Some exterior building joints at south elevation and at precast window sills are improperly installed, repair and replace as necessary.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Interior Partitions** **System Rating: 5** **System Subtotal:** (unresolved issues)  
*Gypsum board in bathrooms and room 122. Exposed brick veneer at room 122. Corrugated metal at room 122. Painted CMU at room 122. Stone veneer at room 122.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors** **System Rating: 5** **System Subtotal:** (unresolved issues)  
*Hollow metal doors with hollow metal frames at balance of building.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors** **System Rating: 5** **System Subtotal:** (unresolved issues)  
*Ceramic tile at restrooms and room 122. Carpet at corridors and 117.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Ceilings** **System Rating: 5** **System Subtotal:** (unresolved issues)  
*Gypsum board at room 122 and restrooms. 2x2 suspended ceiling system at main corridors and room 117. Tongue and groove wood at high bay space at room 122.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Plumbing System: Domestic Water/Plumbing**     **System Rating: 5**     **System Subtotal:** (unresolved issues)  
*Heat exchanger, new piping.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC**     **System Rating: 5**     **System Subtotal:** (unresolved issues)  
*Individual control for each room, no AC in rooms, AC in common areas.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: Steam Production Equip.**     **System Rating: 5**     **System Subtotal:** (unresolved issues)  
*Campus steam.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls**     **System Rating: 5**     **System Subtotal:** (unresolved issues)  
*DDC.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Sprinklers**     **System Rating: 5**     **System Subtotal:** (unresolved issues)  
*Sprinklered.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Emergency Lighting** System Rating: 5 System Subtotal: (unresolved issues)  
*From generator.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Fire Alarm** System Rating: 5 System Subtotal: (unresolved issues)  
*EST-3, strobes thru out.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Electrical Power** System Rating: 5 System Subtotal: (unresolved issues)  
*New power distribution, poke thru plates are not flush with floor.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	Adjust poke thru cover plates down.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Standby Power** System Rating: 5 System Subtotal: (unresolved issues)  
*Generator.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Lighting** System Rating: 5 System Subtotal: (unresolved issues)  
*Fluorescent thru out except some MR16, occupancy sensors in most areas.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

<b>Electrical System: Clock System</b>	<b>System Rating: NA</b>	<b>System Subtotal:</b> (unresolved issues)
NA		

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

<b>Code Compliance: Code/Life Safety</b>	<b>System Rating: 5</b>	<b>System Subtotal:</b> (unresolved issues)
<i>Fire alarm system.</i> <i>Sprinkled.</i> <i>Elevator.</i> <i>Accessible toilet rooms.</i>		

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

<b>Adjacent Site: Immediate Site</b>	<b>System Rating: 5</b>	<b>System Subtotal:</b> (unresolved issues)
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Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

End of Building Report for: **Hillside Place**

**Building Information**

Year Built 1975     Building Area (sf) 29,610     Floors 1     Building Engineer Michael Wilmers

**Building Notes:**

Water penetration observed at NE wall.

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**Building Use Types**

Use Type %	Use Type
100%	Recreation/Gym

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**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	26.08%	Poor	<b>CRV</b>	\$6,662,250	<b>Annual Maint and Capital Renewal Budget</b>	\$159,894
						3% of CRV x 80%

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	18.28%	Poor
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**Priority 1 (current year only)**

<b>FCNI</b>	0.18%	Good
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation	
1 Currently Critical (Current Year)	\$12,000			\$12,000
2 Potentially Critical (Year 1)	\$19,000			\$19,000
3 Not yet Critical (Year 2-5)	\$130,000	\$1,057,000		\$1,187,000
4 Watch List (Year 6-10)	\$21,500		\$183,000	\$204,500
5 Long Term (Year 11+)		\$315,000		\$315,000
Subtotal	\$182,500	\$1,372,000	\$183,000	<b>\$1,737,500</b>
				<b>Total of Projects</b>

**Structure: Structure**      **System Rating: 5**      **System Subtotal:** (unresolved issues)  
*Tennis courts - Steel structure with moment connections. Metal roof deck. Cast in place slab on grade.*  
*Tennis lobby and locker rooms - Load bearing CMU with bar joists. Metal roof deck.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Roof**      **System Rating: 5**      **System Subtotal: \$315,000** (unresolved issues)  
*(2008) Tennis courts - PVC single-ply over fiberglass and EPS.*  
*(2008) Tennis courts - PVC single-ply over EPS.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	2008 PVC single-ply over fiberglass.	Planned Maint/Capital Renewal	\$285,000	<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	2008 PVC single-ply.	Planned Maint/Capital Renewal	\$30,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Glazing**      **System Rating: 5**      **System Subtotal:** (unresolved issues)  
*Exterior - Insulated glass, hollow metal window frames.*  
*Interior - Single pane glass, hollow metal window frames.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Cladding**      **System Rating: 3**      **System Subtotal: \$27,500** (unresolved issues)  
*Brick veneer on lower half of building. Metal panel system on upper half of building.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Where brick slopes away from building, water infiltration is causing spalling and brick failure. Tuck-point.	Deferred Maintenance	\$6,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Some collision damage in brick. Replace and repair large openings and broken brick.	Deferred Maintenance	\$1,500	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Louvers at corrugated metal leaks with driving rain. Re-work louvers.	Deferred Maintenance	\$20,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Interior Partitions**     **System Rating: 4**     **System Subtotal:** (unresolved issues)  
*Painted CMU throughout balance of building.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors**     **System Rating: 4**     **System Subtotal: \$1,500** (unresolved issues)  
*Interior - Hollow metal door with hollow metal frame.*  
*Exterior - Hollow metal door with hollow metal frame.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Due for re-painting.	Deferred Maintenance	\$1,500	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors**     **System Rating: 4**     **System Subtotal: \$1,500** (unresolved issues)  
*Carpet typical in lobby. Ceramic tile typical in bathrooms. Tennis court pavement in gym area.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Carpet is dirty. Near End of Useful Service Life.	Deferred Maintenance	\$1,500	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Ceilings**     **System Rating: 4**     **System Subtotal: \$5,000** (unresolved issues)  
*2x2 suspended ceiling system throughout locker rooms and lobby. Open to deck in gym area.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Sagging suspended ceiling tiles in locker rooms and showers. At End of Useful Service Life. Replace with hard ceiling.	Deferred Maintenance	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Plumbing System: Domestic Water/Plumbing**     **System Rating: 3**     **System Subtotal: \$142,000** (unresolved issues)  
*Large steam-fired domestic hot water heater/tank provides for facility and shower rooms.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace DW/Plumbing.	Planned Maint/Capital Renewal	\$120,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Replace DW heater - at end of useful service life, replace with semi -instantaneous.	Deferred Maintenance	\$22,000	<input type="checkbox"/>	<input type="checkbox"/>	



**HVAC System: HVAC**      **System Rating: 3**      **System Subtotal: \$851,000** (unresolved issues)

*Four Heating and Ventilation units, two at each end of the building for the tennis courts.  
Two Big Ass fans installed on pendants from ceiling of tennis courts stopped icing of roof.  
One H&V unit for Men's/Women's locker/shower room.  
Courts also provided heat from hot water unit heaters approx. 20 feet above floor (several).  
Lobby has a ceiling-mounted fan coil with DX AC, condenser on roof, recirculation air only.  
Duplex heating hot water pumps.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Heating hot water pumps and piping are missing insulation. Remediate.	Deferred Maintenance	\$6,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Replace HVAC system.	Planned Maint/Capital Renewal	\$845,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: Steam Production Equip.**      **System Rating: 3**      **System Subtotal: \$101,000** (unresolved issues)

*Steam provided by Central Heating Plant.  
Single pneumatically controlled Fisher PRV station.  
Simplex steam to hot water heat exchanger for heating hot water.  
Condensate is pumped from simplex CRU to plant.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Insulation on PRV valve and piping is missing. Remediate.	Deferred Maintenance	\$6,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Replace steam piping/condensate, PRV system.	Planned Maint/Capital Renewal	\$85,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Consider replacing CRU with duplex model.	Deferred Maintenance	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls**      **System Rating: 3**      **System Subtotal: \$92,000** (unresolved issues)

*Pneumatic controls predominantly.  
Simplex air compressor is older.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace pneumatic controls DDC.	Deferred Maintenance	\$75,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Simplex air compressor is older. Replace with duplex.	Deferred Maintenance	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls**     **System Rating: 3**     **System Subtotal: \$92,000** (unresolved issues)

*Pneumatic controls predominantly.  
 Simplex air compressor is older.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Tie-in DDC to Central Control.	Planned Maint/Capital Renewal	\$7,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Sprinklers**     **System Rating:**     **System Subtotal:** (unresolved issues)

*None noted or mentioned.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Emergency Lighting**     **System Rating: 4**     **System Subtotal: \$15,000** (unresolved issues)

*Only in office area with battery backup ballast in fixture.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Add additional egress lights.	Facility Adaptation	\$15,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Fire Alarm**     **System Rating: 4**     **System Subtotal: \$15,000** (unresolved issues)

*Fire alarm system provided. No horns/strobes noted.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Add strobes and horns.	Facility Adaptation	\$15,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Electrical Power**     **System Rating: 3**     **System Subtotal: \$10,000** (unresolved issues)

*Older ITE system.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace batteries.	Deferred Maintenance	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Standby Power**     **System Rating: 4**     **System Subtotal:** (unresolved issues)

*No emergency power provided to building.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Lighting**     **System Rating: 4**     **System Subtotal:** (unresolved issues)

*Fluorescent lamps on horizontal beams shine upward to ceiling for indirect court lighting.  
 Halogen HID lamps are mounted at ceiling and on only during court use.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Clock System**     **System Rating: NA**     **System Subtotal:** (unresolved issues)

NA

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Data/Telecom System**     **System Rating: 5**     **System Subtotal:** (unresolved issues)

*Fiber to each building. CAT5/CAT6 Cabling. VOIP System (Phones).*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Code Compliance: Code/Life Safety**     **System Rating: 3**     **System Subtotal: \$153,000** (unresolved issues)

*Fire alarm system - smoke detectors and manual pull stations, horns but no strobes.  
 No sprinkler.  
 Emergency lighting with individual battery backup.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Locker rooms are not accessible. Refer to barrier free requirements for accessibility.	Facility Adaptation	\$150,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Ramp from 102 to 101 is not accessible.	Facility Adaptation	\$3,000	<input type="checkbox"/>	<input type="checkbox"/>	

**BUILDING REPORT Gates Tennis Center****BUILDING No. 50**

Michigan Technological University

CAMPUS Main Campus

**Adjacent Site: Immediate Site****System Rating: 4****System Subtotal: \$8,000** (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Water infiltration at west elevation. Re-grade to redirect flow of water.	Deferred Maintenance	\$8,000	<input type="checkbox"/>	<input type="checkbox"/>	

End of Building Report for: **Gates Tennis Center**

**Building Information**

Year Built    2010                    Building Area (sf)    10,100                    Floors                    Building Engineer    Gregg Richards

Building Notes:

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**Building Use Types**

Use Type %	Use Type
10%	Laboratory, Research
90%	Administrative

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**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	0.33%	Good	<b>CRV</b>	\$2,100,800	<b>Annual Maint and Capital Renewal Budget</b>	\$50,419
						3% of CRV x 80%

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	0.10%	Good
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**Priority 1 (current year only)**

<b>FCNI</b>	0.05%	Good
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation	
1 Currently Critical (Current Year)	\$1,000			\$1,000
2 Potentially Critical (Year 1)	\$1,000			\$1,000
4 Watch List (Year 6-10)	\$5,000			\$5,000
5 Long Term (Year 11+)		\$0		\$0
Subtotal	\$7,000	\$0		<b>\$7,000</b>
				<b>Total of Projects</b>

**Structure: Structure**      **System Rating: 5**      **System Subtotal:** (unresolved issues)  
*Load bearing CMU and steel structure. Steel bar joists. Metal roof deck. Cast in place concrete slab on grade.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Roof**      **System Rating: 5**      **System Subtotal: \$** (unresolved issues)  
*(2010) EPDM single-ply over Styrofoam.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	2010 EPDM single-ply	Planned Maint/Capital Renewal	\$0	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Glazing**      **System Rating: 5**      **System Subtotal:** (unresolved issues)  
*Insulated glazing, aluminum window frames, operable hopper windows.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Cladding**      **System Rating: 5**      **System Subtotal:** (unresolved issues)  
*Split face and smooth CMU. Insulated metal panel. Corrugated metal panel.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Interior Partitions**      **System Rating: 5**      **System Subtotal:** (unresolved issues)  
*Gypsum board in offices. CMU in high bay space.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	





**HVAC System: HVAC****System Rating: 5****System Subtotal: \$1,000** (unresolved issues)

*Hot water boiler is RBI Futura III model MB750, condensing-type supplying 160°; boiler circulation pump CV; HHW distribution pump on Danfoss VLT VFD.  
Envision Water Furnace heat pumps provide heating and cooling for spaces.  
Air conditioning provided by plate-frame HX piped to submersible pumps in casing sunk into abandoned mineshaft.  
Perimeter and glass has hot water finned tube radiation.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Piping through janitor's closet and receiving dock office concrete ceilings is not fire sealed. Remediate.	Deferred Maintenance	\$1,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls****System Rating: 5****System Subtotal:** (unresolved issues)

*Electronic DDC controls by Environmental Systems Inc.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Sprinklers****System Rating:****System Subtotal:** (unresolved issues)

*Wet sprinkler system throughout building.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Emergency Lighting****System Rating: 4****System Subtotal: \$5,000** (unresolved issues)

*Battery backup ballast in fixtures for offices/corridors.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Replace batteries.	Deferred Maintenance	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Fire Alarm****System Rating: 4****System Subtotal:** (unresolved issues)

*Fire alarm system - smoke detectors and manual pull stations, dual horns and strobes.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Electrical Power**      **System Rating: 4**      **System Subtotal:** (unresolved issues)

*Square D substation, switchboards, transformer, distribution panelboards, power panels, etc.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Standby Power**      **System Rating: 5**      **System Subtotal:** (unresolved issues)

*No emergency power available.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Lighting**      **System Rating: 4**      **System Subtotal:** (unresolved issues)

*Offices - 2x4 prismatic lay-in type with 3 T8 lamps.  
Corridors have 6"x4' pendant type with 2 T8 lamps.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Clock System**      **System Rating: NA**      **System Subtotal:** (unresolved issues)

NA

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Data/Telecom System**      **System Rating: 5**      **System Subtotal:** (unresolved issues)

*Fiber to each building. CAT5/CAT6 Cabling. VOIP System (Phones).*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Code Compliance: Code/Life Safety**      **System Rating: 5**      **System Subtotal:** (unresolved issues)

*Fire alarm system - smoke detectors and manual pull stations, dual horns and strobes.Has sprinkler system.Emergency lighting runs on backup battery.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Kitchen sink is not accessible.	Facility Adaptation		<input type="checkbox"/>	<input type="checkbox"/>	

**Adjacent Site: Immediate Site**      **System Rating:**      **System Subtotal:** (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

End of Building Report for:      **KRC Engineering Design Center**

### Building Information

Year Built   1973     Building Area (sf)   15,020     Floors     Building Engineer   James Schultz

#### Building Notes:

Building was extensively remodeled and completely repurposed in 1996.

Sprinklers reported to have gone off in the past and the carpet was not dried. Carpet is damaged. The entire building exhibits a unpleasant odor.

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### Building Use Types

Use Type %	Use Type
100%	Administrative

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**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	23.83%	Poor	<b>CRV</b>	\$2,853,800	<b>Annual Maint and Capital Renewal Budget</b>	\$68,491
						3% of CRV x 80%

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	17.94%	Poor
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**Priority 1 (current year only)**

<b>FCNI</b>	0.00%	Good
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation	
1 Currently Critical (Current Year)	\$0			\$0
2 Potentially Critical (Year 1)	\$42,000			\$42,000
3 Not yet Critical (Year 2-5)	\$40,000	\$430,000		\$470,000
4 Watch List (Year 6-10)	\$8,000	\$45,000		\$53,000
5 Long Term (Year 11+)		\$115,000		\$115,000
Subtotal	\$90,000	\$590,000		<b>\$680,000</b>
				<b>Total of Projects</b>

**Structure: Structure**     **System Rating: 5**     **System Subtotal: \$** (unresolved issues)  
*Steel structure. Wood and Metal roof deck. Cast-in-place concrete basement walls.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Y	No Reported Problems	Deferred Maintenance	\$0	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Roof**     **System Rating: 5**     **System Subtotal: \$55,000** (unresolved issues)  
*(2005) PVC single ply adhered.  
 No overflow drains present.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	2005 PVC single ply adhered.	Planned Maint/Capital Renewal	\$55,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Glazing**     **System Rating: 4**     **System Subtotal: \$3,000** (unresolved issues)  
*(1997) Insulated glazing, aluminum window frames, operable casement windows.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Window hardware is malfunctioning, due for repair.	Deferred Maintenance	\$3,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Cladding**     **System Rating: 4**     **System Subtotal: \$20,000** (unresolved issues)  
*EIFS wall system.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Deterioration damage and cracking observed around the perimeter of the building. Open sealant joints between panels. Due for repair.	Deferred Maintenance	\$20,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Interior Partitions**     **System Rating: 5**     **System Subtotal:** (unresolved issues)  
*Gypsum board typical throughout balance of building. Painted CMU in basement corridors and offices as well as in stairs at all floors.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors** System Rating: 5 System Subtotal: (unresolved issues)

*Solid core wood doors with hollow metal frames typical.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors** System Rating: 4 System Subtotal: \$19,000 (unresolved issues)

*Carpet on concrete slab at basement. Carpet on plywood at offices and corridor. Quarry tile at lobby, restrooms, and stair landing. Rubber tread nosing at stairs.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Carpet at offices and corridor on second level is at End of Useful Service Life.	Deferred Maintenance	\$19,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Ceilings** System Rating: 5 System Subtotal: (unresolved issues)

*2x4 suspended ceiling systems throughout basement. 2x2 suspended ceiling system throughout balance of building.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Conveying System: Elevators** System Rating: 4 System Subtotal: (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No reported problems.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Plumbing System: Domestic Water/Plumbing** System Rating: 3 System Subtotal: \$60,000 (unresolved issues)

*Decent shape.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	Replace DW/Plumbing.	Planned Maint/Capital Renewal	\$60,000	<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC**

**System Rating: 4**

**System Subtotal: \$470,000** (unresolved issues)

*MUA units, 4 on roof, 15 years old, gas-fired, 2 over lower roof are noisy, hydronic baseboard along outside walls, boilers*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Should replace MUA units	Deferred Maintenance	\$40,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Replace HVAC system.	Planned Maint/Capital Renewal	\$430,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: Steam Production Equip.**

**System Rating: 4**

**System Subtotal: \$45,000** (unresolved issues)

*Not on campus steam.*

*Hot water by three (3) Weil McLain HE II boilers.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Replace boilers.	Planned Maint/Capital Renewal	\$45,000	<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	No reported problems.	Planned Maint/Capital Renewal		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Sprinklers**

**System Rating:**

**System Subtotal:** (unresolved issues)

*Sprinklered thru out.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Emergency Lighting**

**System Rating: 4**

**System Subtotal: \$8,000** (unresolved issues)

*EBUs and exits.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Replace batteries.	Deferred Maintenance	\$8,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Fire Alarm**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*EST fire alarm panel.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	



<b>Electrical System: Electrical Power</b>	<b>System Rating: 4</b>	<b>System Subtotal:</b> (unresolved issues)
<i>Good shape.</i>		

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

<b>Electrical System: Standby Power</b>	<b>System Rating: NA</b>	<b>System Subtotal:</b> (unresolved issues)
<i>No emergency power available.</i>		

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

<b>Electrical System: Lighting</b>	<b>System Rating: 4</b>	<b>System Subtotal:</b> (unresolved issues)
<i>T8 2 X 4 lay-in fixtures.</i>		

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

<b>Electrical System: Clock System</b>	<b>System Rating: NA</b>	<b>System Subtotal:</b> (unresolved issues)
NA		

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

<b>Electrical System: Data/Telecom System</b>	<b>System Rating: 5</b>	<b>System Subtotal:</b> (unresolved issues)
<i>Fiber to each building. CAT5/CAT6 Cabling. VOIP System (Phones).</i>		

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**BUILDING REPORT**

Harold Meese Center

**BUILDING No.****84**

Michigan Technological University

CAMPUS Main Campus

**Code Compliance: Code/Life Safety****System Rating: 5****System Subtotal:** (unresolved issues)*Fire alarm system - operational.**Sprinkled.**Emergency lighting is battery operated.**Two hydraulic elevators.**Accessible restrooms.**Code compliant stair.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Adjacent Site: Immediate Site****System Rating: 5****System Subtotal:** (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

End of Building Report for: **Harold Meese Center**

**Building Information**

Year Built   1975     Building Area (sf)   11,520     Floors     Building Engineer   James Schultz

**Building Notes:**

Pre-engineered building.

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**Building Use Types**

Use Type %	Use Type
100%	Laboratory, Research

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**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	16.45%	Poor	<b>CRV</b>	\$4,262,400	<b>Annual Maint and Capital Renewal Budget</b>	\$102,298
						3% of CRV x 80%

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	6.19%	Fair
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**Priority 1 (current year only)**

<b>FCNI</b>	0.00%	Good
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation	
1 Currently Critical (Current Year)	\$0			\$0
2 Potentially Critical (Year 1)	\$33,000			\$33,000
3 Not yet Critical (Year 2-5)	\$226,000	\$5,000		\$231,000
4 Watch List (Year 6-10)		\$330,000	\$35,000	\$365,000
5 Long Term (Year 11+)	\$12,000	\$50,000	\$10,000	\$72,000
Subtotal	\$271,000	\$385,000	\$45,000	<b>\$701,000</b>
				<b>Total of Projects</b>

**Structure: Structure**     **System Rating: 4**     **System Subtotal: \$** (unresolved issues)

*Pre-engineered steel structure. Cast-in-place concrete slab on footings.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	No reported Structural problems, but pre-engineered buildings (not including steel frame) typically have a life expectancy in the range of 40-years.	Deferred Maintenance	\$0	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Roof**     **System Rating: 4**     **System Subtotal: \$75,000** (unresolved issues)

*(1975) Pre-finished mechanically fastened metal roof.*

*Note: assessment team was not able to access the surface of the roof. The downward "pillowing" of the finish ceiling surface may suggest roof leaks.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace metal roof panels.	Deferred Maintenance	\$75,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Glazing**     **System Rating: 4**     **System Subtotal:** (unresolved issues)

*(1975) Original single glazing, fixed aluminum frame.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Cladding**     **System Rating: 4**     **System Subtotal: \$140,000** (unresolved issues)

*Brick veneer on metal stud backup at south half of building. Prefinished vertical metal siding on metal stud back up with insulation at high bay space at north half of building. Translucent fiberglass panels at clearstory with low insulation value.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	All exterior sealant joints are at End of Useful Service Life. Some fasteners at metal siding are deteriorating, Metal panel at End of Useful Service Life.	Deferred Maintenance	\$130,000	<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	Damaged panels observed. No flashing at base of metal siding. Due for repair.	Deferred Maintenance	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Interior Partitions**     **System Rating: 4**     **System Subtotal:** (unresolved issues)  
*Gypsum board on metal stud at balance of building.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors**     **System Rating: 4**     **System Subtotal: \$22,000** (unresolved issues)  
*Hollow metal doors with hollow metal frames at balance of building egress. Aluminum storefront system at south entry. Composite sectional overhead doors.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Composite sectional overhead doors at End of Useful Service Life.	Deferred Maintenance	\$20,000	<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	Hollow metal doors with hollow metal frames due for re-paint.	Deferred Maintenance	\$2,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors**     **System Rating: 4**     **System Subtotal:** (unresolved issues)  
*Sealed concrete at balance of building.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Ceilings**     **System Rating: 4**     **System Subtotal: \$2,000** (unresolved issues)  
*2x4 suspended ceiling system at south part of building. 4x5 vinyl coated insulated panels at high bay space at north half of building.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	2x4 suspended ceiling system at End of Useful Service Life.	Deferred Maintenance	\$2,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Plumbing System: Domestic Water/Plumbing**     **System Rating: 3**     **System Subtotal: \$50,000** (unresolved issues)  
*Tank type toilets, DW lines are copper look ok.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**BUILDING REPORT Sands Pilot Plant****BUILDING No.****90**

Michigan Technological University

CAMPUS Sands Pilot Site

**Plumbing System: Domestic Water/Plumbing****System Rating: 3****System Subtotal: \$50,000** (unresolved issues)*Tank type toilets, DW lines are copper look ok.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	Replace DW/Plumbing.	Planned Maint/Capital Renewal	\$50,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC****System Rating: 3****System Subtotal: \$336,000** (unresolved issues)*HV residential service gas fired in fair shape.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace residential gas-fired furnaces.	Deferred Maintenance	\$6,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Replace HVAC system.	Planned Maint/Capital Renewal	\$330,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls****System Rating: 3****System Subtotal:** (unresolved issues)*Thermostat for HV units.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Sprinklers****System Rating:****System Subtotal:** (unresolved issues)*None.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Emergency Lighting****System Rating: 3****System Subtotal: \$5,000** (unresolved issues)*Two EBUs.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Add additional EBUs to get 1 fc.	Deferred Maintenance	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	

<b>Safety: Fire Alarm</b>		<b>System Rating: NA</b>	<b>System Subtotal: \$10,000</b> (unresolved issues)			
<i>None.</i>						

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	Provide system.	Facility Adaptation	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	

<b>Electrical System: Electrical Power</b>		<b>System Rating: 3</b>	<b>System Subtotal: \$15,000</b> (unresolved issues)			
<i>Two services coming in for heavy duty wood working equipment, distribution getting to end of life.</i>						

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace or service switches in 5 years.	Deferred Maintenance	\$15,000	<input type="checkbox"/>	<input type="checkbox"/>	

<b>Electrical System: Standby Power</b>		<b>System Rating: NA</b>	<b>System Subtotal:</b> (unresolved issues)			
<i>None</i>						

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

<b>Electrical System: Lighting</b>		<b>System Rating: 3</b>	<b>System Subtotal: \$5,000</b> (unresolved issues)			
<i>T12 Ho 8' lamps strip fixtures and lay-in in office area.</i>						

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace fixture with T8 HO strips.	Planned Maint/Capital Renewal	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	

<b>Electrical System: Clock System</b>		<b>System Rating: NA</b>	<b>System Subtotal:</b> (unresolved issues)			
<i>NA</i>						

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	



**Code Compliance: Code/Life Safety** **System Rating: 3** **System Subtotal: \$35,000** (unresolved issues)

*Not sprinkled.*  
*No elevator.*  
*Toilet rooms not accessible.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Wood stairs are non compliant. Replace with metal studs.	Facility Adaptation	\$30,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Non-ADA compliant restroom. Renovate restroom.	Facility Adaptation	\$5,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Adjacent Site: Immediate Site** **System Rating: 3** **System Subtotal: \$6,000** (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Concrete aprons adjacent to exterior doors are at End of Useful Service Life.	Deferred Maintenance	\$6,000	<input type="checkbox"/>	<input type="checkbox"/>	

**End of Building Report for: Sands Pilot Plant**

**Building Information**

Year Built   2004      Building Area (sf)   24,000      Floors      Building Engineer   Gregg Richards

Building Notes:

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**Building Use Types**

Use Type %      Use Type

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70%   Laboratory, Research

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30%   Administrative

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**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	5.04%	Fair	<b>CRV</b>	\$7,584,000	<b>Annual Maint and Capital Renewal Budget</b>	\$182,016
						3% of CRV x 80%

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	1.61%	Good
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**Priority 1 (current year only)**

<b>FCNI</b>	0.18%	Good
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation	
1 Currently Critical (Current Year)	\$6,000		\$8,000	\$14,000
2 Potentially Critical (Year 1)	\$40,000			\$40,000
3 Not yet Critical (Year 2-5)	\$68,000			\$68,000
4 Watch List (Year 6-10)		\$200,000	\$60,000	\$260,000
5 Long Term (Year 11+)				
Subtotal	\$114,000	\$200,000	\$68,000	<b>\$382,000</b>
				<b>Total of Projects</b>

**Structure: Structure**      **System Rating: 4**      **System Subtotal: \$5,500** (unresolved issues)

*Load bearing CMU with bar joists. Metal roof deck. Concrete plank over corridor for mechanical chase. Cast in place slab on footings.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Fire blocking missing at top of CMU wall and roof deck between offices and mechanical chase. Provide proper fire blocking.	Deferred Maintenance	\$3,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Concrete plank system missing fire sealant at expansion joint. Provide proper fire blocking.	Deferred Maintenance	\$2,500	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Roof**      **System Rating: 4**      **System Subtotal: \$219,500** (unresolved issues)

*(2004) EPDM single-ply membrane.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Some leaking at exhaust penetrations. Repair.	Deferred Maintenance	\$7,500	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Provide lightning protection.	Deferred Maintenance	\$12,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Roof not fully adhered.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	2004 EPDM single-ply membrane.	Planned Maint/Capital Renewal	\$200,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Glazing**      **System Rating: 4**      **System Subtotal:** (unresolved issues)

*Insulated glass, alum window frames, operable casement windows.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Cladding**      **System Rating: 4**      **System Subtotal: \$60,000** (unresolved issues)

*CMU veneer. Metal panel system. Corrugated metal panel.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Weather striping between individual metal panels is falling out at joints. Provide alternative solution.	Deferred Maintenance	\$60,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Interior Partitions**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*Gypsum board on metal stud at entry corridors, and offices. Painted CMU in bathrooms, corridor adjacent to high bay space, and exterior walls of high bay space. Wood veneer covering over gypsum in conference room. Movable partition walls.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Partition walls when closed don't allow for required means of egress.	Facility Adaptation		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*Interior - Solid core wood doors with hollow metal frame in offices with compliant door hardware. Hollow metal door with hollow metal frame in high bay spaces and in corridor adjacent to high bay spaces. Over head door at offices and corridor.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Over head door at offices and corridor does not act as a means of egress. Provide second compliant means of egress.	Facility Adaptation		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*Carpet typical in offices. Ceramic tile typical in bathrooms. Ceramic tile in large bathrooms. VCT in corridors and small bathroom with shower. Polished concrete in high bay space.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Ceilings**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*2x2 suspended ceiling system throughout balance of building. Open to deck in high bay spaces. Custom acoustic ceiling in dyno lab.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Plumbing System: Domestic Water/Plumbing**      **System Rating: 5**      **System Subtotal: \$1,500** (unresolved issues)

*Cold water, domestic hot water, compressed air, and natural gas services run through central mezzanine.  
Sewer drains by gravity.  
Bradford-White natural gas fired domestic water heater.  
Low flow fixtures.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Back flow preventer is weeping to drain. Remediate.	Deferred Maintenance	\$1,500	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC**      **System Rating: 5**      **System Subtotal: \$8,000** (unresolved issues)

*MTU space  
VAV air handling unit for MTU spaces.  
Windows have hot water finned tube radiant heat.  
Boiler #1 non-condensing type Burnham.  
Boiler #2 condensing-type Thermal Solutions Evolution model  
Plenum ceiling return air through light fixtures.*

*Tenant space  
Typical tenant units are Carrier AHU with hot water heat with pumped coil and DX AC. Some bays use unit heaters hung from ceiling.  
Tenant space that was State of Michigan (left the building) has (1) SafeAire hood,, (1) HEMCO hood, one canopy, one fixed snorkel, and autoclave.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	No fall protection or floor edge marking at ladder down from mezzanine. Check building code requirements. Remediate.	Facility Adaptation	\$8,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls**      **System Rating: 5**      **System Subtotal: \$4,500** (unresolved issues)

*Delta DDC system - all electric.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Piping and ductwork through mezzanine walls into tenant spaces are not fire sealed. Remediate.	Deferred Maintenance	\$4,500	<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Sprinklers**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

*Wet sprinkler system provided.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Emergency Lighting**

**System Rating: 4**

**System Subtotal: \$8,000** (unresolved issues)

*Emergency lighting with individual battery backup ballast in fixtures.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Replace batteries.	Deferred Maintenance	\$8,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Fire Alarm**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*Fire alarm system provided.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Electrical Power**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*Square D substation, switchboards, transformer, distribution panelboards, power panels, etc. Liebert TVSS.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Standby Power**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*Natural gas engine-generator located outside serves only one tenant suite (State of Michigan) that is unoccupied.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Lighting**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*Room 101 Large Meeting - 2x4 lay-in, prismatic, fixtures with 3 T8 lamps each. Corridors have 6"x4', pendant, fixtures with 2 T8 lamps each. T8 fluorescent lighting and electronic ballasts in balance of building. Typical tenant spaces are high bay and use some form of HID lighting.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Clock System**

**System Rating: NA**

**System Subtotal:** (unresolved issues)

NA

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Data/Telecom System**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

*Fiber to each building. CAT5/CAT6 Cabling. VOIP System (Phones).*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Code Compliance: Code/Life Safety**

**System Rating: 4**

**System Subtotal: \$75,000** (unresolved issues)

*Fire alarm system - smoke detectors and manual pull stations, horns and strobes. Sprinkler system. Emergency lighting with individual battery backup.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Security gate between 217 and GH1 corridor makes space non compliant when closed. Provide compliant store front entry.	Deferred Maintenance	\$15,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Means of egress in high bay space to be verified during each subsequent interior renovation/fit out.	Facility Adaptation	\$60,000	<input type="checkbox"/>	<input type="checkbox"/>	



**Adjacent Site: Immediate Site**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

<b>Priority</b>	<b>Observed Issue</b>	<b>Project Classification</b>	<b>Resolution Budget</b>	<b>Funded</b>	<b>Resolved</b>	<b>Year Resolved</b>
2: Potentially Critical (Year 1)	Update exit signage and emergency lighting per code requirements.	Facility Adaptation		<input type="checkbox"/>	<input type="checkbox"/>	

End of Building Report for:    **Advanced Technology Development Complex**

**Building Information**

Year Built    1999                      Building Area (sf)    68,231                      Floors                      Building Engineer    Gregg Richards

**Building Notes:**

In general warehouse is aging predictably.

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**Building Use Types**

Use Type %	Use Type
85%	Laboratory, Research
15%	Administrative

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**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	1.65%	Good	<b>CRV</b>	\$23,403,233	<b>Annual Maint and Capital Renewal Budget</b>	\$561,678
						3% of CRV x 80%

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	1.23%	Good
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**Priority 1 (current year only)**

<b>FCNI</b>	0.00%	Good
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation	
1 Currently Critical (Current Year)	\$0			\$0
2 Potentially Critical (Year 1)	\$63,500			\$63,500
3 Not yet Critical (Year 2-5)	\$225,000			\$225,000
4 Watch List (Year 6-10)			\$62,000	\$62,000
5 Long Term (Year 11+)	\$35,000			\$35,000
Subtotal	\$323,500		\$62,000	<b>\$385,500</b>
				<b>Total of Projects</b>

**Structure: Structure**                                      **System Rating: 4**                                      **System Subtotal: \$** (unresolved issues)  
*Load bearing CMU. Long span bar joists. Metal roof deck. Cast in place concrete slab on grade.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Y	No Reported Problems	Deferred Maintenance	\$0	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Roof**    **System Rating: 4**                                      **System Subtotal:** (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Glazing**    **System Rating: 4**                                      **System Subtotal:** (unresolved issues)  
*Office - Insulated glazing, vinyl window frames, operable casement windows.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Cladding**    **System Rating: 4**                                      **System Subtotal: \$250,000** (unresolved issues)  
*Split face and scored CMU. Limestone sills. Standing seam metal. Alum soffit and fascia.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Flashing on warehouse at parapet is coming loose.	Deferred Maintenance	\$25,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Non insulated CMU in warehouse causing thermal bridging, moisture infiltration, and deterioration of block especially at horizontal bond beam. Insulate exterior wall.	Deferred Maintenance	\$225,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Interior Partitions**      **System Rating: 4**      **System Subtotal:** (unresolved issues)  
*Unpainted CMU in warehouse. Gypsum board in offices.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors**      **System Rating: 4**      **System Subtotal:** (unresolved issues)  
*Office - Solid core MDF door with hollow metal frame.*  
*Warehouse - Hollow metal door with hollow metal frame.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors**      **System Rating: 4**      **System Subtotal: \$3,000** (unresolved issues)  
*Carpet typical in offices. Exposed concrete in warehouse. Ceramic tile in bathrooms. VCT in lunch room.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	VCT in break room is stained and cracking. Beyond End of Useful Service Life.	Deferred Maintenance	\$3,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Ceilings**      **System Rating: 4**      **System Subtotal:** (unresolved issues)  
*2x2 suspended ceiling system in offices. Gypsum board ceiling in entry vestibule, lobby, lunch room, and bathrooms. Open to deck in warehouse spaces.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls**      **System Rating: NA**      **System Subtotal:** (unresolved issues)  
*Electric controls packaged with units. No central system.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Sprinklers**      **System Rating: 4**      **System Subtotal:** (unresolved issues)  
*Wet sprinkler system.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Emergency Lighting**      **System Rating: 4**      **System Subtotal: \$15,000** (unresolved issues)  
*Office fixtures have battery backup ballasts as needed.  
 High bay has battery powered lamps predominantly at exits.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	Replace batteries.	Deferred Maintenance	\$15,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Fire Alarm**      **System Rating: 5**      **System Subtotal: \$20,000** (unresolved issues)  
*GE FireShield Plus fire alarm system. No horns or strobes noted.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	Add strobes and horns.	Deferred Maintenance	\$20,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Electrical Power**      **System Rating: 4**      **System Subtotal:** (unresolved issues)  
*Cutler-Hammer equipment for all. Transformer is outdoors on pad.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Standby Power**      **System Rating: NA**      **System Subtotal:** (unresolved issues)  
*No emergency power of any kind.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Lighting**      **System Rating: 4**      **System Subtotal:** (unresolved issues)  
*Offices - 2x4 lay-in, coffered type, with three (3) T8 lamps each.*  
*Lobby has incandescent chandelier.*  
*Factory has HID lighting - probably mercury vapor or halogen.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Clock System**      **System Rating: NA**      **System Subtotal:** (unresolved issues)  
 NA

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Data/Telecom System**      **System Rating: 5**      **System Subtotal:** (unresolved issues)  
*Fiber to each building. CAT5/CAT6 Cabling. VOIP System (Phones).*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Code Compliance: Code/Life Safety**      **System Rating: 4**      **System Subtotal: \$97,500** (unresolved issues)  
*Fire alarm system - no fire alarm system.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Non code complaint exiting in warehouse, new exit doors required.	Deferred Maintenance	\$10,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Travel distance to means of egress in warehouse is compromised with addition. Provide compliant means of egress.	Deferred Maintenance	\$20,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Doors from mezzanine to warehouse have no fall protection.	Deferred Maintenance	\$1,500	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Windows between original warehouse and new addition are not rated. Infill with rated wall.	Deferred Maintenance	\$4,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Code Compliance: Code/Life Safety**     **System Rating: 4**     **System Subtotal: \$97,500** (unresolved issues)

*Fire alarm system - no fire alarm system.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Internal access from office to warehouse is not accessible.	Facility Adaptation	\$12,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Office area restroom is not accessible.	Facility Adaptation	\$50,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Adjacent Site: Immediate Site**     **System Rating: 5**     **System Subtotal:** (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

End of Building Report for:     **Blizzard Building**



**Building Information**

Year Built 1960     Building Area (sf) 87,650     Floors 2     Building Engineer James Schultz

**Building Notes:**

Daniell Heights Apartments (Lower Heights) consists of 25 Duplexes.

Plumbing and electrical is original.

No air-conditioning.

The storage space at each building houses the boilers and that is a safety concern. Moreover, if during the winter months the storage door is left open, the domestic water heaters freeze.

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**Building Use Types**

Use Type %     Use Type

100% Student Life/Residential Housing

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**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	15.94%	Poor	<b>CRV</b>	\$16,653,500	Annual Maint and Capital Renewal Budget	\$399,684
	3% of CRV x 80%					

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	8.73%	Fair
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**Priority 1 (current year only)**

<b>FCNI</b>	3.30%	Good
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation	
1 Currently Critical (Current Year)	\$550,000			\$550,000
2 Potentially Critical (Year 1)	\$872,000			\$872,000
3 Not yet Critical (Year 2-5)	\$32,500			\$32,500
4 Watch List (Year 6-10)		\$1,200,000		\$1,200,000
5 Long Term (Year 11+)				
Subtotal	\$1,454,500	\$1,200,000		<b>\$2,654,500</b> Total of Projects

**Structure: Structure**     **System Rating: 4**     **System Subtotal: \$375,000** (unresolved issues)

*Wood framing. Cast-in-place concrete basement walls.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Remove and replace deteriorated exterior stair and railings, End of Useful Service Life.	Deferred Maintenance	\$375,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Roof**     **System Rating: 3**     **System Subtotal: \$230,000** (unresolved issues)

*(1991) EPDM @ Lower (flat).  
(1994) Asphalt shingles @ Lower (sloped).*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	1991 EPDM, End of Useful Service Life.	Deferred Maintenance	\$35,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	1994 Asphalt shingles, End of Useful Service Life.	Deferred Maintenance	\$195,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Glazing**     **System Rating: 5**     **System Subtotal:** (unresolved issues)

*1800 through 1900 Block - Newer insulated glazing, fiber glass frame, operable casement windows with exterior screens.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No reported problems.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Cladding**     **System Rating: 4**     **System Subtotal: \$2,000** (unresolved issues)

*Brick veneer at balance of building. Plywood panels. Vertical vinyl siding.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Repair/replace minor quantity of t-111 wood siding at building no.1808.	Deferred Maintenance	\$2,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Interior Partitions**
**System Rating: 5**
**System Subtotal: \$205,000** (unresolved issues)

*Gypsum board on wood stud at balance of building. Ceramic tile/vinyl panel system at bath tubs.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Replace 50% of kitchen cabinets (metal) with new plastic laminate. cabinets and plastic laminate countertops (both base cabs and wall cabs). End of Useful Service Life.	Deferred Maintenance	\$205,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors**
**System Rating: 4**
**System Subtotal: \$320,000** (unresolved issues)

*Hollow core wood doors with wood frames at balance of building interior. Solid core wood doors with wood frames at balance of building exterior.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Re-use existing exterior screen doors.	Deferred Maintenance	\$20,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Exterior doors showing heavy wear and damage. Doors are at End of Useful Service Life.	Deferred Maintenance	\$300,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors**
**System Rating: 4**
**System Subtotal: \$115,000** (unresolved issues)

*Sheet vinyl floor at kitchens, dining room, and bathrooms typical throughout balance of buildings with the exception of ceramic tile in bathrooms. Carpet at living room.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Damage of tile observed at bathrooms. Tile due for repair.	Deferred Maintenance	\$115,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Ceilings**
**System Rating: 5**
**System Subtotal:** (unresolved issues)

*Gypsum board at balance of building.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Plumbing System: Domestic Water/Plumbing**      **System Rating: 3**      **System Subtotal: \$575,000** (unresolved issues)

*Domestic HW from steam heat exchanger, many problems with oil and grease in sanitary lines-clogging along with roots. Domestic water valves to building have not been used in years and do not close completely, clay piping used for sanitary. City water pressure is high coming into upper area.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	All exterior sanitary piping should be replaced, End of Useful Service Life.	Deferred Maintenance	\$175,000	<input type="checkbox"/>	<input type="checkbox"/>	
3: Not yet Critical (Year 2-5)	Add a PRV at each building.	Deferred Maintenance	\$25,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Replace DW/Plumbing	Planned Maint/Capital Renewal	\$375,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Look at providing grease interceptor for units.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC**      **System Rating: 4**      **System Subtotal: \$750,000** (unresolved issues)

*Hydronic baseboard heating, boilers are in cramped small areas, most are 25-30 years old, MTU has been able to replace one for two, no AC, lower areas have storage in boiler rooms - these should have storage removed.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Replace both HW boilers with one (per MTU)	Planned Maint/Capital Renewal	\$750,000	<input type="checkbox"/>	<input type="checkbox"/>	
5: Long Term (Year 11+)	Lower area should have storage removed from Boiler rooms. Boilers should be replaced in near future.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: Steam Production Equip.**      **System Rating: NA**      **System Subtotal:** (unresolved issues)

*Not on Campus steam.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls**      **System Rating: 4**      **System Subtotal: \$75,000** (unresolved issues)

*LV controls for baseboard.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Replace thermostats with 7-day programmable to conserve energy	Planned Maint/Capital Renewal	\$75,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls**     **System Rating: 4**     **System Subtotal: \$75,000** (unresolved issues)  
*LV controls for baseboard.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Emergency Lighting**     **System Rating: 4**     **System Subtotal:** (unresolved issues)  
 NA

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No reported problems.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Safety: Fire Alarm**     **System Rating: 3**     **System Subtotal: \$7,500** (unresolved issues)  
*Smoke detector in each unit.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
3: Not yet Critical (Year 2-5)	Provide additional smoke detectors in and outside each bedroom.	Deferred Maintenance	\$7,500	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Electrical Power**     **System Rating: 4**     **System Subtotal:** (unresolved issues)  
*Each unit is provided with a panel (40-60 Amps lower and 100A upper) main DP in boiler rooms.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Standby Power**     **System Rating: 5**     **System Subtotal:** (unresolved issues)  
 NA

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Lighting**

**System Rating: 4**

**System Subtotal:** (unresolved issues)

*T8 lamps used in units where possible*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Code Compliance: Code/Life Safety**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

*Fire alarm system - Localized smoke detectors (one per unit).*

*Not sprinkled.*

*No elevator.*

*Exterior painted metal stairs rusting resulting in potential safety hazard. Stairs are at End of Useful Service Life.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No Reported Problems	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Adjacent Site: Immediate Site**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No reported problems.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

End of Building Report for: **Daniell Heights Apartments (Lower Heights)**

**Building Information**

Year Built 1968     Building Area (sf) 66,352     Floors 2     Building Engineer James Schultz

**Building Notes:**

Daniell Heights Apartments (Upper Heights) consists of 13 Duplexes.

Plumbing and electrical is original.  
No air-conditioning.

The storage space at each building houses the boilers and that is a safety concern. Moreover, if during the winter months the storage door is left open, the domestic water heaters freeze.

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**Building Use Types**

Use Type %     Use Type

100% Student Life/Residential Housing

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**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	12.59%	Poor	<b>CRV</b>	\$12,606,880	<b>Annual Maint and Capital Renewal Budget</b>	\$302,565
	3% of CRV x 80%					

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	10.38%	Poor
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**Priority 1 (current year only)**

<b>FCNI</b>	6.07%	Fair
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation	
1 Currently Critical (Current Year)	\$765,000			\$765,000
2 Potentially Critical (Year 1)	\$543,000			\$543,000
4 Watch List (Year 6-10)		\$279,000		\$279,000
5 Long Term (Year 11+)				
Subtotal	\$1,308,000	\$279,000		<b>\$1,587,000</b>
				<b>Total of Projects</b>

**Structure: Structure**      **System Rating: 5**      **System Subtotal:** (unresolved issues)  
*Wood framing. Cast-in-place concrete basement walls.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No reported problems.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Roof**      **System Rating: 3**      **System Subtotal: \$215,000** (unresolved issues)  
*(1987) Asphalt shingles @ Upper.  
 (1995) Asphalt shingles @ Upper except Bldg. 2012.  
 (1997) Asphalt shingles @ Upper Bldg. 2012.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Asphalt shingles at End of Useful Service Life.	Deferred Maintenance	\$215,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Glazing**      **System Rating: 1**      **System Subtotal: \$670,000** (unresolved issues)  
*(1968) 2000 Block - Original insulated glazing, aluminum frame, operable awning window.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Remove and replace (all glazing units) 10,192 sq. ft. of glazing, operable units, clear insulated glazing, vinyl-clad wood units, includes interior jamb repair. End of Useful Service Life.	Deferred Maintenance	\$670,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Cladding**      **System Rating: 5**      **System Subtotal:** (unresolved issues)  
*Brick veneer at balance of building. Plywood panels. Vertical vinyl siding.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No reported problems.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**BUILDING REPORT Daniell Heights Apartments (Upper Heights)****BUILDING No.****32-1**

Michigan Technological University

CAMPUS Main Campus

**Interior Construction: Interior Partitions****System Rating: 5****System Subtotal: \$285,000** (unresolved issues)*Gypsum board on wood stud at balance of building. Ceramic tile/vinyl panel system at bath tubs.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Replace 50% of kitchen cabinets (metal) with new plastic laminate. Cabinets and plastic laminate countertops (both base cabs and wall cabs). End of Useful Service Life.	Deferred Maintenance	\$285,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors****System Rating: 4****System Subtotal: \$43,000** (unresolved issues)*Hollow core wood doors with wood frames at balance of building interior. Solid core wood doors with wood frames at balance of building exterior.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Re-use existing exterior screen doors.	Deferred Maintenance	\$3,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Replace exterior entry doors, end of useful service life.	Deferred Maintenance	\$40,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors****System Rating: 5****System Subtotal:** (unresolved issues)*9x9 floor tile at entries and stair landings at End of Useful Service Life. Sheet vinyl floor at kitchens, dining room, and bathrooms typical throughout balance of buildings.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No reported problems.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Ceilings****System Rating: 5****System Subtotal:** (unresolved issues)*Gypsum board at balance of building.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No reported problems.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Plumbing System: Domestic Water/Plumbing**      **System Rating: 4**      **System Subtotal: \$290,000** (unresolved issues)

*Domestic HW from steam heat exchanger, many problems with oil and grease in sanitary lines are in poor. Domestic water valves to building have not been used in years and do not close completely, clay piping used for sanitary. City water pressure is high coming into upper area.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Replace exterior sanitary piping, End of Useful Service Life.	Deferred Maintenance	\$95,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Replace DW/Plumbing.	Planned Maint/Capital Renewal	\$195,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC**      **System Rating: 4**      **System Subtotal: \$39,000** (unresolved issues)

*Hydronic baseboard heating, boilers are in cramped small areas, most are 25-30 years old, MTU has been able to replace one for two, no AC, lower areas have storage in boiler rooms - these should have storage removed.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Replace HW boiler.	Planned Maint/Capital Renewal	\$39,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls**      **System Rating: 4**      **System Subtotal: \$45,000** (unresolved issues)

*LV controls for baseboard.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Replace thermostats with 7-day programmable to conserve energy.	Planned Maint/Capital Renewal	\$45,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Electrical System: Lighting**      **System Rating:**      **System Subtotal:** (unresolved issues)

*T8 lamps used in units where possible*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No reported problems.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**BUILDING REPORT Daniell Heights Apartments (Upper Heights)****BUILDING No.****32-1**

Michigan Technological University

CAMPUS Main Campus

**Code Compliance: Code/Life Safety****System Rating: 5****System Subtotal:** (unresolved issues)

*Fire alarm system - Localized smoke detectors (one per unit).  
Not sprinkled.  
No elevator.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No reported problems.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Adjacent Site: Immediate Site****System Rating: 4****System Subtotal:** (unresolved issues)

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No reported problems.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

End of Building Report for: **Daniell Heights Apartments (Upper Heights)**

**Building Information**

Year Built 1969      Building Area (sf) 63,354      Floors 2      Building Engineer James Schultz

**Building Notes:**

Daniell Heights Apartments (Upper Heights - Addition) consists of 13 Duplexes.

Plumbing and electrical is original.  
No air-conditioning.

The storage space at each building houses the boilers and that is a safety concern. Moreover, if during the winter months the storage door is left open, the domestic water heaters freeze.

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**Building Use Types**

Use Type %      Use Type

100% Student Life/Residential Housing

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**Facility Condition Needs Index**

All priorities

<b>FCNI</b>	16.14%	Poor	<b>CRV</b>	\$12,037,260	<b>Annual Maint and Capital Renewal Budget</b>	\$288,894
						3% of CRV x 80%

**Priorities 1-3 (current year through year 5 combined)**

<b>FCNI</b>	10.91%	Poor
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**Priority 1 (current year only)**

<b>FCNI</b>	6.36%	Fair
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**Project Classification/Priority Subtotals**

Project Priority	Project Classification			Subtotal
	Deferred Maintenance	Planned Maint/ Capital Renewal	Facility Adaptation	
1 Currently Critical (Current Year)	\$765,000			\$765,000
2 Potentially Critical (Year 1)	\$548,000			\$548,000
4 Watch List (Year 6-10)		\$630,000		\$630,000
5 Long Term (Year 11+)				
	Subtotal	\$1,313,000	\$630,000	<b>\$1,943,000</b>
				<b>Total of Projects</b>

**Structure: Structure**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

*Wood framing. Cast-in-place concrete basement walls.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No reported problem.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Roof**

**System Rating: 3**

**System Subtotal: \$215,000** (unresolved issues)

*(1987) Asphalt shingles @ Upper.  
(1995) Asphalt shingles @ Upper except Bldg. 2012.  
(1997) Asphalt shingles @ Upper Bldg. 2012.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Replace Asphalt shingles, at End of Useful Service Life.	Deferred Maintenance	\$215,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Glazing**

**System Rating: 1**

**System Subtotal: \$670,000** (unresolved issues)

*(1968) 2000 Block - Original insulated glazing, aluminum frame, operable awning window.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Remove and replace (all glazing units) 10,192 sq. ft. of glazing, operable units, clear insulated glazing, vinyl-clad wood units, includes interior jamb repair, at End of Useful Service Life.	Deferred Maintenance	\$670,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Shell: Cladding**

**System Rating: 5**

**System Subtotal:** (unresolved issues)

*Brick veneer at balance of building. Plywood panels. Vertical vinyl siding.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No reported problems.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	



**BUILDING REPORT Daniell Heights Apartments (Upper Heights - Addition)****BUILDING No.****32-2**

Michigan Technological University

CAMPUS Main Campus

**Interior Construction: Interior Partitions****System Rating: 5****System Subtotal: \$290,000** (unresolved issues)*Gypsum board on wood stud at balance of building. Ceramic tile/vinyl panel system at bath tubs.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Replace 50% of kitchen cabinets (metal) with new plastic laminate. Cabinets and plastic laminate countertops (both base cabs and wall cabs), at End of Useful Service Life.	Deferred Maintenance	\$290,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Construction: Doors****System Rating: 4****System Subtotal: \$43,000** (unresolved issues)*Hollow core wood doors with wood frames at balance of building interior. Solid core wood doors with wood frames at balance of building exterior.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
2: Potentially Critical (Year 1)	Re-use existing exterior screen doors.	Deferred Maintenance	\$3,000	<input type="checkbox"/>	<input type="checkbox"/>	
2: Potentially Critical (Year 1)	Replace exterior entry doors, at End of Useful Service Life.	Deferred Maintenance	\$40,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Floors****System Rating: 5****System Subtotal:** (unresolved issues)*9x9 floor tile at entries and stair landings at Upper Daniel Heights. Sheet vinyl floor at kitchens, dining room, and bathrooms typical throughout balance of buildings.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No reported problems.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**Interior Finishes: Ceilings****System Rating: 5****System Subtotal:** (unresolved issues)*Gypsum board at balance of building.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No reported problems.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**BUILDING REPORT****Daniell Heights Apartments (Upper Heights - Addition)****BUILDING No.****32-2**

Michigan Technological University

CAMPUS Main Campus

**Plumbing System: Domestic Water/Plumbing****System Rating: 4****System Subtotal: \$290,000** (unresolved issues)

*Domestic HW from steam heat exchanger, many problems with oil and grease in sanitary lines, should be replaced. Domestic water valves to building have not been used in years and do not close completely, clay piping used for sanitary. City water pressure is high coming into upper area.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
1: Currently Critical (Current Year)	Replace exterior sanitary lines, End of Useful Service Life.	Deferred Maintenance	\$95,000	<input type="checkbox"/>	<input type="checkbox"/>	
4: Watch List (Year 6-10)	Replace DW/Plumbing.	Planned Maint/Capital Renewal	\$195,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC****System Rating: 4****System Subtotal: \$390,000** (unresolved issues)

*Hydronic baseboard heating, boilers are in cramped small areas, most are 25-30 years old, MTU has been able to replace one for two, no AC, lower areas have storage in boiler rooms - these should have storage removed.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Replace HW boiler.	Planned Maint/Capital Renewal	\$390,000	<input type="checkbox"/>	<input type="checkbox"/>	

**HVAC System: HVAC Controls****System Rating: 4****System Subtotal: \$45,000** (unresolved issues)

*LV controls for baseboard.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
4: Watch List (Year 6-10)	Replace thermostats with 7-day programmable to conserve energy.	Planned Maint/Capital Renewal	\$45,000	<input type="checkbox"/>	<input type="checkbox"/>	

**Code Compliance: Code/Life Safety****System Rating: 5****System Subtotal:** (unresolved issues)

*Fire alarm system - Localized smoke detectors (one per unit).  
Not sprinkled.  
No elevator.*

Priority	Observed Issue	Project Classification	Resolution Budget	Funded	Resolved	Year Resolved
5: Long Term (Year 11+)	No reported problems.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

**BUILDING REPORT****Daniell Heights Apartments (Upper Heights - Addition)****BUILDING No.****32-2**

Michigan Technological University

CAMPUS Main Campus

**Adjacent Site: Immediate Site****System Rating: 4****System Subtotal:** (unresolved issues)

<b>Priority</b>	<b>Observed Issue</b>	<b>Project Classification</b>	<b>Resolution Budget</b>	<b>Funded</b>	<b>Resolved</b>	<b>Year Resolved</b>
5: Long Term (Year 11+)	No reported problems.	Deferred Maintenance		<input type="checkbox"/>	<input type="checkbox"/>	

End of Building Report for: **Daniell Heights Apartments (Upper Heights - Addition)**

## GLOSSARY OF RATINGS TERMS

### System Ratings

System Rating	Description	Notes
0	Missing and Needed / ADA-not compliant	System missing, but required in facility. For ADA compliance, DOES NOT comply.
1	Unreliable	System needs to be fixed.
2	Poor	System barely operating. Repair/replace in next renovation.
3	Adequate / ADA-compliant when built	System functioning, but review for repair/replacement in next renovation. For ADA accessibility, was compliant when constructed, review compliance for next renovation
4	Functional / ADA-currently compliant	System functioning well and maintained as intended, no major reported issues. For ADA compliance, item complies with current codes.
5	Excellent	System in excellent operating condition. No reported issues.
NA	Not Needed	System not required for this facility.

### Assessment Priorities

Assessment Priority	Assessment Priority Description
1	Currently Critical (Current Year)
2	Potentially Critical (Year 1)
3	Not yet Critical (Year 2-5)
4	Watch List (Year 6-10)
5	Long Term (Year 11+)

### Project Classifications

Project Classification	Project Classification Description
Planned Maint/Capital Renewal	A subset of regular or normal facility maintenance which refers to major repairs or the replacement / rebuilding of major facility components (e.g., roof replacement at the end of its normal useful life is capital repair; roof replacement several years after its normal useful life is deferred maintenance).
Deferred Maintenance	Refers to expenditures for repairs which were not accomplished as a part of normal maintenance or capital repair which have accumulated to the point that facility deterioration is evident and could impair the proper functioning of the facility. Costs estimated for deferred maintenance projects should include compliance with applicable codes even if such compliance requires expenditures beyond those essential to effect the needed repairs. Deferred maintenance projects represent catch up expenses.
Facility Adaptation	Expenditures required to adapt the physical plant to the evolving needs of the institution and to changing codes or standards. These are expenditures beyond normal maintenance. Examples include compliance with changing codes (e.g. accessibility), facility alterations required by changed teaching or research methods, and improvements occasioned by the adoption of modern technology.



*Proposal for Masonry Preservation,  
Maintenance and Repair*



*Prepared for  
Michigan Tech University  
Houghton, Michigan*

*September 11, 2008*



## CONTENTS

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AND MAINTENANCE

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## ENGINEERING MECHANICS BUILDING #20

### PROPOSAL SUMMARY

The mission of every college or university is to provide an excellent educational opportunity for students. Maintenance and repair projects, while necessary for support of the educational environment, do not directly improve instruction or research. Consequently, our shared goal should be to maximize benefits while reducing costs.

The section of our proposal entitled *Inspection Report* provides:

- ✓an overview of your college's current condition
- ✓a list of repairs which should be made

The *Technical Specifications* provides detailed instructions our technicians use to complete repairs. These work methods will:

- ✓reduce future maintenance
- ✓complete the most durable repairs possible
- ✓protect or improve the campus buildings
- ✓require the least input of financial resources

*Job Site Management* gives specific details of our site management processes. These procedures assure:

- ✓the safety and comfort of students, faculty, staff, and visitors
- ✓honesty and integrity in all communications
- ✓operational reliability
- ✓professional evaluations and recommendations
- ✓competently trained workers who understand the needs of and demonstrate respect for the entire community

Karr Tuekpointing has experience delivering the following advantages for colleges.

- ✓reduce direct oversight of projects by physical plant staff
- ✓build relationships built on performance and mutual benefit
- ✓successfully adapt to the most demanding environments

The testimonials and contacts listed in *Past Projects* will show our experience fulfilling commitments to several thousand clients over the past 42 years.

Our project pricing required to meet these objectives for your building(s) is:

BUILDING	COST AS PROPOSED
Engineering Mechanics Building #20	\$414,676.00

### Payment

No down payment or payments during the course of the project are required. After the project has been inspected and accepted by the Owner, an invoice will be mailed and payment shall be made within 10 days of the invoice date unless other arrangements have been made.

### Guarantee

Upon substantial completion of the work, the Contractor's project supervisor will conduct a thorough inspection with the Owner's representative for acceptance of the work. Karr Tuekpointing Co., Inc., guarantees all materials and workmanship for a period of two years from date of final acceptance.



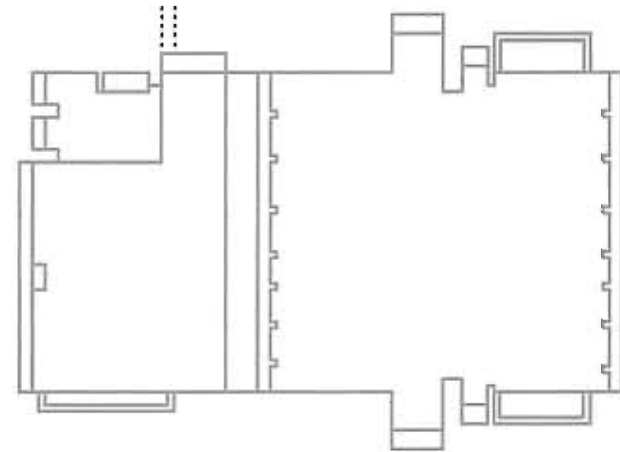
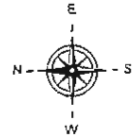
## *INSPECTION REPORT*

*OBSERVATIONS AND RECOMMENDATIONS*

## *ENGINEERING MECHANICS BUILDING #20*

**Work Area - Cost to Complete = \$414,676.00**

All brick masonry on north, south, east and west elevations of the Michigan Tech University Engineering Mechanics Building #20. The work area extends from grade to coping and roof to coping. Also includes brick window wells. The work area is shown in green on the drawing below.



**POWER WASH**

**PRODUCTS**

Clean, potable water

**EQUIPMENT**

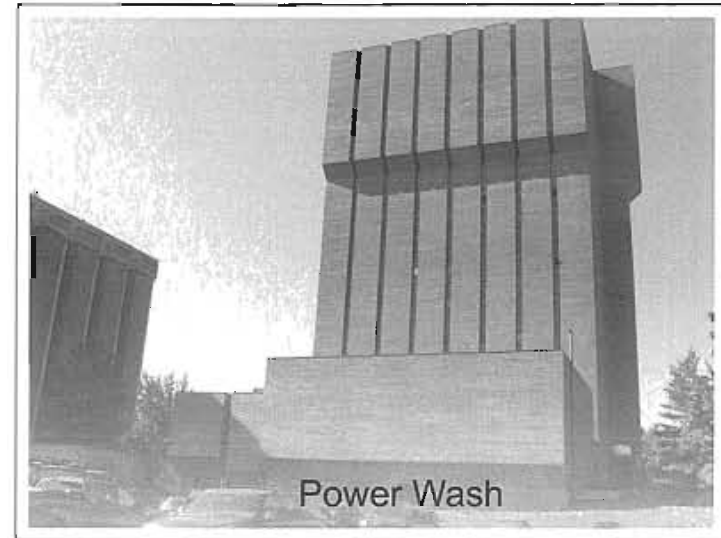
Power wash sprayer with 25 degree nozzle

**EXECUTION**

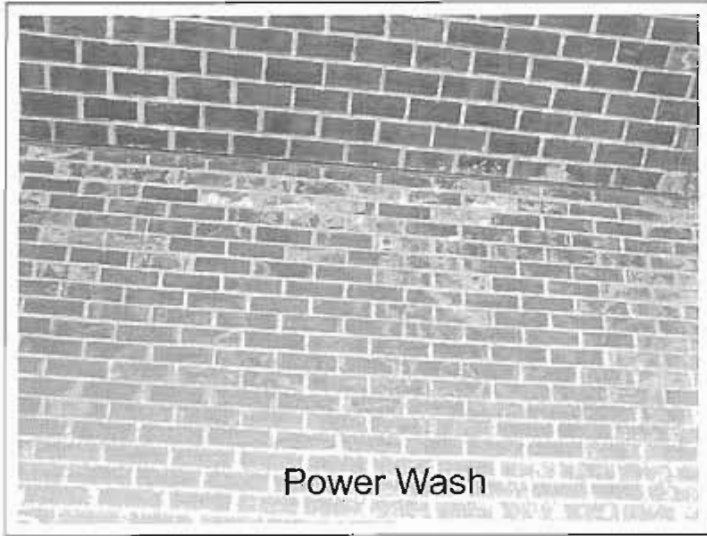
1. Pressure spray equipment shall not exceed 2,000 psi and a 25 degree nozzle for diffusion of the spray stream shall be used.
2. Exterior all brick masonry surfaces will be washed with pressurized water spray.
3. Power Washing is specified to remove surface dirt and foreign materials from all brick masonry surfaces. The intent of this specification is not to substantially change the appearance of the masonry, but to remove such surface staining as can be removed without use of chemicals or abrasives.
4. All necessary shields, barriers, glass protection or other precautions to properly execute this work without damage to the surrounding area will be supplied.

**REASON FOR REPAIR**

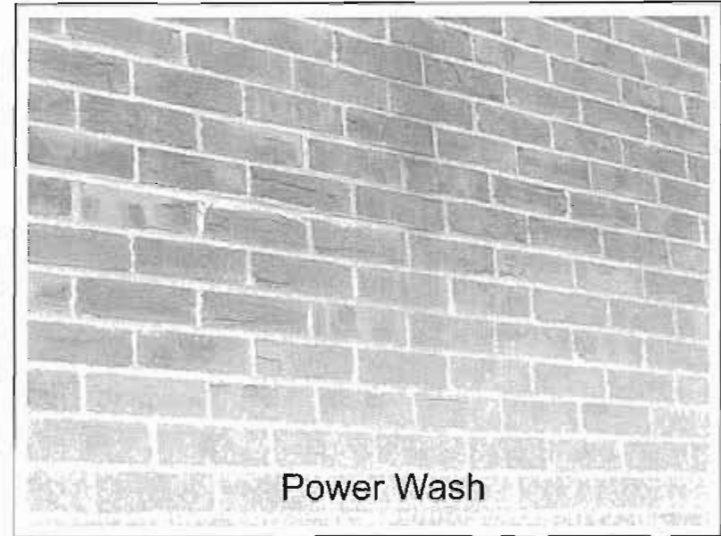
The purpose of power washing is not to change the general appearance of the building but to remove the surface dirt to expose any defective joints in the area.







Power Wash



Power Wash

### TUCKPOINT DAMAGED MORTAR JOINTS (MINIMAL AMOUNT)

#### PRODUCTS

Type N masonry cement  
Sand  
Mortar color as needed  
Potable water

#### EQUIPMENT

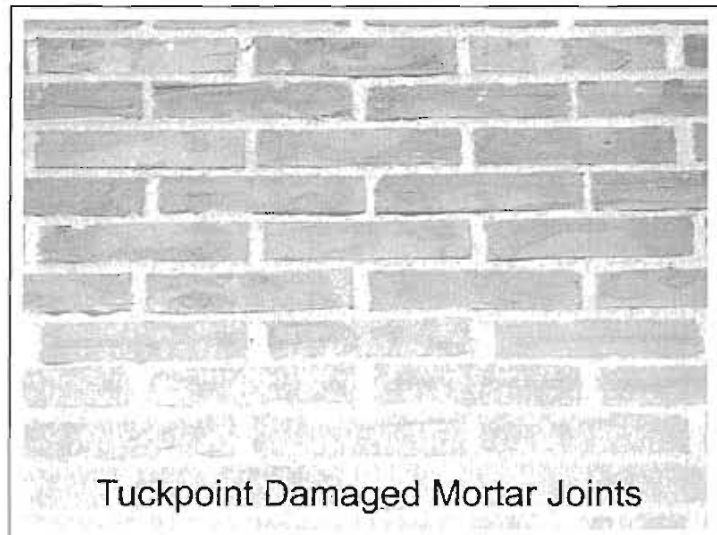
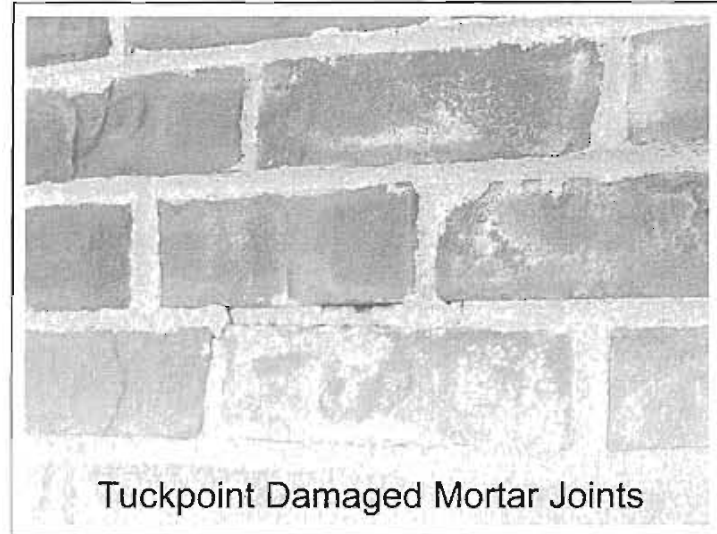
Pneumatic or electric grinder  
Hammer and chisel  
Pneumatic hammer and point  
Hand held masonry tools

#### EXECUTION

1. Carefully inspect for defective mortar joints. Defective joints are those with missing, badly deteriorated, or broken mortar materials. Joints with fine hairline or shrinkage cracks, but which are otherwise sound, are not defective.
2. Remove mortar materials from defective joints areas to a depth of at least one-half inch, or as deep as necessary to expose sound, unweathered mortar.
3. Remove dust and loose material from the joint by compressed air or high pressure water spray.
4. Dampen joints prior to commencement of pointing to assure proper bond between new and existing mortar.
5. Mix new mortar at the job site to match as closely as possible the color and texture of existing mortar.
6. Point new mortar into the open and prepared joints. Compress mortar during initial installation to assure a void-free joint. Hand tool to match the surrounding mortar joints.
7. Dampen upon completion to assure proper curing of the mortar.
8. Clean masonry surfaces of residual mortar upon completion of the tuckpointing

#### REASON FOR WORK

There are few defective joints in the masonry that were visible during the masonry inspection. Following the power washing process, we are now able to closely inspect the masonry surface. Defective joints will need to be tuckpointed so the building can be weatherproof.



**REPLACE 20 MISSING OR DEFECTIVE BRICK UNITS**

**PRODUCTS**

Selected brick units to match as closely as possible to the existing brick masonry  
Mortar to match original mortar in composition and compressive strength  
Mineral oxide colors, colored sands, or other materials to match color and texture of the original mortar  
Water, clean and free of deleterious amounts of acid, alkalis, and organic materials

**EQUIPMENT**

Pneumatic or electric grinder  
Hammer and chisel  
Pneumatic hammer and point

**EXECUTION**

1. Remove 20 defective brick units and mortar from the joints immediately adjacent to the spalled brick by air or pneumatic power tools.
2. Use hammer and chisel or small pneumatic hammer to remove pieces of the brick and remaining mortar.
3. Mix mortar at the jobsite to match as closely as possible the color and texture of the existing mortar.
4. Lay replacement brick units in fresh mortar. Tool joints and lay in bond-type matching the original masonry as closely as possible.
5. We have allowed, as part of the price, for the replacement of the 20 brick units. The price per brick unit to add or deduct for replacement of more or fewer brick units shall be \$6.00 per unit. The unit price shall include labor, materials, and equipment. Should more be required the Owner's representative will be alerted and will be asked in advance for permission to replace additional brick units. Any change in the unit quantity must be mutually agreed upon by both the Owner and Contractor.

**REASON FOR REPAIR**

Moisture enters the face of the brick units by capillary action from open mortar joints and/or defective caulking joints. When present in sufficient quantity and for an extended time, this moisture will freeze and cause the face of the brick to spall. When one brick becomes defective, if not corrected, more brick in this area will also become defective.



## SEAL MOVEMENT CRACKS

### PRODUCTS

Gun grade, 1-part polyurethane sealant  
Sonneborn NP 1 or equal

### EQUIPMENT

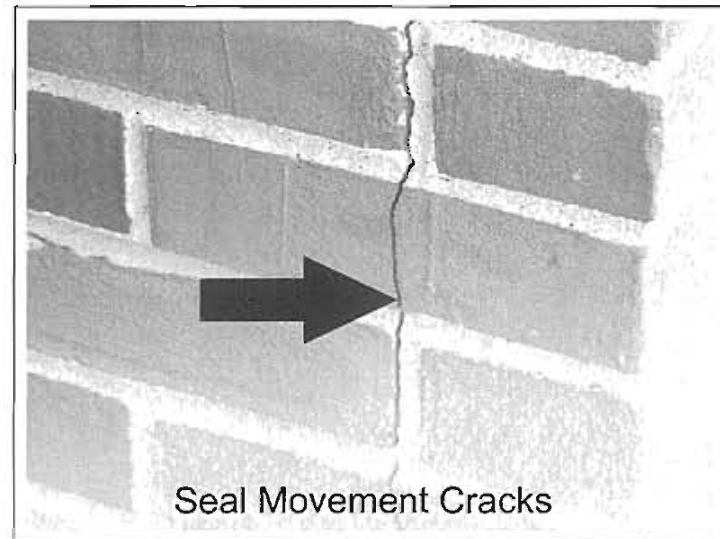
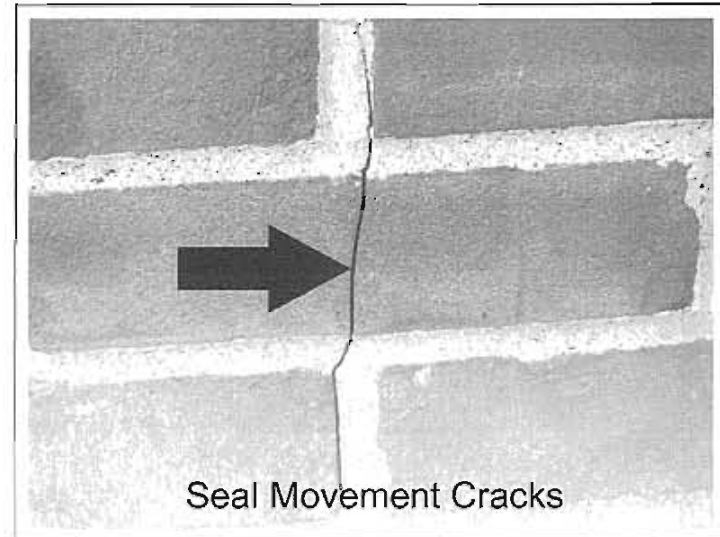
Pneumatic or electric grinder  
Hammer and chisel  
Pneumatic hammer and point  
Caulking applicator

### EXECUTION

1. Remove mortar and other foreign materials from the movement cracks wider than 1/8" to a depth of at least 3/8".
2. Remove dust and other foreign materials by compressed air.
3. Install caulk flush and solid along the entire length of the existing crack.
4. Finish the caulked crack by hand to create a void-free, fully adhered bond.
5. Embed sand into the outer surface of the caulk to diminish contrast between the caulk and the surrounding masonry materials.

### REASON FOR REPAIR

Masonry like all building material expands and contracts due to temperature changes. Clay brick absorbs moisture and expands permanently. Control joints should be used to control changes in height and/or thickness near openings. If the wall is built without control joints or not enough joint movement due to temperature or moisture changes will cause the wall to crack.



**INSTALL FLEXIBLE CAULK AROUND THE PERIMETER OF THE WINDOWS, DOORS AND VENTS**

**PRODUCTS**

- Gun grade, 1-part polyurethane sealant:  
Sonneborn NP 1 or equal
- Backer rod  
Closed cell rod  
Sonofoam soft backer-rod

**EQUIPMENT**

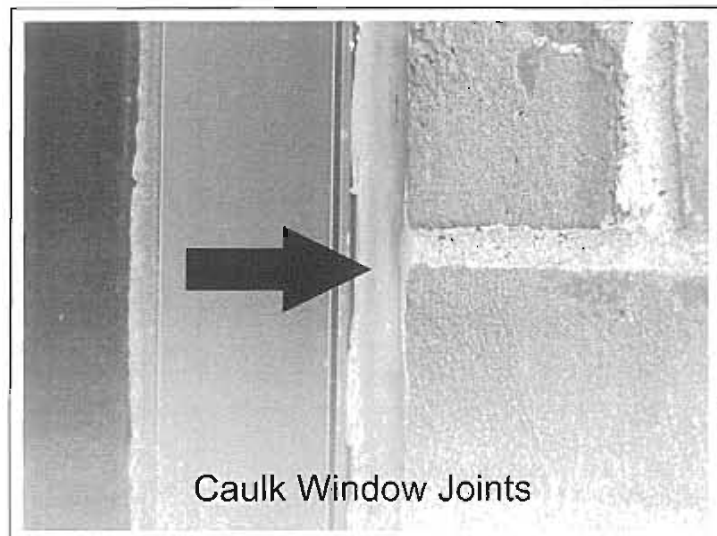
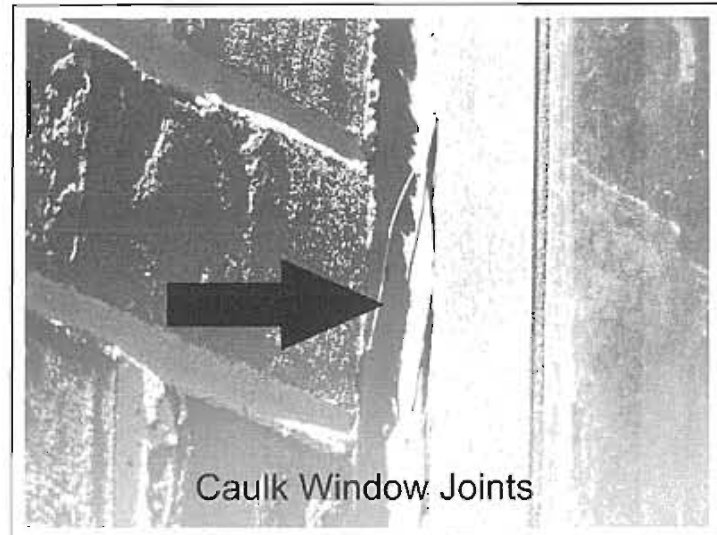
- Power caulking cutter
- Hammer and chisel
- Caulking applicator

**EXECUTION**

1. Clean joint surfaces of old caulk, dirt, moisture, and other materials around the perimeter of the windows, doors and vents. Prevent damage to surrounding materials, especially where caulk is removed from windows, doors and vent surfaces.
2. Control the joint depth of the caulking where needed by inserting backer-rod.
3. Install caulk to the depth required by the manufacturer for the joint width. The minimum width of 3/8" shall be met for all caulked joints.
4. Install the caulk flush and finish by hand to create a void-free, fully adhered bond.

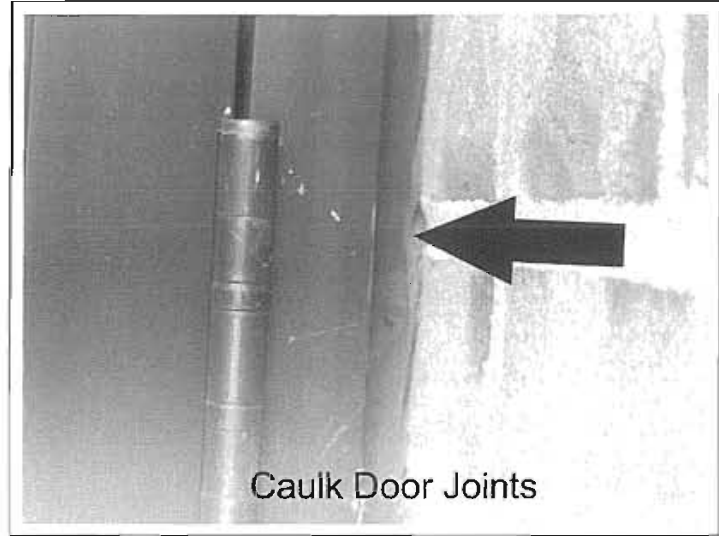
**REASON FOR REPAIR**

Windows, doors and vents are installed in the masonry wall after the masonry walls are completed. When the units are installed, there remains a joint between the installed unit and the masonry of the various widths. When this joint has not been previously caulked or becomes defective, not only is the moisture allowed to penetrate the building, and it also becomes difficult to control your heat and air conditioning costs.

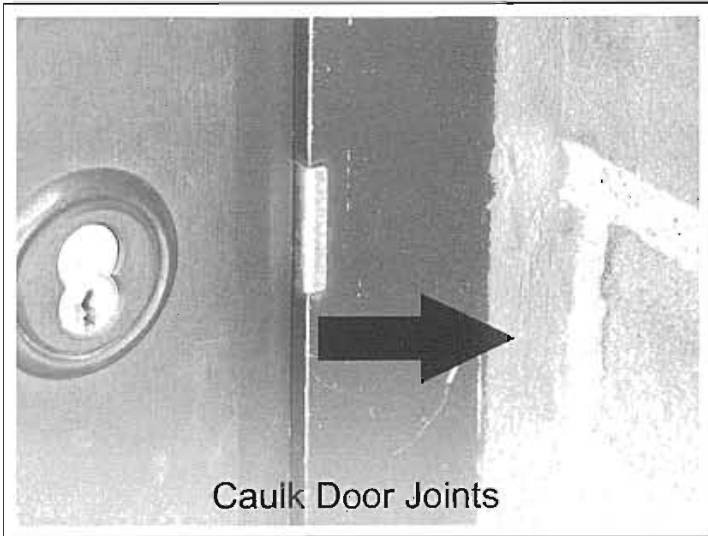




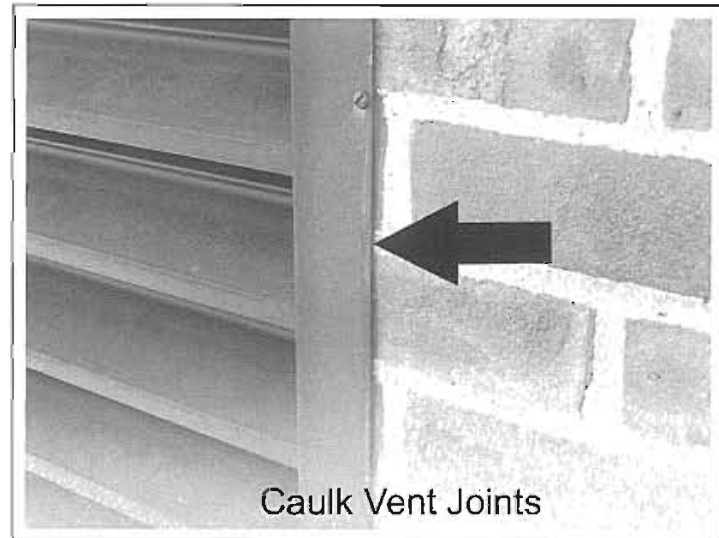
Caulk Window Joints



Caulk Door Joints



Caulk Door Joints



Caulk Vent Joints

### INSTALL 16 OZ. COPPER DRIP EDGE IN SHELF ANGLE JOINTS

#### PRODUCTS

16 oz. copper drip edge designed for the specified purpose  
Gun grade, 1-part polyurethane sealant (Sonneborn NPI)  
Backer rod (Closed cell rod Sonofaom soft backer-rod)

#### EQUIPMENT

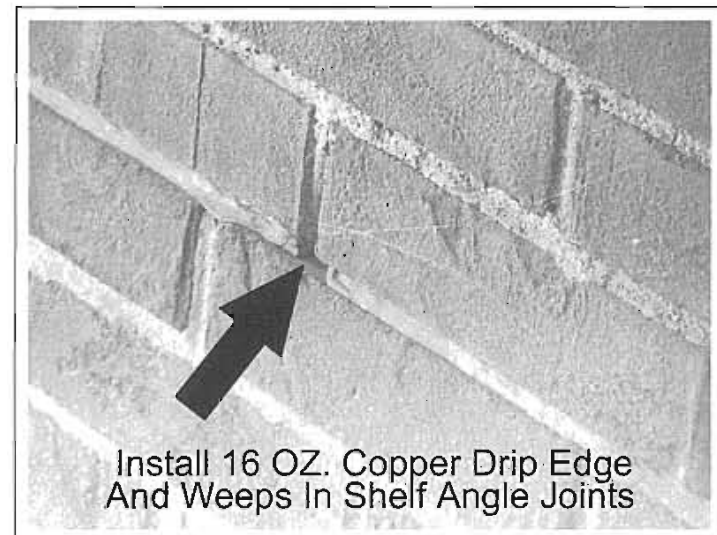
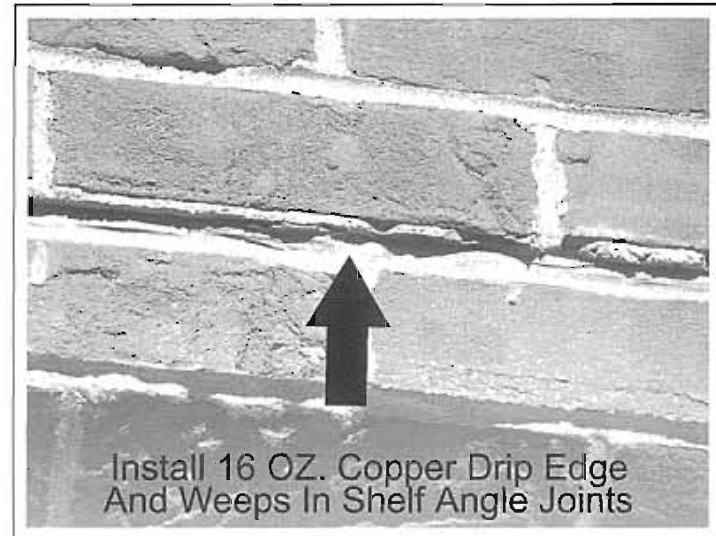
4.5 Electric Grinder  
Hammer and Chisel  
Caulking applicator

#### EXECUTION

1. Cut the old caulking out of the joint between the steel lintel at the top of the window and the stucco surfaces.
2. Dust and other foreign materials removed using compressed air.
3. 16 oz. copper drip edge will be installed.
4. Control the joint depth where needed by inserting backer-rod.
5. Install weeps 2 feet on center and at least 2 weeps in each lintel.
6. Install caulking to the depth required by the manufacturer for the joint width. The minimum width of 3/8 shall be met for all caulking joints.

#### REASON FOR REPAIR

When the lintels are caulked, the caulk prevents moisture from escaping from the lintel joint. The trapped moisture will cause the lintel to rust. The rust will expand causing the lintel to fail to support the masonry unit above it. The system outlined above will allow the moisture to escape from the top of the lintel and prevent the moisture from damaging the interior surface of the structure.



## INSTALL FLEXIBLE CAULK AROUND THE PERIMETER OF DECORATIVE PANELS

### PRODUCTS

- Gun grade, 1-part polyurethane sealant  
Sonneborn NP 1 or equal
- Backer rod
  - Closed cell rod
  - Sonofoam soft backer-rod

### EQUIPMENT

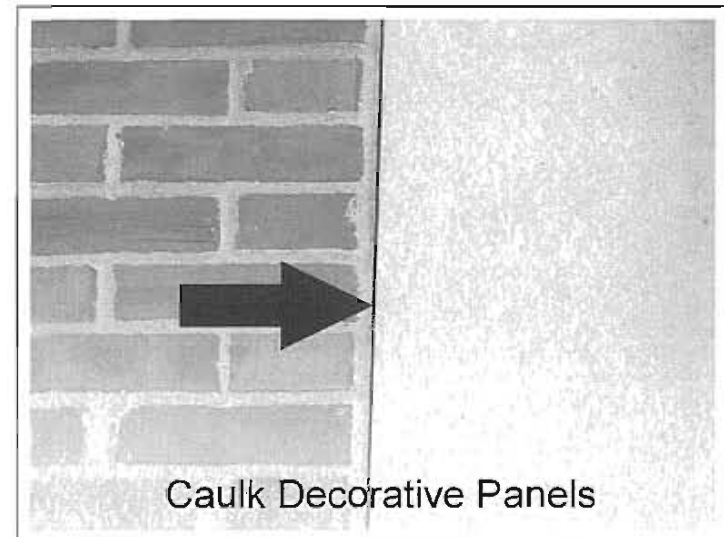
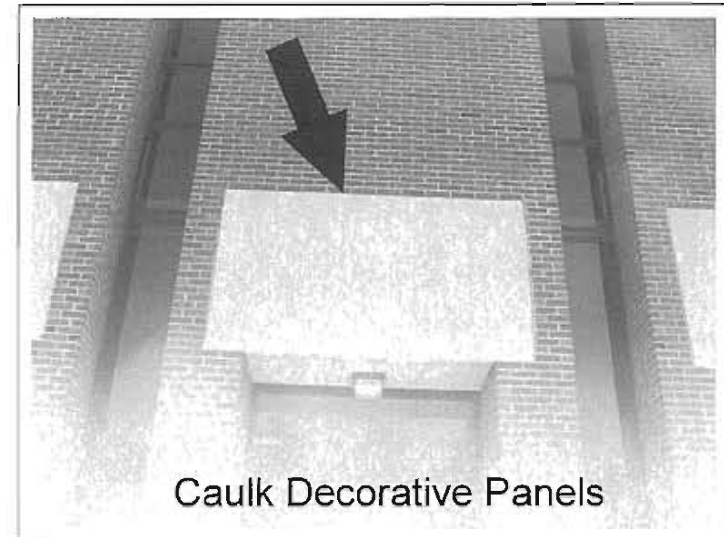
- Power caulking cutter
- Hammer and chisel
- Caulking applicator

### EXECUTION

1. All EIFS panel joints will have EIFS panel joint surfaces cleaned of old caulk, dust, and other foreign materials. Prevent damage to surrounding masonry unit surfaces.
2. Control the joint depth where needed by inserting backer-rod.
3. Install caulk to the depth required by the manufacturer for the joint width. The minimum depth of 3/8" shall be met for all caulked joints.
4. Install the caulk flush and finish by hand to create a void-free, fully adhered bond.

### REASON FOR REPAIR

When the units are installed, there remains a joint between the installed unit and the masonry of the various widths. When this joint has not been previously caulked or becomes defective, not only is the moisture allowed to penetrate the building, and it also becomes difficult to control your heat and air conditioning costs.





## REPAIR EXPANSION JOINTS

### PRODUCTS

- Gun grade, 1-part polyurethane sealant  
Sonneborn NP 1 or equal
- Backer rod
  - Closed cell rod
  - Sonofoam soft backer-rod

### EQUIPMENT

- Power caulking cutter
- Hammer and chisel
- 4.5" Electric angle grinder
- Caulking applicator

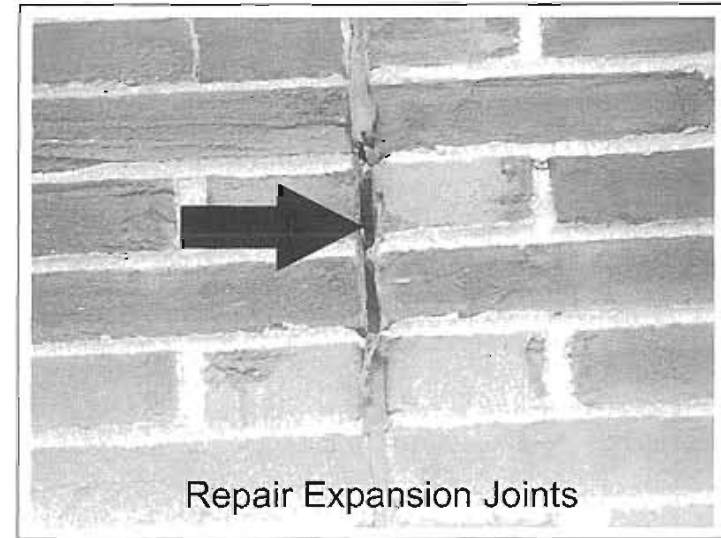
### EXECUTION

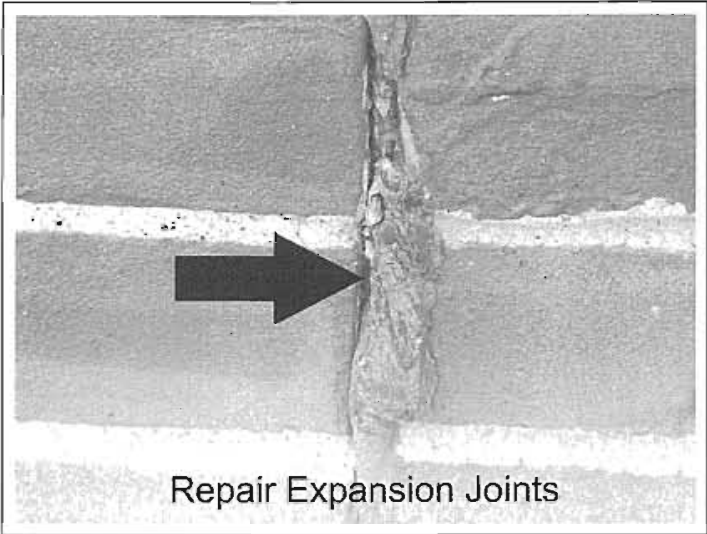
1. Clean expansion joint surfaces of old caulk, dirt, moisture, and other materials. Prevent damage to surrounding materials, especially where caulk is removed from wood or aluminum surfaces.
2. Control the joint depth where needed by inserting backer-rod.
3. Install caulk to the depth required by the manufacturer for the joint width. The minimum width of 1/2" shall be met for all caulked joints.
4. Install the caulk flush and finish by hand to create a void-free, fully adhered bond.

### REASON FOR REPAIR

Buildings and building materials are in a constant state of motion induced by temperature and moisture changes. In masonry walls, this movement must be accommodated by expansion joints, also known as control joints.

The masonry units shrink over a period of time, and if this movement is not restrained by the design, excessive cracking can occur. Expansion joints are continuous, vertically weakened sections between masonry units. When stress occurs, cracking will develop. The cracks will occur at the designed joints and allow moisture to penetrate the masonry units. The expansion joints must be sealed against weather with a flexible caulk because of the constant state of movement.





### WIDEN EXPANSION JOINTS THAT ARE UNDER 1/2" IN WIDTH

#### PRODUCTS

Gun grade, 1-part polyurethane sealant (Sonneborn NP 1 or equal),  
Backer rod (Closed cell rod Sonofoam soft backer-rod)

#### EQUIPMENT

Power caulking cutter  
Hammer and chisel  
4.5" Electric angle grinder  
Caulking applicator

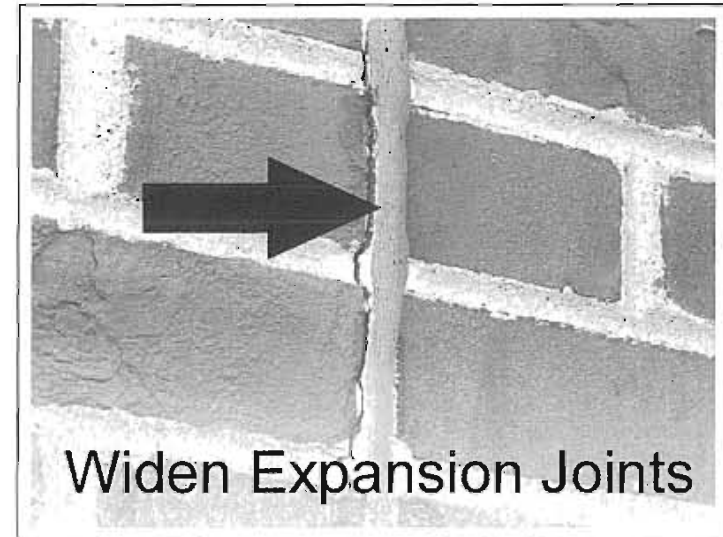
#### EXECUTION

1. Widen the expansion that are under 1/2" in width.
2. The depth of the widened expansion joint will be 3 1/2".
3. Clean expansion joint surfaces of old caulk, dirt, moisture, and other materials. Prevent damage to surrounding materials, especially where caulk is removed from wood or aluminum surfaces.
4. Control the joint depth where needed by inserting backer-rod.
5. Install caulk to the depth required by the manufacturer for the joint width.
6. Finish by hand too create a void-free, fully adhered bond.

#### REASON FOR REPAIR

Buildings and building materials are in a constant state of motion induced by temperature and moisture changes. In masonry walls, this movement must be accommodated by expansion joints, also known as control joints.

The masonry units shrink over a period of time, and if this movement is not restrained by the design, excessive cracking can occur. Expansion joints are continuous, vertically weakened sections between masonry units. When stress occurs, cracking will develop. The cracks will occur at the designed joints and allow moisture to penetrate the masonry units. The expansion joints must be sealed against weather with a flexible caulk because of the constant state of movement.



**INSTALL COLORKLAD 26-GAUGE PRE-FINISHED SHEET METAL COPING ON WINDOW WELLS**

**PRODUCTS**

ColorKlad 26-gauge pre-finished sheet metal  
ColorKlad by Vincent Metals  
Fasteners, connections, and flashings

**EQUIPMENT**

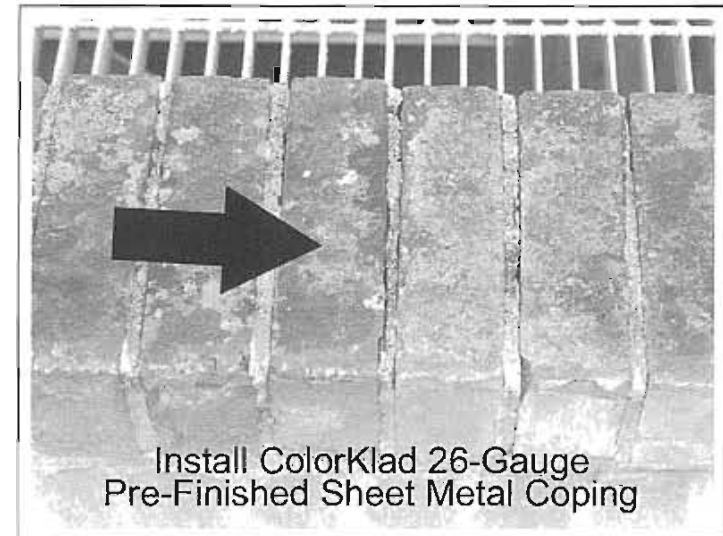
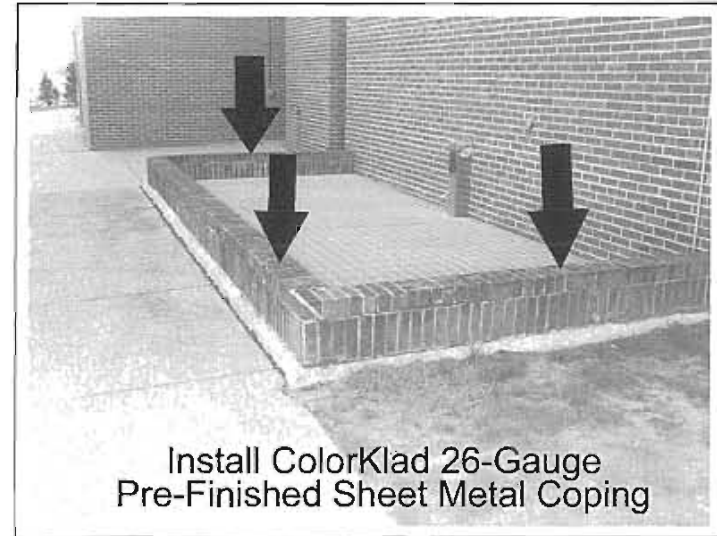
1.6 Electric Grinder  
Hammer and Chisel  
Caulking Applicator  
Related Hand Tools

**EXECUTION**

1. The Contractor will supply ColorKlad pre-finished 26-gauge metal copings, all related fasteners, connections, and flashing for installation of metal coping. The Owner or Owner's Representative will choose a color from the color chart provided by the Contractor.
2. Protect roof structure and membranes from damage during the work.
3. The surface will be covered with ColorKlad 26-gauge pre-finished sheet metal coping using proper fasteners, connections, and flashings. All work will be done so the covered area is weather tight.
4. Install sheet metal coping to provide expansion and contraction. for overlap in the direction of water flow, and for water-tight seams.

**REASON FOR REPAIR**

Brick is not a suitable material to use for a coping on a masonry wall. When brick is used we have far to many joints that allow water to enter the masonry and over time the freeze and thaw cycles cause the wall to deteriorate. When a stone or metal coping is applied, the joints are caulked and sealed to prevent water from entering the masonry unit below and also allows for expansion of the masonry wall.



## CENTRAL ENERGY PLANT

### REQUEST FOR CRITICAL MAINTENANCE FUNDING FOR 08/09

Our experiences of the last few days have re-enforced our resolve to press for funding to address some critical maintenance needs that would reduce our vulnerability to providing emergency power to the campus in power outage situations and in supplying steam to campus. There are five specific items that we would like to bring forward for consideration at this time.

1) On Thursday, Sept 4, the heating plant diesel generator failed to start on a monthly test. This unit is 38 years old and has had some issues over the years. This immediately made us vulnerable to being able to provide power to the campus within the ten minutes that we have advised the campus to expect as a maximum during a utility outage. That is because the heating plant diesel generator provides switching power to the primary sub station to allow the controls to disconnect us from UPPCO in an outage. If the breakers connecting us to UPPCO are not opened, the campus generators will not start. We can call out an electrician to manually open the breakers in the sub-station but that might take one to two hours depending on when the outage occurs. We have advised the campus that they should provide for the first ten minutes of a power outage by having on site backup systems. If campus power is out for more than ten minutes, critical research, data and samples may be lost.

On Friday morning, the 5<sup>th</sup>, we were able to determine the cause of failure to start. Both starters had failed. We dispatched our Operator/Mechanic to Wausau Wisconsin to pick up two replacements and the starters were replaced and the diesel generator became operational by 8:30 pm. Our total known window of vulnerability to this condition was about 32 hours.

It is evident that our current backup plan to restore campus power in the event of failure of the heating plant generator is inadequate. We will face heavy criticism from the campus community were such a lengthy delay to occur. We can solve this by installing a UPS system in the sub-station for about \$10,000 that would allow switching and hence startup of the campus generators to occur in this scenario. This becomes more critical if this scenario occurs in cold weather. It could mean the difference between going without steam for heating for the duration of the 1 to 2 hour delay plus another 1 to 2 hours recovery time vs 10 minutes.

The other reason that this is especially critical is that the heating plant generator also provides power to the Dow Building for life/safety equipment. That includes the emergency lighting, elevator, etc. By being able to restore campus power within a few minutes, the window of zero power to the Dow for life/safety can be reduced from one to two hours down to minutes.

2) We have also been having problems for many years with the 38 year old switchgear that connects our heating plant generator to the electrical system. It has hung up on several occasions causing delays in the starting of the campus generators during power outages. At one time we ran a pull cord from inside the heating plant out across the alley and down into the switchgear housing. The cord was connected to a home made hammer that would hit the re-set button when the switchgear hung up. This saved time by eliminating the need to shovel our way out to the switchgear yard, unlock the fence and switchgear and manually press the button. A few years ago we had the switchgear serviced and it seemed to work fine for a while. Because of this and also for concern of the pull cord getting snagged by the end loader during plowing we removed the trip cord. The old switchgear is also an unsafe design by today's standards. It is not a true transfer switch but actually two separate switches which are interlocked. There is a potential for both switches to be closed at the same time which would cause the heating plant generator to short circuit and damage itself and other critical steam plant equipment. This old switch system should be replaced to eliminate this potential for mishap as well as improve its reliability. The cost estimate for this is about \$20,000.

3) Another item that threatens our reliability is a lack of a UPS backup system for our boiler instrumentation and controls. We have been looking at the idea of a central UPS system that would cover all of the boiler controls and instrumentation. Last winter an electrical spike took out about a dozen of our boiler instruments because they are unprotected. We feared that they would have to all be replaced at a cost of \$18,000. We sent them in to see if they could be repaired and we lucked out with the repairs being relatively minor in nature totaling only \$1,605. While the cost was minimal compared to what it could have been, we also were without this instrumentation for about 60 days while we waited for repairs. The biggest lesson was that this was a wake up call to the amount of damage that could occur with unprotected systems in terms of both cost and loss of critical boiler capacity. The cost to implement this would be around \$10,000.

4) The last item that needs to be completed this fiscal year is the repair of boiler #2 burner refractory. This typically needs to be redone about every ten years. This is the last season that we can get out of this boiler without making these critical repairs. The cost of repairing the refractory on #3 boiler in Feb of 2008 was \$24,500, therefore we should budget \$25,000 for this one.

5) There is also a life safety issue for the heating plant which was noted in the recent MiOsha M-Sharp inspection. Almost all of our battery operated emergency lights are defective. We have tried to get by with cheaper models but the problem is that they are not rated for high temperatures such as we typically have throughout the heating plant. The proper units

designed for higher temperatures would cost about \$19,500. Instead of doing this and having to maintain 13 units, we would like to consider a central backup battery system that can provide the DC voltage to operate remote emergency lighting. This would involve a fair amount of wiring but it might be a preferable solution. We should budget \$20,000 to fix this problem one way or another.

**SUMMARY OF CENTRAL ENERGY PLANT CRITICAL MAINTENANCE NEEDS**

1.	UPS System for Sub-Station Switchgear	\$10,000
2.	Replace Heating Plant Generator Transfer Switch	\$20,000
3.	UPS System for Boiler Controls & Instrumentation	\$15,000
4.	Repair No. 2 Boiler Refractory	\$25,000
5.	Replace Heating Plant Emergency Lighting	\$20,000

CRITICAL MAINTENANCE SUB-TOTAL \$70,000

MI-OSHA RELATED MAINTENANCE ITEM \$20,000

Please note that there are 73 other items that Mi-OSHA identified that need correction. In addition there are 66 items that were identified by our personnel as being safety items that need to be addressed. Many of these are low or no cost items in terms of supplies and equipment. The total of supplies and equipment required to address these 139 items may amount to an additional \$10-20,000. Item 5 listed above is the largest single item.

If these critical needs could receive preliminary approval we recommend that Ed Maki prepare finalized design and cost estimates to address these items which are mostly electrical in nature.

One possibility would be to create accounts for the campus generators and the heating plant to which these costs non-routine could be charged. Those costs could then be allocated to the cost of campus power and steam along with fuel costs which we are already doing. Then all of these costs would be allocated between the General Fund and Auxiliaries. Otherwise, the General Fund will bear the expense of all these critical maintenance items.

Dave Taivalkoski

9/09/2008

**CENTRAL ENERGY PLANT, SAFETY, RELIABILITY & EFFICIENCY**

P.1

<u>NO.</u>	<u>DESCRIPTION</u>	<u>COST ESTIMATE</u>	<u>NOTE:</u>
<b><u>A. SAFETY &amp; RISK MANAGEMENT</u></b>			
1	INSTALL AUTO SHUTOFF VALVE ON LINES FROM 1 MIL GAL TANK		
2	ADD SPRINKLERS OVER FUEL OIL PUMPS IN THE BASEMENT		
3	ADD SPRINKLERS ALONG BOILER FRONTS ON 1ST FLOOR		
4	MIOSHA ITEM-REPLACE HEATING PLANT EMERGENCY LIGHTING	\$ 20,000	
5	EVALUATE FIRE SUPPRESSION REQUIREMENTS FOR GEN. ROOMS		
6	MISC MIOSHA MAINTENANCE ITEMS, 139 INITIAL TOTAL	\$ 20,000	
7	SPRINKLER SYSTEM TO KEEP TANK FARM WET		
<b><u>B. IMMEDIATE RELIABILITY ISSUES</u></b>			
1	BOILER 1-R REPLACE FIREYE COMBUSTION CONTROLS	\$ 20,000	C-2006
2	ELIMINATE WATER LEAKS ON ELEC EQUIPMENT IN STEAM TUNNEL	\$ 25,000	C-2006
3	BOILER CONTROLS, VALVES, AUX EQUIP & PUMP REPLACEMENTS	\$ 165,000	C-2006
4	REPAIR NO. 3 BOILER REFRACTORY	\$ 24,428	C-2008
5	REPAIR STEAM LINE SUPPORTS IN TUNNEL & REMOTE VAULTS	\$ 20,000	IP
6	UPS SYSTEM FOR PRIMARY SUB-STATION SWITCHGEAR	\$ 10,000	
7	REPLACE HEATING PLANT GENERATOR TRANSFER SWITCH	\$ 20,000	
8	UPS SYSTEM FOR BOILER CONTROLS AND INSTRUMENTATION	\$ 15,000	
9	REPLACE DEFUNCT CONDENSATE & WATER METERS IN BLDGS	\$ 10,000	
10	REPAIR NO. 2 BOILER REFRACTORY	\$ 25,000	
11	NO. 1-R BOILER VFD TO ELIMINATE REDUCED VOLTAGE STARTER	\$ 20,000	
12	REPAIR OR REPLACE PLANT GENERATOR RADIATOR	\$ 20,000	
13	REPLACE CONTINUOUS BLOWDOWN VALVES	\$ 5,000	
14	REPLACE NO. 2 & 3 ORIFICE PLATES	\$ 3,000	
15	ISOLATE 2ND MAIN STEAM LINE	\$ 50,000	
16	REPLACE BOILER STACK COVERS	\$ 25,000	
17	BOILER BREACHING & STACK REPAIR	\$ 50,000	
18	REPLACE STEAM LINE TO ACAD OFF & ANNEX	\$ 100,000	
<b><u>C. CENTRAL MONITORING &amp; CONTROL SYSTEM RELIABILITY</u></b>			
1	RE-VAMP ME-EM DYNAMOMETER LAB CONTROLS	\$ 4,000	C-2008
2	ME-EM, BU-1&2, CONTROLS UPGRADES	\$ 10,000	C-2008
3	UPGRADE NIAGRA TOWER COMPUTERS FOR HEAD END	\$ 3,300	C-2011
4	UPGRADE OTHER TOWER COMPUTERS FOR HEAD END	\$ 7,000	
5	START REPLACING OBSOLETE JCI CONTROL SYSTEM IN FISHER H.	\$ 20,000	
6	REPLACE OBSOLETE JCI CONTROL SYSTEM FPU'S IN DILLMAN	\$ 35,000	
7	REPLACE OBSOLETE JCI CONTROL SYSTEM FPU'S IN SDG	\$ 60,000	
8	REPLACE OBSOLETE JCI CONTROL SYSTEM FPU'S IN DHH	\$ 20,000	
9	REPLACE OBSOLETE FPU'S & EQUIPMENT IN OTHER BLDGS	\$ 340,000	

my doc/maintenance/critical mtse/chp project list

Last Update 5/27/11  
9/12/11

**CENTRAL ENERGY PLANT, SAFETY, RELIABILITY & EFFICIENCY**

P.2

<u>NO.</u>	<u>DESCRIPTION</u>	<u>COST ESTIMATE</u>	<u>NOTE:</u>
<b><u>D. LONG TERM RELIABILITY &amp; PLANNING ISSUES</u></b>			
1	BOILER NO. 4, INSPECTION & EVALUATION IN 46TH YEAR (2010)	\$ 18,000	IP-2010
2	EPA MAY REQUIRE CATALYTIC CONVERTORS ON GENS BY 2013	\$ 500,000	200-500K
3	BOILER NO. 3 USEFUL LIFE EVALUATION IN IT'S 55TH YEAR (2012)	\$ 20,000	
4	BOILER NO. 2 USEFUL LIFE EVALUATION IN IT'S 60TH YEAR (2010)	\$ 20,000	
5	BOILER NO. 1-R USEFUL LIFE EVALUATION IN ITS 45TH YEAR (2015)	\$ 20,000	
6	BOILER NO. 1-R CAPACITY IMPROVEMENTS (90,000 TO 120,000 PPH)	\$ 50,000	
7	INSTALL BOILER TUNE UP MUFFLER	\$ 50,000	
8	REPLACE 1970 MODEL STEAM PLANT BACKUP GENERATOR	\$ 100,000	
9	NEW D/A, NEXT 5 YEAR INSPECTION IN 2015	\$ 3,000	
10	OLD D/A, NEXT 5 YEAR INSPECTION IN 2016	\$ 3,000	
11	REVIEW SANITARY AND STORM PLUMBING & DRAINAGE		
12A	CONSTRUCT NEW 240,000 GAL FUEL OIL FACILITY PRIOR TO 2015 AND REMOVE EXISTING 1 MILLION GAL TANK BUILT IN 1976	\$ 500,000 \$ 50,000	
12B	OR INSPECT EXISTING 1 MIL GAL TANK IN 2015 AND USE UP AND REPLACE 240,000 GALS OF FUEL TO ALLOW INSP. RE-LINE TANK FARM DIKE & REPLACE VALVES FUEL STORAGE INTERNAL CORROSION MITIGATION FUEL STORAGE EXTERNAL CORROSION CONTROL	\$ 20,000 \$ 250,000 \$ 100,000 \$ 50,000 \$ 65,000	
13	REPLACE WEST WINDOWS	\$ 30,000	
<b><u>D. EFFICIENCY IMPROVEMENTS</u></b>			
1	ADD STACK ECONOMIZER FOR NO. 2 & 3 BOILERS		IN GLRC JOB
2	ADD STACK ECONOMIZER TO NO. 4 BOILER TO IMPROVE EFFIC.		
3	INSTALL HEAT RECOVERY ON DEAEERATOR VENTS		
4	COMBUSTION AIR HEATER USING WASTE HEAT AT 1ST FLOOR LEV.		
<b><u>E. ENERGY SECURITY AND COST REDUCTION</u></b>			
1	CAMPUS DIESEL GENERATORS FOR INTERR RATE & BACKUP PWR	\$ 3,900,000	C-2006
2	ADD BIOMASS FUEL CAPABILITY FOR 80% OF THERMAL LOADS	\$ 10,000,000	
3	ADD 2 MW COGEN CAPABILITY FOR 25% OF ELECTRICAL LOADS	\$ 5,000,000	
<b><u>F. ENERGY CONSERVATION IN CAMPUS FACILITIES</u></b>			
1	LIGHTING RETROFIT TO T-8 LAMPS & ELECTRONIC BALLAST	\$ 850,000	C-2006
2	DILLMAN CORRIDORS, LIGHTING	\$ 150,000	C-2006
3	VARIABLE FREQ DRIVES ON 14 MOTORS TOTALING 692 HP	\$ 137,000	L-08/10
4	ADDITIONAL OCCUPANCY SENSORS	\$ 50,000	IP-2011
5	DAYLIGHT HARVESTING CNTRLS (SOUTH CLASSRMS FISHER COMP)	\$ 50,000	L-2006
6	LAB BUILDING HVAC RETROFITS	\$ 5,000,000	
7	COMPUTER USE & LIGHTING REDUCTION	\$ 500,000	
8	ADDITIONAL BUILDING ENERGY CONSERVATION	\$ 2,000,000	

C-Completion Year

IP- Some work started and in progress

L-Limited work initiated in some buildings

5/27/11  
Last Update 9/12/11



BUILDING EFFICIENCY GROUP  
2875 HIGH MEADOW CIRCLE  
AUBURN HILLS, MI 48326

To: David Tetreau, SHW Group  
Project: **Michigan Technological University – Building Management System Upgrade, Budget**  
Date: July 14, 2011

Johnson Controls is pleased to provide a budgetary proposal for the planning cycle at Michigan Technological University Building Management System upgrade.

The request was to provide an upgrade in three different scenarios:

- Johnson Controls JC/80 & JC/8540 equipment**, denoted in red in the provided (and attached document) This vintage product was initially launched to market in 1980 & 1982. It is now considered obsolete and replacement parts are no longer available.
- Johnson Controls Metasys PMI equipment**, denoted in pink hue in the provided (and attached) document. This vintage product was introduced to the market in 1990. Although the availability of parts is limited, this product line can be serviced and repaired by the Johnson Controls Repair Center located in Louisville, KY.
- Existing pneumatically controlled buildings and/or mechanical systems. Specifics on these buildings and systems were not provided.

The proposed upgrade is based on converting the scenarios presented to a web-based access technology, an open platform with a BACnet protocol using BTL 2.0 certified and tested devices that conform to ASHRAE standards. The budgets presented below are based on providing *Johnson Controls Metasys Extended Architecture* hardware and software.

Please note the following is to be used only for budgetary purposes, as detailed scope of work, sequence of operations, site visits, transition plan, timelines, etc are needed to provide a firm cost on this upgrade.

**SCENARIO 1. Johnson Controls JC/80 & JC/8540 Equipment**

History: JC/80 & JC8540 equipment is based on an S2 proprietary protocol, prior to Arcnet’s existence.

**Upgrade Summary:**

In order to upgrade the following red labeled devices to a web-based technology:

- SDC NCM 13 > All FPU’s listed
- FISHER NCM 11 > All FPU’s listed
- CIVIL NCM 18 > All FPU’s listed
- DHH NCM 12 > All FPU’s listed

- A Network Integration Engine (NIE) is required at each NCM location.
- The Metasys PMI workstation is required to remain online, as well as the existing NCMs & FPU’s.
- Temperature Control Contractor to verify existing FPU’s are online and communicating.
- FPU level controllers and/or processes will not be commissioned and/or verified as part of this scope of work.

Budget Estimate to Upgrade Scenario 1 as described above. ....\$130,000

In order to eliminate the PMI workstation, all the FPU devices will have to be replaced with a new field level controller. In order to provide budgetary pricing for this replacement a description of the equipment, existing sequence of operations and points list is required.

**SCENARIO 2. Johnson Controls Metasys PMI Equipment**

History: PMI equipment sold and installed prior to 1995, as in this scenario was based on N1 proprietary software that runs on an Arcnet network, prior to Ethernet’s existence.

**Upgrade Summary:**

- Each NCM will be replaced with a Network Automation Engine that will integrate into the existing field controllers via the existing N2 communication bus.
- An additional Application Data Server (ADX) is required.
- PMI workstation is required to be maintained active and live on the network until all NCMs have been upgraded, or if Scenario 1 devices are not upgraded.
- Review the existing NCM Graphical Programming Language (GPL) database, CS Objects and Model files.
- All GPL code will require conversion to the new Metasys Extended Architecture LCT.
- Simulate the converted processes to verify proper operation

Budget Estimate to Upgrade Scenario 2 as described above. ....\$455,000

**SCENARIO 3. Pneumatic Controlled Systems**

In order to provide budgetary pricing for this replacement a description of the equipment, existing sequence of operations and points list is required.

**General Notes / Clarifications**

**Installation**

- All work to be performed during normal business hours
- Provide wire/cable in minimum ½” EMT type conduit in mechanical and electrical rooms and inaccessible locations.
- Provide plenum rated cable with bridle rings in concealed accessible locations, plenum areas, and ceiling cavities.

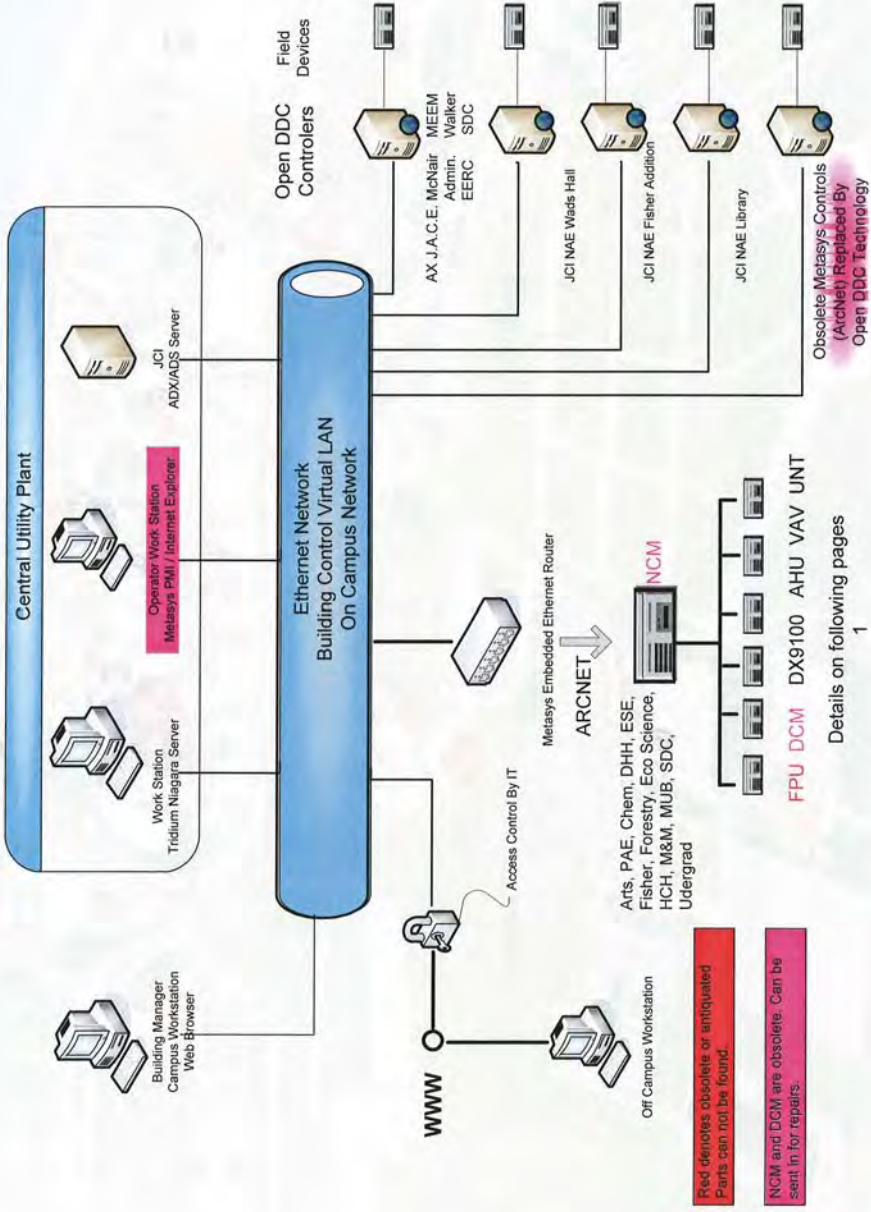
**Commissioning**

- TC Contractor shall conduct an Audit on the system and only provide the existing live control and monitoring points.
- TC Contractor shall verify the new Network Automation Engine software and processes are functional.
- TC Contractor to verify existing N2 devices are online and communicating.
  - N2 system level controllers and/or processes will not be commissioned and/or verified as part of this scope of work.

**Exclusions**

- Repair and/or replacement of the existing temperature control devices found to be non-existent and/or non-functional at the time of the upgrade.
- University IT department shall provide required I.P. drops and addresses.



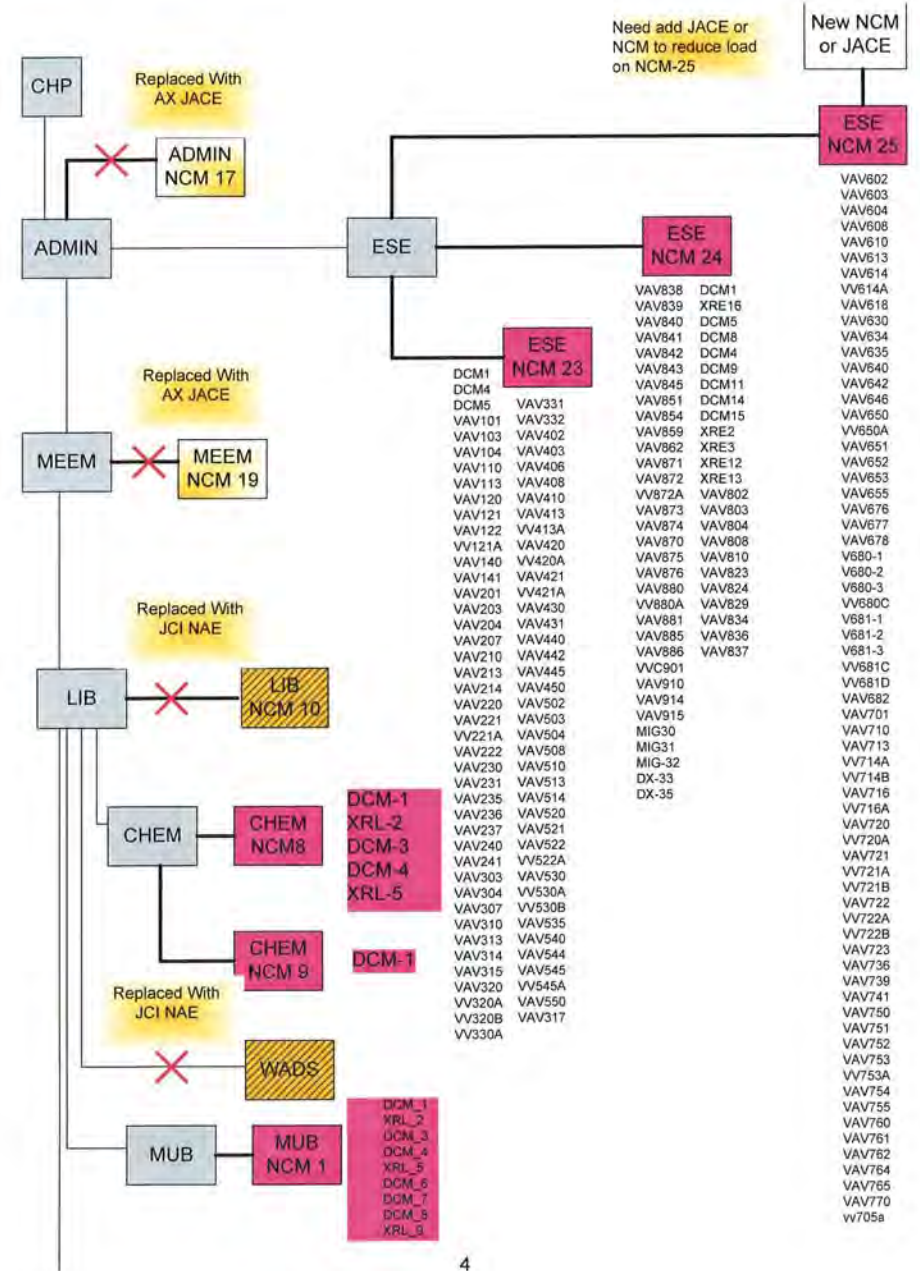
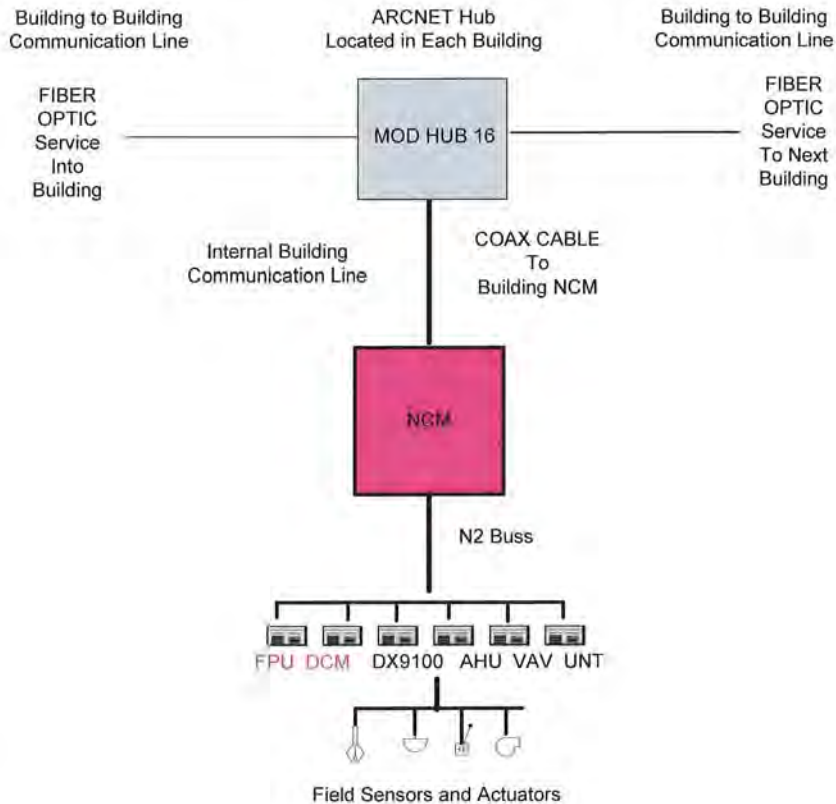


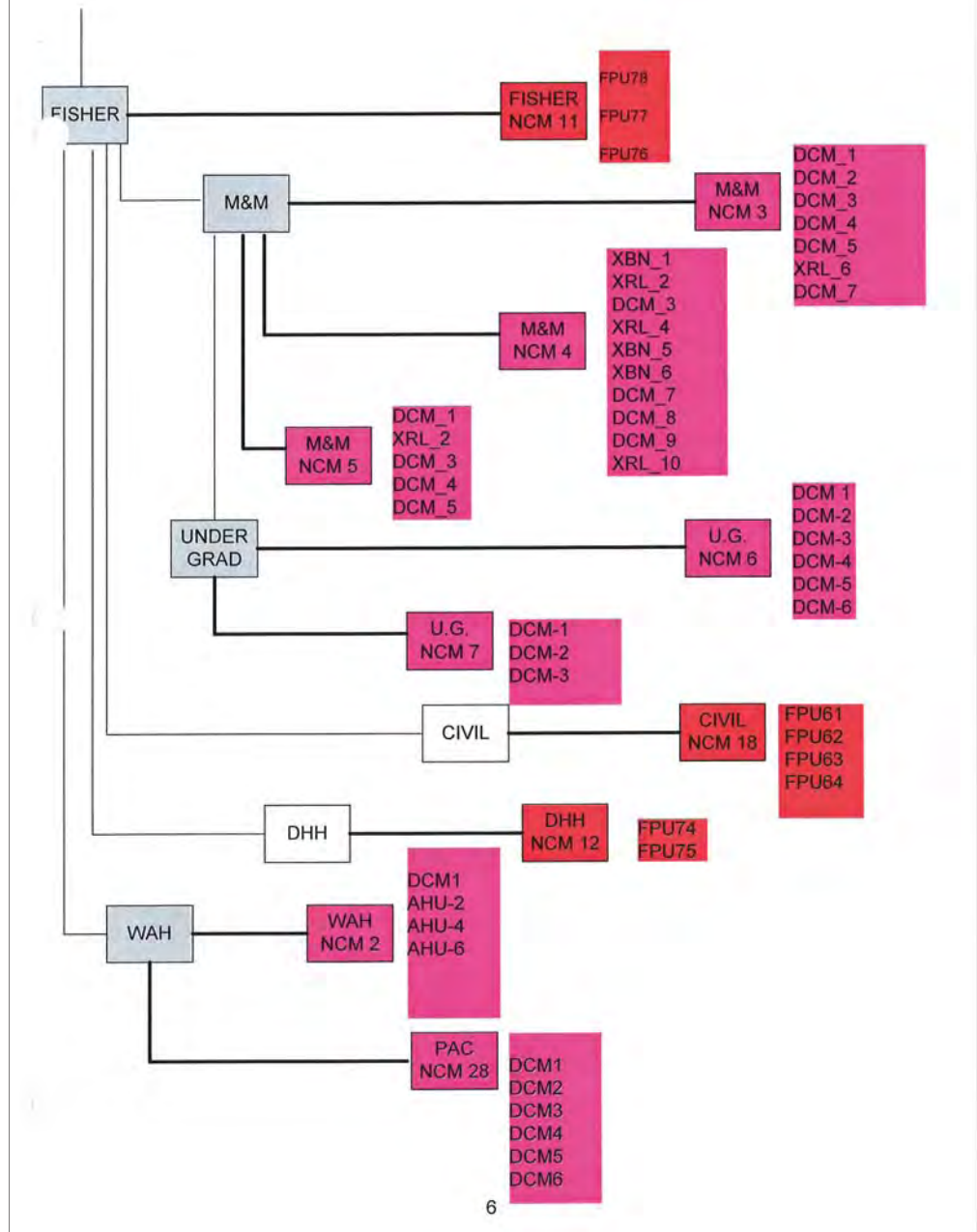
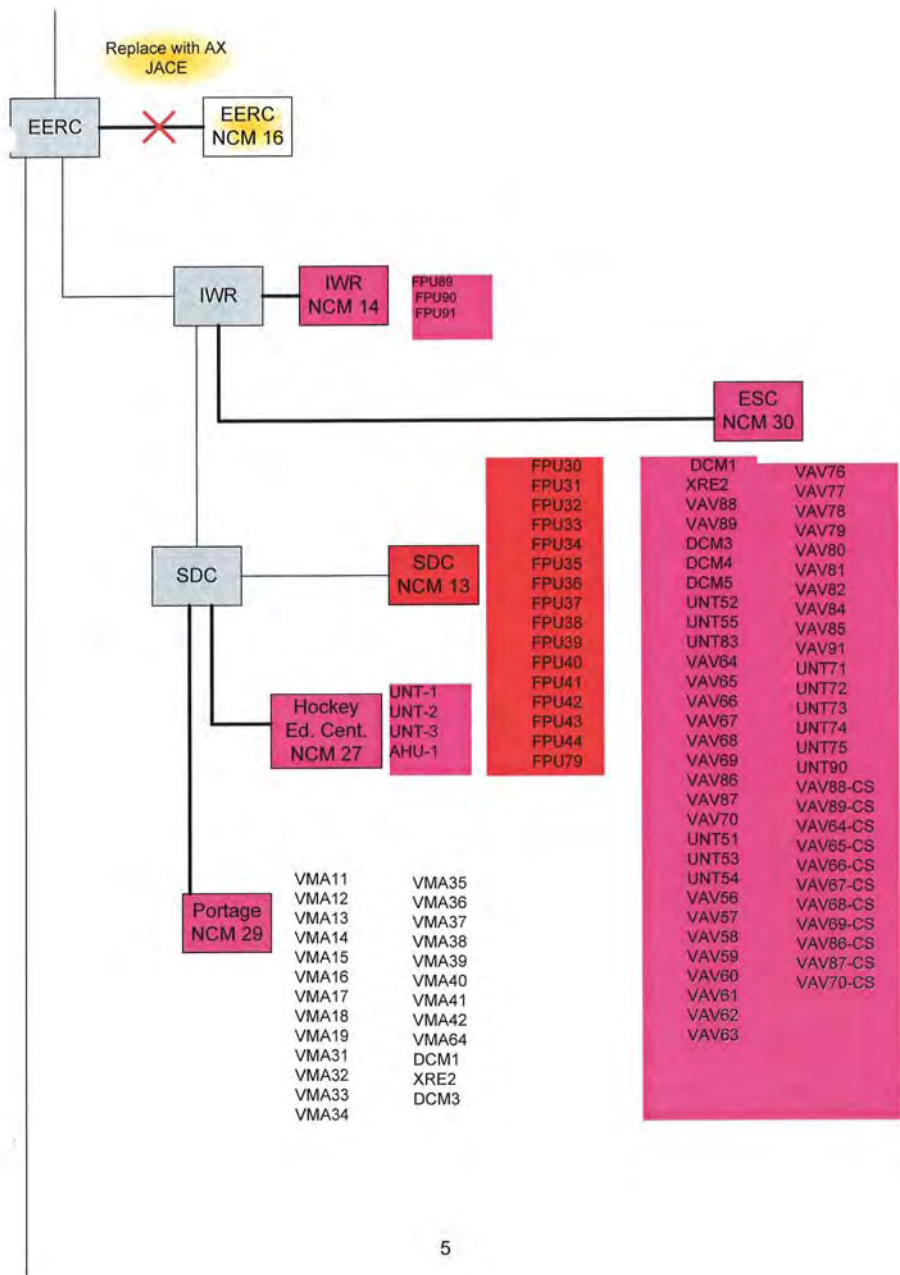
# Metasys and Tridium AX

## Building Monitor and Control System

Details on following pages

CENTRAL MONITORING SYSTEM COMMUNICATION TRUNK  
via  
FIBER OPTIC AND COAX CABLE  
NETWORK TYPE: ARCNET





# Network Automation Engine

## Product Bulletin

MS-NAE35xx-x, MS-NAE45xx-x  
MS-NAE55xx-x, NAE8500-0

**Code No. LIT-1201160**  
**Software Release 5.2**  
**Issued May 13, 2011**  
*Supersedes April 15, 2011*

Refer to the [QuickLIT Web site](#) for the most up-to-date version of this document.

Network Automation Engines (NAEs) enable Internet Protocol (IP) connectivity and Web-based access to Metasys® Building Management Systems (BMSs).

NAEs leverage standard building management communication technologies, including BACnet® protocol, LONWORKS® network, and N2 Bus protocol to monitor and supervise a wide variety of Heating, Ventilating, and Air Conditioning (HVAC); lighting; security; and fire safety equipment.

NAEs provide comprehensive equipment monitoring and control, scheduling, alarm and event management, energy management, data exchange, data trending, and data storage.

NAEs feature an embedded Site Management Portal user interface, support multiple concurrent Web browser sessions with password and permission access control, and provide the protection of industry standard Information Technology (IT) security.

NAE55 models support a comprehensive set of supervisory features and functions for large facilities and technically advanced buildings and complexes.



**Figure 1: NAE55 Network Automation Engine**

The NAE35/NAE45 models enable cost-effective NAE connectivity and control in smaller facilities, and can increase distribution of control in larger facilities.

The NAE85 is a high-capacity NAE that allows integration of large BACnet IP systems and can take the place of multiple NAEs.

**Table 1: Features and Benefits**

Features	Benefits
<b>Communication Using Commonly Accepted IT Standards, Including Web Services, at the Automation and Enterprise Level</b>	Allows you to install a system on your existing IT infrastructure within a building or enterprise and use standard IT communication services over the company intranet, Wide Area Network (WAN), or public Internet with firewall protection.
<b>Web-Based User Interface</b>	Allows you to access system data in the NAEs from any supported Web browser device connected to the network including remote users connected by dial-up telephone or an Internet Service Provider (ISP).
<b>Site Director Function</b>	Allows you to access all data on one site through one device. The device designated as the Site Director coordinates the display of data from multiple NAE devices for easy navigation through the entire site.
<b>User Interface and Online System Configuration Software Embedded in NAE</b>	Allows configuration, commissioning, data archiving, monitoring, commanding, and system diagnosis from any device with Web browser software and does not require separate workstation software.
<b>Supervision of Field Controller Networks Including BACnet MS/TP, N2 Bus, LonWorks Network, and BACnet IP Devices</b>	Supports connectivity to open network standards for complete flexibility in the selection of field devices. Supported protocols include BACnet Master-Slave/Token-Passing (MS/TP), BACnet IP, LonWorks, and N2 Bus.
<b>Multiple Connection Options for Data Access</b>	Allow connection of a Web browser via the Internet Protocol (IP) network using the Ethernet port. For a dial-up connection, use the optional internal or external modem.

## NAE Networking

NAEs have multiple connection port options that allow you to build an extremely flexible network at the automation and enterprise level of your system, as well as at the field controller and data acquisition levels.

### Web Browser Access

You view building systems through the NAE with a supported Web browser on a desktop or laptop computer. The computer does not require any special workstation software, just a supported browser and a standard Java® plug-in. The Web browser accesses the NAE directly over the IP network, or via the Internet or public telephone service.

### IP Ethernet Network

NAEs connect directly to IP Ethernet networks running at 10 or 100 Mbps. NAE55xx-2 and NAE85 engines can also connect to 1 Gbps networks. Multiple NAEs communicate with each other over the network, and one NAE can act as the Site Director.

Authorized users log on to the Site Director via a supported browser to access the entire Metasys system for the site. Data transmission on the network uses standard IT protocols, services, and formats.

You can interconnect Networks in different buildings using standard WAN technologies and network service providers. The speed of transmission depends on the technology used.

### Remote NAE

You can access the NAE remotely over standard WAN infrastructures, over the Internet using an ISP line, or over the public telephone network using a modem and Point-to-Point Protocol (PPP). Specified NAE models offer an optional internal modem; most models support an external modem.

### Application and Data Server (ADS)/ Extended Application and Data Server (ADX)

The ADS/ADX is an optional software package running on a computing platform that provides a location for storage of the system configuration database, trend logs, alarm logs, audit trails, and graphics.

You can also configure an ADS/ADX as the Site Director to allow more concurrent users and coordinate access to all components on a site via a Web browser connected over the network, Internet, or telephone line via dial-up communication. Refer to the *Application and Data Server (ADS/ADX) Product Bulletin (LIT-1201525)* for more information about ADSs and ADXs.

## Field Networks and Protocols

The NAE communicates data from one field network to another and from the field network level to the enterprise and automation network level, enabling your system to operate as one virtual control network.

### Automation Level Communication

NAEs communicate internal system data using peer-to-peer messaging over the IP Ethernet network. Each NAE shares data and has access to information on the other NAEs connected on the network, which enables coordination and control of the entire building management system.

### BACnet Protocol

The automation level communication also supports the BACnet protocol and facilitates the network integration of other systems and devices that use BACnet. You can also integrate the Johnson Controls® N30 Supervisory Controller into the NAE network at the automation level using BACnet services.

The NAE supports the BACnet services and objects typically used by a workstation and a field controller device, including BACnet alarm and event services.

Refer to the *NAE/NCE Protocol Implementation Conformance Statement Technical Bulletin (LIT-1201532)* for detailed information on BACnet conformance and the supported BACnet Interoperability Building Blocks.

### MS/TP Field Controller (FC) Bus

The BACnet MS/TP FC Bus is a standard peer-to-peer, multiple-master protocol in which each master device takes turns originating messages to pass to any device on the bus.

NAEs can communicate via the MS/TP FC Bus with the Metasys Field Equipment Controller family of controllers, including FEC16 and FEC26 field equipment controllers; VMA16 variable-air-volume controllers; and IOM17, IOM27, IOM37, and IOM47 input/output control modules.

NAEs can also communicate over the FC Bus with TEC26xx Series thermostat controllers and third-party MS/TP devices that comply with the BACnet standard protocol based on American National Standards Institute/American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ANSI/ASHRAE) Standard 135-2004.

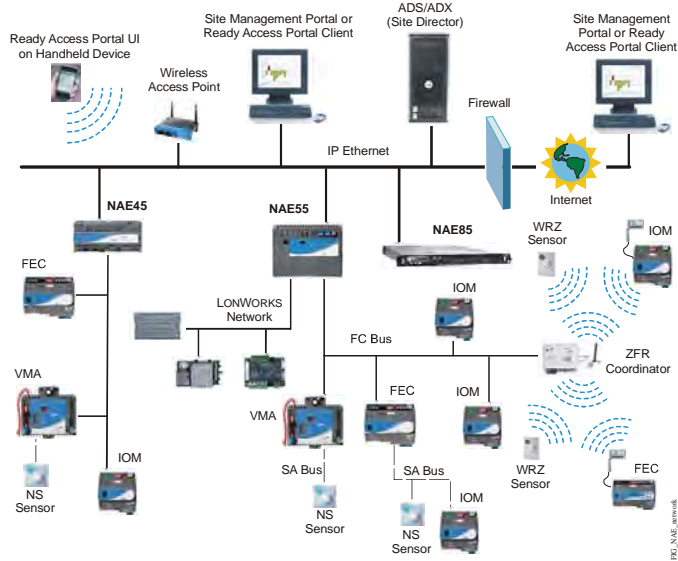


Figure 2: Diagram of Metasys Network with NAEs

### N2 Bus

The N2 Bus is an open Johnson Controls field communications trunk that links Application Specific Controllers (ASCs) and programmable controllers to a supervisory controller. ASCs include the Air Handling Unit (AHU) controller, Unitary (UNT) controller, VAV controllers, and VAV Modular Assembly devices. Programmable controllers include the DX9100.

The N2 Bus supports Metasys system compatible devices from other manufacturers and the Metasys Integrator® system.

### LONWORKS Bus

Specified NAE models can supervise LONWORKS devices, if the network interface follows current LONMARK® guidelines, and uses the Free Topology Transceiver (FTT)10. The LONWORKS network interface in specified NAE models supports all current LONMARK certified devices including Johnson Controls devices, such as the LN Series Controllers, the NexSys® controller line, and the LONWORKS enabled programmable Flexible System Controller (FSC).

## Software for Efficient Building Operation

NAEs ship with the latest version of the Metasys system software, which provides the following features:

- Metasys Site Management Portal User Interface** provides data and graphic screens to supported Web browsers. Authorized users simply log on to the NAE from the Web browser to access the Site Management Portal. This embedded user interface is ideal for smaller networks and remote locations where a dedicated computer platform to support a user interface is not required.



Figure 3: Metasys Site Management Portal Screen

- System Security** enables an NAE to recognize legitimate users with valid user IDs and passwords at the Site Management Portal user interface. User access data is encrypted in the transmission and in the NAE database. The system administrator manages user profiles, authorization levels, user ID, password, and specific NAE data access privileges in each user account.
- Basic Access** allows access to a subset of the standard Site Management Portal capabilities based on their assigned permissions.
- Monitoring and Control** all the mechanical and electrical systems in a typical building by collecting data from the field devices and then coordinating and sending the required commands to the controlled equipment at the required priority.
- Global Search** allows you to search the Metasys system and manage lists of objects, which can be used by other features for commanding, trending, reporting, and object selection.
- Global Command** allows you to send a single command to multiple objects, and view a log of the command results.
- Transaction Recording** audits and logs all user actions performed through the NAE.
- Alarm and Event Processing** enables NAEs to send alarm and event messages to Web browsers, pagers, e-mail servers, Network Management Systems, and serial printers, as well as store and view alarm and event logs on the NAE and transfer the data to an ADS/ADX.
- Historical Trend Data** can be collected by NAEs for any monitored value at user-defined intervals, or trending can be based on Change-of-Value. You can use trend logs to analyze building system performance and locate system problems. You can transfer NAE trend logs to the ADS/ADX at defined intervals or when the NAE logs are full.
- Totalization Data** allows you to monitor energy (and other consumables) use and generate cost reports to support utility cost reductions, and also provides data for service, maintenance, and early identification of building system problems.
- Trend Studies** allows you to view multiple trend extensions in a single view to facilitate monitoring and troubleshooting your Metasys site.
- Scheduling** allows you to define occupancy periods and start and stop times for mechanical or electrical equipment. Operating parameters can be set according to time of day, day/days of the week, holiday, or for calendar dates.
- Network-Wide System Interlocking** enables NAEs to collect field controller data, make logical comparisons, and issue relevant commands to other field controllers anywhere on the network.
- Optimal Start** automatically determines the best time to start heating and cooling systems to ensure that the facility is ready for occupants. It adjusts to seasonal variations and reduces energy use.
- Demand Limit and Load Rolling (DLLR)** monitors energy meters for electricity, gas, steam, or water, and automatically sheds equipment loads according to user-defined levels. Demand Limit helps manage utility demand charges. Load Rolling controls equipment operating levels to reduce total energy consumption. Comfort overrides prioritize equipment shedding.

- **Database Configuration Management** allows you to define the Metasys system configuration and database offline for download to the NAE. All the required database configuration software resides on the NAE or SCT. You do not need a copy of the database on your local client computer to make authorized changes.

#### Metasys for Validated Environments

We designed Metasys for Validated Environments (MVE) extended architecture for Johnson Controls customers who manage facilities that require compliance to Food and Drug Administration (FDA) Title 21, Code of Federal Regulations (Part 11), and other electronic information management requirements. MVE provides:

- precise digital control of the facility environment
- electronic records and signatures
- time-stamped audit and events trail
- secure user access
- Web-based advanced reporting
- scalable configuration
- intuitive Web browser interface

The MVE feature is available on NAE55 models only.

#### Hardware Features

##### NAE35, NAE45, and NAE55



Figure 4: NAE45 Network Automation Engine

Depending on the model, an NAE35, NAE45 (Figure 4), and NAE55 (Figure 1) provide the following features for the building controls market:

- industrial Single Board Computer (SBC)
- nonvolatile solid-state Flash memory to store all programs and data
- standard Universal Serial Bus (USB) connections

- battery backup to save data from Dynamic Random Access Memory (DRAM) into Flash memory when power to the NAE is interrupted
- real-time clock with battery backup
- Light-Emitting Diodes (LEDs) to indicate power, communications, and fault, to allow easy servicing
- optional internal modem
- removable screw terminals for 24 VAC power and field network bus connections
- standard 9-pin sub-D connectors for RS-232-C serial ports
- RJ-11 telephone line connector for internal modem
- RJ-45 connector for Ethernet connection

##### NAE85



Figure 5: NAE85 Network Automation Engine

The NAE85 (Figure 5) has most of the same functions and capabilities as the NAE35, NAE45, and NAE55; features a scalable design; and integrates large numbers of BACnet IP devices into your Metasys network. The NAE85 is available in a 1U rack-mount chassis configuration.

The NAE85 does **not** support:

- BACnet MS/TP field controllers
- N2 Bus networks
- LonWORKS networks
- dial-out to an ADS/ADX
- device Reset command in the Metasys Site Management Portal UI
- upgrade using the NAE/NIE Update Tool

##### NAE Series Comparison

Table 2 contains a brief comparison of the features of the different NAE Series engines. (Not all features are available on every model in a series.)

Table 2: Comparison of Features for NAE Models

Features	NAE85	NAE55	NAE45	NAE35
Number of N2 or BACnet MS/TP Trunks	None	2	1	1
Maximum Number of N2 or MS/TP Devices per Trunk	None	100	100	50
Maximum Number of Objects	25,000 <sup>1</sup>	5,000	2,500	2,500
Model with Internal Modem	No	Available	Available	Available
RS-232-C Serial Ports	None	2	1 or 2	1 or 2
USB Serial Ports	2	2	1	1
Ethernet Ports	1	1	1	1
LonWORKS Network Support (Number of Devices)	No	Available (255)	Available (127)	Available (64)
Smoke Control Applications (UUKL Listed)	No	Available	Available	Available

1. Standard is 10,000 objects; 15,000 object upgrade available.

#### Conclusion

The NAE affirms Johnson Controls position as a leader in the BMS industry and as an innovator of solutions for the complete management of buildings. The integration of Information Technology and Internet standards into the NAE platform, as well as the use of open protocols for field networks, bring the benefits of the global communications and control industries into one system. Web browser-based access from any location is a key to the effective use of the automation network.

The Metasys system continues to be the integrating network within buildings and has now been extended to bridge the gap between traditional control systems and the business and communication network systems of the enterprise.

Table 3: NAE35 Ordering Information (Part 1 of 2)

Product Code Number <sup>1</sup>	Description
MS-NAE35xx-x (Base Features of Each NAE35)	NAE35 Network Automation Engines: Requires a 24 VAC power supply. Each model includes one RS-232-C serial port, one USB serial port, one Ethernet port, and an MS-BAT1020-0 Data Protection Battery.
MS-NAE3510-2	Supports one N2 Bus or BACnet MS/TP (RS-485) trunk; includes an additional RS-232-C serial port for optional external modem; supports a maximum of 50 devices on the N2 Bus or BACnet MS/TP trunk.
MS-NAE3510-2U	Supports one BACnet MS/TP (RS-485) trunk; includes an additional RS-232-C serial port for optional external modem; supports a maximum of 50 devices on the BACnet MS/TP trunk. <b>Note:</b> This model is UL Listed, File S4977, UUKL 864 - 9th Edition Smoke Control Equipment.
MS-NAE3511-2	Supports one N2 Bus or BACnet MS/TP (RS-485) trunk; includes an internal modem; supports a maximum of 50 devices on the N2 Bus or BACnet MS/TP trunk.
MS-NAE3514-2	Supports one N2 Bus or BACnet MS/TP (RS-485) trunk; limited to Basic Access support; includes an additional RS-232-C serial port for optional external modem; supports a maximum of 50 devices on the N2 Bus or BACnet MS/TP trunk.
MS-NAE3515-2	Supports one N2 Bus or BACnet MS/TP (RS-485) trunk; limited to Basic Access support; includes an internal modem; supports a maximum of 50 devices on the N2 Bus or BACnet MS/TP trunk.

The Metasys Network Automation Engine and Metasys Web-enabled network are wise investments that yield returns to the building owner and operator far into the future.

#### Ordering Information

Contact the nearest Johnson Controls representative to order an NAE. Specify the desired product code from Table 3 for the NAE35, Table 4 for the NAE45, Table 5 for the NAE55, Table 6 for the NAE85, and Table 7 for accessories.

**Table 3: NAE35 Ordering Information (Part 2 of 2)**

Product Code Number <sup>1</sup>	Description
MS-NAE3520-2	Supports one LONWORKS trunk; includes an additional RS-232-C serial port for optional external modem. Supports a maximum of 64 devices on the LONWORKS port.
MS-NAE3520-2U	Supports one LONWORKS trunk; includes an additional RS-232-C serial port for optional external modem. Supports a maximum of 64 devices on the LONWORKS port. <b>Note:</b> This model is UL Listed, File S4977, UUKL 864 - 9th Edition Smoke Control Equipment.
MS-NAE3521-2	Supports one LONWORKS trunk; includes an internal modem. Supports a maximum of 64 devices on the LONWORKS port.
MS-NAE3524-2	Supports one LONWORKS trunk; limited to Basic Access support; and includes an additional RS-232-C serial port for optional external modem. Supports a maximum of 64 devices on the LONWORKS trunks.
MS-NAE3525-2	Supports one LONWORKS trunk; limited to Basic Access support; and includes an internal modem. Supports a maximum of 64 devices on the LONWORKS trunks.

1. Some models are also available in a Buy American version (add a G after the code number). For repair parts, add -702 after the code number.

**Table 4: NAE45 Ordering Information**

Product Code Number <sup>1</sup>	Description
MS-NAE45xx-x (Base Features of Each NAE45)	NAE45 Network Automation Engines: Requires a 24 VAC power supply. Each model includes one RS-232-C serial port, one USB serial port, one Ethernet port, and an MS-BAT1020-0 Data Protection Battery.
MS-NAE4510-2	Supports one N2 Bus or BACnet MS/TP (RS-485) trunk; includes an additional RS-232-C serial port for optional external modem; supports a maximum of 100 devices on the N2 Bus or BACnet MS/TP trunk.
MS-NAE4510-2U	Supports one BACnet MS/TP (RS-485) trunk; includes an additional RS-232-C serial port for optional external modem; supports a maximum of 100 devices on the BACnet MS/TP trunk. <b>Note:</b> This model is UL Listed, File S4977, UUKL 864 - 9th Edition Smoke Control Equipment.
MS-NAE4511-2	Supports one N2 Bus or BACnet MS/TP (RS-485) trunk; includes an internal modem; supports a maximum of 100 devices on the N2 Bus or BACnet MS/TP trunk.
MS-NAE4520-2	Supports one LONWORKS trunk, includes an additional RS-232-C serial port for optional external modem; supports a maximum of 127 devices on the LONWORKS port.
MS-NAE4520-2U	Supports one LONWORKS trunk, includes an additional RS-232-C serial port for optional external modem; supports a maximum of 127 devices on the LONWORKS port. <b>Note:</b> This model is UL Listed, File S4977, UUKL 864 - 9th Edition Smoke Control Equipment.
MS-NAE4521-2	Supports one LONWORKS trunk, includes an internal modem; supports a maximum of 127 devices on the LONWORKS port.

1. Some models are also available in a Buy American version (add a G after the code number). For repair parts, add -702 after the code number.

**Table 5: NAE55 Ordering Information (Part 1 of 2)**

Product Code Number <sup>1</sup>	Description
MS-NAE55xx-x (Base Features of Each NAE55)	NAE55 Network Automation Engines: Requires a 24 VAC power supply. Each model includes two RS-232-C serial ports, two USB serial ports, two RS-485 ports, one Ethernet port, and one MS-BAT1010-0 Data Protection Battery.
MS-NAE5510-1	Supports two N2 Bus or two BACnet MS/TP (RS-485) trunks (or one N2 Bus trunk and one BACnet MS/TP trunk); supports a maximum of 100 devices on each N2 Bus or BACnet MS/TP trunk.

**Table 5: NAE55 Ordering Information (Part 2 of 2)**

Product Code Number <sup>1</sup>	Description
MS-NAE5510-1U	Supports two BACnet MS/TP (RS-485) trunks, which support a maximum of 100 devices on each BACnet MS/TP trunk. <b>Note:</b> This model is UL Listed, File S4977, UUKL 864 - 9th Edition Smoke Control Equipment.
MS-NAE5510-2	Supports two N2 Bus or two BACnet MS/TP (RS-485) trunks (or one N2 Bus trunk and one BACnet MS/TP trunk); supports a maximum of 100 devices on each N2 Bus or BACnet MS/TP trunk.
MS-NAE5511-1	Supports two N2 Bus or two BACnet MS/TP (RS-485) trunks (or one N2 Bus trunk and one BACnet MS/TP trunk); supports a maximum of 100 devices on each N2 Bus or BACnet MS/TP trunk; includes an internal modem.
MS-NAE5511-2	Supports two N2 Bus or two BACnet MS/TP (RS-485) trunks (or one N2 Bus trunk and one BACnet MS/TP trunk); supports a maximum of 100 devices on each N2 Bus or BACnet MS/TP trunk; includes an internal modem.
MS-NAE5520-1	Supports a LONWORKS trunk, and two N2 Bus trunks or two BACnet MS/TP (RS-485) trunks (or one N2 Bus trunk and one BACnet MS/TP trunk). Supports a maximum of 255 devices on the LONWORKS trunk and a maximum of 100 devices on each N2 Bus or BACnet MS/TP trunk
MS-NAE5520-1U	Supports a LONWORKS trunk, and two BACnet MS/TP (RS-485) trunks. Supports a maximum of 255 devices on the LONWORKS trunk and a maximum of 100 devices on each BACnet MS/TP trunk. <b>Note:</b> This model is UL Listed, File S4977, UUKL 864 - 9th Edition Smoke Control Equipment.
MS-NAE5520-2	Supports a LONWORKS trunk, and two N2 Bus trunks or two BACnet MS/TP (RS-485) trunks (or one N2 Bus trunk and one BACnet MS/TP trunk). Supports a maximum of 255 devices on the LONWORKS trunk and a maximum of 100 devices on each N2 Bus or BACnet MS/TP trunk
MS-NAE5521-1	Supports a LONWORKS trunk, and two N2 Bus trunks or two BACnet MS/TP (RS-485) trunks (or one N2 Bus trunk and one BACnet MS/TP trunk); includes an internal modem. Supports a maximum of 255 devices on the LONWORKS trunk and a maximum of 100 devices on each N2 Bus or BACnet MS/TP trunk.
MS-NAE5521-2	Supports a LONWORKS trunk, and two N2 Bus trunks or two BACnet MS/TP (RS-485) trunks (or one N2 Bus trunk and one BACnet MS/TP trunk); includes an internal modem. Supports a maximum of 255 devices on the LONWORKS trunk and a maximum of 100 devices on each N2 Bus or BACnet MS/TP trunk.

1. Some models are also available in a Buy American version (add a G after the code number). For the European versions of the NAE55, add an E after the code number. For repair parts, add -702 after the code number.

**Table 6: NAE85 Ordering Information**

Product Code Number	Description
MS-NIE8500-0	Rack-mount server preloaded with supported operating system, NxE85 software, and other Metasys system software components; supports up to 10,000 objects. <b>Note:</b> The NAE85 models ship as MS-NIE8500-0 models. Use the ChangeModel utility in the NxE85 Metasys software to change an NIE85 to an NAE85.
MS-NxE85SW-0 <sup>1</sup>	New NxE85 software only; for new installations/projects
MS-NxE85SW-6 <sup>1</sup>	Upgrade NxE85 software; for existing NxE85 engines

1. Standard NxE85 models support 10,000 objects; an expansion upgrade is available to support an additional 15,000 objects.

**Table 7: NAE Accessories Ordering Information (Part 1 of 2)**

Product Code Number	Description
MS-BAT1010-0	Replacement data protection battery for NAE55 and NIE55. Rechargeable gel cell battery: 12 V, 1.2 Ah, with a typical life of 3 to 5 years at 21°C (70°F)
MS-BAT1020-0	Replacement data protection battery for NAE35, NAE45, and NCE25. Rechargeable NiMH battery: 3.6 V 500 mAh, with a typical life of 10 years at 21°C (70°F)
MS-15KUPG-0	15,000 object expansion upgrade for NxE85 (only one expansion per NxE85)

Table 7: NAE Accessories Ordering Information (Part 2 of 2)

Product Code Number	Description
MS-MULTENGSW-6	Contains ToggleTunnel utility for converting an NAE55/NIE55 to an NAE55 model with the N2 Tunneling features enabled. Not for use with MS-NAE5510-1U.
MS-RAP-0	Ready Access Portal Server provides a user interface that is a natural, complementary extension of the Metasys Site Management Portal user interface. <b>Note:</b> This option is not necessary for sites that have an ADS/ADX that is the Site Director because Ready Access Portal Server is provided with the ADS/ADX solution.
MS-EXPORT-0	Export Utility extracts historical trend, alarm, and audit data from the system and presents the historical data in a variety of formats. <b>Note:</b> This option is not necessary for sites that have an ADS/ADX that is the Site Director because Export Utility is provided with the ADS/ADX solution.
AS-XFR100-1	Power transformer (Class 2, 24 VAC, 92 VA maximum output), with enclosure
AS-XFR010-1	Power transformer (Class 2, 24 VAC, 92 VA maximum output), no enclosure
SC450RM1U (OEM Part No.)	Recommended Uninterruptable Power Supply (UPS) for NxE85 model: American Power Conversion (APC®) Smart-UPS SC 450 VA, 280 W, 120 VAC input/output with NEMA 5-15R output connections

## Technical Specifications

### NAE35 and NAE45

<b>Power Requirement</b>	Dedicated nominal 24 VAC, Class 2 power supply (North America), Safety Extra-Low Voltage (SELV) power supply (Europe), at 50/60 Hz (20 VAC minimum to 30 VAC maximum)
<b>Power Consumption</b>	25 VA maximum
<b>Ambient Operating Conditions</b>	0 to 50°C (32 to 122°F); 10 to 90% RH, 30°C (86°F) maximum dew point
<b>Ambient Storage Conditions</b>	-40 to 70°C (-40 to 158°F); 5 to 95% RH, 30°C (86°F) maximum dew point
<b>Data Protection Battery</b>	Supports data protection on power failure. Rechargeable NiMH battery: 3.6 VDC 500 mAh, with a typical life of 5 to 7 years at 21°C (70°F); Product Code Number: MS-BAT1020-0
<b>Processor</b>	192 MHz Renesas™ SH4 7760 RISC processor
<b>Memory</b>	128 MB Flash nonvolatile memory for operating system, configuration data, and operations data storage and backup 128 MB Synchronous Dynamic Random Access Memory (DRAM) for operations data dynamic memory
<b>Operating System</b>	Microsoft® Windows® CE embedded
<b>Network and Serial Interfaces</b>	One Ethernet port; connects at 10 or 100 Mbps; 8-pin RJ-45 connector One optically isolated RS-485 port; 9.6k, 19.2k, 38.4k, or 76.8k baud (depending on protocol); with a pluggable and keyed 4-position terminal block (FC Bus available on NAE351x and NAE451x models only) One LONWORKS port; FTT10 78 Kbps; pluggable, keyed 3-position terminal block (LONWORKS port available on NAE352x-x and NAE452x models only) One RS-232-C serial port with standard 9-pin sub-D connector that supports standard baud rates. A second serial port, on models without an internal modem, that supports an optional, user-supplied external modem. One USB serial port with standard USB connector that supports an optional, user-supplied external modem. Option: One telephone port for internal modem; up to 56 Kbps; 6-pin RJ-11 connector (NAE models with an optional internal modem have one RS-232-C serial port only.)
<b>Housing</b>	Plastic housing material: ABS + polycarbonate Protection: IP20 (IEC 60529)
<b>Mounting</b>	On flat surface with screws on three mounting clips or a single 35 mm DIN rail
<b>Dimensions (Height x Width x Depth)</b>	131 x 270 x 62 mm (5-3/16 x 10-5/8 x 2-1/2 in.) Minimum space for mounting NAE35 and NAE45: 210 x 350 x 110 mm (8-3/16 x 13-13/16 x 4.-5/16 in.)
<b>Shipping Weight</b>	1.2 kg (2.7 lb)
<b>Compliance</b>	<b>United States:</b> UL Listed, File E107041, CCN PAZX, UL 916, Energy Management Equipment, UL Listed, File S4977, UUKL 864 - 9th Edition, Smoke Control Equipment (MS-NAE35x0-2U and MS-NAE45x0-2U models only) FCC Compliant to CFR47, Part 15, Subpart B, Class A <b>Canada:</b> UL Listed, File E107041, CCN PAZX7, CAN/CSA C22.2 No. 205, Signal Equipment; Industry Canada Compliant, ICES-003 <b>Europe:</b> CE Mark – Johnson Controls, Inc., declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC. <b>Australia and New Zealand:</b> C-Tick Mark, Australia/NZ Emissions Compliant <b>BACnet International:</b> BACnet Testing Laboratories™ (BTL) 135-2004 Listed BACnet Building Controller (B-BC)





**NAE55xx-1**

<b>Power Requirement</b>	Dedicated nominal 24 VAC, Class 2 power supply (North America), Safety Extra-Low Voltage (SELV) power supply (Europe), at 50/60 Hz (20 VAC minimum to 30 VAC maximum)
<b>Power Consumption</b>	50 VA maximum
<b>Ambient Operating Conditions</b>	0 to 50°C (32 to 122°F); 10 to 90% RH, 30°C (86°F) maximum dew point
<b>Ambient Storage Conditions</b>	-40 to 70°C (-40 to 158°F); 5 to 95% RH, 30°C (86°F) maximum dew point
<b>Data Protection Battery</b>	Supports data protection on power failure. Rechargeable gel cell battery: 12 V, 1.2 Ah, with a typical life of 3 to 5 years at 21°C (70°F); Product Code Number: MS-BAT1010-0
<b>Clock Battery</b>	Maintains real-time clock through a power failure. Onboard cell; typical life 10 years at 21°C (70°F)
<b>Processor</b>	400 MHz Pentium® class Geode® GX533 processor for MS-NAE55xx-1 models
<b>Memory</b>	512 MB Flash nonvolatile memory for operating system, configuration data, and operations data storage and backup for MS-NAE55xx-1 models. 256 MB Synchronous Dynamic Random Access Memory (DRAM) for operations data dynamic memory for all models
<b>Operating System</b>	Microsoft Windows XP® embedded
<b>Network and Serial Interfaces</b>	One Ethernet port; connects at 10 or 100 Mbps; 8-pin RJ-45 connector Two optically isolated RS-485 ports; 9.6k, 19.2k, 38.4k, or 76.8k baud; pluggable and keyed 4-position terminal blocks Two RS-232-C serial ports, with standard 9-pin sub-D connectors, that support all standard baud rates Two USB serial ports, standard USB connectors support an optional, user-supplied external modem Options: One telephone port for internal modem; up to 56 Kbps; 6-pin RJ-11 connector One LONWORKS port; FTT10 78 Kbps; pluggable, keyed 3-position terminal block (LONWORKS port available on NAE552x-xxx models only)
<b>Housing</b>	Plastic housing with internal metal shield Plastic material: ABS + polycarbonate UL94-5VB Protection: IP20 (IEC 60529)
<b>Mounting</b>	On flat surface with screws on four mounting feet or on dual DIN rail
<b>Dimensions (Height x Width x Depth)</b>	226 x 332 x 96.5 mm (8-7/8 x 13-1/8 x 3-13/16 in.) including mounting feet Minimum space for mounting: 303 x 408 x 148 mm (12 x 16-1/8 x 5-13/16 in.)
<b>Shipping Weight</b>	2.9 kg (6.4 lb)
<b>Compliance</b>	<b>United States:</b> UL Listed, File E107041, CCN PAZX, UL 916, Energy Management Equipment UL Listed, File S4977, UUKL 864 - 9th Edition, Smoke Control Equipment (MS-NAE55x0-1U models only) FCC Compliant to CFR47, Part 15, Subpart B, Class A <b>Canada:</b> UL Listed, File E107041, CCN PAZX7, CAN/CSA C22.2 No. 205, Signal Equipment, Industry Canada Compliant, ICES-003 <b>Europe:</b> CE Mark – Johnson Controls, Inc., declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC. <b>Australia and New Zealand:</b> C-Tick Mark, Australia/NZ Emissions Compliant <b>BACnet International:</b> BACnet Testing Laboratories™ (BTL) 135-2004 Listed BACnet Building Controller (B-BC)



**NAE55xx-2**

<b>Power Requirement</b>	Dedicated nominal 24 VAC, Class 2 power supply (North America), Safety Extra-Low Voltage (SELV) power supply (Europe), at 50/60 Hz (20 VAC minimum to 30 VAC maximum)
<b>Power Consumption</b>	50 VA maximum
<b>Ambient Operating Conditions</b>	0 to 50°C (32 to 122°F); 10 to 90% RH, 30°C (86°F) maximum dew point
<b>Ambient Storage Conditions</b>	-40 to 70°C (-40 to 158°F); 5 to 95% RH, 30°C (86°F) maximum dew point
<b>Data Protection Battery</b>	Supports data protection on power failure. Rechargeable gel cell battery: 12 V, 1.2 Ah, with a typical life of 3 to 5 years at 21°C (70°F); Product Code Number: MS-BAT1010-0
<b>Clock Battery</b>	Maintains real-time clock through a power failure. Onboard cell; typical life 10 years at 21°C (70°F)
<b>Processor</b>	1.6 GHz Intel® Atom™ processor
<b>Memory</b>	4 GB Flash nonvolatile memory for operating system, configuration data, and operations data storage and backup 1 GB Synchronous Dynamic Random Access Memory (DRAM) for operations data dynamic memory for all models
<b>Operating System</b>	Microsoft® Windows® Embedded Standard (WES) 2009
<b>Network and Serial Interfaces</b>	One Ethernet port; connects at 10 Mbps, 100 Mbps, or 1 Gbps; 8-pin RJ-45 connector Two optically isolated RS-485 ports; 9.6k, 19.2k, 38.4k, or 76.8k baud; pluggable and keyed 4 position terminal blocks (RS-485 ports available on NAE55 models only) Two RS-232-C serial ports, with standard 9-pin sub-D connectors, that support all standard baud rates Two USB serial ports; standard USB connectors support an optional, user-supplied external modem Options: One telephone port for internal modem; up to 56 kbps; 6-pin RJ-12 connector One LONWORKS port; FTT10 78 kbps; pluggable, keyed 3-position terminal block (LONWORKS port available on NAE552x-x models only)
<b>Housing</b>	Plastic housing with internal metal shield Plastic material: ABS + polycarbonate UL94-5VB; Protection: IP20 (IEC 60529)
<b>Mounting</b>	On flat surface with screws on four mounting feet or on dual 35 mm DIN rail
<b>Dimensions (Height x Width x Depth)</b>	226 x 332 x 96.5 mm (8-7/8 x 13-1/8 x 3-13/16 in.) including mounting feet Minimum space for mounting: 303 x 408 x 148 mm (12 x 16-1/8 x 5-13/16 in.)
<b>Shipping Weight</b>	2.9 kg (6.4 lb)
<b>Compliance</b>	<b>United States:</b> UL Listed, File E107041, CCN PAZX, UL 916, Energy Management Equipment, FCC Compliant to CFR47, Part 15, Subpart B, Class A <b>Canada:</b> UL Listed, File E107041, CCN PAZX7, CAN/CSA C22.2 No. 205, Signal Equipment, Industry Canada Compliant, ICES-003 <b>Europe:</b> CE Mark – Johnson Controls, Inc., declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC. <b>Australia and New Zealand:</b> C-Tick Mark, Australia/NZ Emissions Compliant <b>BACnet International:</b> BACnet Testing Laboratories™ (BTL) 135-2004 Listed BACnet Building Controller (B-BC)



### NAE85 Turnkey

<b>Computer Type</b>	Dell® PowerEdge® R410
<b>Power Requirement</b>	100–240 VAC 50/60 Hz
<b>Power Supply</b>	480 W
<b>Ambient Operating Conditions</b>	10 to 35°C (50 to 95°F); 20 to 80% RH, noncondensing (twmax=29C)
<b>Ambient Storage Conditions</b>	-40 to 65°C (-40 to 149°F); 5 to 95% RH, noncondensing (twmax=38C)
<b>Data Protection</b>	Recommended Uninterruptible Power Supply (UPS): American Power Conversion (APC®) Smart-UPS SC 450 VA, 280 W, 120 VAC input/output, NEMA 5-15R output connections, OEM Part No. SC450RM1U
<b>Processor</b>	Intel® Xeon® E5506, 2.13 GHz, 4 MB Cache
<b>Memory</b>	2 GB DDR2, 1066 MHz, 2 x 1 GB, Single Ranked UDIMMs for 1 Processor
<b>Hard Disk</b>	2 x 160 GB 7.2K RPM Serial Advanced Technology Attachment (SATA), 8.9 cm (3.5 in.) Cabled 3 Gbps, RAID 1 configuration with add-in SAS6/iR (SATA/SAS Controller)
<b>Internal Optical Drive</b>	DVD ROM, SATA
<b>Operating System</b>	Microsoft® Windows® Web Server 2008 R2 Operating System (64-bit)
<b>AntiVirus Software</b>	Symantec® AntiVirus Corporate Edition Version 11
<b>Network and Serial Interfaces</b>	2 RJ45 1-Gbps Ethernet ports, Port 2 is disabled 2 video ports: 1 front, 1 back 1 9-pin Serial port 4 USB ports (2 front, 2 back)
<b>Dimensions (Height x Width x Depth)</b>	4.3 x 43.4 x 62.7 cm (1-11/16 x 17-1/8 x 24-11/16 in.)
<b>Mounting</b>	Mount in an EIA-310D compatible server cabinet
<b>Shipping Weight</b>	15.9 kg (35 lb)
<b>Compliance</b>	Europe: CE Mark (Record Holder: www.dell.com/regulatory_compliance) BACnet International: BACnet Testing Laboratories™ (BTL) 135-2004 Listed BACnet Building Controller (B-BC)

### NAE85 Software System Requirements for Installation/Upgrade

<b>Product Code</b>	MS-NxE85SW-0	NxE85 software for 10,000 objects (new projects only software)
<b>Recommended Computer Platform</b>	Intel® Xeon® E5506, 2.13 GHz, 4 MB Cache 2 x 160 GB 7.2K RPM Serial Advanced Technology Attachment (SATA), 8.9 cm (3.5 in.) Cabled 3 Gbps, RAID 1 configuration with add-in SAS6/iR (SATA/SAS Controller) DVD ROM, SATA	
<b>Memory</b>	1 GB RAM minimum	
<b>Hard Disk</b>	160 GB minimum	
<b>Supported Operating Systems and Software</b>	<b>Microsoft® Windows® Web Server 2008 R2 OS (64-bit)</b> IIS Version 7.5, Microsoft .NET Framework Version 3.5.1 <b>Microsoft Windows Web Server 2008 OS (32-bit) with SP1</b> IIS Version 7.0, Microsoft .NET Framework Version 3.5 with SP1 <b>Microsoft Windows 2003 Web Edition OS<sup>1</sup> (32-bit) with SP2</b> IIS Version 6.0, Microsoft .NET Framework Version 3.5 with SP1	
<b>Network Communication</b>	Network Interface: Single 1 Gbps Ethernet network interface card connects at 10 Mbps, 100 Mbps or 1Gbps; (100 Mbps or better recommended)	
<b>Data Protection</b>	Recommended Uninterruptible Power Supply (UPS): American Power Conversion (APC®) Smart-UPS SC 450VA, 280 W, 120 VAC input/output, NEMA 5-15R output connections, OEM Part No. SC450RM1U	
<b>Compliance</b>	BACnet International: BACnet Testing Laboratories™ (BTL) 135-2004 Listed BACnet Building Controller	

1. We support the 32-bit version only. We do not support the 64-bit version.

*The performance specifications are nominal and conform to acceptable industry standard. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.*

#### United States Emissions Compliance

*This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when this equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his/her own expense.*

#### Canadian Emissions Compliance

*This Class (A) digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulations. Cet appareil numérique de la Classe (A) respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.*



**Building Efficiency**  
507 E. Michigan Street, Milwaukee, WI 53202

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# Network Integration Engine

## Product Bulletin

MS-NIE55xx-x  
MS-NIE8500-x

**Code No. LIT-1201537**  
**Software Release 5.2**  
**Issued May 13, 2011**  
*Supersedes April 15, 2011*

Refer to the [QuickLIT Web site](#) for the most up-to-date version of this document.

The Metasys® Network Integration Engine (NIE) integrates existing Metasys N1-based Building Management Systems (BMSs) into the new generation of technology that includes the Internet, Information Technology (IT), and enterprise-level global communication. Metasys system N1 Integration is based on the NIE, a Web-enabled network controller that speaks IT and Internet language to the expanding world of Web browsers and remote operations centers. At the same time, it uses Internet Protocol (IP) Ethernet network technology to communicate with Metasys N1 networks that we install in many facilities worldwide.

The NIE transfers point data from one or more Network Control Module (NCM) devices in a Metasys N1 network, providing alarm and event management, trending, energy management, scheduling, and data sharing capabilities in a manner consistent with the new technology of Metasys system extended architecture.

The network may include Network Automation Engines (NAEs), Network Control Engines (NCEs), and other NIE units communicating with single or multiple Web browser-based User Interfaces (UIs) using the security protection technology of the IT industry.



**NIE55 Network Integration Engine**

**Table 1: Features and Benefits**

Features	Benefits
<b>Communication with N1 Networks Using Commonly Accepted IT Standards at the Automation and Enterprise Levels</b>	Installs on the existing IT infrastructure within a building or enterprise and integrates the existing N1 network using standard IT communication services over the company intranet, wide area network, or public Internet with firewall protection.
<b>Web-Based User Interface</b>	Provides user access to system data in the NIE from any supported Web browser device connected to the network, including remote users connected by dial-up telephone or an Internet Service Provider (ISP).
<b>User Interface and Online System Configuration Software Embedded in NIE</b>	Enables configuration, commissioning, data archiving, monitoring, commanding, and system diagnosis from any device with Web browser software; and does not require separate workstation software.
<b>Site Director Function in One NIE or One NAE, or in an Application and Data Server (ADS) for Large Installations</b>	Provides user access to all data on one site through one device; the Site Director coordinates the display of data from multiple NIE and NAE devices for ease of navigation through the entire site.
<b>Scalable System Integration Solution for Integrating and Migrating Metasys N1 Networks</b>	Integrates N1 devices in one building, a network of small buildings, or multiple N1 networks in a large building complex, providing new technology while protecting existing investment using the scalable line of NIEs.
<b>Mapping Capability of N1 Data Types Including Analog, Binary, Multistate and Control System Objects, and Access to Scheduling Feature</b>	Allows you to perform all day-by-day operations for an integrated N1 network from the Web-enabled Metasys Site Management Portal user interface.
<b>Trending, Totalization, and Alarming Functions Automatically Regenerated in the Metasys System Extended Architecture</b>	Protect functionality and data recording capabilities, and fully integrate processing, presentation, and storage of N1 network data in the Web-enabled system.



## Flexible Networking

The NIE has multiple connection port options, enabling you to integrate one or several NCM devices that reside on an N1 network and build an extremely flexible network at the automation and enterprise level of your system.

## Web Browser Access

You view and access an N1 network via the NIE with a supported Web browser on a desktop, laptop, or any other type of computer platform. The computer does not require any special workstation software. The Web browser accesses the NIE directly over the IP network, or via the Internet or public telephone service.

## IP Ethernet Network

NIEs connect directly to an IP Ethernet network running at 10, 100 Mbps, or 1 Gbps. Multiple NIEs communicate with each other and with NAEs over the network. You can designate one NIE, NAE, or ADS as the Site Director. The device is then the point of UI access to the site network.

Authorized users log on to the Site Director via a supported browser to access the entire Metasys system for the site. Data transmission on the network uses standard IT protocols, services, and formats. The NIE supports Domain Name System (DNS).

Networks in different buildings may be interconnected using standard Wide Area Network (WAN) technologies and network service providers. Transmission speed depends on the technology used.

## Remote NIE

The NIE can be accessed locally by connecting a computer to the NIE Ethernet port or to one of the NIE serial ports. Remote access can be set up over the Internet using an ISP line or over the public telephone network using a modem and Point-to-Point Protocol (PPP). Several NIE models have an optional internal modem; other NIE models support an external analog modem on the NIE Universal Series Bus (USB) port.

## Application and Data Server (ADS)

The ADS is an optional software package running on a server platform, which provides storage of the system configuration database, trend logs, alarm logs, and audit trails.

An ADS can also be configured as the Site Director to allow more concurrent users and coordinate access to all components on a site via a Web browser connected over the network, Internet, or telephone line via dial-up communication. Refer to the *Application and Data Server (ADS/ADX) Product Bulletin (LIT-1201525)* for more information about ADSs.

## Engineering Workstation on the N1 Network

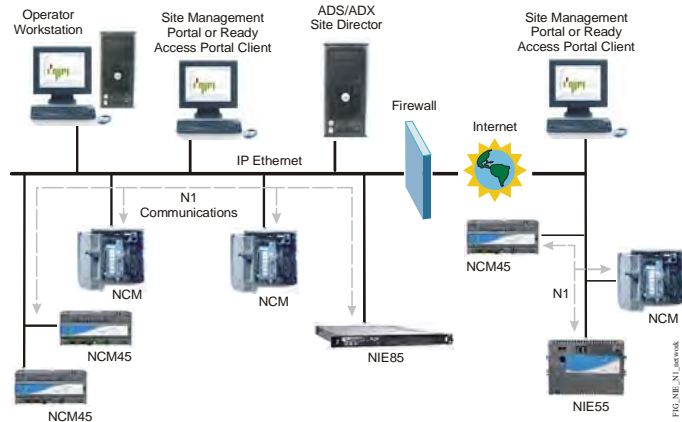
At least one Operator Workstation (OWS) should remain on the integrated N1 network as an engineering workstation for managing and archiving the N1 network system configuration database. You may continue to use M5 Workstation/OWS on the Metasys N1 network for operator functions as functions transfer to the NIE and the new system. When the transfer is complete, the integrated N1 network can be controlled and monitored via the Metasys UI.

## Integration Capabilities

The NIE55 supports the integration of one or more NCMs on an Ethernet-based Metasys N1 network. The NIE55 supports approximately 5,000 objects on an N1 network. If a network has more than 5,000 objects, consider using an NIE85, which can support up to 25,000 objects. (You can also use multiple NIE55s to integrate large N1 networks or multiple N1 networks with more than 5,000 objects.) Data is exchanged between NIEs, NAEs, and NCEs on the network; displayed on Web browsers; and stored in an ADS. These features allow your N1 network and the Metasys system to operate as one virtual control network.

## Automation Level Communication

Each NIE shares data and has access to information on all other NIEs, NCEs, and NAEs on the IP network. The NIEs, NCEs, and NAEs use this peer-to-peer communication to coordinate the overall functions of the building control system at the automation level.



Integrating Metasys N1 Networks

### Metasys N1 Network Communication

The NIE communicates over the IP Ethernet network with the NCM devices on the N1 network. The NIE is configured as a Metasys N1 node and stores N1 network global data, including a list of NCM devices and system names.

The NIE continuously monitors the integrated N1 network just like a workstation. This monitoring allows the NIE to efficiently integrate NCM devices into the Metasys system extended architecture.

### Integrating N1 Data

The Metasys N1 Integration solution provides online and offline options for generating a table of N1 point objects. These N1 point objects are mapped to the NIE and displayed in the system navigation tree on the Site Management Portal user interface. The following N1 object types can be mapped to the Metasys system through the NIE:

- Analog Data (AD)
- Analog Input (AI)
- Analog Output Digital (AOD)
- Analog Output Setpoint (AOS)
- Binary Data (BD)
- Binary Input (BI)

- Binary Output (BO)
- Multistate Data (MSD)
- Multistate Input (MSI)
- Multistate Output (MSO)
- Control System (CS)

The N1 migration process leaves the N1 object configurations unchanged.

### Migrating N1 Features

The N1 Integration solution also provides options to automatically generate features configured for data point objects in the N1 network system as data object extensions in the NIE. The N1 Integration solution supports the following features:

- alarming and alarm limit parameters
- point history trend data collection
- totalization of events, runtime, and analog rate value

These feature generation options leave the existing N1 feature configurations unchanged.

The Metasys system extended architecture also provides a new Site Management Portal user interface, which allows you to view and edit existing N1 schedules and calendars.

### N1 Network Data Import Utility

The N1 network data import utility is part of the System Configuration Tool (SCT) and facilitates the N1 Integration process in offline mode. The utility reads the N1 point object configuration from a Metasys OWS workstation file and converts this information to an Extensible Markup Language (XML) based data structure, which can be used to automatically set up the table of N1 point objects in the NIE. This utility also imports the N1 Personal Computer (PC) Groups for generating a similar display structure in the navigation tree of the Web-enabled Metasys UI, as shown on the OWS.

### Automatic Discovery

The table of N1 point objects can also be generated online by the NIE. The NIE uses the N1 global data to penetrate the NCM database and automatically populate the navigation tree with the objects it finds. The user can then confirm or delete each point object for permanent mapping into the NIE database. This feature also helps keep the NIE synchronized with any changes that you make on the integrated Metasys N1 network.

When mapping N1 point objects to the NIE database, the automatic discovery process also generates alarming, trend, and totalization extensions to the mapped objects that match the parallel features in the N1 network.

### Software for Efficient Building Operation

NIEs ship with the latest version of the Metasys system software, which provides the following features:

- **Metasys Site Management Portal User Interface** provides data and graphic screens to supported Web browsers. Authorized users simply log on to the NIE from the Web browser to access the Site Management Portal. This embedded user interface is ideal for smaller networks and remote locations where a dedicated computer platform to support a user interface is not required.
- **System Security** enables an NIE to recognize legitimate users with valid user IDs and passwords at the Site Management Portal user interface. User access data is encrypted in the transmission and in the NIE database. The system administrator manages user profiles, authorization levels, user ID, password, and specific NIE data access privileges in each user account.



Metasys Site Management Portal Screen

- **Monitoring and Control** works with all the mechanical and electrical systems in a typical building by collecting data from the field devices and then coordinating and sending the required commands to the controlled equipment at the required priority.
- **Transaction Recording** audits and logs all user actions performed through the NIE.
- **Alarm and Event Processing** enables NIEs to send alarm and event messages to Web browsers, pagers, e-mail servers, Network Management Systems, and serial printers, as well as store and view alarm and event logs on the NIE and transfer it to an ADS.
- **Historical Trend Data** is collected by NIEs for any monitored value at user-defined intervals, or trending can be based on Change-of-Value. You can use trend logs to analyze building system performance and locate system problems. NIE trend logs can be transferred to the ADS at defined intervals or when the NIE logs are full.
- **Totalization Data** allows you to monitor energy (and other consumables) use and generate cost reports to support utility cost reductions, and also provides data for service, maintenance, and early identification of building system problems.
- **Trend Studies** allows you to view multiple trend extensions in a single view to facilitate monitoring and troubleshooting your Metasys site.
- **Scheduling** allows you to define occupancy periods and start and stop times for mechanical or electrical equipment. Operating parameters can be set according to time of day, day/days of the week, holiday, or for calendar dates.

- **Network-Wide System Interlocking** enables NIEs to collect field controller data, make logical comparisons, and issue relevant commands to other field controllers anywhere on the network.
- **Optimal Start** automatically determines the best time to start heating and cooling systems to ensure that the facility is ready for occupants. It adjusts to seasonal variations and reduces energy use.
- **Demand Limit and Load Rolling (DLLR)** monitors energy meters for electricity, gas, steam, or water, and automatically sheds equipment loads according to user-defined levels. Demand Limit helps manage utility demand charges. Load Rolling controls equipment operating levels to reduce total energy consumption. Comfort overrides prioritize equipment shedding.
- **Database Configuration Management** allows you to define the Metasys system configuration and database offline for download to the NIE. All the required database configuration software resides on the NIE or SCT. You do not need a copy of the database on your local client computer to make authorized changes.

All the software required for the Metasys N1 network configuration and the configuration of N2 devices connected to NCMs continues to reside on an OWS workstation. The N1 network configuration is normally complete and requires only minor changes after the N1 network has been integrated through an NIE.

### Hardware Features

We designed the Network Integration Engine to provide industrial level reliability for the building controls market. The NIE features two main hardware platforms: the NIE55 and NIE85. These platforms feature different hardware to allow for scalability in various applications.

The NIE55 Series features:

- industrial Single Board Computer (SBC)
- embedded Microsoft® Windows® Embedded Standard (WES) 2009 operating system
- nonvolatile solid-state Flash memory to store all programs and data
- battery backup to keep the NIE online and operating during short power outages, and to transfer data from Dynamic Random Access Memory (DRAM) into Flash memory when the power supply fails

- real-time clock with battery backup
- status-indicating Light-Emitting Diodes (LEDs) for power, communications, and fault detection allow easy troubleshooting
- optional internal modem
- removable terminal block plugs for 24 VAC power
- standard 9-pin sub-D connectors for RS232C Serial ports A and B
- standard USB ports for USB Serial Ports A and B
- RJ11 telephone line port for internal modem
- RJ45 port for Ethernet connection

The NIE85 has most of the features of the NIE55 and features a scalable design. The NIE85 does not support:

- direct connect
- call-out to an ADS/ADX
- Device Reset command in the Metasys system UI

Consider the following when adding an NIE85. The NIE85:

- supports up to four supervisory devices when configured as a Site Director
- is limited to ten simultaneous users
- is not upgradeable using the NAE Update Tool
- should use an Uninterruptible Power Supply (UPS) for orderly shutdown in the event of sudden power loss. Order the UPS separately.

### Conclusion

The Metasys N1 Network Integration solution affirms Johnson Controls as a leader in the building automation systems industry. The NIE shows the commitment to provide an effective and innovative way to migrate existing Metasys N1 systems to benefit from new technologies that provide even more opportunities for the efficient management of buildings.

The integration of IT and Internet standards into the NIE merges the benefits of global communications and building automation controls into one system. Web browser-based access from any location is a key to the effective use of the automation network.

The Metasys system continues to be the network integration solution in buildings and is now extended to connect to the business and communication network systems of the enterprise. The NIE and the Metasys Web-enabled networks are wise investments that yield returns to the building owner and operator well into the future.

### Repair Information

If the Network Integration Engine fails to operate within its specifications, replace the unit. For a replacement NIE, contact the nearest Johnson Controls® representative.

**Table 2: NIE55 Series Ordering Information**

Product Code Number <sup>1</sup>	Description
<b>MS-NIE55xx-x (Base Features of Each NIE55)</b>	NIE Network Integration Engines: Requires a 24 VAC power supply. Each model includes two RS-232-C serial ports, two USB serial ports, one Ethernet port, and one MS-BAT1010-0 Data Protection Battery.
<b>MS-NIE5510-1</b>	Supports N1 network migrations.
<b>MS-NIE5510-2</b>	Supports N1 network migrations.
<b>MS-NIE5511-1</b>	Supports N1 network migrations, includes an internal modem.
<b>MS-NIE5511-2</b>	Supports N1 network migrations, includes an internal modem.

1. Some models are also available in a Buy American version (add a G after the code number). For the European version, add an E after the code number. For repair parts, add -701 after the code number for -1 models.

**Table 3: NIE85 Series Ordering Information**

Product Code Number	Description
<b>MS-NIE8500-0<sup>1</sup></b>	Rack-mount server preloaded with supported operating system, Nx85 software, and other Metasys system software components; supports up to 10,000 objects.
<b>MS-NxE85SW-0<sup>1</sup></b>	New Nx85 software only; for new installations/projects
<b>MS-NxE85SW-6<sup>1</sup></b>	Upgrade Nx85 software only; for existing Nx85 engines

1. Standard NIE85 models support 10,000 objects; an expansion upgrade is available to support an additional 15,000 objects.

**Table 4: NIE Accessories Ordering Information**

Product Code Number	Description
<b>MS-15KUPG-0</b>	15,000 object expansion upgrade for Nx85 (one expansion only per Nx85)
<b>MS-MULTENGSW-6</b>	Contains ToggleTunnel utility for converting an NAE55/NIE55 to an NAE55 model with the N2 Tunneling features enabled.
<b>MS-RAP-0</b>	Ready Access Portal Server provides a user interface that is a natural, complementary extension of the Metasys Site Management Portal. <b>Note:</b> This option is not necessary for sites that have an ADS/ADX that is the Site Director because Ready Access Portal is provided with the ADS/ADX solution.
<b>MS-EXPORT-0</b>	Export Utility extracts historical trend, alarm, and audit data from the system and presents the historical data in a variety of formats. <b>Note:</b> This option is not necessary for sites that have an ADS/ADX that is the Site Director because Export Utility is provided with the ADS/ADX solution.
<b>MS-BAT1010-0</b>	Replacement data protection battery for NAE55 and NIE55. Rechargeable gel cell battery with a typical life of 3 to 5 years at 21°C (70°F).
<b>AS-XFR100-1</b>	Power transformer (Class 2, 24 VAC, 92 VA maximum output), with enclosure
<b>AS-XFR010-1</b>	Power transformer (Class 2, 24 VAC, 92 VA maximum output), no enclosure
<b>(OEM Part No.) SC450RM1U</b>	Recommended Uninterruptible Power Supply for NIE85 Models: American Power Conversion (APC®) Smart-UPS SC 450 VA, 280 W 120 VAC input/output with NEMA 5-15R output connections

## Technical Specifications

### NIE55xx-1

<b>Power Requirement</b>	Dedicated Nominal 24 VAC, Class 2 Power Supply (North America), Safety Extra-Low Voltage (SELV) Power Supply (Europe), at 50/60 Hz (20 VAC Minimum to 30 VAC Maximum)
<b>Power Consumption</b>	50 VA Maximum
<b>Ambient Operating Conditions</b>	0 to 50°C (32 to 122°F), 10 to 90% RH, 30°C (86°F) maximum dew point
<b>Ambient Storage Conditions</b>	-40 to 70°C (-40 to 158°F), 5 to 95% RH, 30°C (86°F) maximum dew point
<b>Data Protection Battery</b>	Supports data protection on power failure. Rechargeable gel cell battery; 12 V, 1.2 Ah, with a typical life of 3 to 5 years at 21°C (70°F); Product Code Number: MS-BAT1010-0
<b>Clock Battery</b>	Maintains real-time clock through a power failure. Onboard cell; typical life 10 years at 21°C (70°F)
<b>Processor</b>	400 MHz Pentium® Geode® GX533 processor for MS-NIE55xx-1 models
<b>Memory</b>	512 MB Flash nonvolatile memory for operating system, configuration data, and operations data storage and backup for MS-NIE55xx-1 models 256 MB Synchronous Dynamic Random Access Memory (SDRAM) for operations data dynamic memory for all models
<b>Operating System</b>	Microsoft Windows XP embedded
<b>Network and Serial Interfaces</b>	One Ethernet port; 10/100 Mbps, 8-pin RJ-45 connector (N1 migration connection) Two RS-232-C serial ports, with standard 9-pin sub-D connectors, that support all standard baud rates Two USB serial ports, standard USB connectors Options: One telephone port for internal modem; up to 56 Kbps, 6-pin RJ-11 connector
<b>Housing</b>	Plastic housing with internal metal shield Plastic material: ABS + polycarbonate UL 94-5VB Protection: IP20 (IEC 60529)
<b>Mounting</b>	On flat surface with screws on four mounting feet or on dual DIN rail
<b>Dimensions (Height x Width x Depth)</b>	226 x 332 x 96.5 mm (8.9 x 13.1 x 3.8 in.) including mounting feet Minimum space for mounting NIE: 303 x 408 x 148 mm (12.0 x 16.1 x 5.8 in.)
<b>Shipping Weight</b>	2.9 kg (6.4 lb)
<b>Compliance</b>	<b>United States:</b> UL Listed, File E107041, CCN PAZX, UL 916, Energy Management Equipment; FCC Compliant to CFR47, Part 15, Subpart B, Class A <b>Canada:</b> UL Listed, File E107041, CCN PAZX7, CAN/CSA C22.2 No. 205, Signal Equipment; Industry Canada Compliant, ICES-003 <b>Europe:</b> CE Mark – Johnson Controls, Inc., declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC. <b>Australia and New Zealand:</b> C-Tick Mark, Australia/NZ Emissions Compliant



### NIE55xx-2

<b>Power Requirement</b>	Dedicated nominal 24 VAC, Class 2 power supply (North America), Safety Extra-Low Voltage (SELV) power supply (Europe), at 50/60 Hz (20 VAC minimum to 30 VAC maximum)
<b>Power Consumption</b>	50 VA maximum
<b>Ambient Operating Conditions</b>	0 to 50°C (32 to 122°F); 10 to 90% RH, 30°C (86°F) maximum dew point
<b>Ambient Storage Conditions</b>	-40 to 70°C (-40 to 158°F); 5 to 95% RH, 30°C (86°F) maximum dew point
<b>Data Protection Battery</b>	Supports data protection on power failure. Rechargeable gel cell battery; 12 V, 1.2 Ah, with a typical life of 3 to 5 years at 21°C (70°F); Product Code Number: MS-BAT1010-0
<b>Clock Battery</b>	Maintains real-time clock through a power failure. Onboard cell; typical life 10 years at 21°C (70°F)
<b>Processor</b>	1.6 GHz Intel® Atom™ processor
<b>Memory</b>	4 GB Flash nonvolatile memory for operating system, configuration data, and operations data storage and backup 1 GB Synchronous Dynamic Random Access Memory (DRAM) for operations data dynamic memory for all models
<b>Operating System</b>	Microsoft® Windows® Embedded Standard (WES) 2009
<b>Network and Serial Interfaces</b>	One Ethernet port; connects at 10 Mbps, 100 Mbps, or 1 Gbps; 8-pin RJ-45 connector Two RS-232-C serial ports, with standard 9-pin sub-D connectors, that support all standard baud rates Two USB serial ports; standard USB connectors support an optional, user-supplied external modem Options: One telephone port for internal modem; up to 56 kbps; 6-pin RJ-12 connector
<b>Housing</b>	Plastic housing with internal metal shield Plastic material: ABS + polycarbonate; Protection: IP20 (IEC 60529)
<b>Mounting</b>	On flat surface with screws on four mounting feet or on dual 35 mm DIN rail
<b>Dimensions (Height x Width x Depth)</b>	226 x 332 x 96.5 mm (8-7/8 x 13-1/8 x 3-13/16 in.) including mounting feet Minimum space for mounting: 303 x 408 x 148 mm (12 x 16-1/8 x 5-13/16 in.)
<b>Shipping Weight</b>	2.9 kg (6.4 lb)
<b>Compliance</b>	<b>United States:</b> UL Listed, File E107041, CCN PAZX, UL 916, Energy Management Equipment, FCC Compliant to CFR47, Part 15, Subpart B, Class A <b>Canada:</b> UL Listed, File E107041, CCN PAZX7, CAN/CSA C22.2 No. 205, Signal Equipment, Industry Canada Compliant, ICES-003 <b>Europe:</b> CE Mark – Johnson Controls, Inc., declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC. <b>Australia and New Zealand:</b> C-Tick Mark, Australia/NZ Emissions Compliant



**NIE85**

<b>Computer Type</b>	Dell® PowerEdge® R410
<b>Power Requirement</b>	100–240 VAC 50/60 Hz
<b>Power Supply</b>	480 W
<b>Ambient Operating Conditions</b>	10 to 35°C (50 to 95°F); 20 to 80% RH, noncondensing (twmax=29C)
<b>Ambient Storage Conditions</b>	-40 to 65°C (-40 to 149°F); 5 to 95% RH, noncondensing (twmax=38C)
<b>Data Protection</b>	Recommended Uninterruptible Power Supply (UPS): American Power Conversion (APC®) Smart-UPS SC 450 VA, 280 W, 120 VAC input/output, NEMA 5-15R output connections, OEM Part No. SC450RM1U
<b>Processor</b>	Intel® Xeon® E5506, 2.13 GHz, 4 MB Cache
<b>Memory</b>	2 GB DDR2, 1,066 MHz, 2 x 1 GB, Single Ranked UDIMMs for 1 Processor
<b>Hard Disk</b>	2 x 160 GB 7.2K RPM Serial Advanced Technology Attachment (SATA), 8.9 cm (3-1/2 in.) Cabled 3 Gbps, RAID 1 configuration with add-in SAS6/iR (SATA/SAS Controller)
<b>Internal Optical Drive</b>	DVD ROM, SATA
<b>Operating System</b>	Microsoft® Windows® Web Server 2008 R2 OS (64-bit)
<b>AntiVirus Software</b>	Symantec® AntiVirus Corporate Edition Version 11
<b>Network and Serial Interfaces</b>	2 RJ45 1 Gbps Ethernet Ports, Port 2 is disabled 2 video ports; 1 front, 1 back 1 9-pin Serial port 4 USB ports (2 front, 2 back)
<b>Dimensions (Height x Width x Depth)</b>	4.3 x 43.4 x 62.7 cm (1-11/16 x 17-1/8 x 24-11/16 in.)
<b>Mounting</b>	Mount in an EIA-310D compatible server cabinet
<b>Shipping Weight</b>	15.9 kg (35 lb)
<b>Compliance</b>	Europe: CE Mark (Record Holder: <a href="http://www.dell.com/regulatory_compliance">www.dell.com/regulatory_compliance</a> )

**Computer Requirements for NxE85 Installation/Upgrade**

<b>Product Code</b>	MS-NxE85SW-0	NxE85 software for 10,000 objects (new projects only software)
<b>Recommended Computer Platform</b>	Intel® Xeon® E5506, 2.13 GHz, 4 MB Cache 2 x 160 GB 7.2K RPM Serial Advanced Technology Attachment (SATA), 8.9 cm (3.5 in.) Cabled 3 Gbps, RAID 1 configuration with add-in SAS6/iR (SATA/SAS Controller) DVD ROM, SATA	
<b>Memory</b>	1 GB RAM minimum	
<b>Hard Disk</b>	160 GB minimum	
<b>Supported Operating Systems and Software</b>	<b>Microsoft® Windows® Web Server 2008 R2 OS (64-bit)</b> IIS Version 7.5, Microsoft .NET Framework Version 3.5.1 <b>Microsoft Windows Web Server 2008 OS (32-bit) with SP1</b> IIS Version 7.0, Microsoft .NET Framework Version 3.5 with SP1 <b>Microsoft Windows 2003 Web Edition OS (32-bit) with SP2</b> IIS Version 6.0, Microsoft .NET Framework Version 3.5 with SP1	
<b>Network Communication</b>	Network Interface: Single 1 Gbps Ethernet network interface card 10/100/1000 Mbps (100 Mbps or better recommended)	
<b>Data Protection</b>	Recommended Uninterruptible Power Supply (UPS): American Power Conversion (APC®) Smart-UPS SC 450VA, 280 W, 120 VAC input/output, NEMA 5-15R output connections, OEM Part No. SC450RM1U	

The performance specifications are nominal and conform to acceptable industry standard. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

**United States Emissions Compliance**

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when this equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his/her own expense.

**Canadian Compliance Statement**

This Class (A) digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulations. Cet appareil numérique de la Classe (A) respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

**Building Efficiency**

507 E. Michigan Street, Milwaukee, WI 53202

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**Corporate Elevator Consultants, Inc.**  
**Michigan Technological University**  
**Building #1 — Administration Building**

Elevator	Priority	Project	Action Required	Approx Cost	Benefits
Dover Bldg. #1 SOM #12744	HIGH	Total Modernization	Critical need for Complete Modernization all controls old relay logic, old DC Generator, Not Energy Efficient	\$250,000	Save Energy, More Reliable, Safer, Less Shutdowns
Dover Bldg. #2 SOM #12745	HIGH	Total Modernization	Critical need for Complete Modernization all controls old relay logic, old DC Generator, Not Energy Efficient	\$250,000	Save Energy, More Reliable, Safer, Less Shutdowns
<b>Total Approximate Costs:</b>				<b>\$500,000</b>	

**Michigan Technological University**  
**Building #5 — Academic Building**

Elevator	Priority	Project	Action Required	Approx Cost	Benefits
Otis Freight SOM #5784	HIGH	Total Modernization	Critical need for Complete Modernization all controls old relay logic, winding drum Not Energy Efficient	\$250,000	Save Energy, More Reliable, Safer, Less Shutdowns
<b>Total Approximate Costs:</b>				<b>\$250,000</b>	

**Michigan Technological University**  
**Building #20 — R. L. Smith Mechanical Engineering Building Tac 50 Controls**

Elevator	Priority	Project	Action Required	Approx Cost	Benefits
Dover Bldg. #1 SOM #13968	LOW	Upgrade	Replace signal fixtures	\$25,000	Improved Reliabilty with Digital display no burnt out bulbs
Dover Bldg. #2 SOM #13969	LOW	Upgrade	Replace signal fixtures	\$25,000	Improved Reliabilty with Digital display no burnt out bulbs
Dover Bldg. #3 SOM #13970	LOW	Upgrade	Replace signal fixtures	\$25,000	Improved Reliabilty with Digital display no burnt out bulbs
<b>Total Approximate Costs:</b>				<b>\$75,000</b>	



**Corporate Elevator Consultants, Inc.**  
**Michigan Technological University**  
**Building #19 — Chemical Science & Engineering Building**

<b>Elevator</b>	<b>Priority</b>	<b>Project</b>	<b>Action Required</b>	<b>Approx Cost</b>	<b>Benefits</b>
Otis Bldg. #1 Service SOM #11644	None	Newly Modernized in 2006	NONE		
Otis Bldg. #2 Passenger SOM #11645	None	Newly Modernized in 2006	NONE		
Otis Bldg. #3 Passenger SOM #11646	None	Newly Modernized in 2006	NONE		
Otis Bldg. # Freight SOM #11657	Low	Upgrade	Modernization Potential, Old Original Controls, Motors, and Electrical Mechanical components	\$200,000	Save Energy, More Reliable, Safer, Less Shutdowns
<b>Total Approximate Costs:</b>				<b>\$200,000</b>	

**Corporate Elevator Consultants, Inc.**  
**Michigan Technological University**  
**Building #7 — Electrical Energy Resource Center**

Elevator	Priority	Project	Action Required	Approx Cost	Benefits
Dover Bldg. #1 SOM #16472	HIGH	Upgrade	Upgrade Key components, Selectors, Door Operators, and New Fixtures and New Cab interiors	\$85,000	Much more dependable leveling less shutdowns improved service improved perception
Dover Bldg. #2 SOM #16473	HIGH	Upgrade	Upgrade Key components, Selectors, Door Operators, and New Fixtures and New Cab interiors	\$85,000	Much more dependable leveling less shutdowns improved service improved perception
Dover Bldg. #3 SOM #16474	HIGH	Upgrade	Upgrade Key components, Selectors, Door Operators, and New Fixtures and New Cab interiors	\$85,000	Much more dependable leveling less shutdowns improved service improved perception
<b>Total Approximate Costs:</b>				<b>\$255,000</b>	

**Michigan Technological University**  
**Building #8 — Dow Environmental Sciences & Engineering Building**

Elevator	Priority	Project	Action Required	Approx Cost	Benefits
Dover Bldg. #1 Passenger/Service SOM #32994	None	None	NONE		
Otis Bldg. #2 Passenger SOM #32993	None	None	NONE		
<b>Total Approximate Costs:</b>				<b>\$0</b>	

**Michigan Technological University**  
**Building #14 — Dillman Hall**

Elevator	Priority	Project	Action Required	Approx Cost	Benefits
Shepard – Warner Freight SOM #8636	HIGH	Total Modernization	Critical need for Complete Modernization all controls old relay logic, old DC Generator, Not Energy Efficient	\$250,000	Save Energy, More Reliable, Safer, Less Shutdowns
<b>Total Approximate Costs:</b>				<b>\$250,000</b>	

**Corporate Elevator Consultants, Inc.**  
**Michigan Technological University**  
**Buildings #12R & #12U — M M & E Undergrad**

<b>Elevator</b>	<b>Priority</b>	<b>Project</b>	<b>Action Required</b>	<b>Approx Cost</b>	<b>Benefits</b>
Detroit Elevator North SOM #8113	<b>HIGH</b>	Total Modernization	Critical need for Complete Modernization all controls old relay logic, Not Energy Efficient	\$250,000	Save Energy, More Reliable, Safer, Less Shutdowns
Dover North SOM #27862	Low	Upgrade	Future consideration for control change to solid state in 5 years - Hydraulic Elevator	\$100,000	More Reliable Less Shutdowns
Dover North SOM #26808	Low	Upgrade	Future consideration for control change to solid state 5 years from now, get rid of DC Generators	\$175,000	Save Energy, More Reliable, Safer, Less Shutdowns
Dover Car W/Future Hatch SOM #26809	Low	Upgrade	Future consideration for control change to solid state 5 years from now, get rid of DC Generators	\$175,000	Save Energy, More Reliable, Safer, Less Shutdowns
<b>Total Approximate Costs:</b>				<b>\$700,000</b>	