

## MEMORANDUM

**DATE:** October 7, 2021

**TO:** Planning and Resources Committee

**From:** Debbie Martin, Assistant Vice-President and Chief Facilities Officer

**RE:** **Asset Management Plan (AMP) – Update**

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### Background

The AMP Version 2, dated December 2012, was approved by the Planning and Building Committee on January 17, 2013, and by the Board of Governors on June 6<sup>th</sup>, 2013. Subsequent updates were submitted for information to the Planning and Building Committee (latterly the Planning & Resources Committee) with the latest update on April 2, 2020.

This report provides an update on the status of deferred maintenance at McMaster.

### Strategic Context

The University manages 760,840 square meters in 66 buildings spread across its main campus, downtown campus and Burlington campus. The list of buildings, area and age of buildings is included as part of Appendix B. Out of the 66 buildings, 46 buildings (70%) are over 40 years old. With the total deferred maintenance backlog for all the buildings and infrastructure at \$404.7M funding for deferred maintenance remains a high priority. The growing deferred maintenance issue was identified in the original AMP back in 2012, and since then the University has been incrementally increasing its allocation from \$2.15M in 2012 to \$10.7M/year in 2021.

### Assessment methodology change, Data Harmonization with the Colleges and the new direction:

In 2019/20, the Ontario Universities undertook an exercise to harmonize their individual FCI data. In past, different methodologies between the University sector and other sectors in the province (most notably colleges and hospitals), has meant comparing data has been extremely challenging. In addition, University FCI appeared to be very low in comparison to others in the sector, which long-term would disadvantage Universities with funding opportunities.

The data harmonization process has also looked to more accurately define the true current replacement value of a facility and provide defensible system cost and condition data. As we migrated towards the new system model, our Replacement Values (CRV) of the buildings changed dramatically in the April 2020 AMP update from previous updates. Data clean-up is still happening as McMaster audits 20% of the campus every year, so the year over year comparisons may not be fully possible until 2025.

In order to have harmonized data with that of the Colleges, the University data underwent a few changes:

- Introduction of a 30% soft cost multiplier to all requirement costs.



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- The FCI definition was changed to align with the College sector, and the new FCI calculation includes action items for 3 years instead of 5 years.
- Turn on the auto-renewal feature. This will generate automatic requirements as building systems approach their theoretical end of life. This feature duplicates some requirements and these duplications are captured and deleted during the annual audit of our buildings.

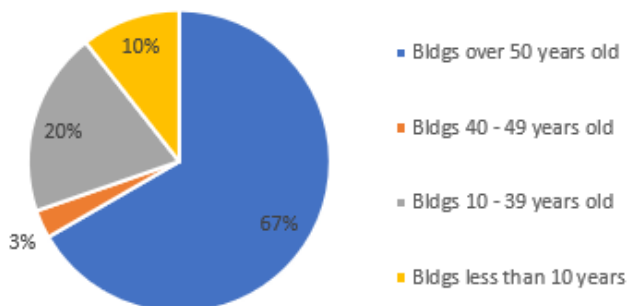
McMaster’s backlog of DM consists of nearly 75 percent Priority 3 requirements which have at least a 5-year timeline, and many of those requirements will be omitted from the FCI calculation in this new approach. This decreases our overall FCI numbers. The 30 percent soft cost multiplier and turning on auto renewal increases our FCI numbers. All of these changes, combined with addition of new buildings to the campus portfolio, affect the FCI numbers. As such, starting from the April 2020 update, Facility Services will be focusing on the DM backlog rather than the FCI. The granular building level breakdown of DM backlog can be found in the new building dashboards under Appendix C. The chart that shows the FCI and RI (Requirements Index) by building is included under Appendix B.

### Asbestos Liability:

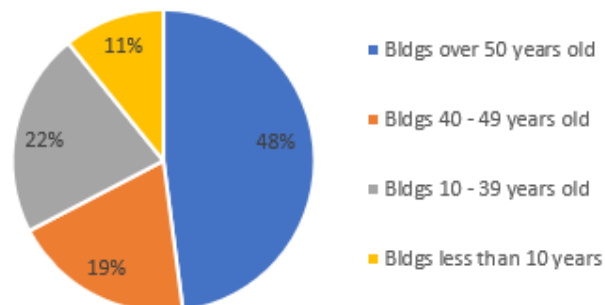
There is no consistent approach across Ontario Universities regarding asbestos liability reporting. Some Universities include the asbestos liability within their backlog requirements and most of the others do not. McMaster has traditionally not included this liability within the backlog requirements cost but is doing so effective 2020. In September 2019, we had a consultant estimate McMaster’s total asbestos liability. Asbestos is present in 43 buildings (including MUMC) along with the service tunnels. The high-level estimate for our asbestos liability is \$86M for the known asbestos containing material locations (\$60M of this estimate is related to the University portion of the MUMC Building).

### The Aging Infrastructure

As is the case with most Canadian Universities, McMaster has an aging portfolio with the majority of our buildings over 50 years old. See charts below. As many of the major buildings systems reach their theoretical end of service life after 50 years (as defined by BOMA standards), the 50-year mark for a building is significant.



Number of buildings based on age



Gross area based on age

**Figure 1 – Pie-charts showing age of buildings**

**Current facility data compared with data reported in AMP Version 2:**

Facility Services continuously updates McMaster University’s asset management database as deferred maintenance projects are created, implemented, and completed. McMaster re-audits 20% of the campus every year, so that each asset is audited at least once every 5 years. Table 1 below compares the data reported in the AMP Version 2 dated December 2012 to numbers in the AMP update of April 2020 and to the current numbers.

**Table 1 – Current campus data Comparison to AMP Version 2 report**

#	Description	2012			2020			2021		
		All Bldg. & Infrastructure	HCS	MUMC	All Bldg. & Infrastructure	HCS	MUMC	All Bldg. & Infrastructure	HCS	MUMC (McMaster 38%)
1	Number of buildings	43	12	1	53	13	1	53*	13**	1
2	Total Gross Area of buildings	356,786 m <sup>2</sup>	93,744 m <sup>2</sup>	118,268 m <sup>2</sup>	424,224 m <sup>2</sup>	108,716 m <sup>2</sup>	118,268 m <sup>2</sup>	424,244 m <sup>2</sup>	108,716 m <sup>2</sup>	118,268 m <sup>2</sup>
3	Current Replacement Value	\$1.36B	\$187 M	\$221.1 M	\$2.068 B	\$308.57 M	\$256.96 M	\$2.108 B	\$356.76 M	\$264.67 M
4	Deferred Maintenance backlog (All Priorities)	\$227 M	\$28 M	\$80 M	\$419.77 M	\$81.57 M	\$212.53 M	\$404.65 M	\$57.52 M	\$262.35 M
5	Prioritized Priorities Backlog	\$159 M	N/A	N/A	\$327.69 M	N/A	N/A	\$293.91M	N/A	N/A
6	McMaster Portfolio Gross Area	568,798 m <sup>2</sup>			651,208 m <sup>2</sup>			651,208 m <sup>2</sup>		
7	McMaster Portfolio CRV	\$1.75 B			\$2.63 B			\$2.73 B		
8	McMaster Portfolio DM Backlog	\$335 M			\$713.87 M			\$732.52M		
9	McMaster Portfolio DM Backlog with Asbestos				\$799.87M			\$818.52M		

\*Buildings demolished or sold since 2012: T18, T28, T29 and CIM Ancaster. Buildings added since AMP Version 2: T32, T33, T34, David Braley Health Sciences Centre, Halton McMaster Family Health Centre, L. R. Wilson Hall, ABB new tower addition, Peter George Centre for Living and Learning and the houses 182



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\*\*PGCLL is a mixed use building which has both academic and residence activities, it is split between both academic and HCS portfolios.

The change in the assessment methodology, requirement costing, and the aging infrastructure contributed to a dramatic increase in the DM backlog in the 2020 update. The DM backlog has decreased slightly in this update with the exception of the MUMC building. The 'All Buildings and Infrastructure' column in Table 1 (includes all academic and ancillary buildings on campus as well as the campus infrastructure) the DM backlog for all priorities has decreased from \$419.77M to \$404.65M a 3.6% percent decrease.

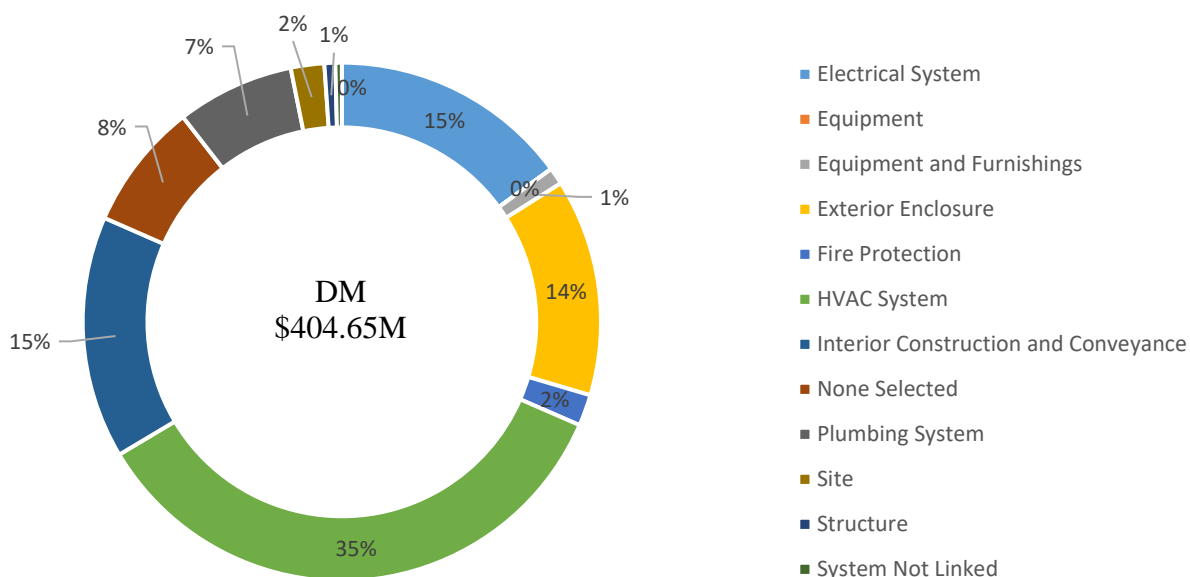
There was an investment of \$105.31M on DM over the last ten (10) years (from 2012 to 2021). This includes both the University annual contribution and the Facilities Renewal funding provided by the Provincial Government. Numerous HVAC, electrical, plumbing, fire safety and exterior envelope projects were undertaken and successfully completed in these years. A listing of completed DM projects is included in Appendix A.

Many HCS Buildings (Matthews, McKay, Woodstock, Brandon and Bates) built in years 1964 to 1971 are at the 50-year mark where many new requirements have been added to the backlog list. The DM backlog increased dramatically in the 2020 update however since the clean-up of some requirement duplication, the DM backlog has decreased from \$81.57M to \$57.52M, a 29.5 percent decrease in the HCS buildings.

McMaster and Hamilton Health Sciences have jointly retained Nadine International, a building assessment service provider, to do a comprehensive review of the McMaster University Medical Centre (MUMC). This data will be helpful in assessing ongoing commitments by both organizations to the building and whether current investments are sufficient for ongoing use for the next 40 years. The DM backlog value currently is at \$262.35 reflects McMaster's portion and is based on the 2018 condition assessment and the data harmonization that occurred thereafter.

The DM breakdown for the "All Buildings and Infrastructure" portfolio by Building System is shown in Figure 2 below.

### DM Breakdown by System Group



**Figure 2: Pie Chart – DM breakdown per Building System**

The electrical system (15%), exterior enclosure (14%) HVAC systems (35%), interior systems and conveyance (15%) and plumbing systems (7%) comprise 86 percent of the total \$404.65M deferred maintenance requirements.

#### Funding the Asset Management Plan

Currently the University funds deferred maintenance from the operating budget. The asset management base was increased by \$2 million in each of 2013/14, 2014/2015, 2015/16 and 2016/17; i.e., until the allocation reached an annual base increase of \$8M per year. This allocation continued for years 2017/18 and 2018/19. An increase of \$700,000 on a continued basis was approved to pay for the infrastructure projects at MUMC in 2019/20. In 2020/21, an additional \$1M was approved on an ongoing basis dedicated to the tunnels, buried utilities and other failing infrastructure upgrades. The total budget for deferred maintenance for 2021/22 is \$15.76M, which includes the \$9.7M base allocation, \$5.06M from the Ministry of Colleges and Universities for deferred maintenance needs and \$1M in additional operating funding within Facilities Services.

Table 2 shows the annual Deferred Maintenance and Facility Renewal Program budgets for the previous four years. <sup>1</sup>

<sup>1</sup>All campus buildings and infrastructures that provide and sustain their own funding for deferred maintenance are excluded. These include all HCS buildings, Parking Infrastructure, Divinity College and Student Centre.

**Table 2 – Summary of Deferred Maintenance Funding**

Funding Source	2018/19	2019/20	2020/21	2021/22
Ministry–FRP	\$3,642,629	\$3,561,800	\$3,390,000	5,060,900
McMaster - Facilities Operating Annual Allocation	\$1,000,000	\$1,000,000	\$1,000,000	1,000,000
McMaster - Asset Management Base Increase	\$8,000,000	\$8,700,000	\$9,700,000	9,700,000
<b>Total</b>	<b>\$12,642,649</b>	<b>\$13,261,800</b>	<b>14,090,000</b>	<b>\$15,760,000</b>

**The Facility Renewal Program - Ministry Fund**

On April 4<sup>th</sup>, 2014, the Ministry of Colleges and Universities announced enhanced future funding for the Facilities Renewal Program (FRP) beginning in 2015/16. The proposed phased-in funding increase raised the total allocation to all institutions from \$17.2 million to \$40 million in 2015/16 and 2016/17, with a further increase to \$60 million in 2017/18, \$80 million in 2018-19 and to \$100 million in 2019/20. Table 3 shows the ministry funding allocation of the previous years as well as projected funding for the next 2 years.

**Table 3: FRP Planned Government Investment (\$M)**

Ministry Fund						Projection for 2 years	
2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
\$40	\$60	\$80	\$80	\$144	\$144	174.5	174.5

The FRP funding provided to McMaster from the Ministry in the fall of 2020 was \$5,060,900 as compared to \$3,390,000 in the spring 2020, an increase of \$1,670,900. The Ministry provided another round of FRP funding in August 2021, matching the earlier contribution of \$5,060,900 but with a spending deadline of March 2022. Table 4 shows the FRP amounts McMaster received in the previous year and the anticipated amount for 2022.

**Table 4: FRP funds received and anticipated**

Status	Fund Date	Amount	Eligibility Period
Received	2020 April	\$3,390,000	Apr 2020 – Sep 2020
Received	2020 Sep	\$5,560,900	Oct 2020 – Sep 2021
Received	2021 Sep	\$5,560,900	Apr 2021 – Mar 2022
Anticipated	2022 April	\$5,560,900	Apr 2022 – Sep 2022

Discussions are occurring with provincial Universities through OAPPA (Ontario Association of Physical Plant Administrators) and Council of Senior Administrative Officers (CSAO) related to the FRP allocation

methodology. The current formula is based on the COU projected net assignable square meters. There are several new approaches being discussed based on the following 6 principles.

1. Model should be based on consistently collected, and validated data across universities
2. Model should reflect DM, renewal need, CRV, gross space, etc.
3. Model should not penalize or reward how a university has maintained their facilities
4. No dislocations of capital renewal funding between universities during formula transition
5. Model to incorporate a 'floor' to ensure no institution receives less than X% of funding
6. Model must have consistency in the sector's data to ensure equitable share between colleges and universities.

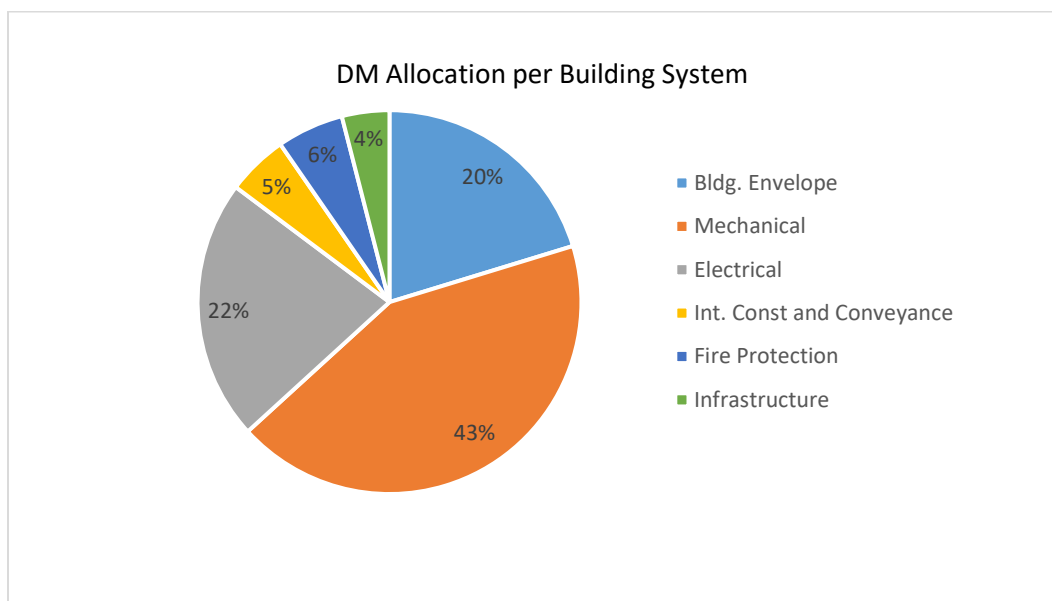
Based on these principles a formula based on %CRV (Base) + % FCI (Needs) may be adopted for distribution of FRP funds among colleges and universities. We anticipate this change would be a positive for the McMaster proportion of funds, but this has yet to be confirmed.

#### **Prioritization Criteria:**

Facility Services undertakes a prioritization process to select the DM projects every year. A review of the priorities from VFA, annual maintenance work orders, interviews with tradesmen, supervisors and front-line managers are conducted to select the most critical DM projects. The following are the considerations for project prioritization.

- Required repairs (failed systems) within Priorities 1, 2 or 3;
- Component failure that has or will affect the health & safety of the University students, staff, faculty or visitors;
- Higher priority for mechanical (HVAC and plumbing), electrical, building envelope and fire safety systems, which are considered critical building systems;
- Systems or components which are most likely to have a significant impact on the learning, teaching and research mission of University, if they fail;
- Items that have an impact on the reputation of the University;
- Systems that are likely to suffer from sudden failure.

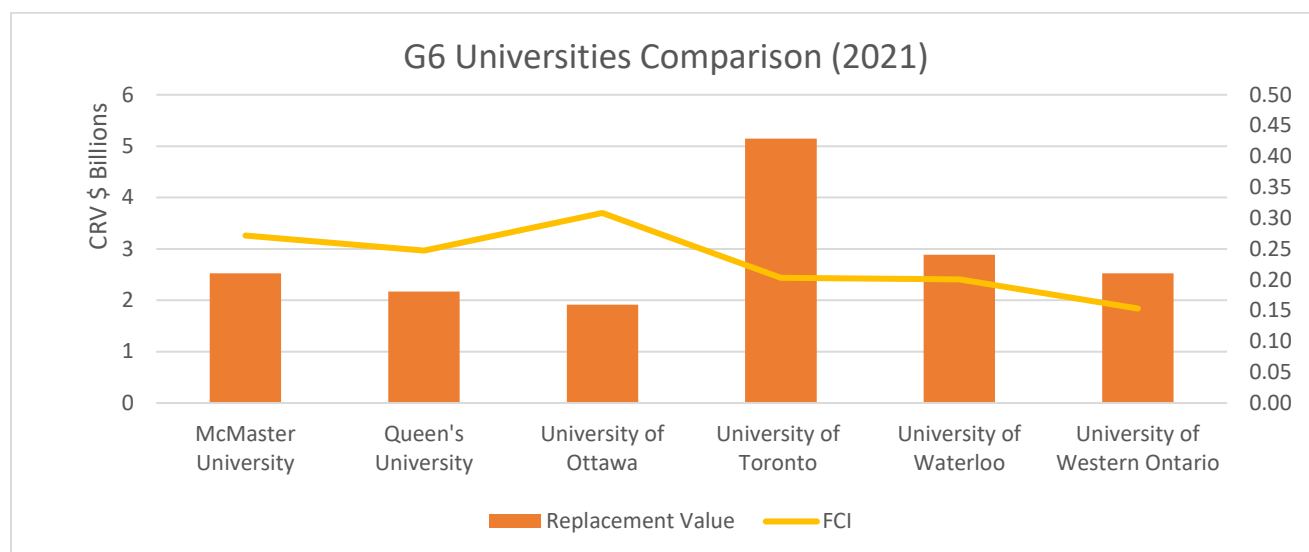
Figure 3 summarizes the percentage of the \$105.31M allocation per building system for the years 2012-13 to 2021-22. Ninety-five percent (\$100M) have been allocated to date on critical building systems such as building envelope - foundation, roofing, cladding, windows and doors, mechanical, electrical equipment, and fire safety systems; areas deemed to be the highest priorities within the Prioritized Priority backlog.



**Figure 3: Budget allocated to building system as a percentage of total funding: Years 2012-13 to 2021-22**

**Comparison to G6 Universities:**

The graph below (Figure 4) depicts comparative FCI, backlog and current replacement values for the G6 Universities. This information was obtained from VFA database that the universities use to manage their built assets and includes Academic and Residence assets.



**Figure 4: FCI and Backlog comparison to Ontario G6 Universities**



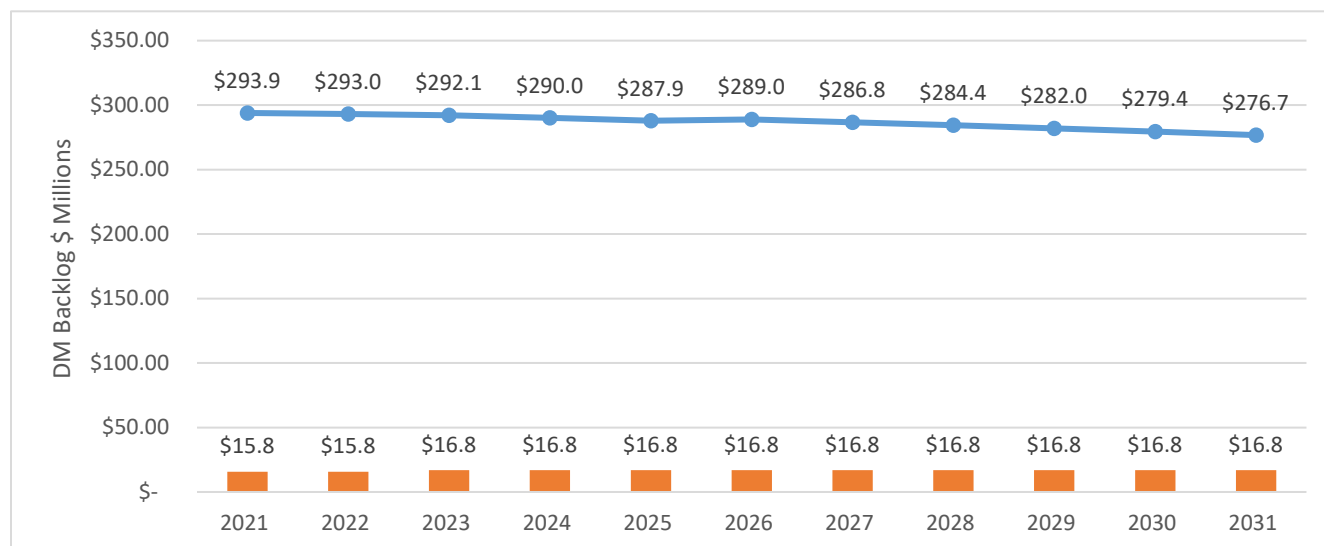
### **Deferred maintenance funding and its effect on backlog:**

In order to ensure DM money is spent on critical building systems, the non-critical components (systems which are least likely to suffer from sudden failure) were excluded, unless they became a health and safety issue. These include requirements such as flooring, ceiling and wall finishes, washroom upgrades, interior doors and hardware replacement, parking lots, sidewalks, site infrastructure except tunnels and buried utilities, grandfathered code compliance items, etc. The buildings that provide and sustain their own infrastructure funding such as Divinity College, the McMaster University Student Centre (MUSC) and the McMaster University Medical Centre (MUMC) were excluded. The Institute for Applied Health Sciences (IAHS) has a shared model between Mohawk College and McMaster for the DM on the building. The newly acquired houses on Sterling Street, Forsyth, Whitton and Mayfair were excluded as well. This reduced the DM backlog (Priorities 1 to 3) from \$732.52M to \$293.91M, a reduction of \$438.61M. This resulted in a shortened list of requirements focused on mission critical academic buildings and the most vulnerable building systems. As a note, the MUMC building is handled through a separate prioritization process with Hamilton Health Sciences.

Most of the requirements with Priority 1, 2 or 3 ratings are building systems that have exceeded their recommended life cycle. The priorities are assigned at the time of the visual assessment and may become a critical item due to sudden failure. Checking the maintenance work order log and interviews with trades and supervisors, help ensure that McMaster is allocating DM funding to the most vulnerable and failing building components. The proposed annual DM and FRP project list is created following this process and is presented to PRC for approval.

The priorities of \$293.91M is comprised of \$20.37M Priority 1, \$79M Priority 2 and \$194.54M Priority 3 items. The total available funding for deferred maintenance in 2022/23 is \$15.76M. Facility Services has allocated all of this to the most critical items, except for the \$3.3M commitment for the cooling tower project (environmental compliance), \$1.3M contribution to MUMC, a \$500,000 commitment for a joint project with the Faculty of Engineering to completed DM at the John Hodgins Engineering Building in conjunction with Faculty renovations, a \$1M commitment as McMaster Contribution to the Enabling Accessibility Fund grant application and a \$1M commitment for tunnels and buried utilities repairs.

The projection of the deferred maintenance backlog for the prioritized items, assuming current funding levels are maintained, is shown in Figure 5 below. **As the University funding is maintained at the current levels and the Ministry funding increases, the current backlog is projected to decrease by about 6% percent over the next 10 years.** This means that the University is making significant improvements to the critical deferred maintenance backlog. Many major projects such as the E.T. Clarke Boiler and Chiller replacement and Cooling Tower replacement are underway. Facility Services will continue to assess the building health (see appendix for building dashboards) and concentrate spending on the deferred maintenance of buildings that are in poor condition, thus ensuring that the Facility Condition Index (FCI) of buildings are in the good to fair range.



**Figure 5: Backlog forecast for Prioritized Priorities 1, 2, & 3**

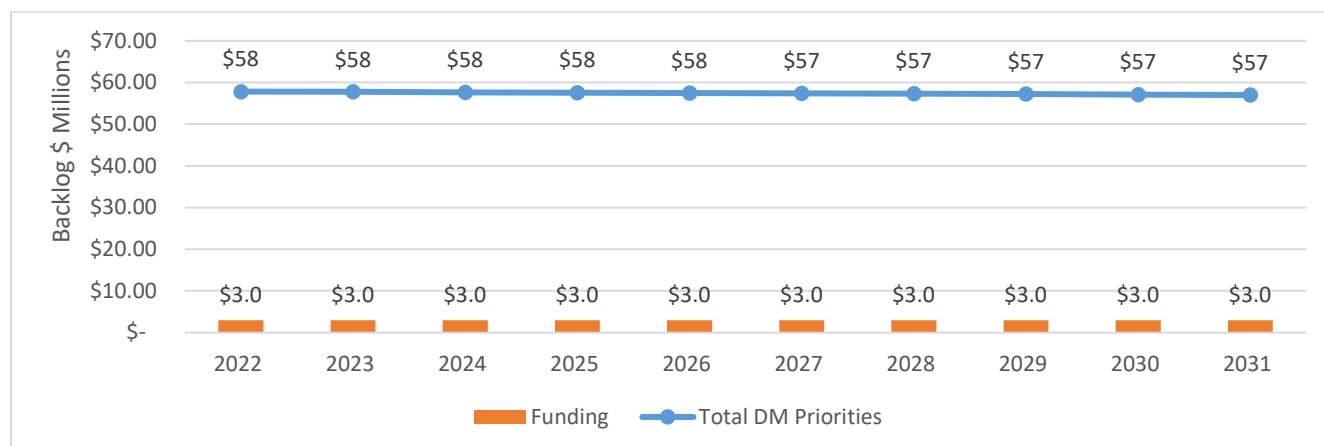
The following are assumptions made to generate this backlog forecast projection.

- Inflation at 2% and backlog deterioration at 3%
- Current internal funding is maintained and the Ministry FRP funding is sustained at the 2023/24 levels for the rest of the years
- New requirements as a result of future audits are not considered

### **Housing and Conference Services (HCS) Buildings**

HCS operations maintain its own funding for HCS buildings. 3M is set aside for deferred maintenance projects for 2022/23 (only \$1M was allocated in 2021/22 due to fiscal challenges related to Covid). There were funds set aside to do a major retrofit of Bates Residence, however these funds were spent on the HCS deficit this year. The planned retrofit of Bates Residence will substantially reduce the DM backlog of the HCS portfolio if and when this project proceed.

The effect of the deferred maintenance investment on the HCS backlog, based on the current deferred maintenance spending model, is depicted in Figures 6 below. The projection assumes sustained DM spending of \$3M for the next 10 years. **The DM backlog is projected to stay at the current levels.**



**Figure 6: Current funding level and its projected effect on Backlog for HCS Buildings**

The following are assumptions made to generate this backlog forecast projection.

- Inflation at 2% and backlog deterioration at 3%
- Current internal funding is maintained for the next 10 years
- New requirements as a result of future audits are not considered

**Conclusion:** There is no doubt that our historic level of funding of Deferred Maintenance was inadequate. The University’s commitment of \$10.7 M per year and the \$3M commitment from HCS plus the increased provincial support, McMaster is making significant progress with the most critical DM backlog.. The regular reviews of facility condition will lead to future increases in the Deferred Maintenance backlog demanding continued vigilance. The proposed list of deferred maintenance and FRP projects is presented as a separate memorandum.

Attachments:

Appendix A – List of completed DM projects

Appendix B – Building FCI and RI

Appendix C – Building Dashboards

**APPENDIX A**

**List of Completed Deferred Maintenance Projects**

#	Description
1	Gilmour Hall Substation replacement
2	Chester New Hall brick work restoration
3	Ivor Wynne Centre roof replacement
4	Togo Salmon Hall window replacement
5	University Hall window replacement
6	E.T. Clarke Centre roof section replacement
7	Kenneth Taylor Hall window replacement
8	Life Sciences Building structural repairs to retaining wall
9	Communication Research Lab heating pump replacement
10	General Sciences Building window replacement
11	John Hodgins Engineering window replacement
12	E.T. Clarke Centre – Boiler 4 replacement
13	Gilmour Hall exterior steps repair leaks to basement
14	Burke Sciences Building foundation wall water leak repair
15	Hamilton Hall foundation wall water leak repair
16	Mills Library foundation wall water leak repair
17	General Sciences Building foundation water leak repair
18	University Hall replace drainage system and failed floor drain
19	H.G.Thode Library elevator modernization
20	Mills Library window replacement
21	Burke Science Building roof replacement
22	University Hall fire alarm system replacement
23	Various buildings – repair / install fire stops at fire penetrations
24	Replace aging fire hoses in all buildings
25	Psychology replace water main feed to building
26	MDCL modifications to strobic fans to achieve noise compliance
27	Ivor Wynne Centre replace electrical service feeders and buried conduits
28	Perform arc flash study campus wide
29	Kenneth Taylor Hall repair foundation water leak
30	Refectory repair foundation water leak
31	Ivor Wynne Centre south ramp replacement
32	Burke Science Building elevator modernization
33	University Hall roof replacement
34	Kenneth Taylor Hall roof replacement
35	Chester New Hall replace fire alarm system
36	Commons building replace fire alarm system
37	ABB replace constant volume air distribution system

38	Life Sciences Building replace domestic water distribution system
39	Ivor Wynne Centre MCC replacement
40	Life Sciences Building MCC replacement
41	ABB MCC replacement
42	Campus high voltage underground cable replacement
43	Ivor Wynne Centre – Spinal cord – strobic fan noise compliance
44	Nuclear Reactor – modifications to building mechanical systems for noise compliance
45	Alumni Memorial Hall – exhaust fan replacement for noise compliance
46	General Sciences Building – modifications to building mechanical systems for noise compliance
47	H.G.Thode Library foundation wall repair
48	Cootes Bridge repairs
49	Togo Salmon Hall – Freight elevator modernization
50	University Hall – repairs to exterior masonry
51	Hamilton Hall – roof replacement
52	ABB – roof replacement
53	H.G. Thode Library – roof replacement
54	DeGroot School of Business – roof replacement
55	Campus Fire Hydrants repairs
56	Hamilton Hall – replace fire alarm system
57	Life Sciences Building – replace fire alarm system
58	H.G. Thode Library – replace fire alarm system
59	John Hodgins Engineering Annex – repairs to fire alarm system
60	ABB – air handling units replacement
61	Psychology Building – air handling units replacement
62	Install pressure relief valves in various campus buildings
63	E.T. Clarke switch gear replacement (NF 91)
64	John Hodgins Engineering south wing substation and main distribution panels replacement
65	High voltage cables condition testing and infrared scans for switchgears and transformers
66	Applied Dynamics Lab – repair foundation water leak
67	Life Sciences Building – repair foundation water leak
68	Psychology Building window replacement
69	Life Sciences Building replace roofing
70	John Hodgins Engineering building – replace roofing
71	John Hodgins Engineering building – replace fire alarm
72	Mills library – replace air handling units 10 and 11
73	Commons Building – replace Air Handling Units SF1 and 6
74	NF 91 replacement – 2 transformers
75	E.T.Clarke Boiler replacement as part of the CHP project
76	ABB – SIF Project – deferred maintenance work
77	Ivor Wynne Centre – repair structural damage in the basement
78	Togo Salmon Hall – repairs to exterior precast concrete panels

79	John Hodgins Engineering – replace south windows
80	Gilmour Hall – replace windows
81	Burke Science Building – replace entrance doors
82	Biology Greenhouse – replace roofing
83	Institute of Applied Health Science – replace fire alarm system
84	Mills Library – Elevator modernization
85	88 Forsyth Ave – building upgrade
86	Museum of Arts – replace air handling unit
87	Information Technology Building – replace heat exchangers
88	Chester New Hall – chilled water supply and return piping system replacement
89	General Science Building – basement mechanical room, pumps, distribution system, valves and electrical switchgear replacement
90	Applied Dynamics Lab – replace existing cooling system
91	E.T.Clarke Centre – MCC 3 & 4 replacement
92	Ivor Wynne Centre – Solar collector roof replacement
93	Psychology – courtyard and balcony roof replacement
94	General Sciences Building – fire alarm replacement
95	Togo Salmon Hall – fire alarm replacement
96	Fire Alarm Campus System installation
97	Institute of Applied Health – rebalance air and water distribution systems and replace valves
98	John Hodgins Engineering – replace fumehoods and exhaust system and achieve noise compliance
99	Burke Sciences Building – strobic fan replacement and achieve noise compliance
100	Tandem Accelerator exhaust fan – noise remediation
101	Nuclear Research Building – Strobic fan – noise remediation
102	Mary Keyes – East Meets West Café Exhaust fan noise remediation
103	NF91 – Transformer Replacement
104	Commons Building rooftop HVAC replacement and achieve noise compliance
105	Exterior cladding repairs for Chester New Hall and Kenneth Taylor Hall
106	Replace AHUs 4, 6 & 7 at John Hodgins Engineering Building
107	Mills Library Elevator 1 modernization
108	Mills Library Pneumatic Control upgrades to DDC
109	Ivor Wynn Centre Concrete Repairs
110	Foundation water leak repairs at John Hodgins Engineering Building
111	Mechanical Units replacement at Campus Services Building
112	Gilmour Hall Roof replacement (high sections and low roof at courtyard)
113	Nuclear Research Building Structural repairs to loading dock
114	T13-Preliminary Medical Building Roof Replacement
115	General Science Building – Exterior Precase Panel repairs – currently proceeding
116	Togo Salmon Hall – Low Roof Replacement North side – currently proceeding
117	John Hodgins Engineering – South and North washrooms renovations



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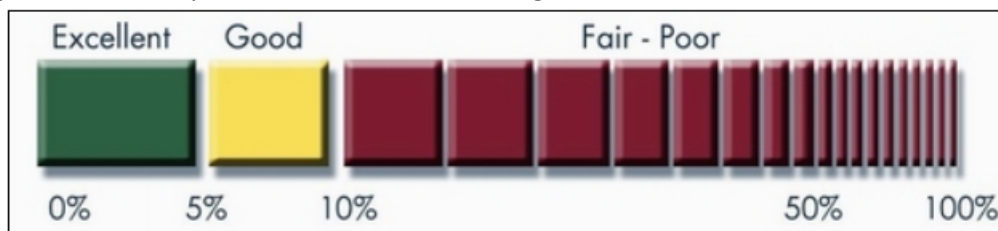
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118	T13 – Preliminary Medical Building – Boiler Replacement
119	Applied Dynamics Lab MCC replacement
120	Campus Services Building MCC replacement

## APPENDIX B Buildings FCI and RI

**Facility Condition Index (FCI)** is the ratio of the DM backlog for the current year + two future years divided by the Current Replacement Value of a building.



An Asset in excellent condition has an 0.00 to 0.05 FCI, while an Asset in good condition has an 0.05 to 0.10 FCI. A high FCI (greater than 0.10 and less than 0.20 ) signals that the Asset is in fair condition and a FCI greater than 0.20 indicates the facility is in poor condition; it indicates that the Asset has Requirements with costs that are a high percentage of the Asset's CRV.

**Requirements Index (RI)** measures the total needs of a facility by using the costs from all Requirements, including the deferred maintenance issues included in FCI, as well as any short or long-term capital improvements and grandfathered code issues that are not included in FCI. If a building is not sprinklered and is a grand fathered item, the RI would capture the cost whereas the FCI will not.

Building #	Building Name	Facility Condition Index	Requirement Index
1	University Hall	0.42	0.7
2	Hamilton Hall	0.35	0.66
4	Refectory	0.43	0.71
5	Edwards Hall	0.3	0.75
6	Wallingford Hall	0.32	0.73
7	Alumni House	0.54	0.85
8	Alumni Memorial Hall	0.4	0.81
9	Nuclear Research Building	0.32	0.64
10	Mills Memorial Library	0.27	0.67
11	Burke Science Building	0.02	0.4
12	E.T. Clarke	0.22	0.48
15	Nuclear Reactor	0.07	0.54
16	John Hodgins Engineering Building	0.14	0.65
18	Moulton Hall	0.18	0.51
19	Whidden Hall	0.23	0.5
20	Gilmour Hall	0.46	0.52



22	General Science Building	0.22	0.47
23	Chester New Hall	0.36	0.43
24	Ivor Wynne Centre	0.47	0.54
25	A.N. Bourns Science Building	0.1	0.71
26	Matthews Hall	0.38	0.59
27	McKay Hall	0.43	0.77
28	Commons Building	0.51	0.74
29	Togo Salmon Hall	0.51	0.72
30	Biology Greenhouse	0.51	0.67
31	Campus Services Building	0.2	0.65
32	Tandem Accelerator Building	0.13	0.65
33	Applied Dynamics Lab	0.34	0.6
34	Psychology Building	0.09	0.56
35	Woodstock	0.19	0.68
36	Brandon Hall	0.21	0.93
37	McMaster University Medical Centre	1.12	1.18
38	Kenneth Taylor Hall	0.12	0.6
39	Life Sciences Building	0.67	0.76
40	Bates Residence	0.21	0.48
42	Thode Library	0.62	0.82
43	Communications Research Laboratory	0.2	0.45
45	Hedden Hall	0.08	0.49
46	DeGroote School of Business	0.15	0.63
48	Institute for Applied Health Sciences	0.04	0.47
49	Information Technology Building	0.16	0.63
50	Mary Keyes Residence	0.04	0.71
52	Michael G. DeGroote Centre for Learning and Discovery	0.1	0.73
53	Les Prince Hall	0.07	0.45
54	David Braley Athletic Complex	0.08	0.3
55	Ron Joyce Stadium	0.12	0.3
56	Engineering Technology Building	0	0.3
57	Ron Joyce Centre Burlington	0.01	0.4
74	L.R. Wilson Hall	0	0.07
82	88 Forsyth Avenue N	0	0.32
83	David Braley Health Sciences Centre	0	0.06
86	47 Whitton Road	0.11	0.58
87	182 Sterling	0.18	0.57
89	PGCLL - Academic	0	0
89	PGCLL - Residence	0	0



Debbie Martin  
AVP (Facility Services)  
& Chief Facilities Officer

FACILITY SERVICES  
Campus Services Building  
1280 Main Street West  
Hamilton, Ontario, Canada  
L8S 4M3

Phone: 905.525.9140 Ext. 23054  
Fax: 905.572-6990  
E-mail: martind@mcmaster.ca

90	Halton McMaster Family Health Centre	0	0.37
94	96 Forsyth Avenue North	0.07	0.39
95	106 Forsyth Avenue North	0.05	0.37
96	132 Mayfair Cres	0	0
97	8 Mayfair Cres	0.13	0.56
T13	Preliminary Medical Building	0.33	0.7
T26	Scourge	0.51	0.75
T32	Temporary Portable - Offices	0.04	0.3
T33	Temporary Portable - Children Centre	0.04	0.37
T34	Temporary Lecture Hall	0.05	0.26

University Hall (01)

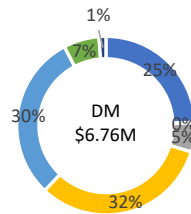
Age = 92 years (1929)

Replacement Value = \$15.90M

## Deferred Maintenance – Dash Board

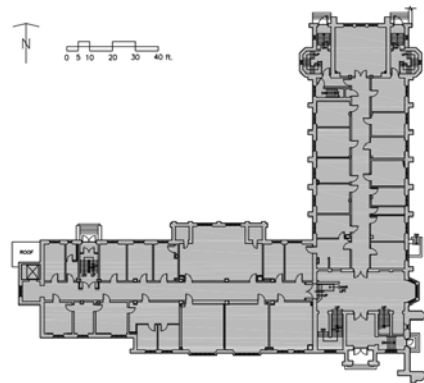
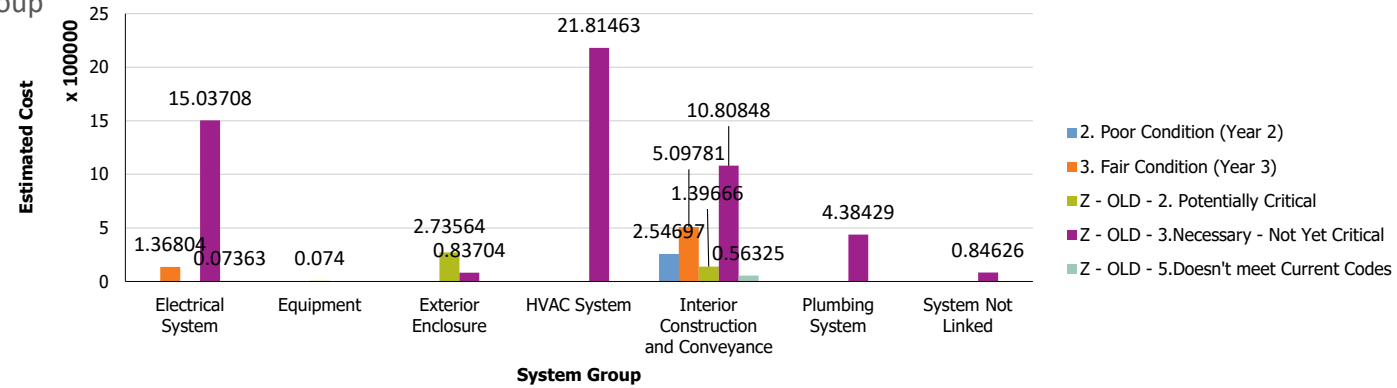
Department: Philosophy / Religious Studies

University Hall - DM Breakdown by System Group

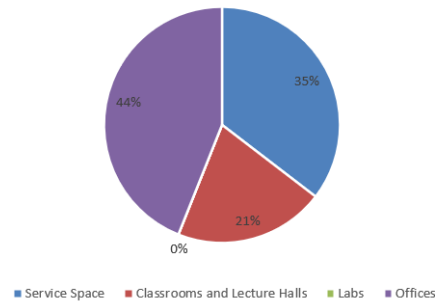


- Electrical System
- Equipment
- Exterior Enclosure
- HVAC System
- Interior Construction and Conveyance
- Plumbing System
- System Not Linked

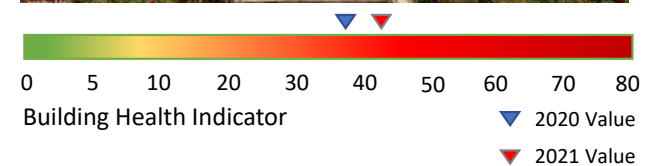
University Hall - DM Priorities



UH – Evolution



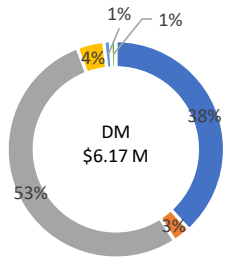
UH - Current Building Use



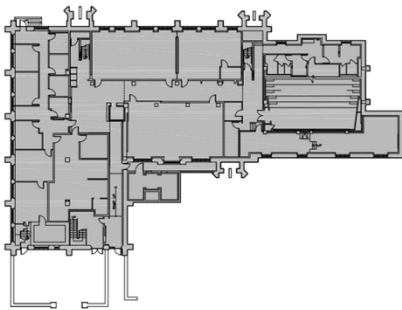
# Hamilton Hall (02)

## Deferred Maintenance – Dash Board

Hamilton Hall - DM Breakdown by System Group



- Electrical System
- HVAC System
- Plumbing System
- Exterior Enclosure
- Interior Construction and Conveyance
- Structure



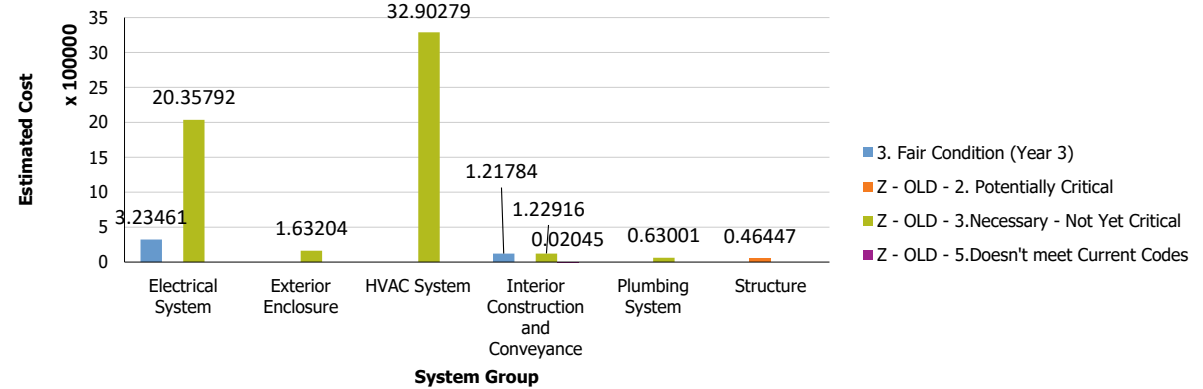
Hamilton Hall Building – Evolution

Age = 92 years (1929)

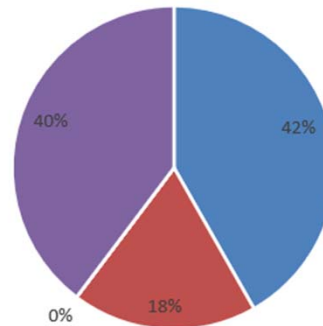
Replacement Value = \$17.47M

Department: Mathematics and Statistics

Hamilton Hall - DM Priorities

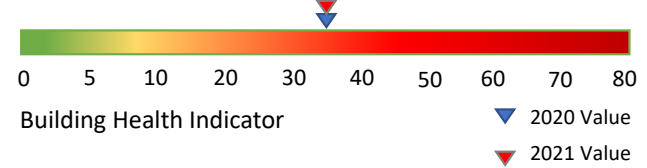


- 3. Fair Condition (Year 3)
- Z - OLD - 2. Potentially Critical
- Z - OLD - 3. Necessary - Not Yet Critical
- Z - OLD - 5. Doesn't meet Current Codes



- Service Space
- Classrooms and Lecture Halls
- Labs
- Offices

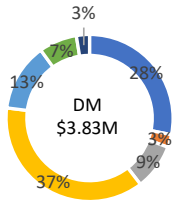
Hamilton Hall Library Current Building Use



# Refectory Building (04)

## Deferred Maintenance – Dash Board

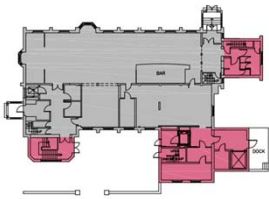
Refectory - DM Breakdown by System Group



- Electrical System
- Fire Protection
- Interior Construction and Conveyance
- Structure
- Exterior Enclosure
- HVAC System
- Plumbing System



- 1930 Original Building
- Addition 1965



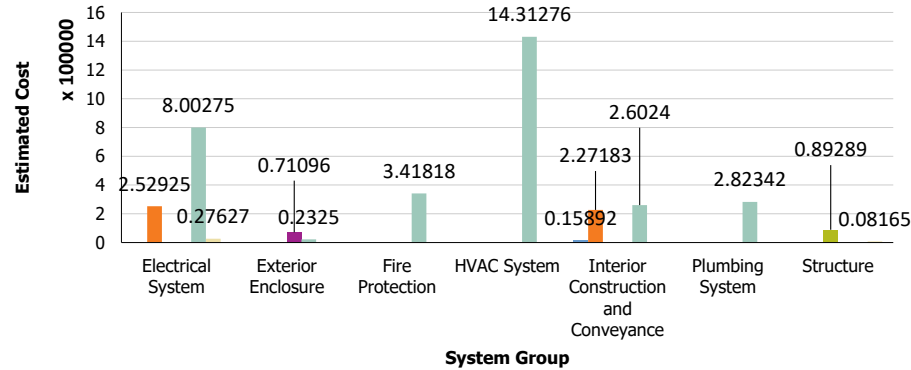
Psychology – Evolution

Age = 92 years (1929)

Replacement Value = \$8.95M

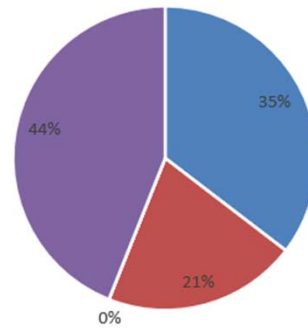
Department: Hospitality

Refectory DM Priorities



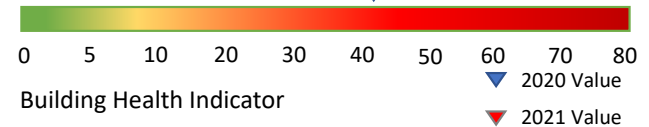
- 1. Currently Critical (Year 1)
- 3. Fair Condition (Year 3)
- Z - OLD - 1. Currently Critical
- Z - OLD - 2. Potentially Critical
- Z - OLD - 3. Necessary - Not Yet Critical
- Z - OLD - 5. Doesn't meet Current Codes

Chart Area



- Service Space
- Classrooms and Lecture Halls
- Labs
- Offices

Psychology - Current Building Use

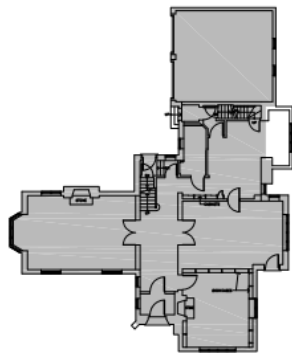
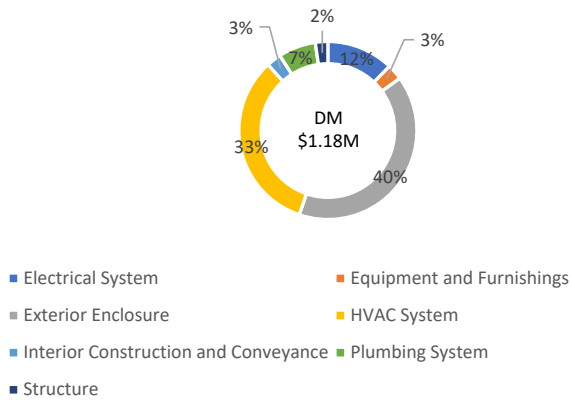


Building Health Indicator

# Alumni House (07)

## Deferred Maintenance – Dash Board

Alumni Hall DM Breakdown by System Group



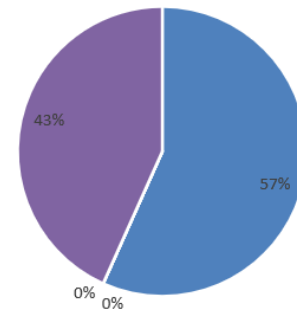
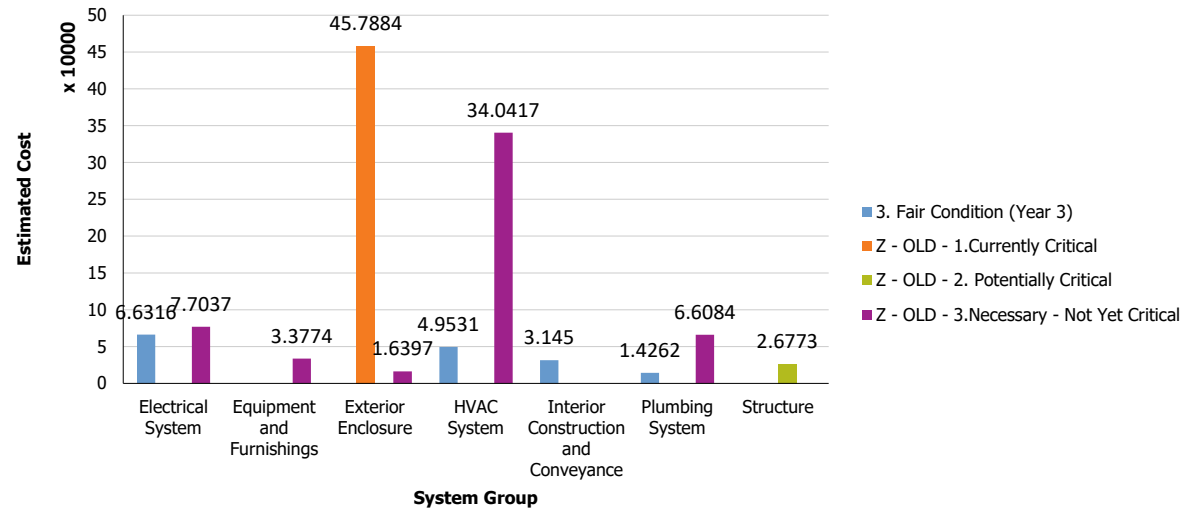
Alumni Hall – Evolution

Age = 92 years (1929)

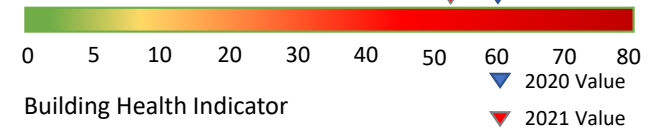
Replacement Value = \$2.20 M

Department: Alumni

Alumni DM Priorities



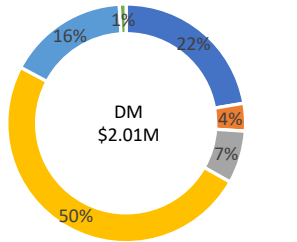
Alumni Current Building Use



# Alumni Memorial Hall (08)

## Deferred Maintenance – Dash Board

Alumni Memorial Hall DM Breakdown by System Group



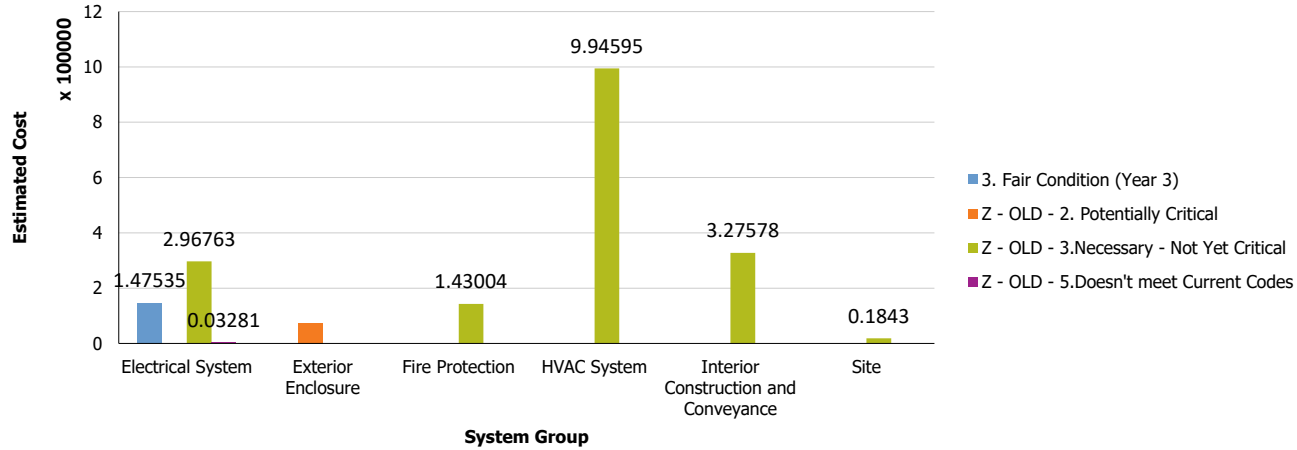
- Electrical System
- Fire Protection
- Interior Construction and Conveyance
- Exterior Enclosure
- HVAC System
- Site

Age = 72 years (1949)

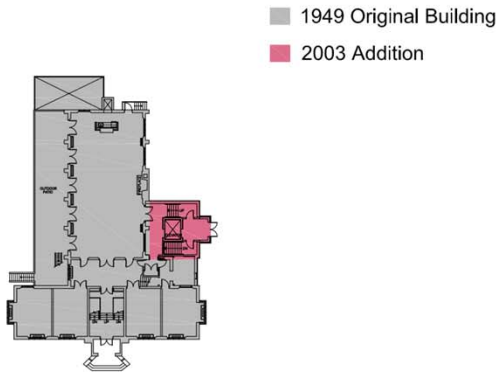
Replacement Value = \$5.56 M

Department: Faculty Club

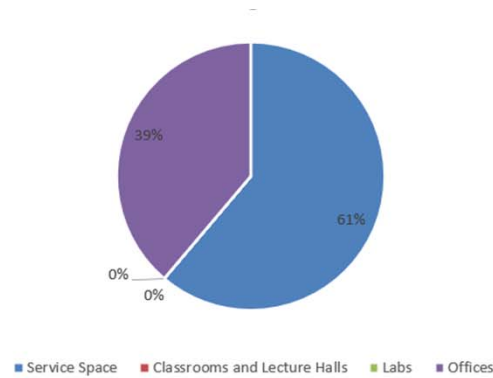
Alumni Memorial Hall DM Priorities



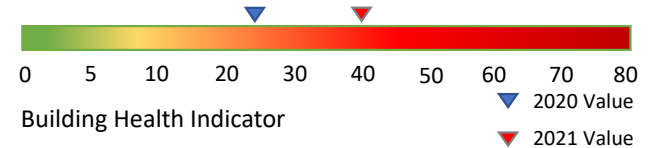
- 3. Fair Condition (Year 3)
- Z - OLD - 2. Potentially Critical
- Z - OLD - 3. Necessary - Not Yet Critical
- Z - OLD - 5. Doesn't meet Current Codes



Alumni Hall – Evolution



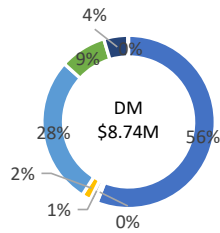
Alumni Memorial Current Building Use



# Nuclear Research Building (09)

## Deferred Maintenance – Dash Board

NRB - DM Breakdown by System Group

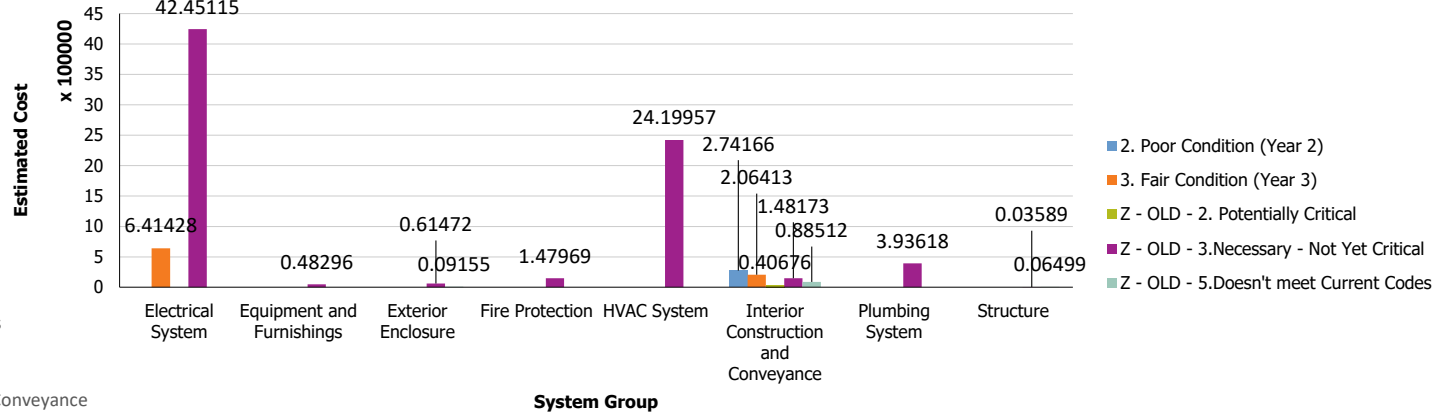


- Electrical System
- Equipment and Furnishings
- Exterior Enclosure
- Fire Protection
- HVAC System
- Interior Construction and Conveyance
- Plumbing System
- Structure

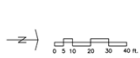
Age = 71 years (1950)

Replacement Value = \$26.62M  
Department: Engineering Physics

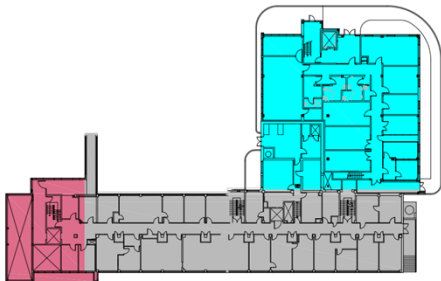
NRB DM Priorities



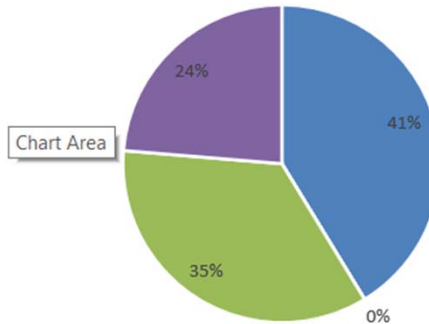
- 2. Poor Condition (Year 2)
- 3. Fair Condition (Year 3)
- Z - OLD - 2. Potentially Critical
- Z - OLD - 3. Necessary - Not Yet Critical
- Z - OLD - 5. Doesn't meet Current Codes



- 1950 Original Building
- 2001 Addition
- 2011 Addition

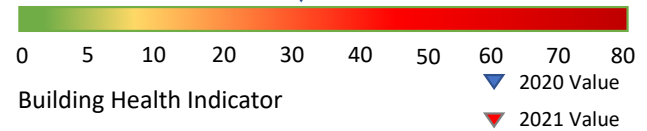


NRB – Evolution



- Service Space
- Classrooms and Lecture Halls
- Labs
- Offices

NRB Current Building Use



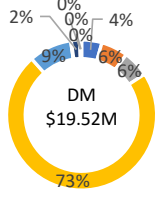
Building Health Indicator



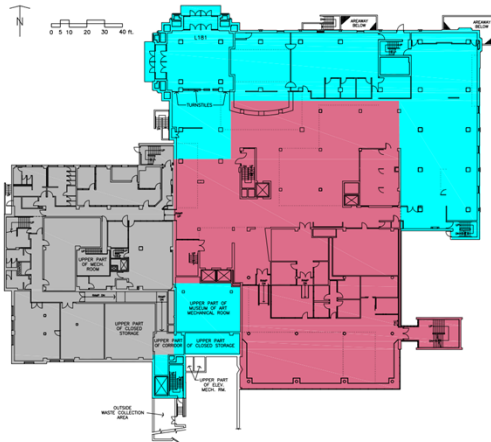
# Mills Memorial Library (10)

## Deferred Maintenance – Dash Board

Mills Library - DM Breakdown by System Group



- Electrical System
- Fire Protection
- Interior Construction and Conveyance
- Site
- System Not Linked
- Exterior Enclosure
- HVAC System
- Plumbing System
- Structure



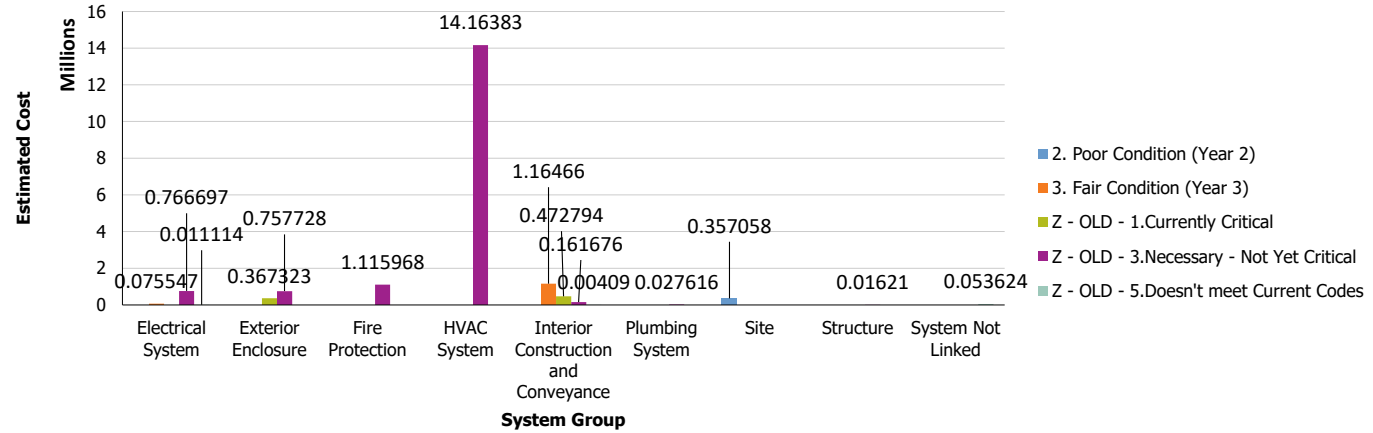
Mills Library – Evolution

Age = 71 years (1950)

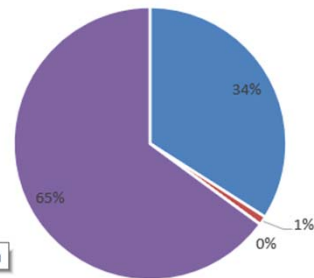
Replacement Value = \$73.40M

Department: Library

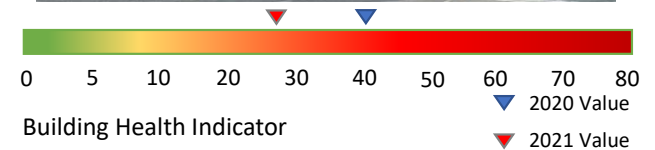
Mills Library DM Priorities



- 2. Poor Condition (Year 2)
- 3. Fair Condition (Year 3)
- Z - OLD - 1.Currently Critical
- Z - OLD - 3.Necessary - Not Yet Critical
- Z - OLD - 5.Doesn't meet Current Codes



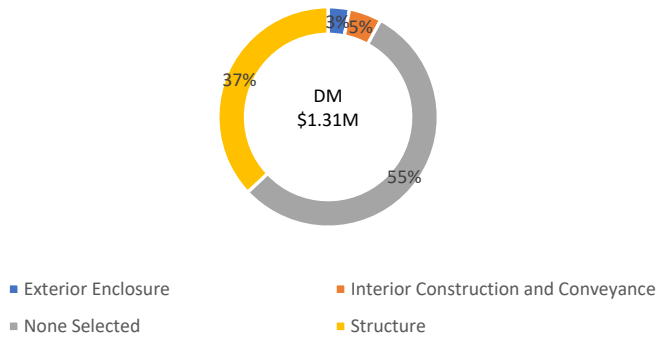
Mills Library Current Building Use



# Burke Science Building (11)

## Deferred Maintenance – Dash Board

BSB DM Breakdown by System Group

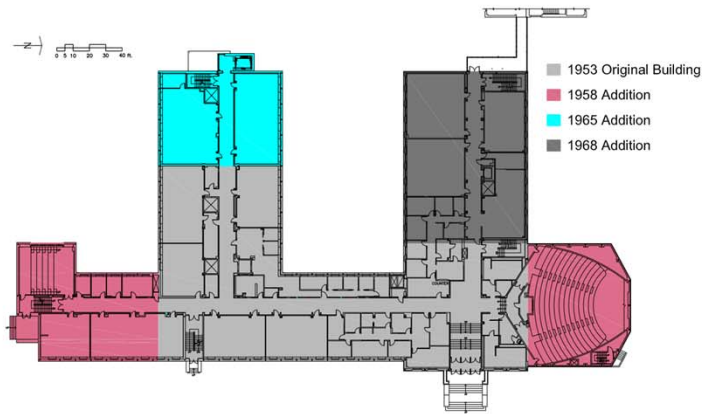
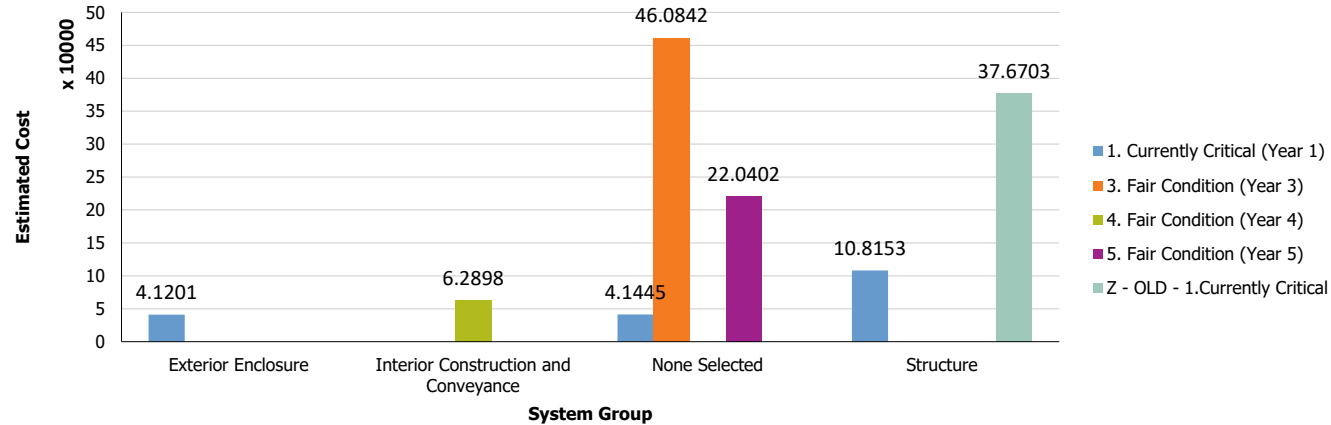


Age = 68 years (1953)

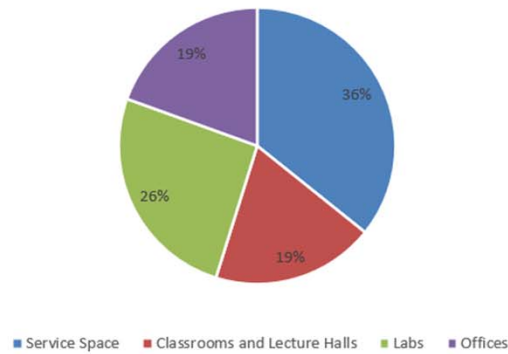
Replacement Value = \$58.88 M

Department: Science

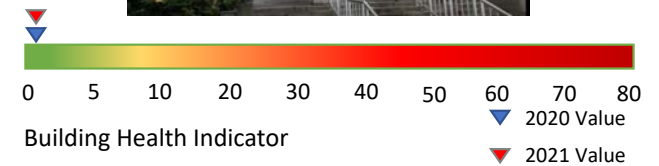
Burke Science Building DM Priorities



BSB— Evolution



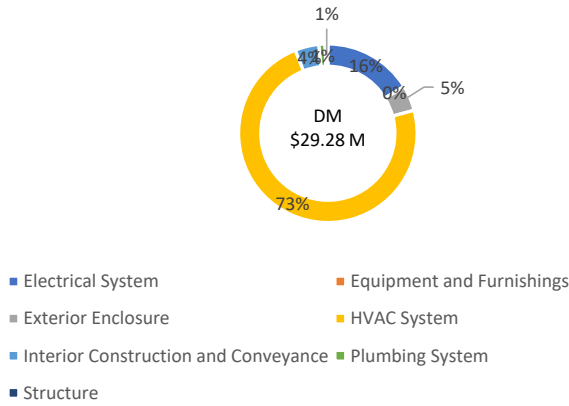
BSB Current Building Use



E. T. Clarke (12)

Deferred Maintenance – Dash Board

E.T. Clarke DM Backlog by System Group

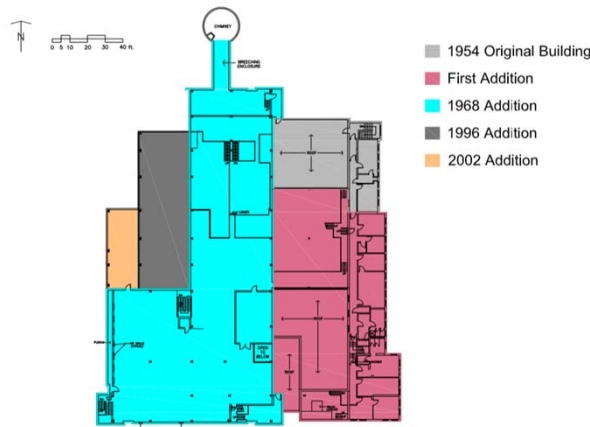
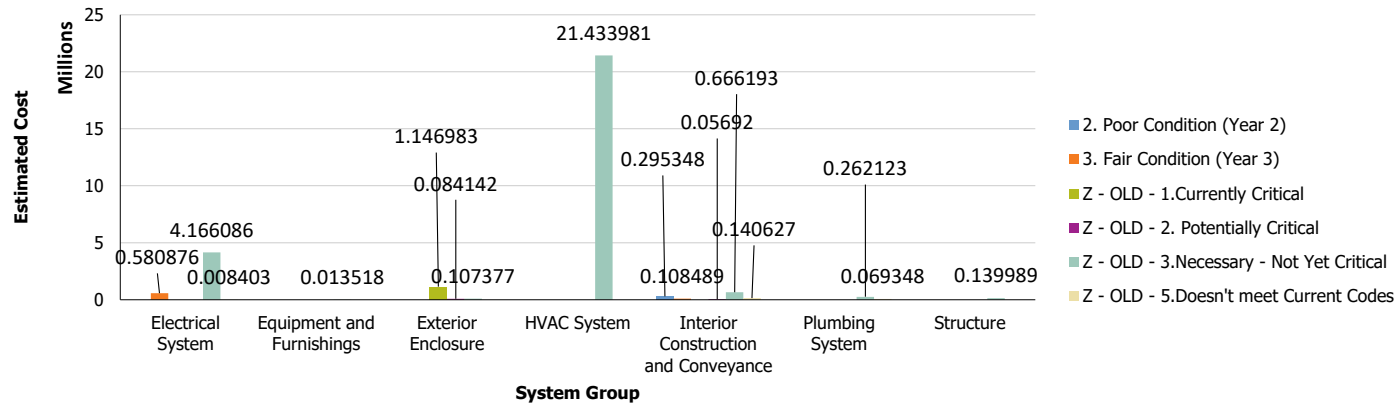


Age = 67 years (1954)

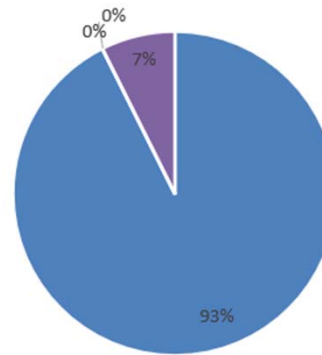
Replacement Value = \$129.88 M

Department: Facility Services

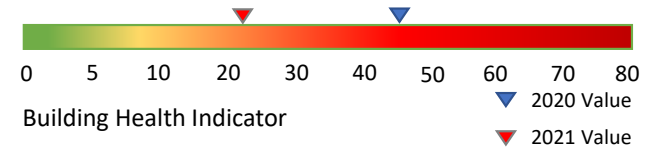
E.T. Clarke - DM Priorities



E.T. Clarke Building – Evolution



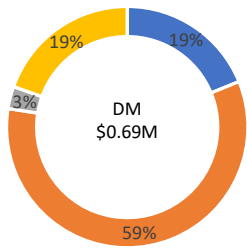
E.T. Clarke Current Building Use



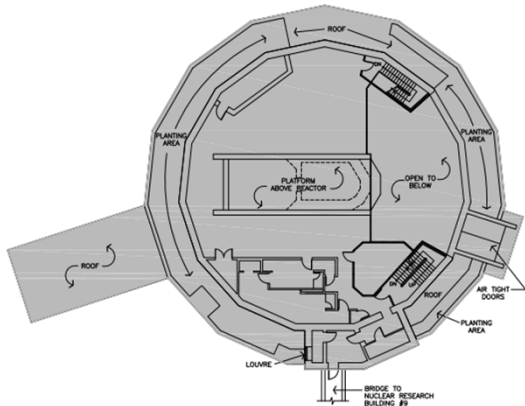
# Nuclear Reactor (15)

## Deferred Maintenance – Dash Board

Nuclear Reactor - DM Breakdown by System Group



■ Fire Protection ■ None Selected ■ Plumbing System ■ Structure

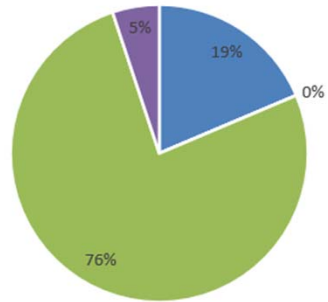
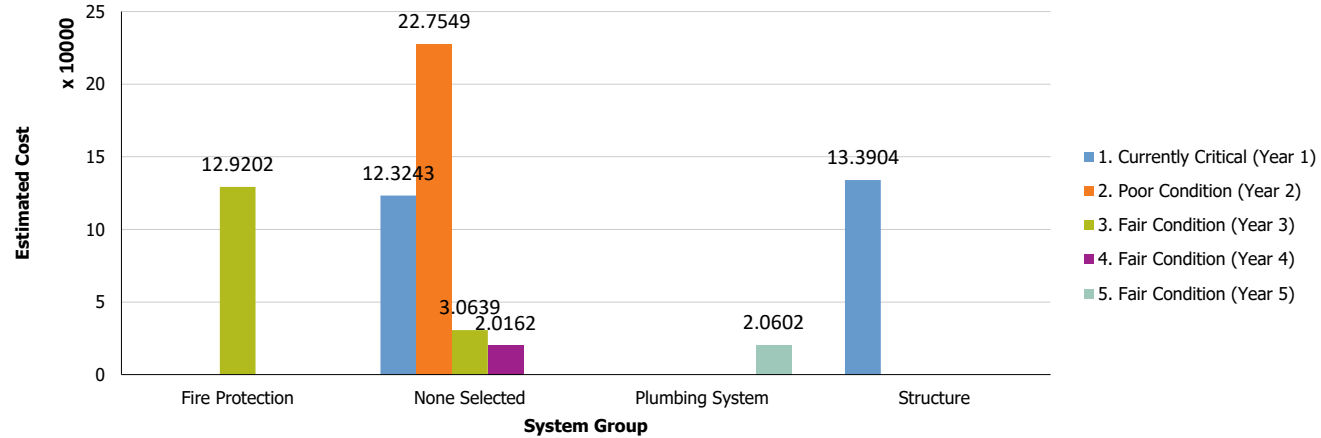


Nuclear Reactor – Evolution

Age = 64 years (1957)

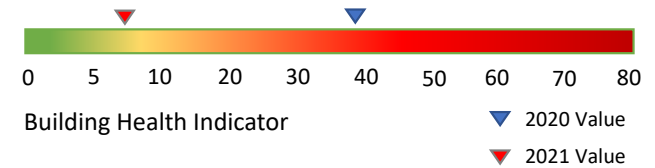
Replacement Value = \$9.05M  
Department: Engineering Physics

Nuclear Reactor DM Priorities



■ Service Space ■ Classrooms and Lecture Halls ■ Labs ■ Offices

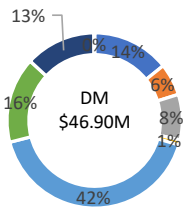
Nuclear Reactor Current Building Use



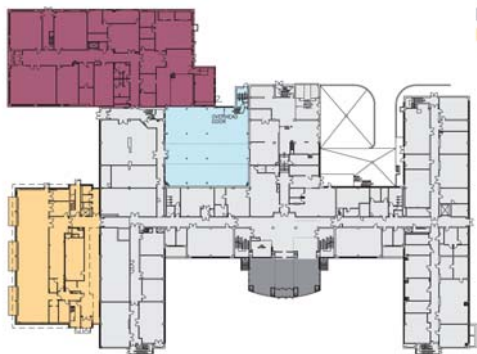
# John Hodgins Engineering Building (16)

## Deferred Maintenance – Dash Board

JHE DM Breakdown by System Group



- Electrical System
- Exterior Enclosure
- HVAC System
- Plumbing System
- Equipment and Furnishings
- Fire Protection
- Interior Construction and Conveyance
- Structure



JHE – Evolution

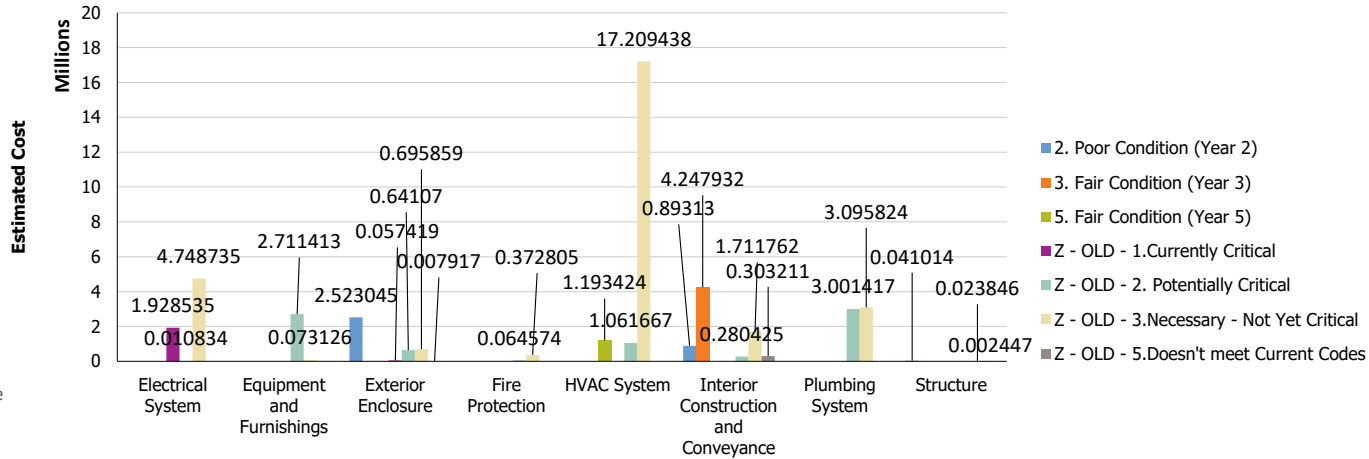
- 1958 | Original building
- 1991 | Annex
- 2001 | MMRI
- 2016 | Lobby expansion
- 2017 | Hatch Centre

Age = 63 years (1958)

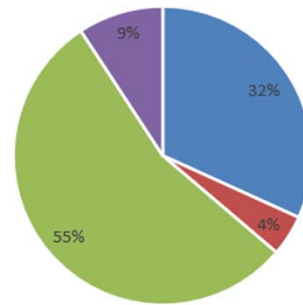
Replacement Value = \$123.54M

Department: Engineering

JHE DM Priorities

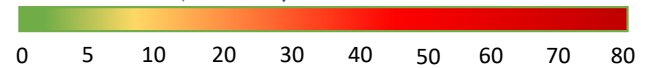


System Group



- Service Space
- Classrooms and Lecture Halls
- Labs
- Offices

JHE Current Building Use



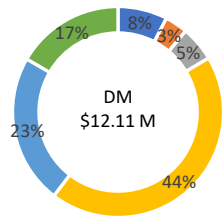
Building Health Indicator

- 2020 Value
- 2021 Value

# Gilmour Hall (20)

## Deferred Maintenance – Dash Board

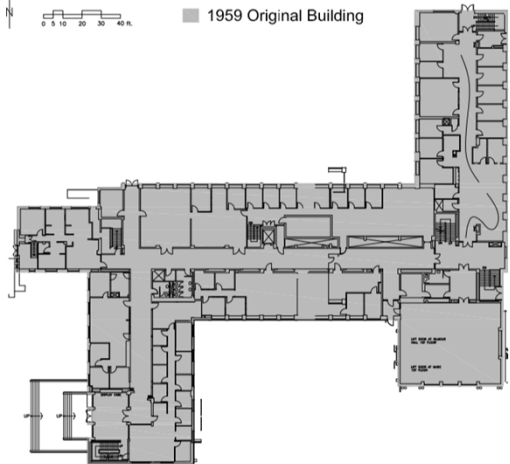
Gilmour Hall DM Breakdown by System Group



- Electrical System
- Fire Protection
- Interior Construction and Conveyance
- Exterior Enclosure
- HVAC System
- Plumbing System



1959 Original Building



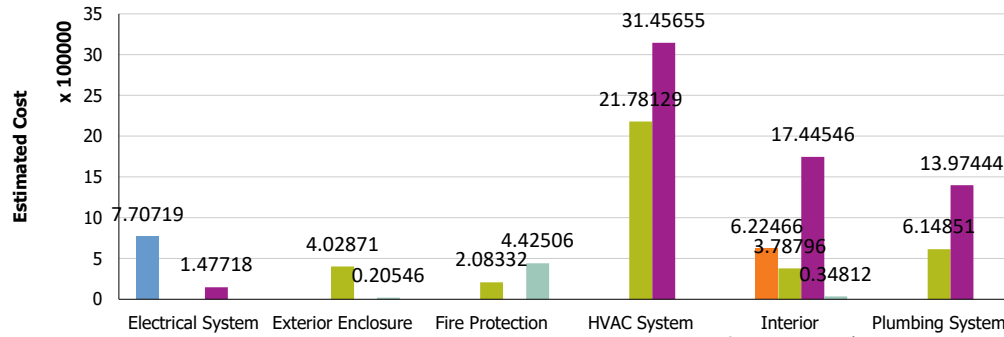
Gilmour Hall Building – Evolution

Age = 62 years (1959)

Replacement Value = \$25.30M

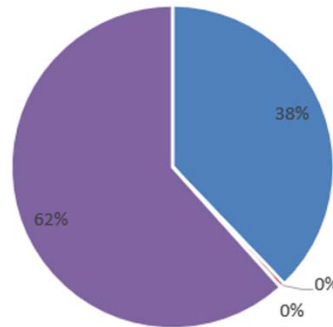
Department: Administration

GSB - DM Priorities



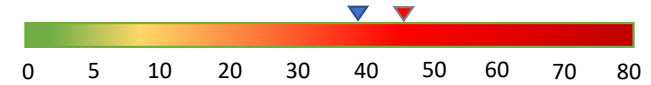
- 2. Poor Condition (Year 2)
- 3. Fair Condition (Year 3)
- Z - OLD - 2. Potentially Critical
- Z - OLD - 3. Necessary - Not Yet Critical
- Z - OLD - 5. Doesn't meet Current Codes

System Group



- Service Space
- Classrooms and Lecture Halls
- Labs
- Offices

Gilmour Hall Current Building Use



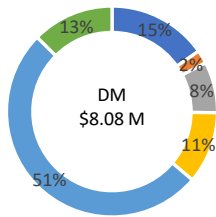
Building Health Indicator

- ▼ 2020 Value
- ▼ 2021 Value

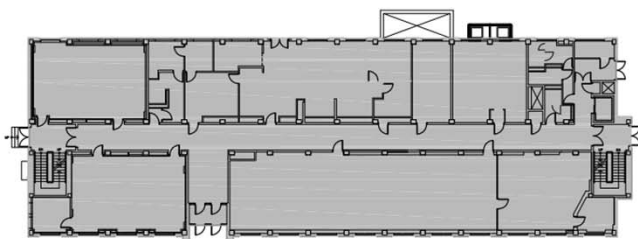
# General Science Building (22)

## Deferred Maintenance – Dash Board

GSB DM Breakdown by System Group



- Electrical System
- Exterior Enclosure
- Fire Protection
- HVAC System
- Interior Construction and Conveyance
- Plumbing System



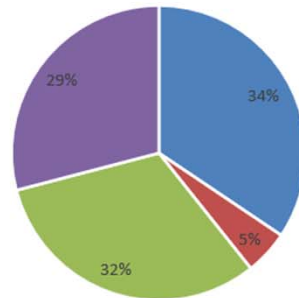
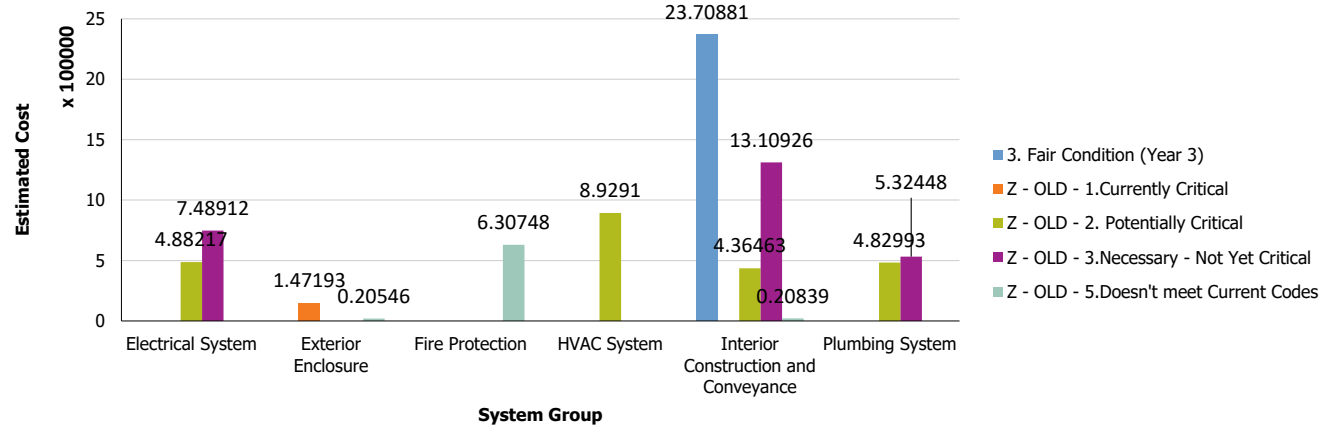
GSB Building – Evolution

Age = 59 years (1962)

Replacement Value = \$34.05 M

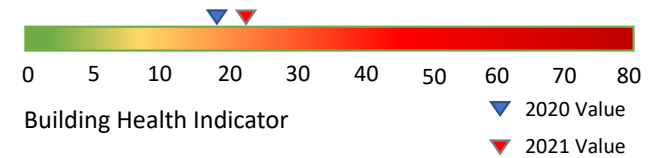
Department: Science

GSB - DM Priorities



- Service Space
- Classrooms and Lecture Halls
- Labs
- Offices

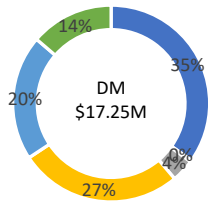
GSB Current Building Use



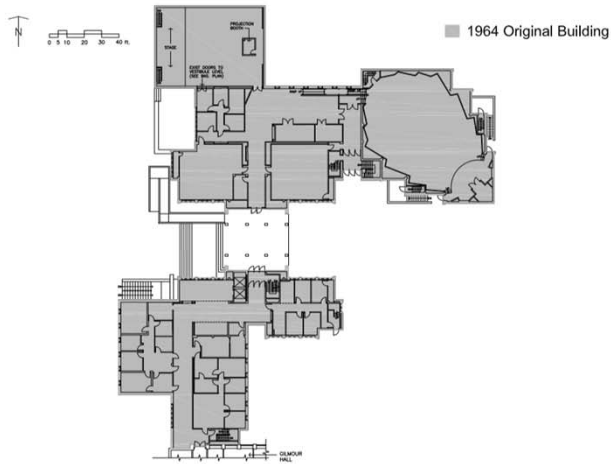
# Chester New Hall (23)

## Deferred Maintenance – Dash Board

CNH DM Breakdown by System Group



- Electrical System
- Fire Protection
- Interior Construction and Conveyance
- Exterior Enclosure
- HVAC System
- Plumbing System



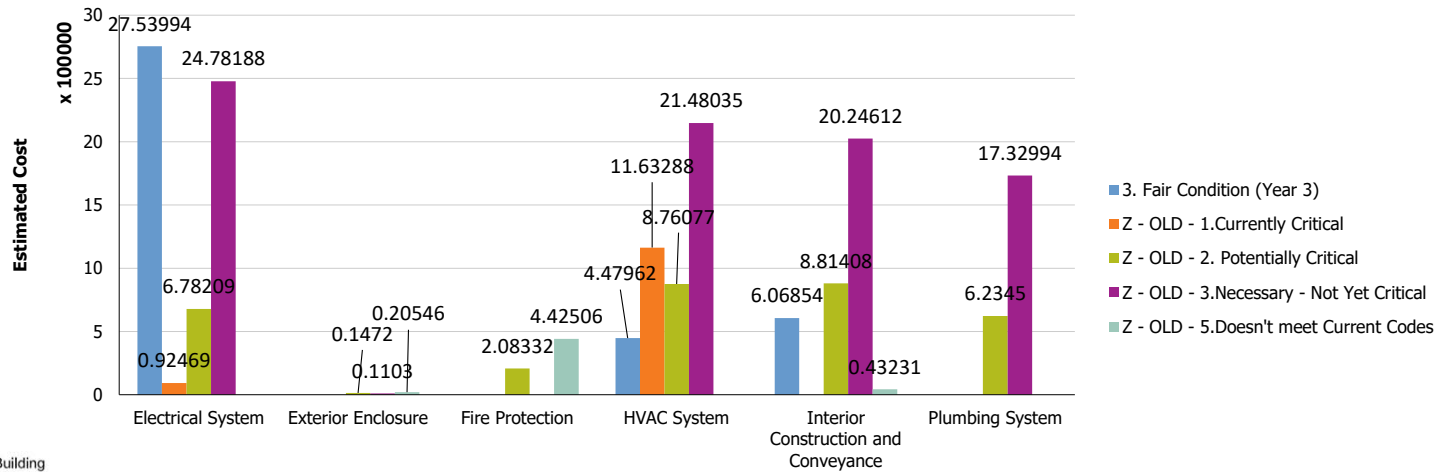
CNH – Evolution

Age = 57 years (1964)

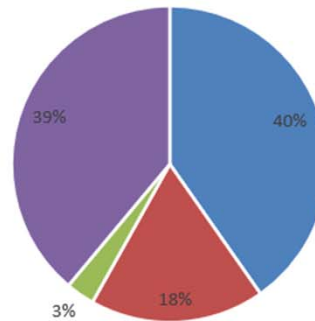
Replacement Value = \$46.31 M

Department: Social Science, Humanities

CNH - DM Priorities

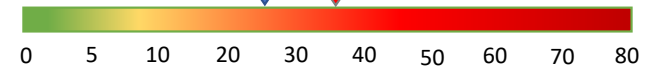


System Group



- Service Space
- Classrooms and Lecture Halls
- Labs
- Offices

CNH Current Building Use



Building Health Indicator

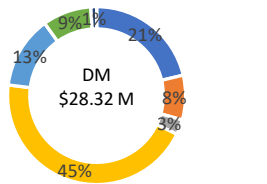
- ▼ 2020 Value
- ▼ 2021 Value



# Ivor Wynne Centre (24)

## Deferred Maintenance – Dash Board

IWC DM Breakdown by System Group

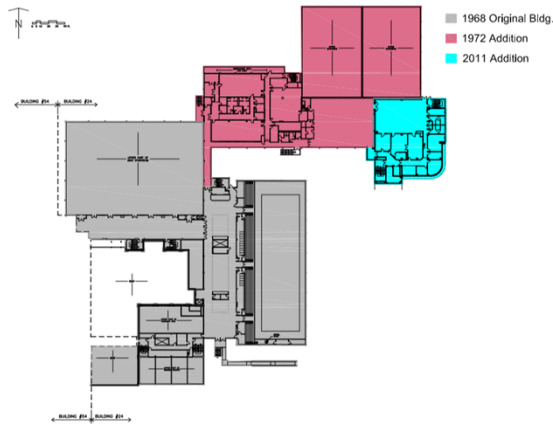
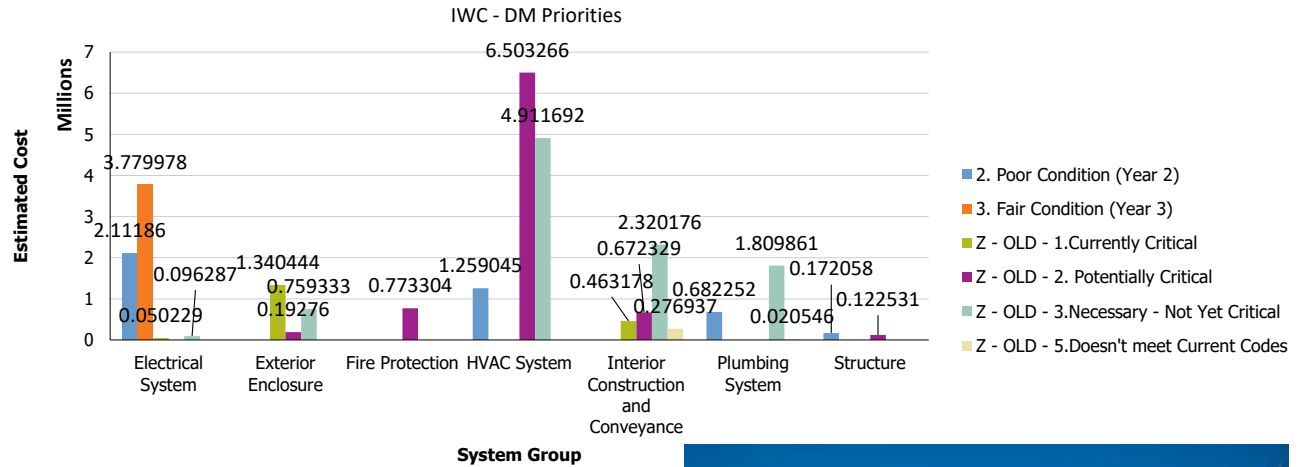


- Electrical System
- Fire Protection
- Interior Construction and Conveyance
- Structure
- Exterior Enclosure
- HVAC System
- Plumbing System

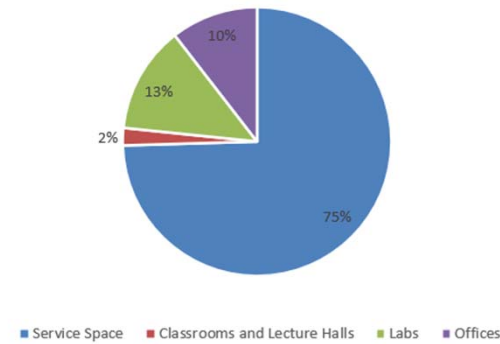
Age = 57 years (1964)

Replacement Value = \$59.70M

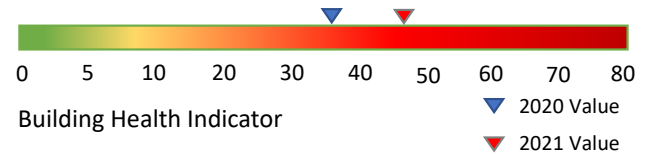
Department: Athletics & Recreation



IWC Building – Evolution



IWC Current Building Use



# Arthur Bourns Building (25)

## Deferred Maintenance – Dash Board

ABB DM Breakdown by System Group

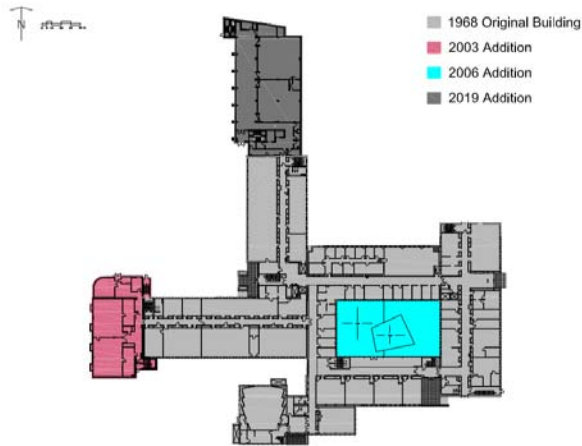
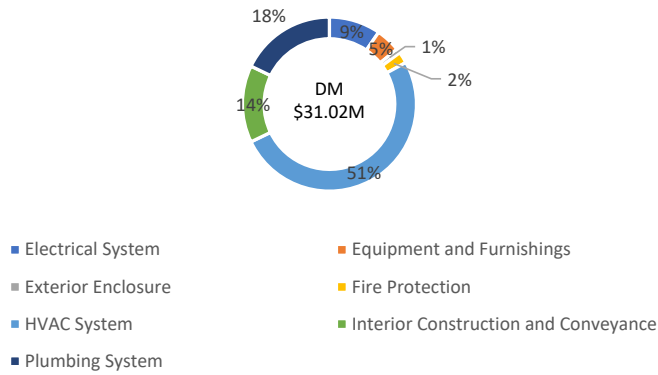


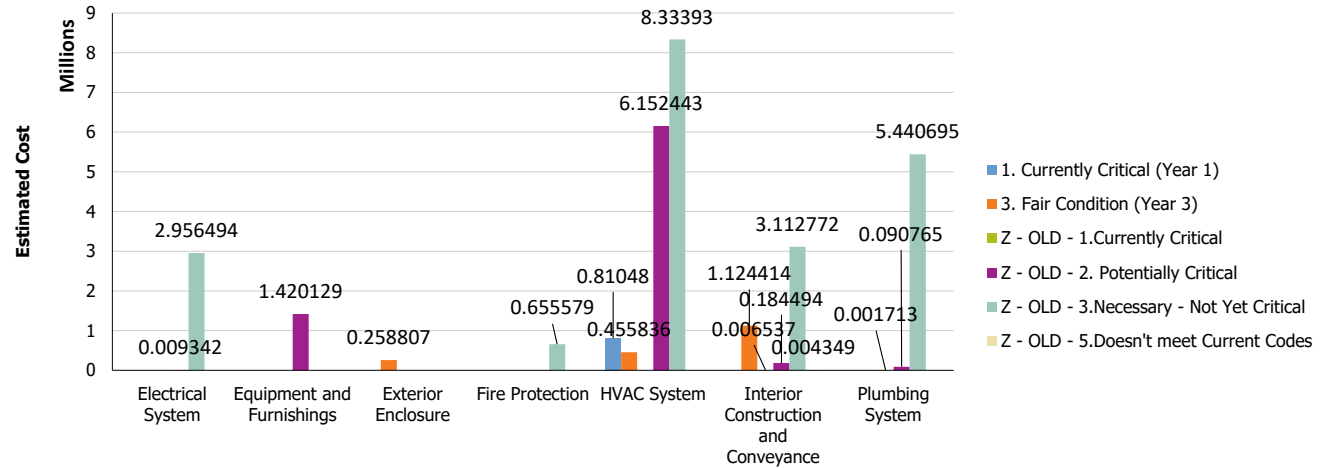
ABB – Evolution

Age = 53 years (1968)

Replacement Value = \$104.75 M

Department: Science & Engineering

ABB DM Priorities



System Group

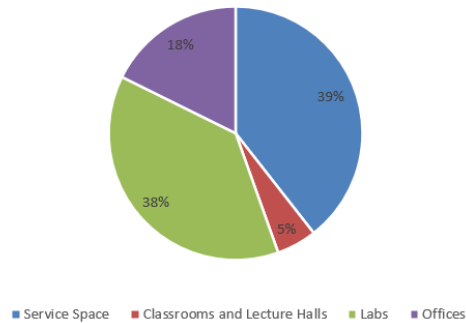
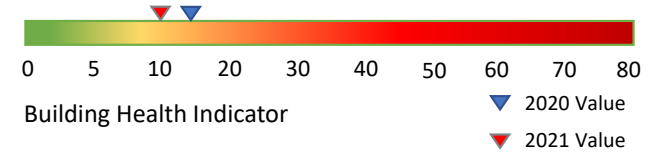


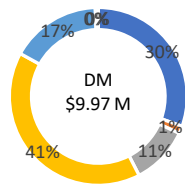
ABB Current Building Use



# Commons Building (28)

## Deferred Maintenance – Dash Board

Commons DM Breakdown by System Group



- Electrical System
- Equipment and Furnishings
- Exterior Enclosure
- HVAC System
- Interior Construction and Conveyance
- Plumbing System
- System Not Linked



- 1965 Original Building
- 1968 Addition



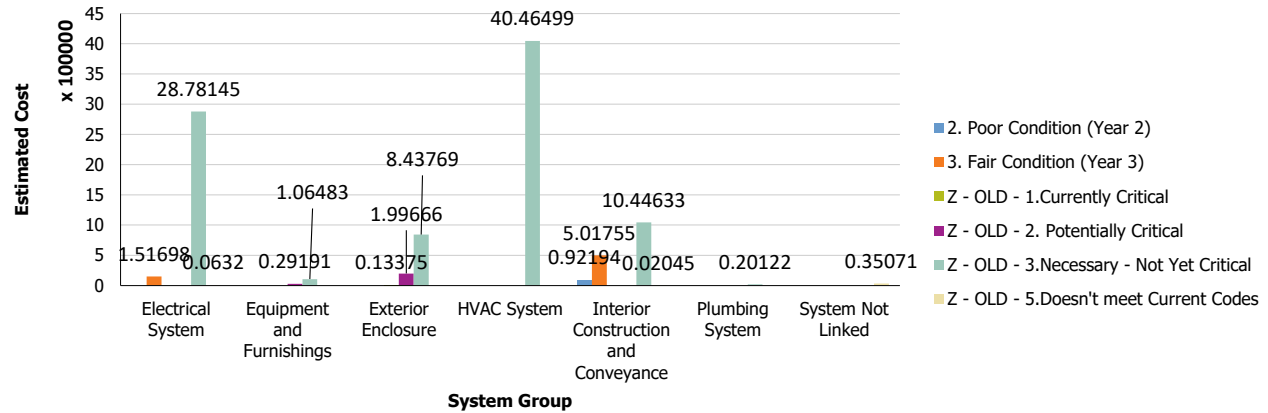
Commons Building – Evolution

Age = 56 years (1965)

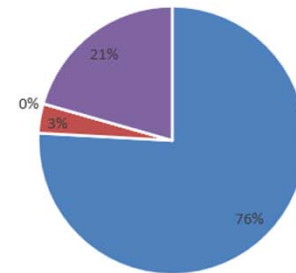
Replacement Value = \$19.31 M

Department: HCS, Hospitality

Commons Building - DM Priorities

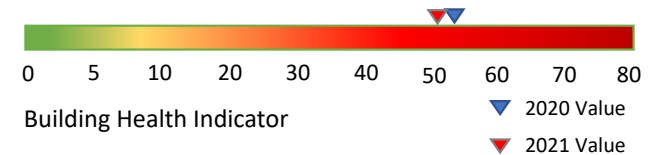


- 2. Poor Condition (Year 2)
- 3. Fair Condition (Year 3)
- Z - OLD - 1. Currently Critical
- Z - OLD - 2. Potentially Critical
- Z - OLD - 3. Necessary - Not Yet Critical
- Z - OLD - 5. Doesn't meet Current Codes



- Service Space
- Classrooms and Lecture Halls
- Labs
- Offices

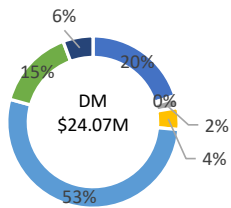
Commons Building Current Building Use



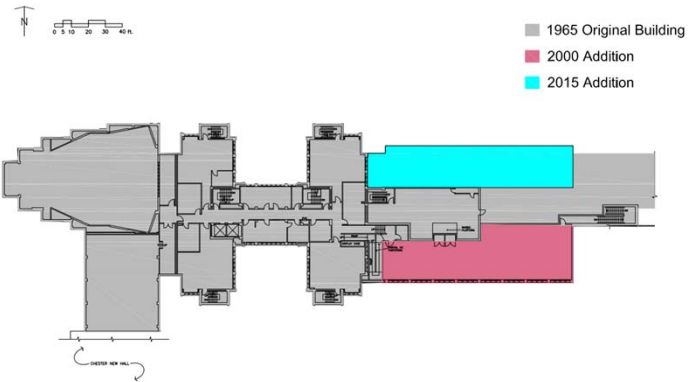
# Togo Salmon Hall (29)

## Deferred Maintenance – Dash Board

TSH DM Breakdown by System Group



- Electrical System
- Equipment and Furnishings
- Exterior Enclosure
- Fire Protection
- HVAC System
- Interior Construction and Conveyance
- Plumbing System



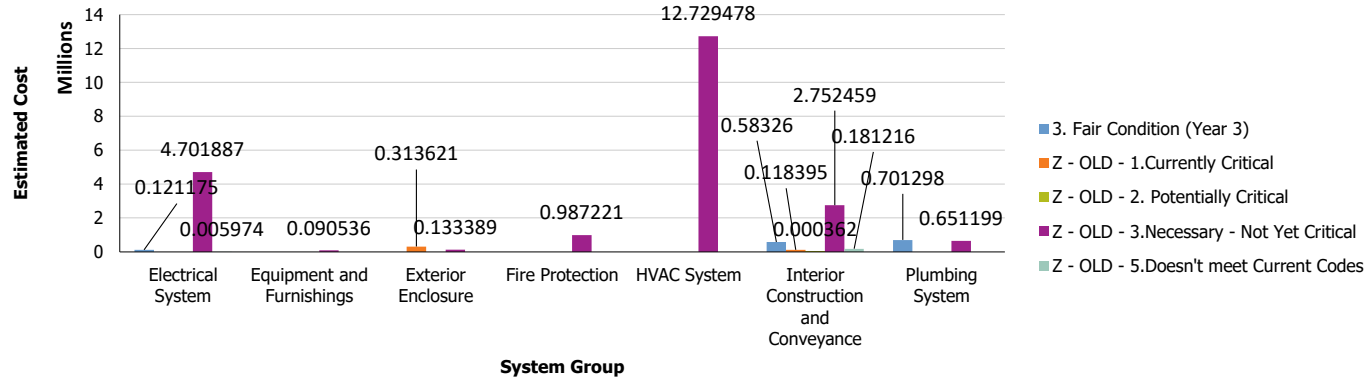
TSH – Evolution

Age = 56 years (1965)

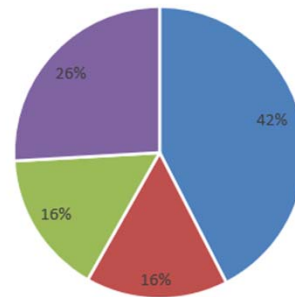
Replacement Value = \$46.50M

Department: Social Science

Togo Salmon Hall - DM Priorities

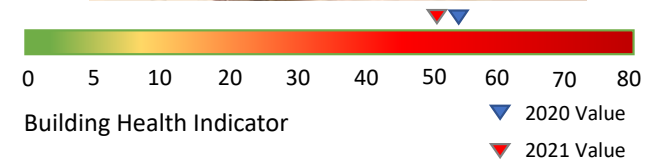


- 3. Fair Condition (Year 3)
- Z - OLD - 1. Currently Critical
- Z - OLD - 2. Potentially Critical
- Z - OLD - 3. Necessary - Not Yet Critical
- Z - OLD - 5. Doesn't meet Current Codes



- Service Space
- Classrooms and Lecture Halls
- Labs
- Offices

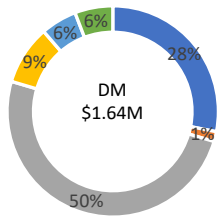
TSH - Current Building Use



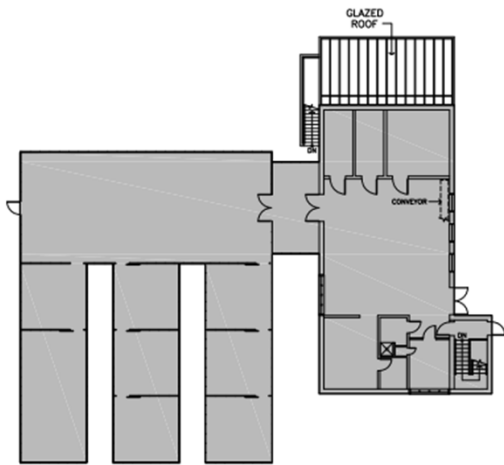
# Biology Green House (30)

## Deferred Maintenance – Dash Board

Biology GH DM Breakdown by System Group



- Electrical System
- HVAC System
- Plumbing System
- Exterior Enclosure
- Interior Construction and Conveyance
- Structure



Biology Greenhouse – Evolution

Age = 54 years (1967)

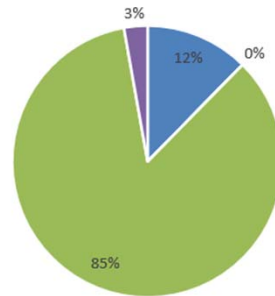
Replacement Value = \$3.17 M

Department: Science

Biology Greenhouse DM Priorities

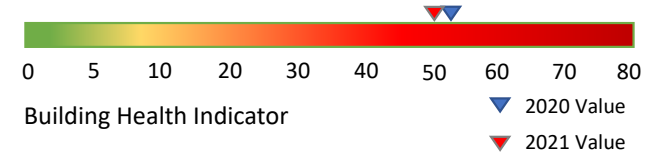


- 3. Fair Condition (Year 3)
- Z - OLD - 2. Potentially Critical
- Z - OLD - 3. Necessary - Not Yet Critical
- Z - OLD - 5. Doesn't meet Current Codes



- Service Space
- Classrooms and Lecture Halls
- Labs
- Offices

Biology Greenhouse Current Building Use



# Campus Services Building (31)

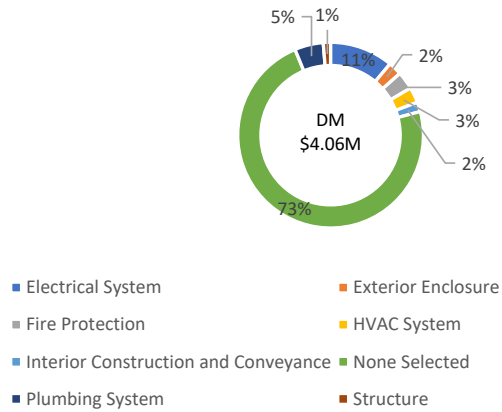
## Deferred Maintenance – Dash Board

Age = 53 years (1968)

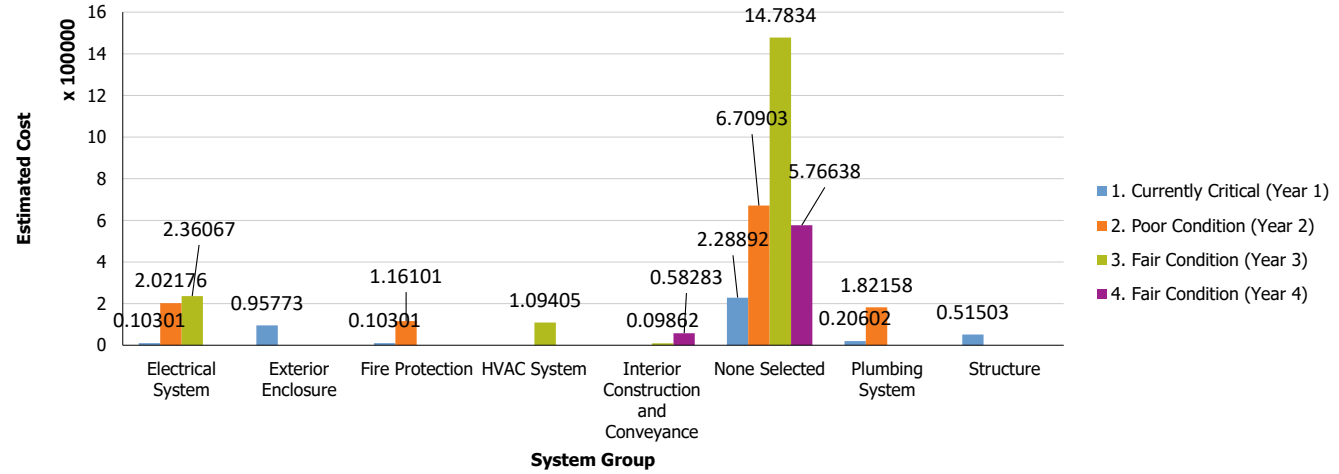
Replacement Value = \$17.50 M

Department: Facility Services

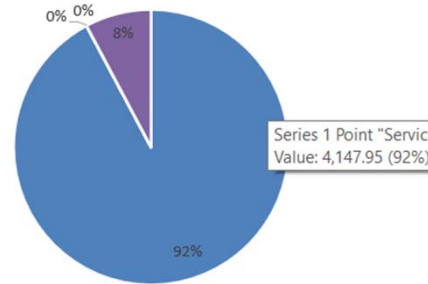
CSB DM Breakdown by System Group



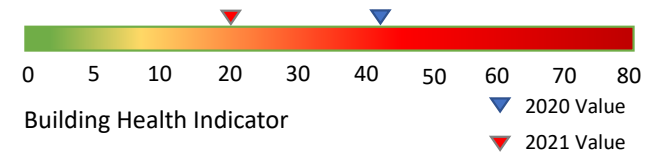
Campus Services Building DM Priorities



CSB— Evolution



CSB Current Building Use

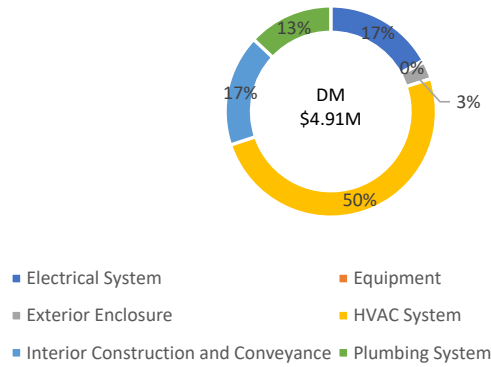


■ Service Space ■ Classrooms and Lecture Halls ■ Labs ■ Offices

# Tandem Accelerator (32)

## Deferred Maintenance – Dash Board

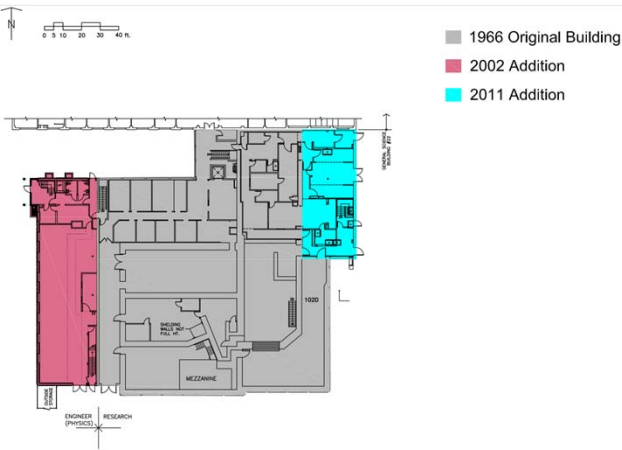
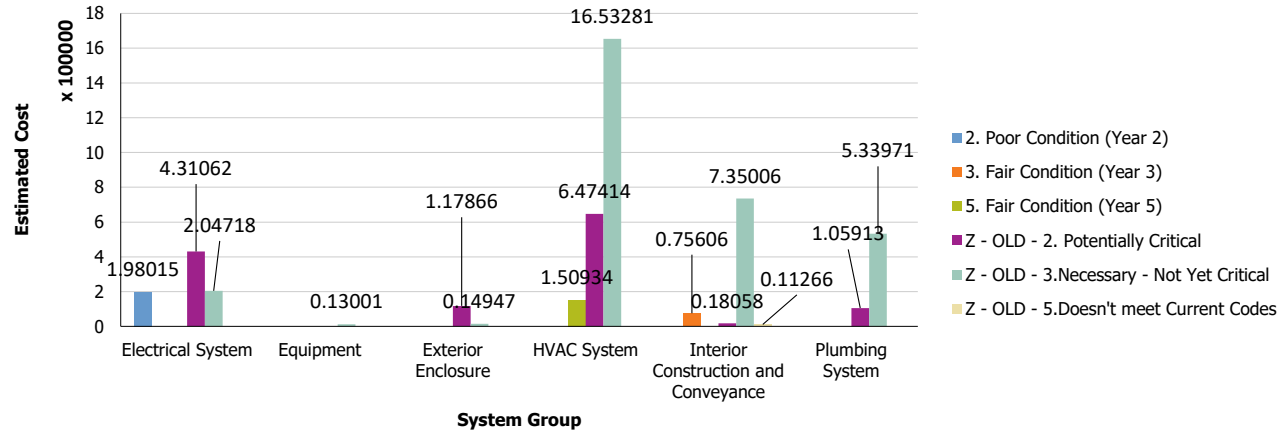
TA DM Breakdown by System Group



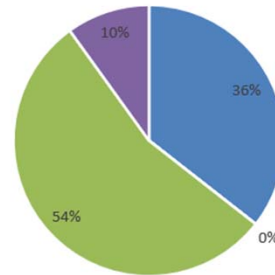
Age = 55 years (1966)

Replacement Value = \$12.61M  
Department: Engineering Physics

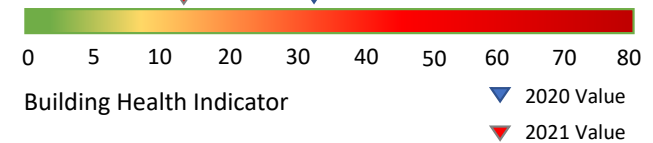
Tandem Accelerator - DM Priorities



Tandem Accelerator – Evolution



Tandem Accelerator - Current Building Use



# Applied Dynamics Lab (33)

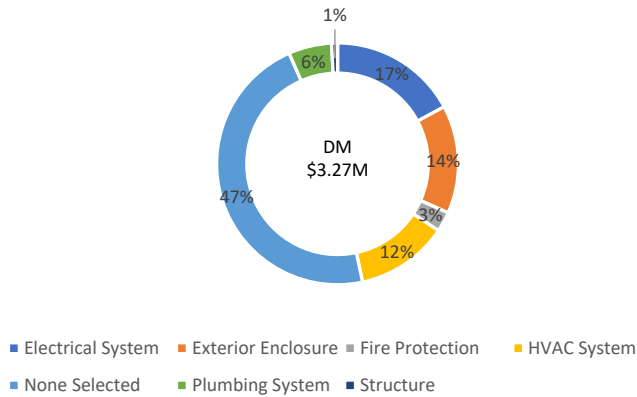
## Deferred Maintenance – Dash Board

Age = 54 years (1967)

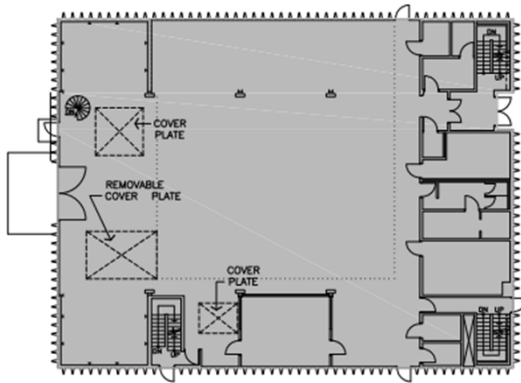
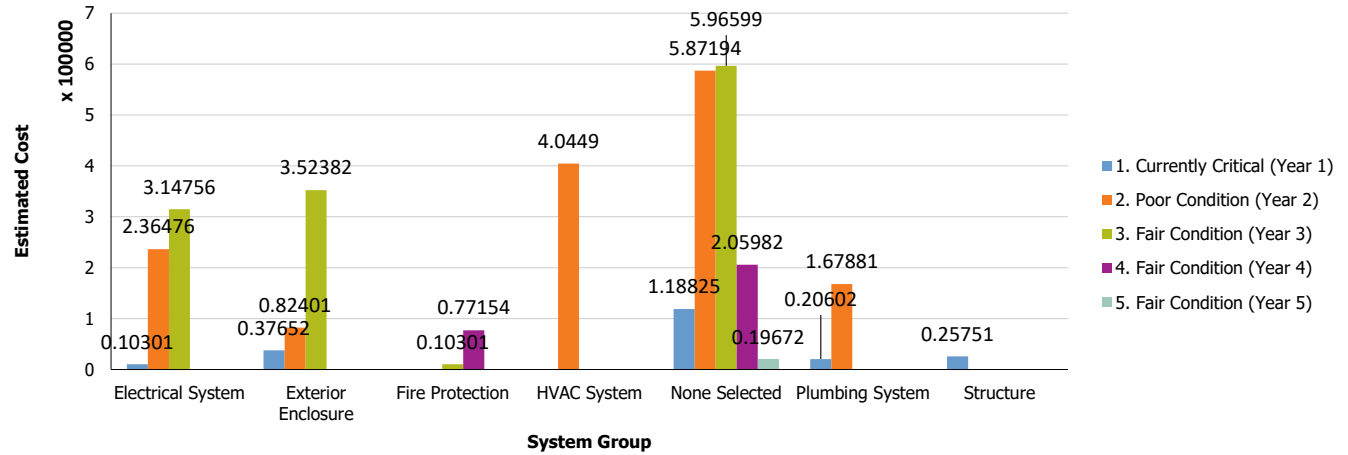
Replacement Value = \$8.72 M

Department: Engineering

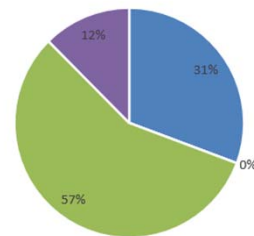
ADL DM Breakdown by System Group



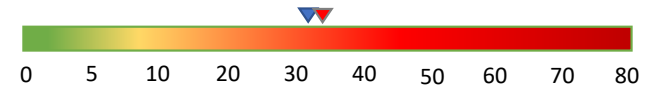
Applied Dynamics Lab DM Priorities



ADL – Evolution



ADL Current Building Use



Building Health Indicator

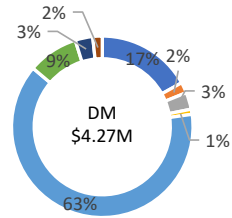
▼ 2020 Value  
▼ 2021 Value



# Psychology Building (34)

## Deferred Maintenance – Dash Board

Psychology DM Breakdown by System Group



- Electrical System
- Fire Protection
- None Selected
- Structure
- Exterior Enclosure
- Interior Construction and Conveyance
- Plumbing System
- System Not Linked



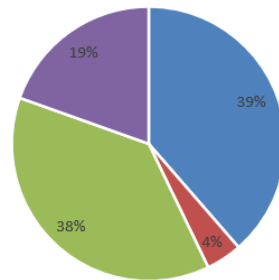
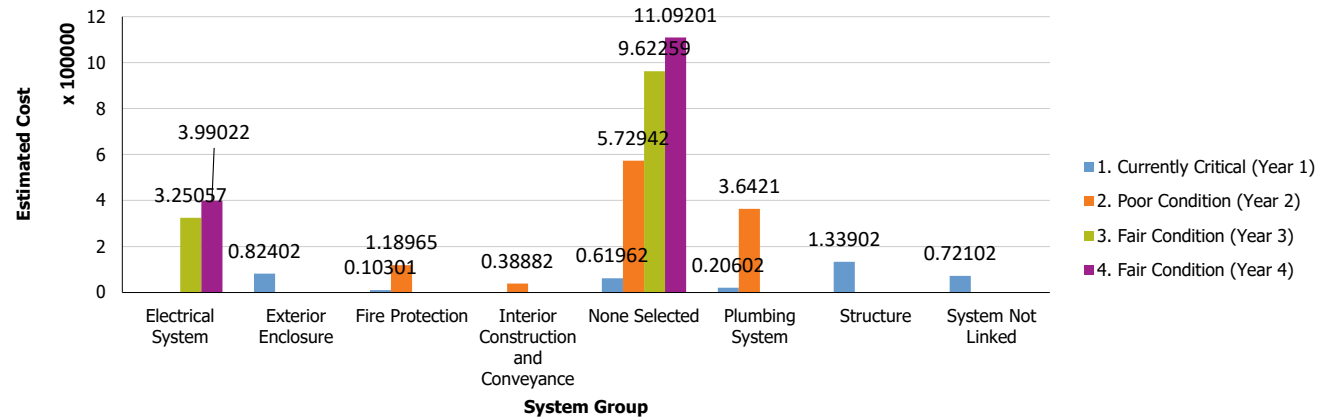
Psychology – Evolution

Age = 51 years (1970)

Replacement Value = \$30.86M

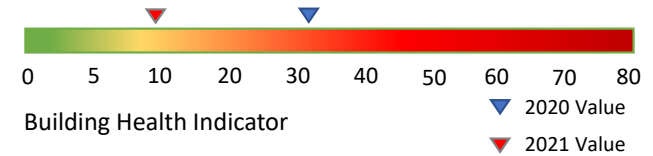
Department: Science

Psychology DM Priorities



- Service Space
- Classrooms and Lecture Halls
- Labs
- Offices

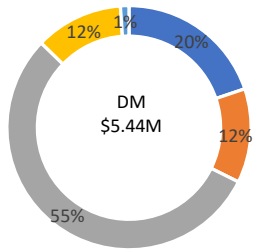
Psychology - Current Building Use



# Kenneth Taylor Hall Building (38)

## Deferred Maintenance – Dash Board

KTH - DM Breakdown by System Group



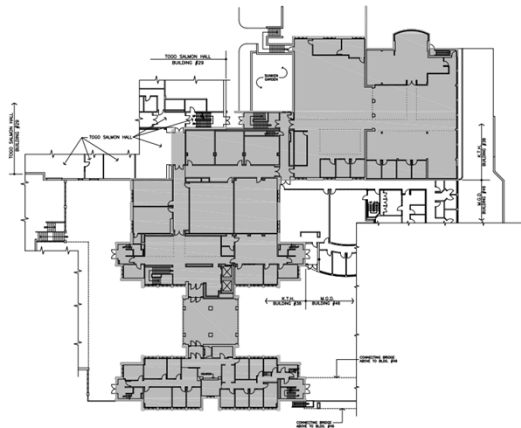
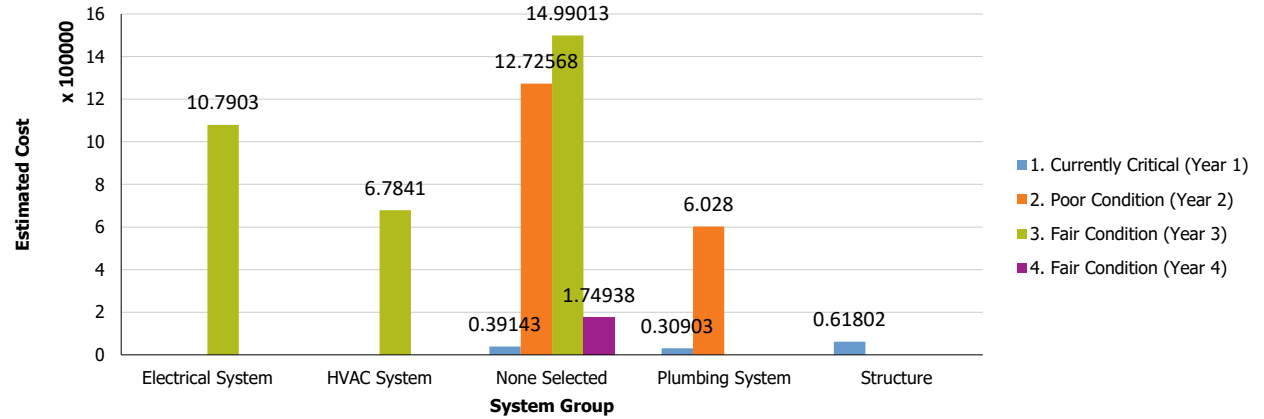
■ Electrical System ■ HVAC System ■ None Selected ■ Plumbing System ■ Structure

Age = 50 years (1971)

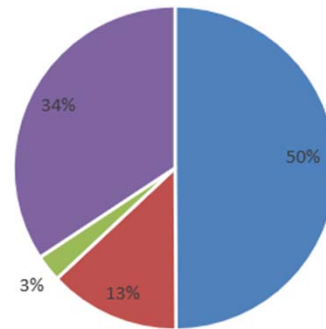
Replacement Value = \$44.04M

Department: Social Science

KTH DM Priorities

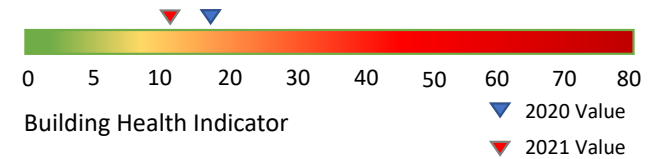


KTH – Evolution



■ Service Space ■ Classrooms and Lecture Halls ■ Labs ■ Offices

KTH Current Building Use

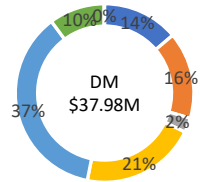


Building Health Indicator

# Life Sciences Building (39)

## Deferred Maintenance – Dash Board

LSB DM Breakdown by System Group



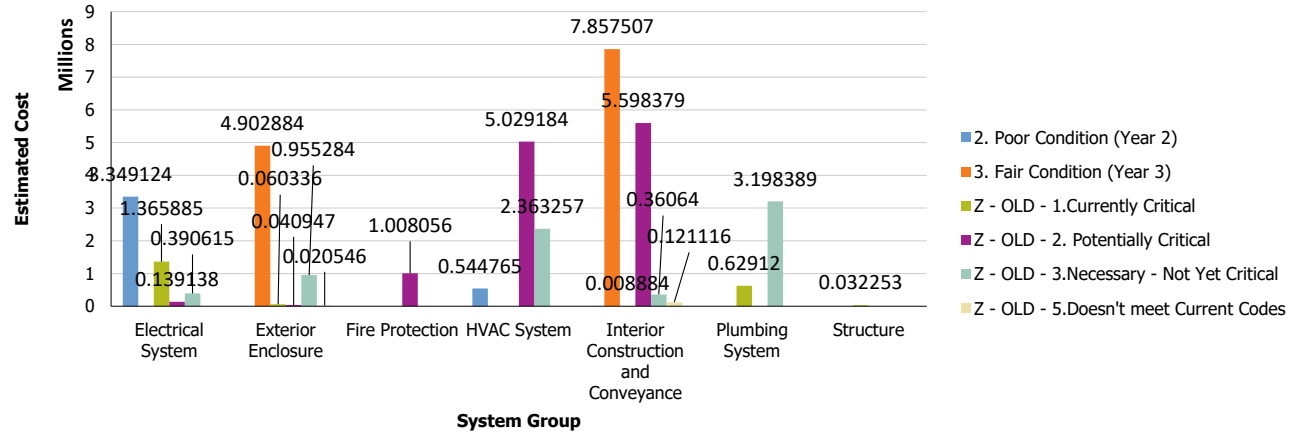
- Electrical System
- Fire Protection
- Interior Construction and Conveyance
- Structure
- Exterior Enclosure
- HVAC System
- Plumbing System

Age = 51 years (1970)

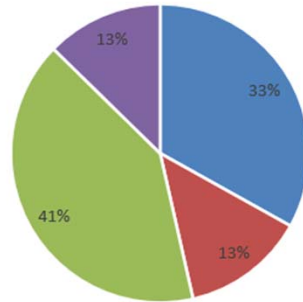
Replacement Value = \$56.35M

Department: Science

LSB DM Priorities

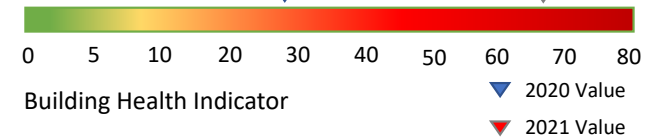


LSB – Evolution



- Service Space
- Classrooms and Lecture Halls
- Labs
- Offices

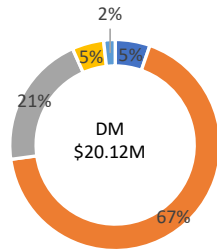
LSB Current Building Use



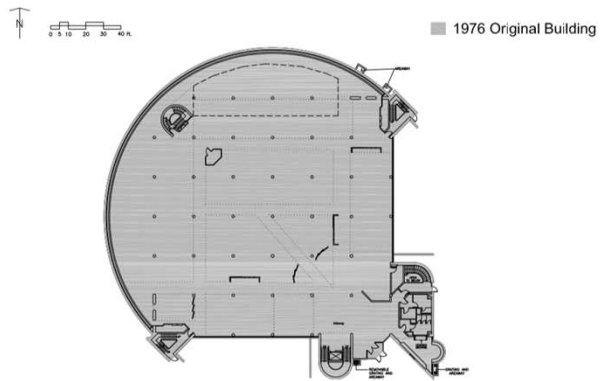
# H. G. Thode Library (42)

## Deferred Maintenance – Dash Board

Thode Library DM Breakdown by System Group



- Electrical System
- HVAC System
- Plumbing System
- Exterior Enclosure
- Interior Construction and Conveyance



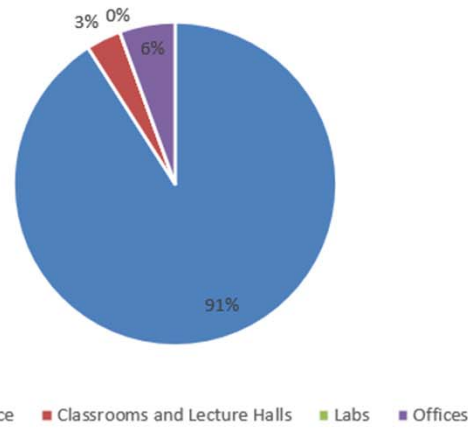
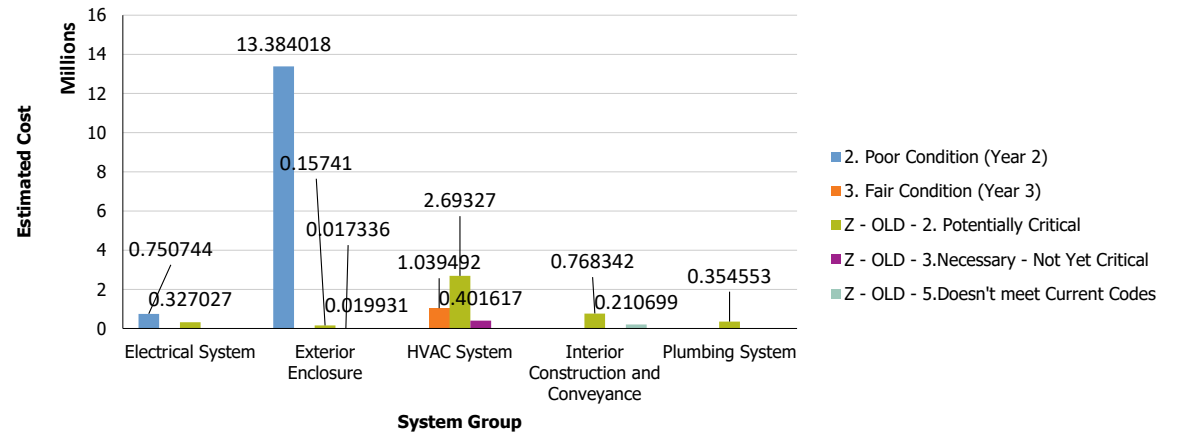
Thode Library Building – Evolution

Age = 45 years (1976)

Replacement Value = \$31.87M

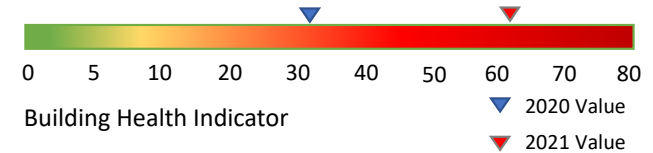
Department: Library

Thode Library - DM Priorities



- Service Space
- Classrooms and Lecture Halls
- Labs
- Offices

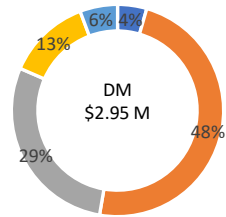
Thode Library Current Building Use



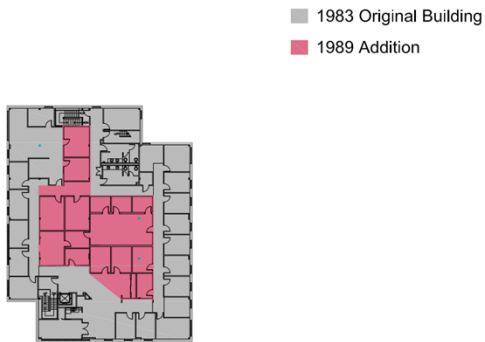
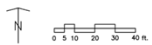
# Communications Research Building (43)

## Deferred Maintenance – Dash Board

CRL DM Breakdown by System Group



- Electrical System
- HVAC System
- Plumbing System
- Exterior Enclosure
- Interior Construction and Conveyance



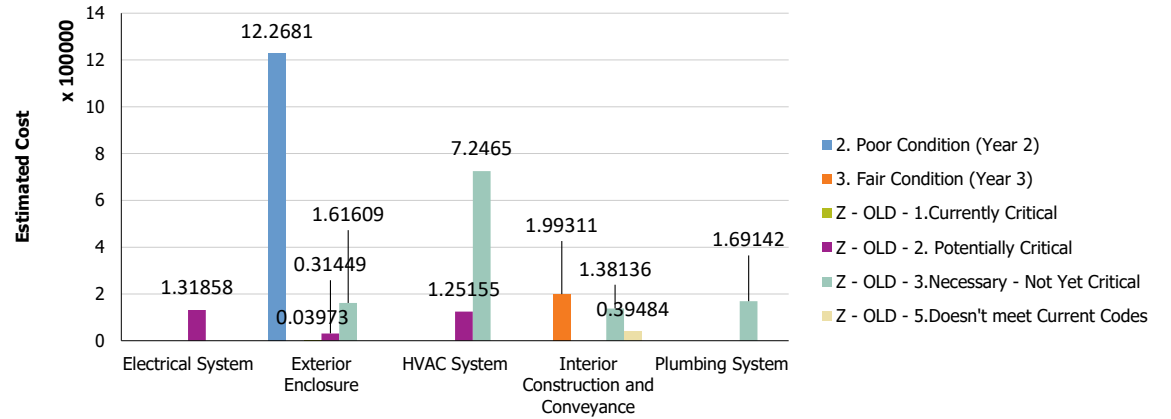
CRL Building – Evolution

Age = 38 years (1983)

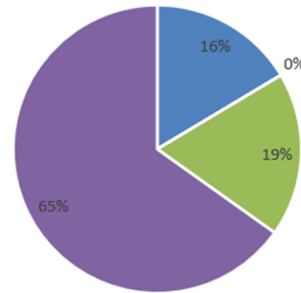
Replacement Value = \$15.31 M

Department: Humanities

CRL - DM Priorities

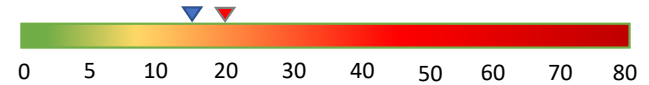


System Group



- Service Space
- Classrooms and Lecture Halls
- Labs
- Offices

CRL Current Building Use



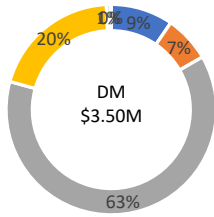
Building Health Indicator

- ▼ 2020 Value
- ▼ 2021 Value

# DeGroot School of Business (46)

## Deferred Maintenance – Dash Board

DSB DM Breakdown by System Group

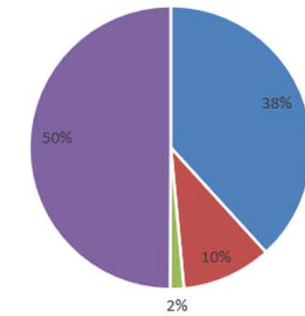


- Electrical System
- HVAC System
- Structure
- Exterior Enclosure
- Interior Construction and Conveyance
- System Not Linked



DSB – Evolution

- 1990 Original Building
- 1999 Addition
- 2001 Addition



- Service Space
- Classrooms and Lecture Halls
- Labs
- Offices

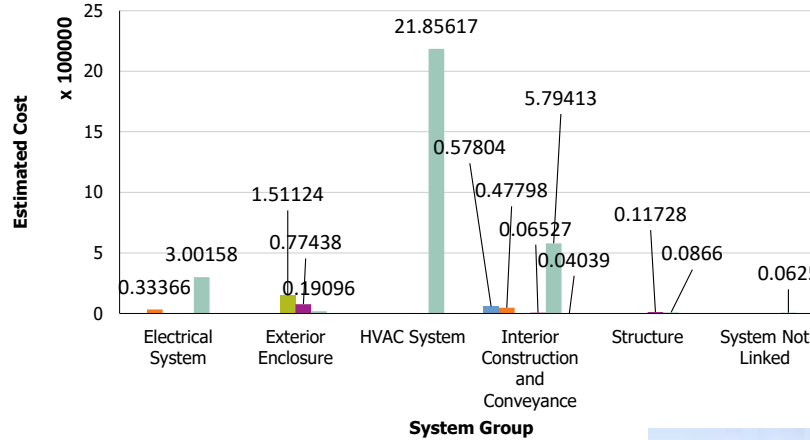
DSB Current Building Use

Age = 31 years (1990)

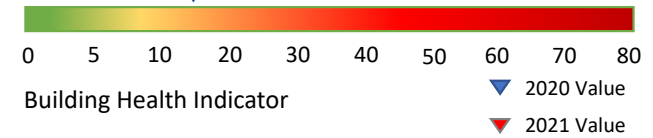
Replacement Value = \$24.56M

Department: Business

DSB DM Priorities



- 1. Currently Critical (Year 1)
- 3. Fair Condition (Year 3)
- Z - OLD - 1.Currently Critical
- Z - OLD - 2. Potentially Critical
- Z - OLD - 3.Necessary - Not Yet Critical
- Z - OLD - 5.Doesn't meet Current Codes



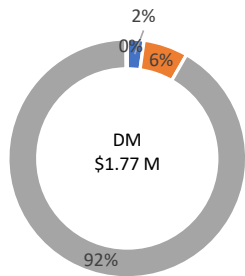
# Institute of Applied Health Science (48)

## Deferred Maintenance – Dash Board

Age = 21 years (2000)

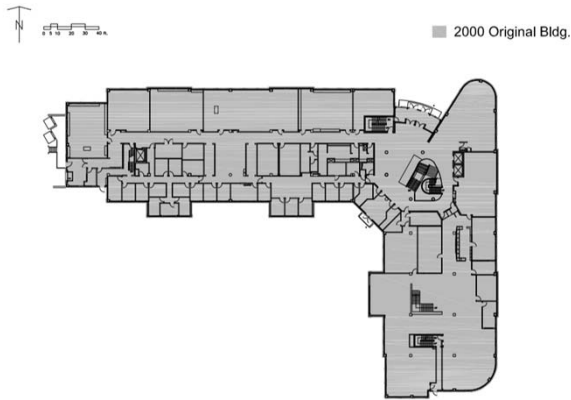
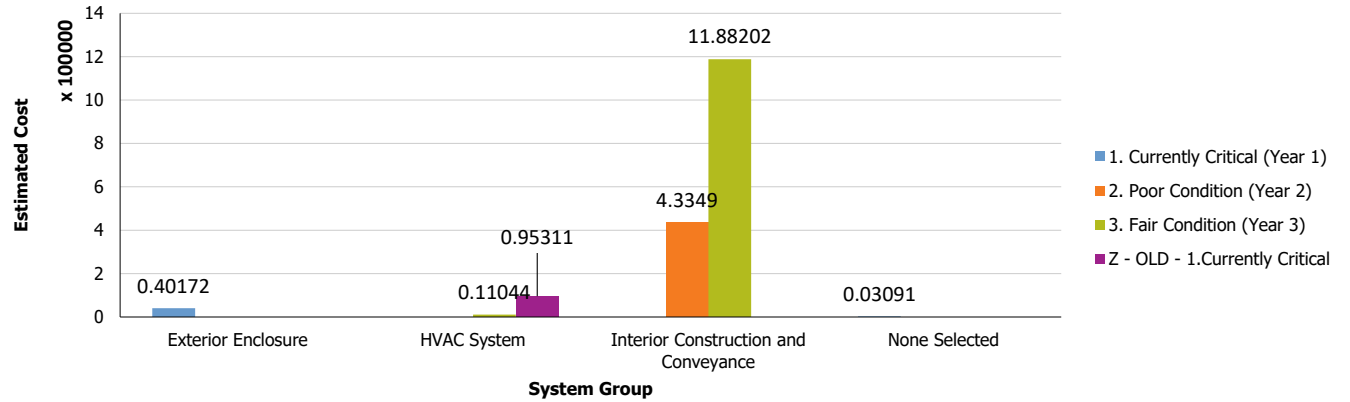
Replacement Value = \$49.77M  
Department: Health Science/Mohawk

IAHS DM Breakdown by System Group

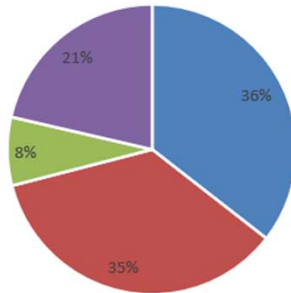


- Exterior Enclosure
- HVAC System
- Interior Construction and Conveyance
- None Selected

IAHS - DM Priorities

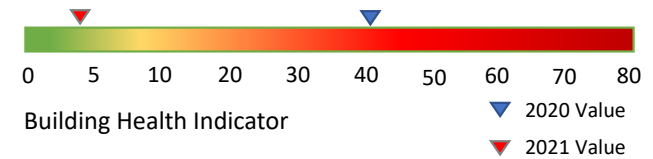


IAHS Building – Evolution



- Service Space
- Classrooms and Lecture Halls
- Labs
- Offices

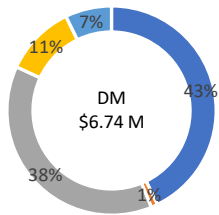
IAHS Current Building Use



# Information Technology Building (49)

## Deferred Maintenance – Dash Board

ITB - DM Breakdown by System Group



- Electrical System
- HVAC System
- Plumbing System
- Exterior Enclosure
- Interior Construction and Conveyance

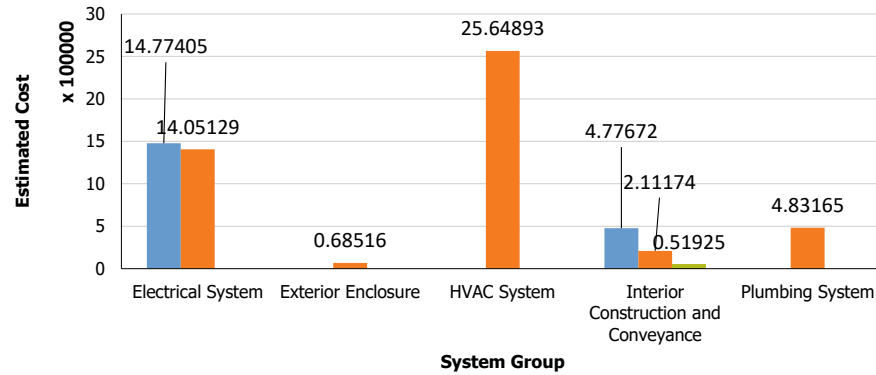


ITB Building – Evolution

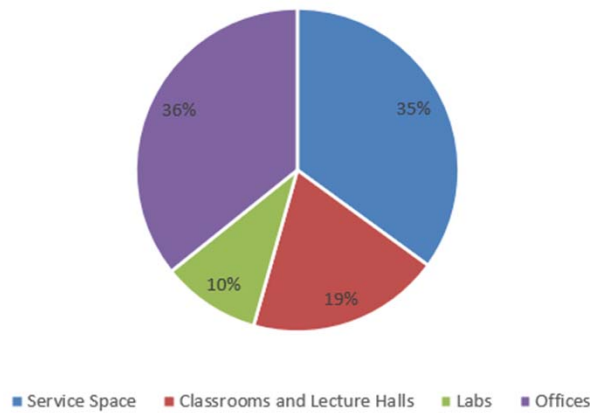
Age = 66 years (1955)

Replacement Value = \$41.65M

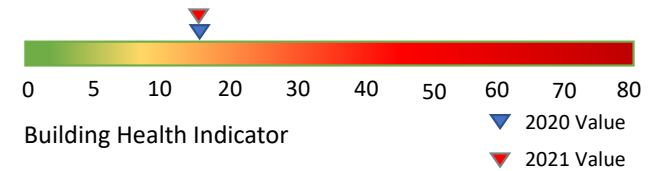
Department: Engineering; Computing and Software  
Information Technology - DM Priorities



- 3. Fair Condition (Year 3)
- Z - OLD - 3.Necessary - Not Yet Critical
- Z - OLD - 5.Doesn't meet Current Codes



ITB Current Building Use



Building Health Indicator



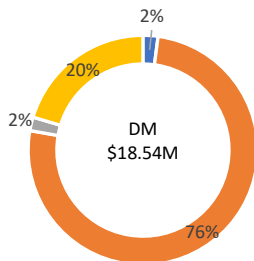
Michael DeGroot Centre for Learning and Discovery (52) Age = 17 years (2004)

Age = 17 years (2004)

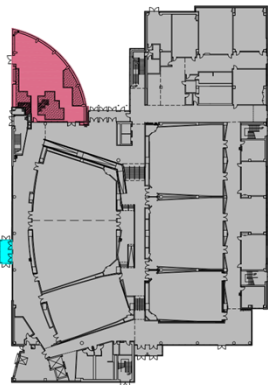
Replacement Value = \$177.68M

### Deferred Maintenance – Dash Board

MDCL DM Breakdown by System Group



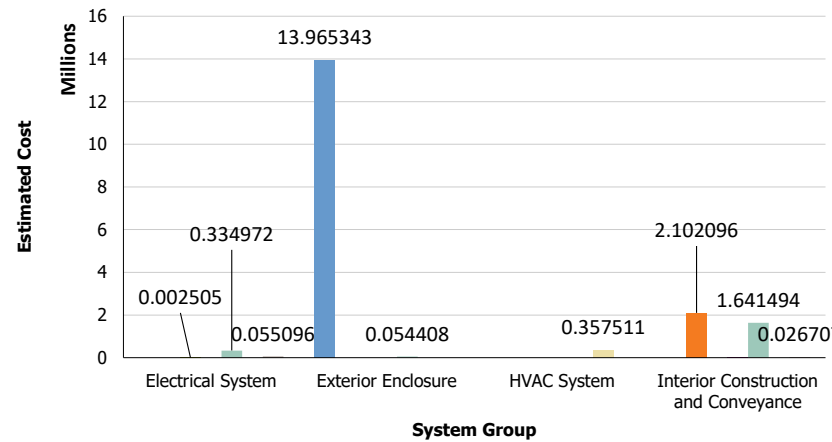
- Electrical System
- Exterior Enclosure
- HVAC System
- Interior Construction and Conveyance



MDCL – Evolution

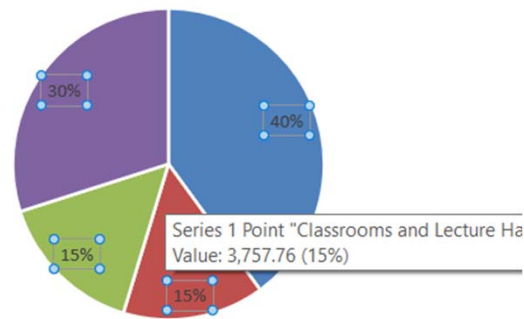
- 2004 Original Building
- 2005 First Addition
- 2017 Second Addition

MDCL DM Priorities



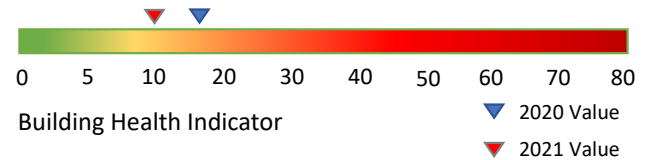
Department: Science

- 1. Currently Critical (Year 1)
- 3. Fair Condition (Year 3)
- Z - OLD - 1.Currently Critical
- Z - OLD - 2. Potentially Critical
- Z - OLD - 3.Necessary - Not Yet Critical
- Z - OLD - 4.Functional Need
- Z - OLD - 5.Doesn't meet Current Codes



- Service Space
- Classrooms and Lecture Halls
- Labs
- Offices

MDCL Current Building Use



Series 1 Point "Classrooms and Lecture Ha  
Value: 3,757.76 (15%)

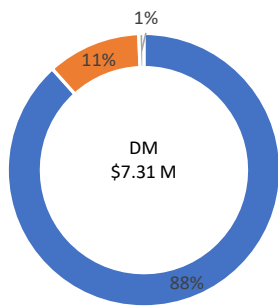
# David Braley Athletic Centre (54)

## Deferred Maintenance – Dash Board

Age = 14 years (2007)

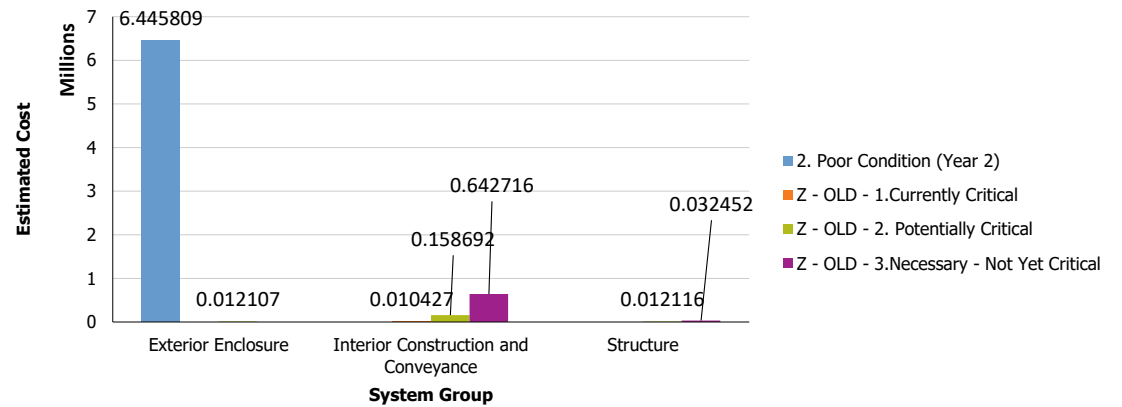
Replacement Value = \$87.61 M  
Department: Athletics & Rec.

DBAC DM Breakdown by System Group

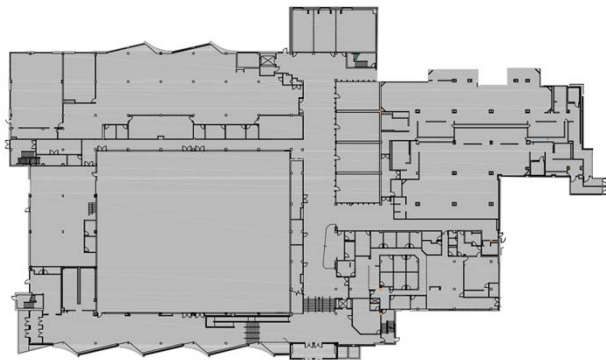


■ Exterior Enclosure ■ Interior Construction and Conveyance ■ Structure

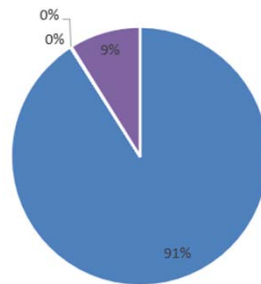
DBAC - DM Priorities



■ 2. Poor Condition (Year 2)  
 ■ Z - OLD - 1. Currently Critical  
 ■ Z - OLD - 2. Potentially Critical  
 ■ Z - OLD - 3. Necessary - Not Yet Critical

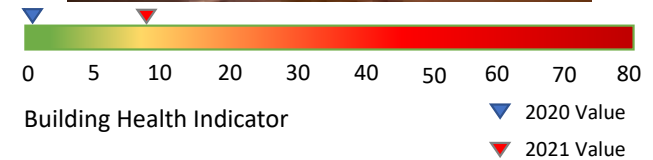


DBAC Building – Evolution



■ Service Space ■ Classrooms and Lecture Halls ■ Labs ■ Offices

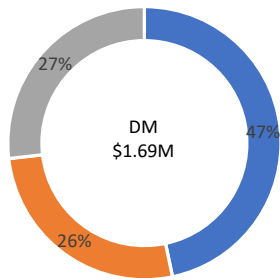
DBAC Current Building Use



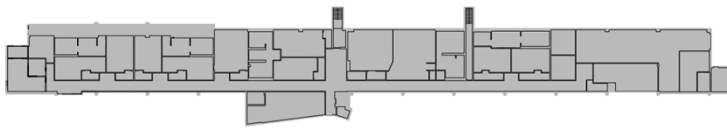
# Ron Joyce Stadium (55)

## Deferred Maintenance – Dash Board

Stadium - DM Breakdown by System Group



■ Exterior Enclosure ■ Interior Construction and Conveyance ■ Structure



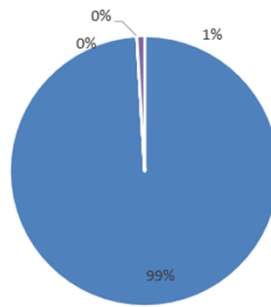
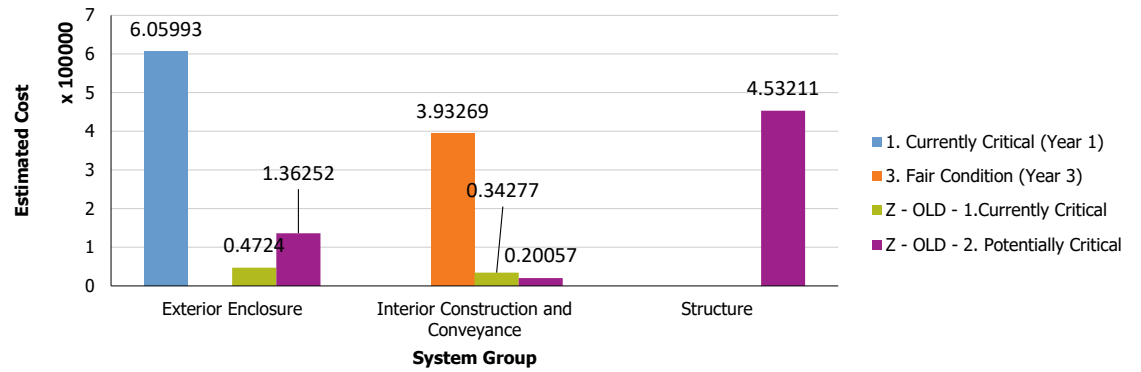
Stadium – Evolution

Age = 13 years (2008)

Replacement Value = \$14.55M

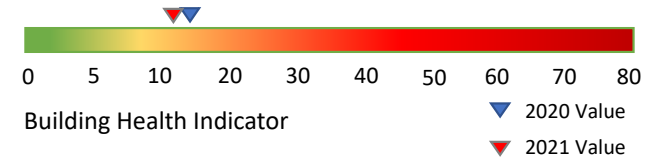
Department: Athletics and Recreation

Stadium - DM Priorities



■ Service Space ■ Classrooms and Lecture Halls ■ Labs ■ Offices

Stadium - Current Building Use



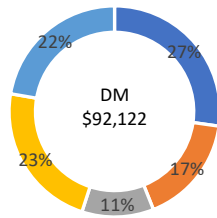
# Engineering Technology Building (56)

## Deferred Maintenance – Dash Board

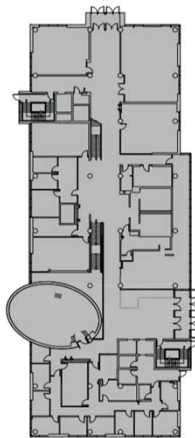
Age = 12 years (2009)

Replacement Value = \$83.38 M  
Department: Engineering

ETB DM Breakdown by System Group

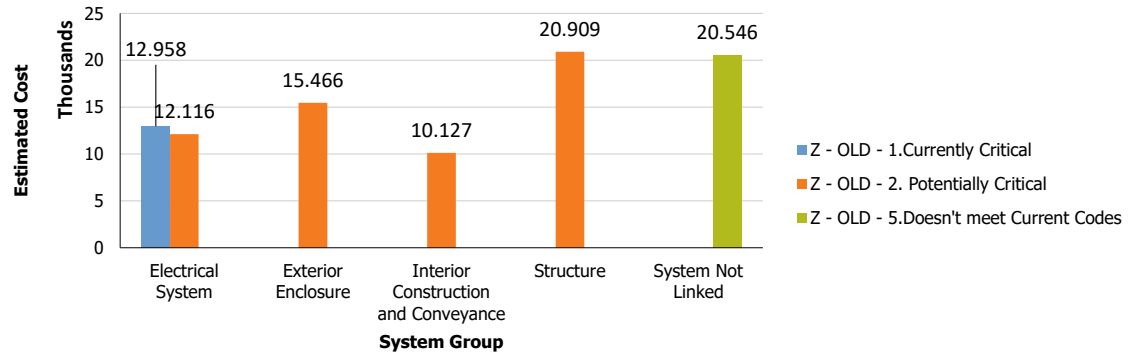


- Electrical System
- Exterior Enclosure
- Interior Construction and Conveyance
- Structure
- System Not Linked

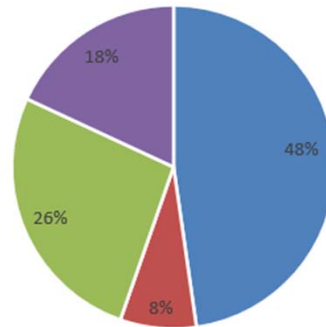


ETB Building – Evolution

ETB - DM Priorities

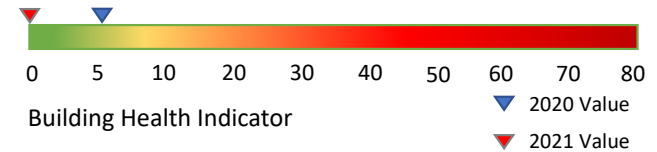


- Z - OLD - 1. Currently Critical
- Z - OLD - 2. Potentially Critical
- Z - OLD - 5. Doesn't meet Current Codes



- Service Space
- Classrooms and Lecture Halls
- Labs
- Offices

ETB Current Building Use

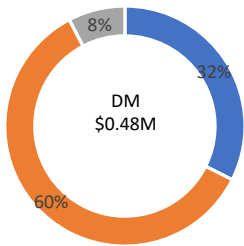


Building Health Indicator

# Ron Joyce Centre Burlington (57)

## Deferred Maintenance – Dash Board

Ron Joyce Centre - DM Breakdown by System Group



■ Exterior Enclosure ■ Interior Construction and Conveyance ■ System Not Linked

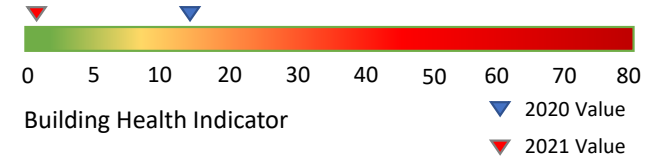
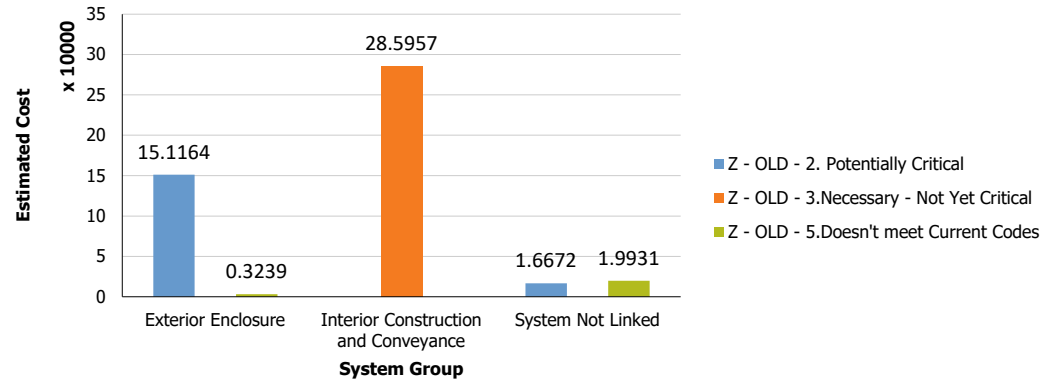
Ron Joyce Centre – Evolution

Age = 11 years (2010)

Replacement Value = \$58.85M

Department: Business

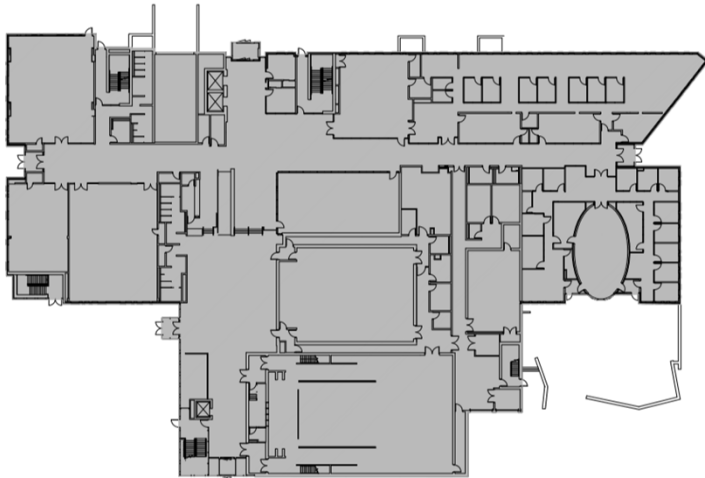
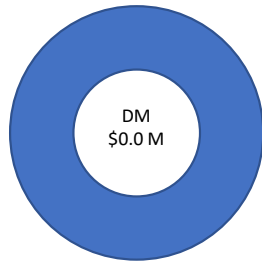
Ron Joyce Centre - DM Priorities



Ron Joyce Centre - Current Building Use

# L. R. Wilson Hall (74)

## Deferred Maintenance – Dash Board



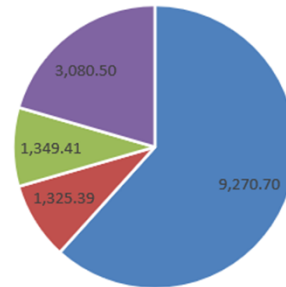
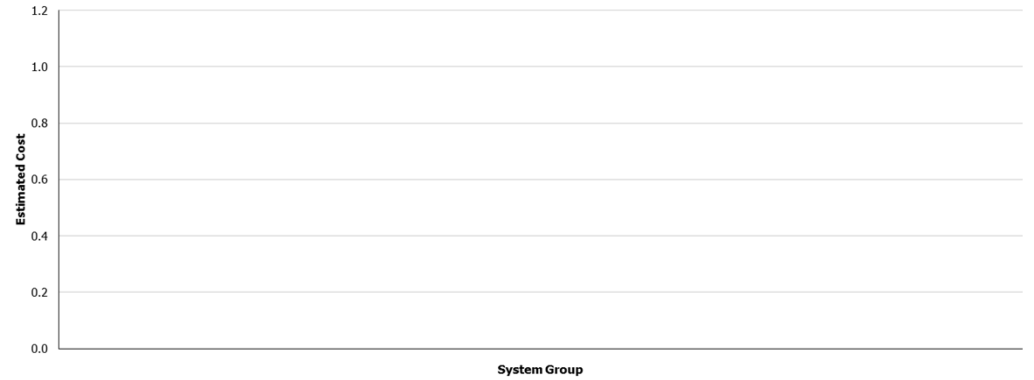
L R Wilson Hall – Evolution

Age = 5 years (2016)

Replacement Value = \$94.48M

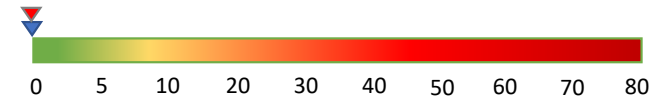
Department: Social Science

L R. Wilson Hall - DM Priorities



■ Service Space ■ Classrooms and Lecture Halls ■ Labs ■ Offices

L R Wilson Hall Current Building Use



Building Health Indicator

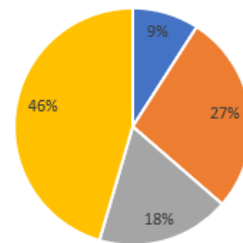
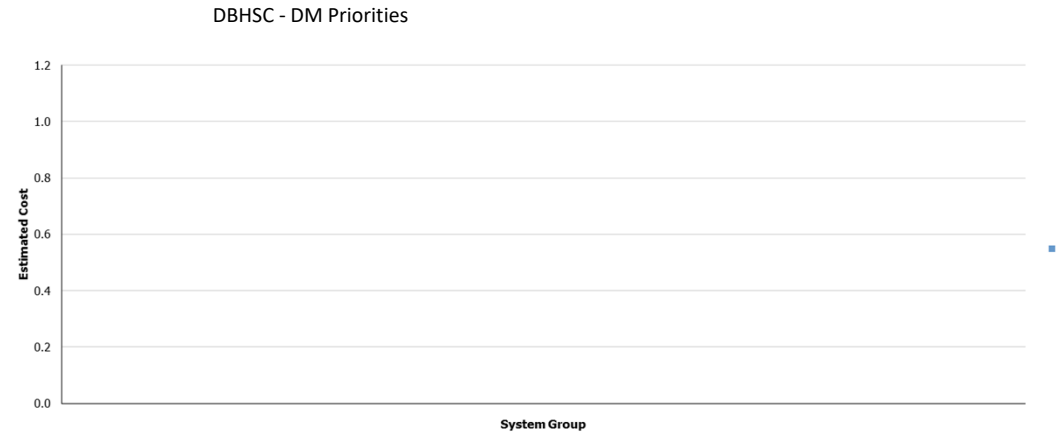
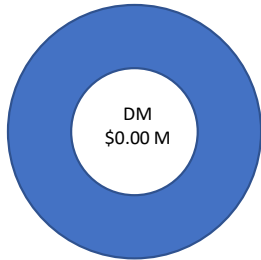
▼ 2020 Value

▼ 2021 Value

David Braley Health Sciences Centre (83)  
Deferred Maintenance – Dash Board

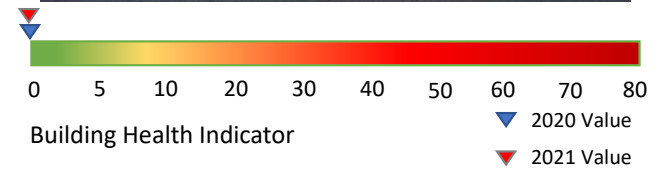
Age = 6 years (2015)

Replacement Value = \$133.56 M  
Department: Health Science



■ Service Space ■ Classrooms and Lecture Halls ■ Labs ■ Offices

DBAC Current Building Use

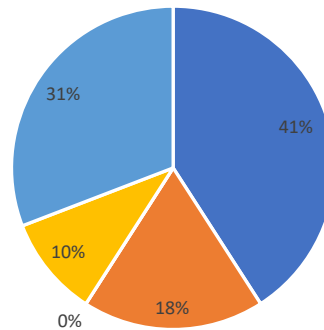
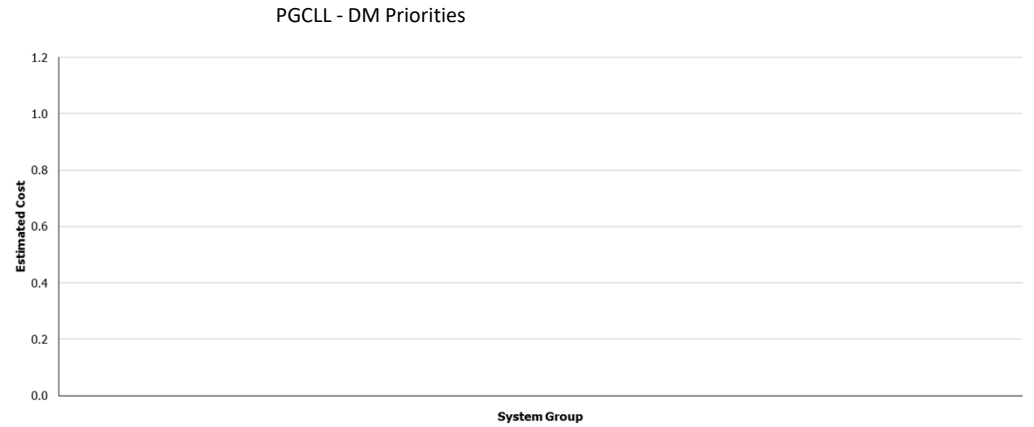
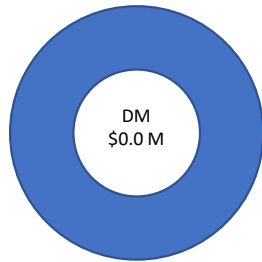


DBAC Building – Evolution

Peter George Living and Learning Centre (89)  
Deferred Maintenance – Dash Board

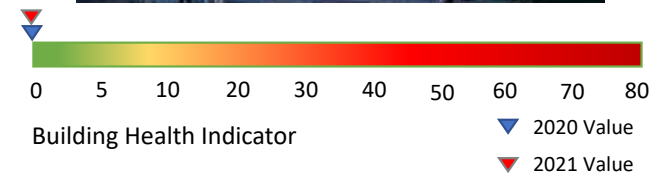
Age = 2 year (2019)

Replacement Value = \$75.82M  
Department: Shared Building



■ Service Space ■ Classrooms and Lecture Halls ■ Labs ■ Offices ■ Residences

PGCLL Current Building Use



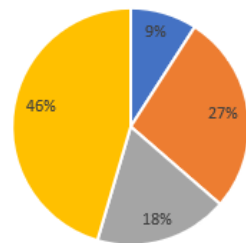
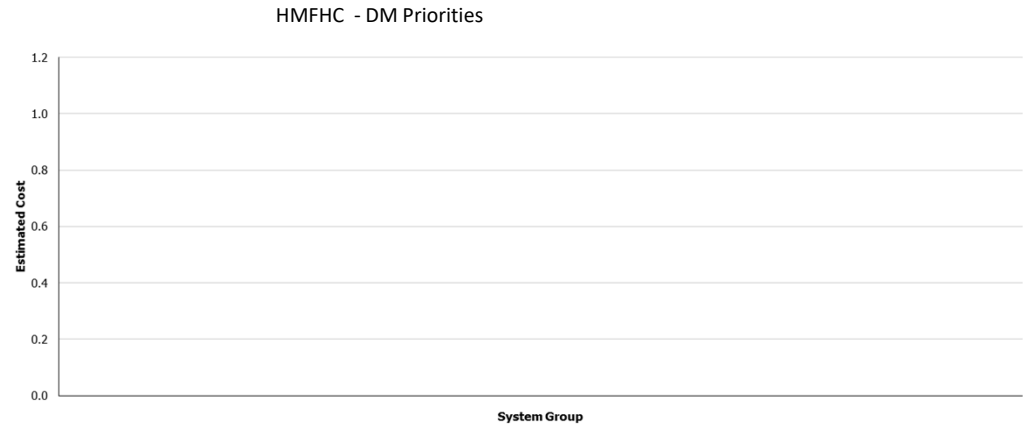
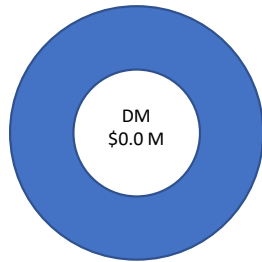
PGCLL – Evolution



Halton McMaster Family Health Centre (90)  
Deferred Maintenance – Dash Board

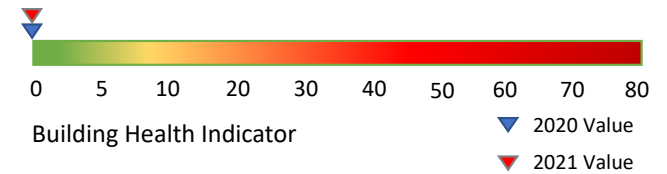
Age = 8 years (2013)

Replacement Value = \$2.67M  
Department: Library



■ Service Space ■ Classrooms and Lecture Halls ■ Labs ■ Offices

HMFHC Current Building Use



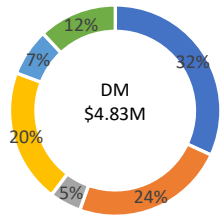
Building Health Indicator

▼ 2020 Value  
▼ 2021 Value

HMFHC Building – Evolution

# Preliminary Medical Building (T13) Deferred Maintenance – Dash Board

T13 DM Breakdown by System Group



- Electrical System
- Exterior Enclosure
- Fire Protection
- HVAC System
- Interior Construction and Conveyance
- Plumbing System

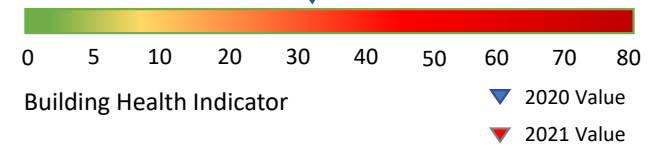
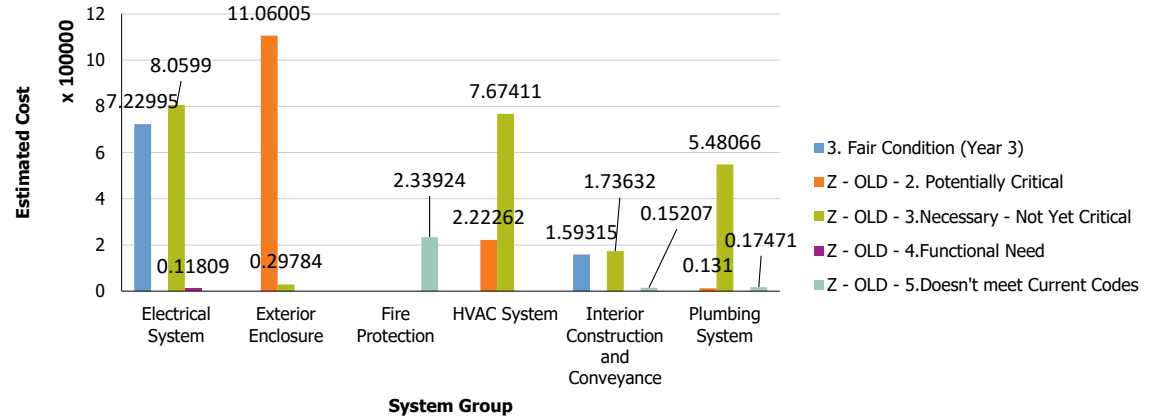
T13 – Evolution

Age = 54 years (1967)

Replacement Value = \$13.66M

Department: Classrooms

T13 DM Priorities

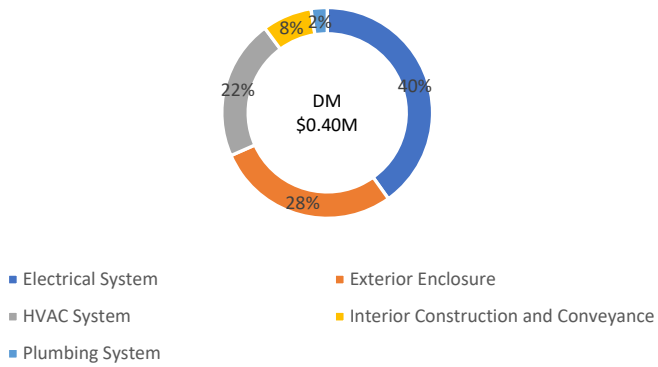


T13 Current Building Use

# Scourge (T26)

## Deferred Maintenance – Dash Board

T26 DM Breakdown by System Group



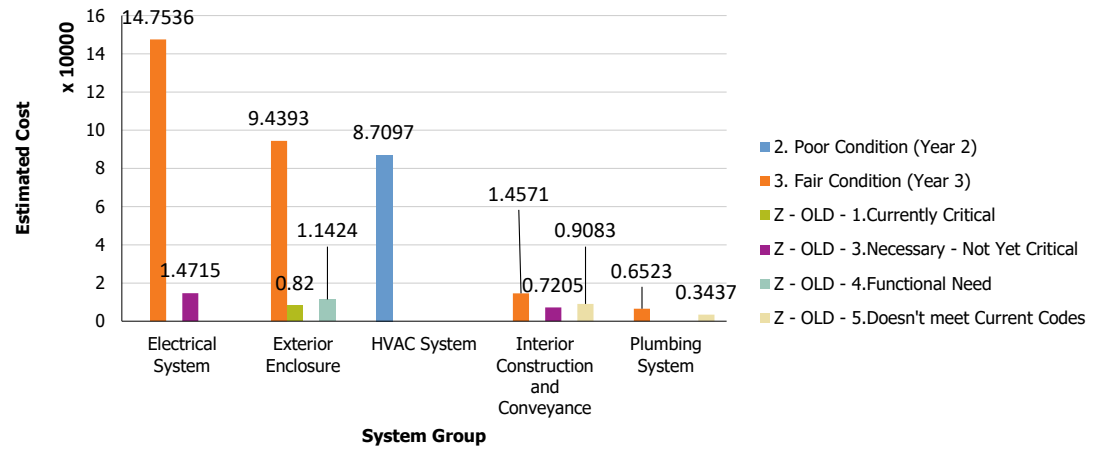
T26 – Evolution

Age = 32 years (1989)

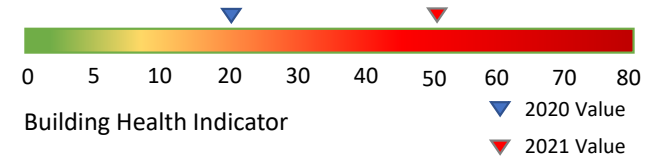
Replacement Value = \$1.06M

Department: Hospitality

T26 - DM Priorities

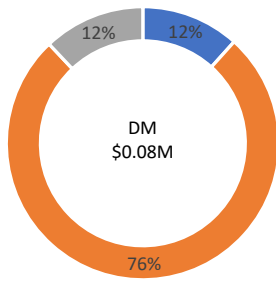


T26 - Current Building Use



Temporary Portable – Offices (T32)  
Deferred Maintenance – Dash Board

T32 DM Breakdown by System Group



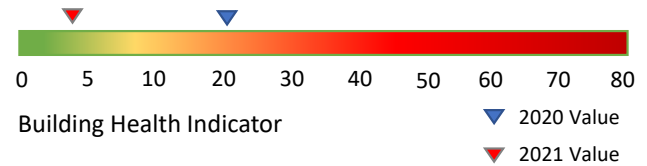
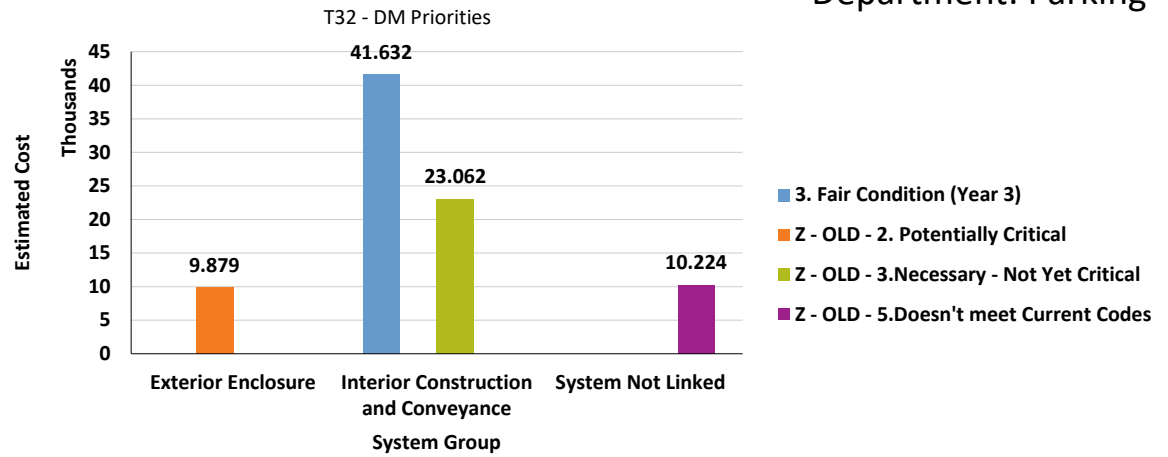
■ Exterior Enclosure ■ Interior Construction and Conveyance ■ System Not Linked

T32 – Evolution

Age = 8 years (2013)

Replacement Value = \$1.81M

Department: Parking

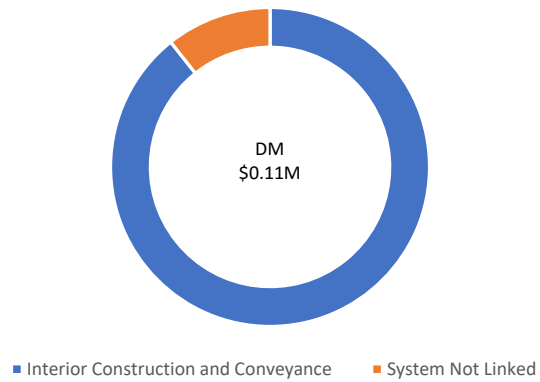


T32 - Current Building Use

# Temporary Portable – Children Centre (T33)

## Deferred Maintenance – Dash Board

T33 DM Breakdown by System Group



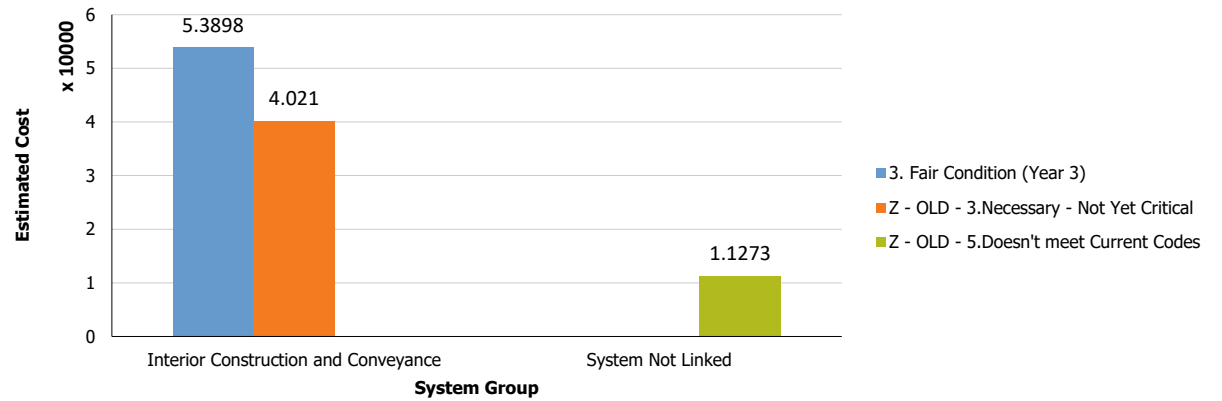
T33 – Evolution

Age = 8 years (2013)

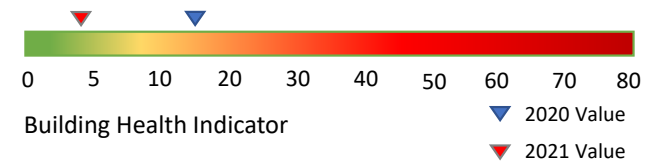
Replacement Value = \$2.23M

Department: Day Care

T33 - DM Priorities



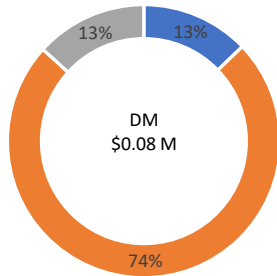
T33 - Current Building Use



# Temporary Lecture Hall (T34)

## Deferred Maintenance – Dash Board

T34 DM Breakdown by System Group



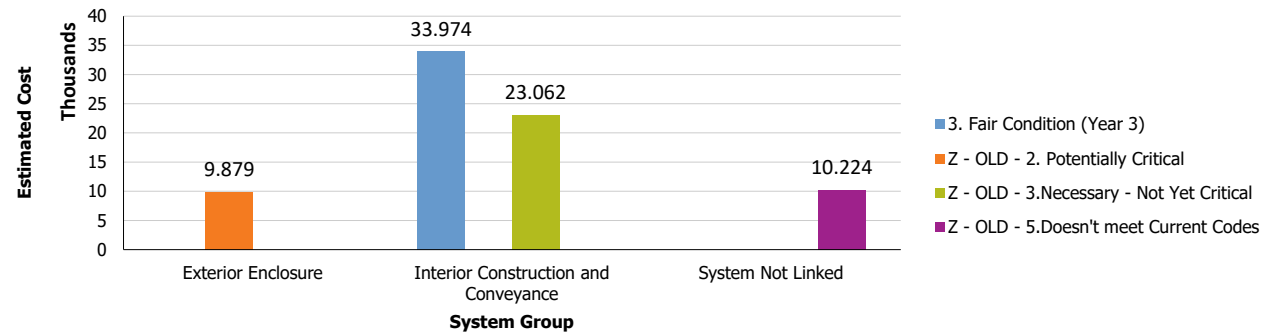
■ Exterior Enclosure ■ Interior Construction and Conveyance ■ System Not Linked

Age = 3 years (2018)

Replacement Value = \$1.42M

Department: Lecture Hall

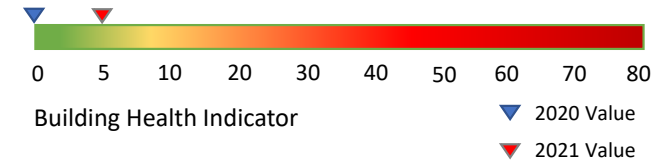
T34 - DM Priorities



■ 3. Fair Condition (Year 3)  
 ■ Z - OLD - 2. Potentially Critical  
 ■ Z - OLD - 3.Necessary - Not Yet Critical  
 ■ Z - OLD - 5.Doesn't meet Current Codes

T34 – Evolution

T34 Current Building Use

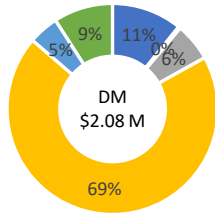


# APPENDIX C Building Dashboard

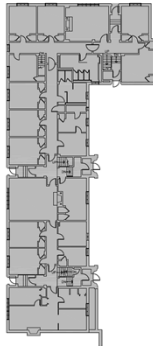
Edwards Hall (05)

## Deferred Maintenance – Dash Board

Edwards Hall DM Breakdown by System Group



- Electrical System
- Equipment and Furnishings
- Fire Protection
- HVAC System
- Interior Construction and Conveyance
- Plumbing System

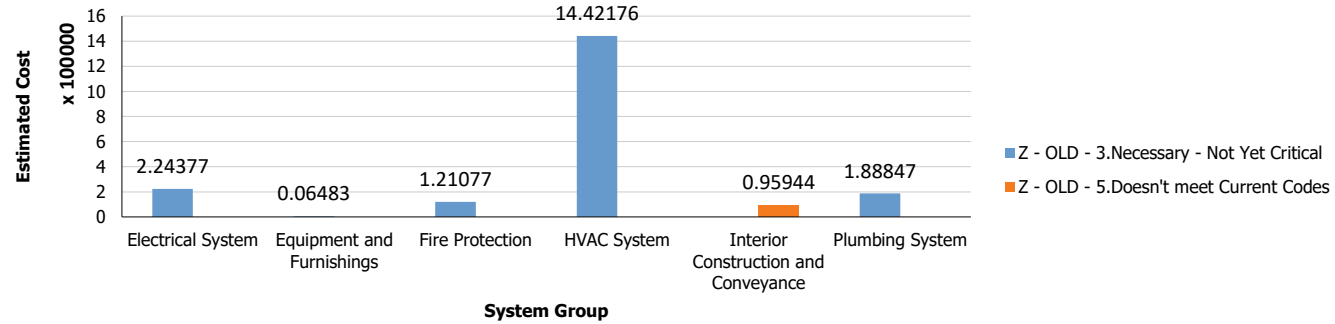


Edwards Hall – Evolution

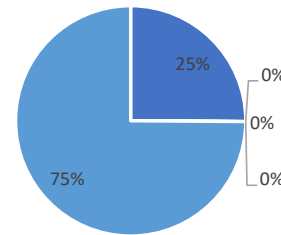
Age = 92 Years (1929)

Replacement Value = \$7.70M

Edwards Hall - DM Priorities

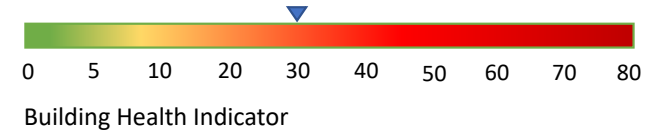


- Z - OLD - 3.Necessary - Not Yet Critical
- Z - OLD - 5.Doesn't meet Current Codes



- Service Space
- Classrooms and Lecture Halls
- Labs
- Offices
- Residences

Edwards Hall Current Building Use



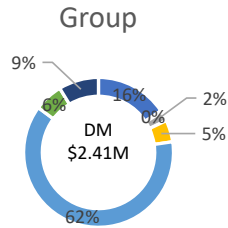
# Wallingford Hall (06)

Age = 92 years (1929)

Replacement Value = \$8.14M

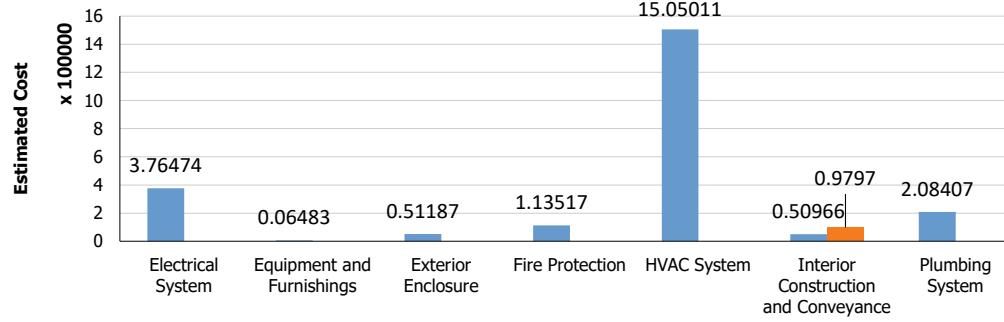
## Deferred Maintenance – Dash Board

Wallingford Hall DM Breakdown by System Group



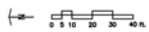
- Electrical System
- Exterior Enclosure
- HVAC System
- Plumbing System
- Equipment and Furnishings
- Fire Protection
- Interior Construction and Conveyance

Wallingford Hall - DM Priorities

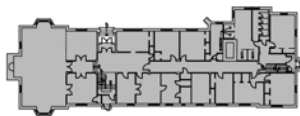


- Z - OLD - 3.Necessary - Not Yet Critical
- Z - OLD - 5.Doesn't meet Current Codes

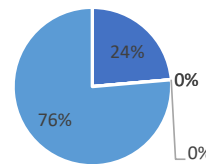
System Group



■ 1930 Original Building

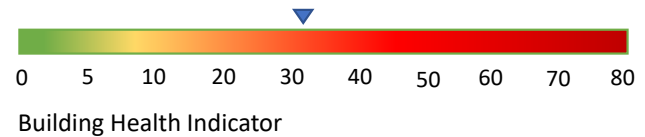


Wallingford Hall – Evolution



- Service Space
- Labs
- Residences
- Classrooms and Lecture Halls
- Offices

Wallingford Hall - Current Building Use

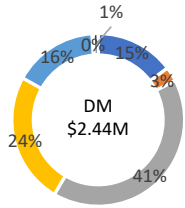




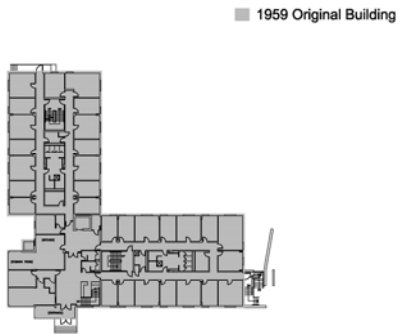
# Moulton Hall (18)

## Deferred Maintenance – Dash Board

### Moulton Hall DM Breakdown by System Group



- Electrical System
- HVAC System
- Plumbing System
- Structure
- Exterior Enclosure
- Interior Construction and Conveyance
- Site

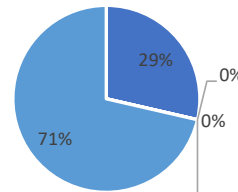
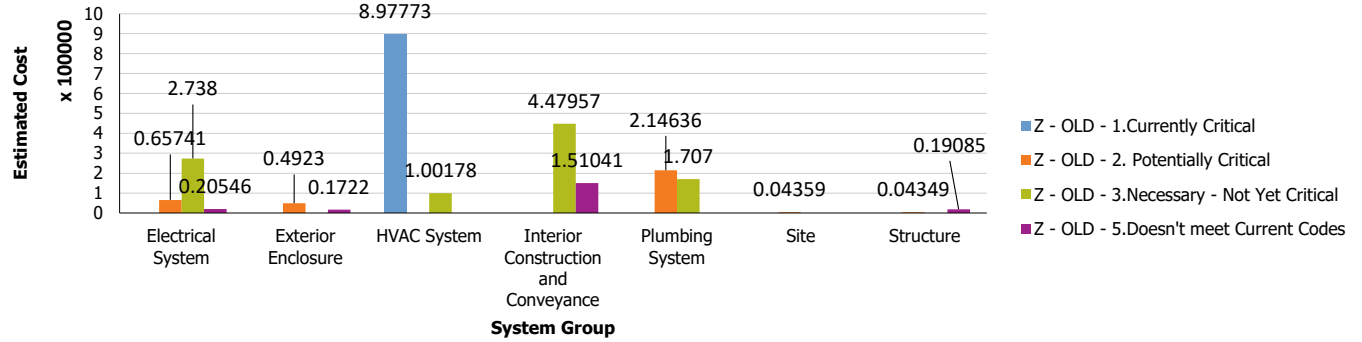


Moulton Hall – Evolution

Age = 62 years (1959)

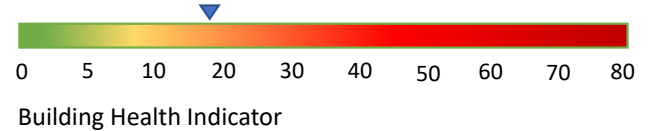
Replacement Value = \$20.82 M

Moulton Hall - DM Priorities



- Service Space
- Labs
- Residences
- Classrooms and Lecture Halls
- Offices

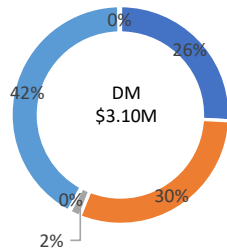
Moulton Hall Current Building Use



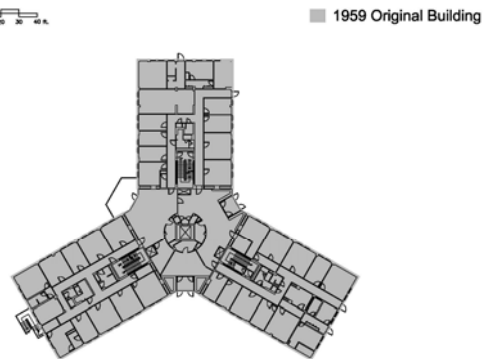
# Whidden Hall (19)

## Deferred Maintenance – Dash Board

### Whidden Hall DM Breakdown by System Group



- Electrical System
- Equipment and Furnishings
- Exterior Enclosure
- HVAC System
- Interior Construction and Conveyance
- Structure

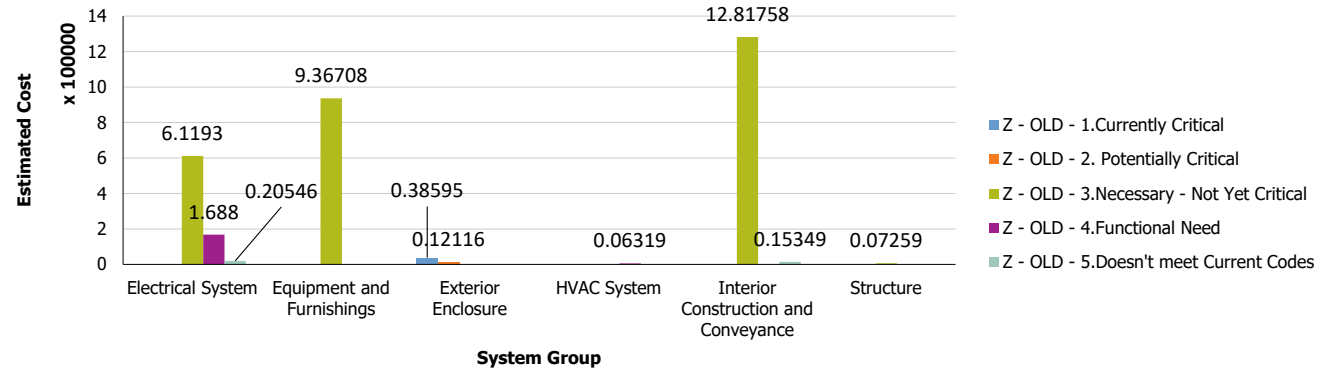


Whidden Hall – Evolution

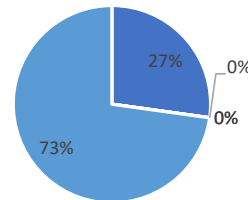
Age = 62 years (1959)

Replacement Value = \$16.24 M

Whidden Hall - DM Priorities

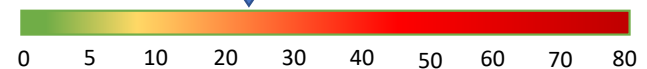


- Z - OLD - 1.Currently Critical
- Z - OLD - 2. Potentially Critical
- Z - OLD - 3.Necessary - Not Yet Critical
- Z - OLD - 4.Functional Need
- Z - OLD - 5.Doesn't meet Current Codes



- Service Space
- Classrooms and Lecture Halls
- Labs
- Offices
- Residences

Whidden Hall Current Building Use

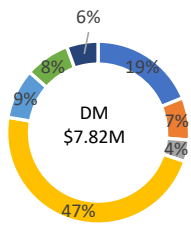


Building Health Indicator

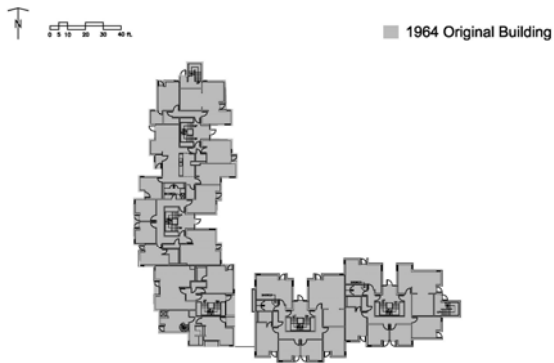
# Matthews Hall (26)

## Deferred Maintenance – Dash Board

Matthews Hall DM Breakdown by System Group



- Electrical System
- Fire Protection
- Interior Construction and Conveyance
- Structure
- Exterior Enclosure
- HVAC System
- Plumbing System

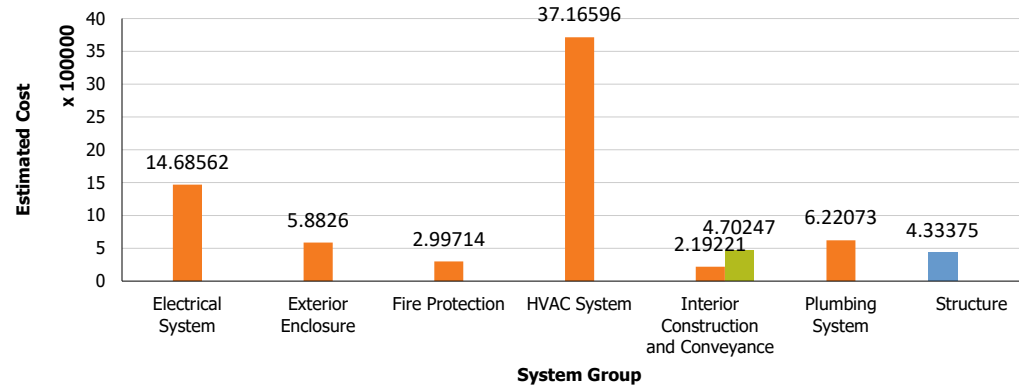


Matthews Hall – Evolution

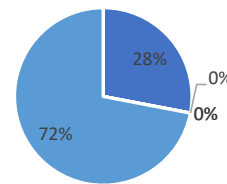
Age = 57 years (1964)

Replacement Value = \$20.91M

Matthews Hall - DM Priorities

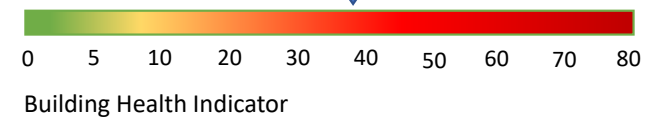


- Z - OLD - 2. Potentially Critical
- Z - OLD - 3.Necessary - Not Yet Critical
- Z - OLD - 5.Doesn't meet Current Codes



- Service Space
- Labs
- Residences
- Classrooms and Lecture Halls
- Offices

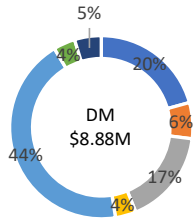
Matthews Hall Current Building Use



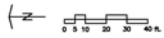
# McKay Hall (27)

## Deferred Maintenance – Dash Board

### McKay Hall DM Breakdown by System Group



- Electrical System
- Equipment and Furnishings
- Exterior Enclosure
- Fire Protection
- HVAC System
- Interior Construction and Conveyance
- Plumbing System



■ 1964 Original Building

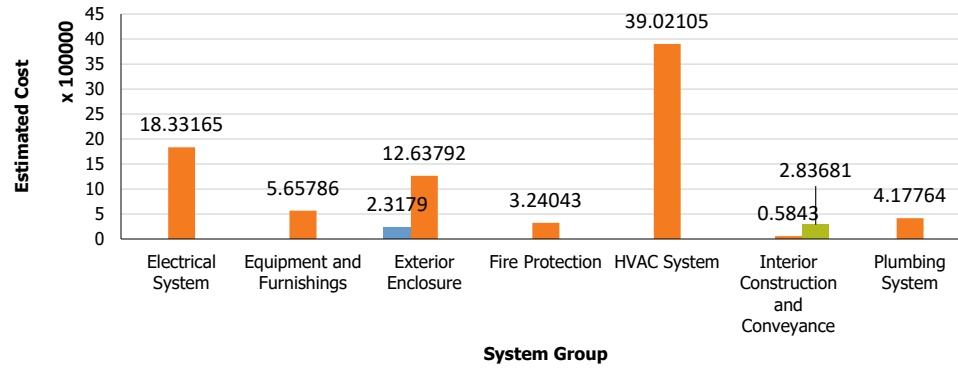


McKay Hall – Evolution

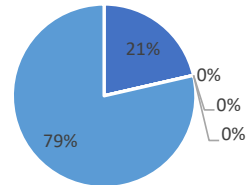
Age = 57 years (1964)

Replacement Value = \$23.68M

McKay Hall - DM Priorities

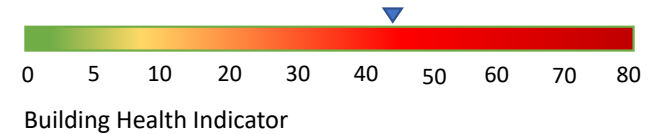


- Z - OLD - 2. Potentially Critical
- Z - OLD - 3. Necessary - Not Yet Critical
- Z - OLD - 5. Doesn't meet Current Codes



- Service Space
- Classrooms and Lecture Halls
- Labs
- Offices
- Residences

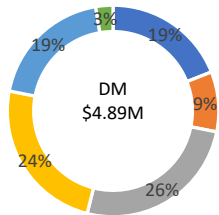
McKay Hall Current Building Use



# Woodstock (35)

## Deferred Maintenance – Dash Board

Woodstock DM Breakdown by System Group



- Electrical System
- Exterior Enclosure
- HVAC System
- Interior Construction and Conveyance
- None Selected
- Plumbing System



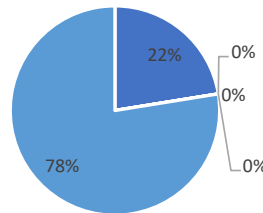
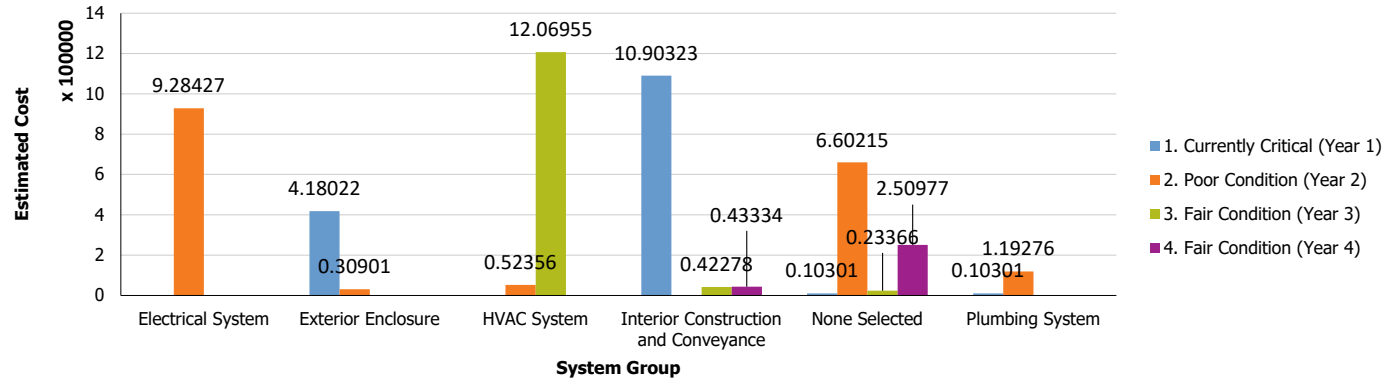
Woodstock – Evolution

■ 1968 Original Building

Age = 53 years (1968)

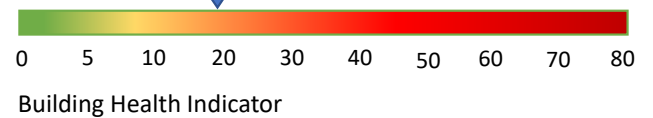
Replacement Value = \$23.91 M

Woodstock - DM Priorities



- Service Space
- Classrooms and Lecture Halls
- Labs
- Offices
- Residences

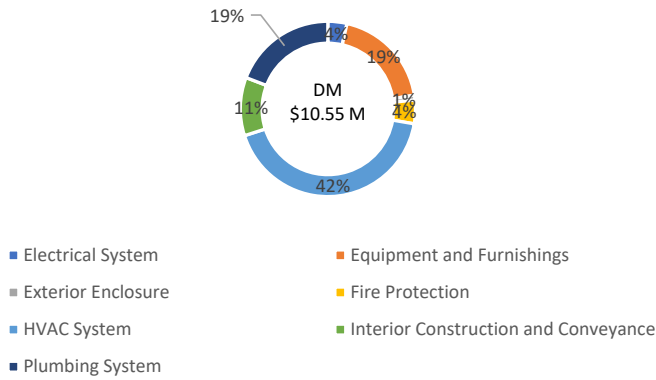
Woodstock Current Building Use



# Brandon Hall (36)

## Deferred Maintenance – Dash Board

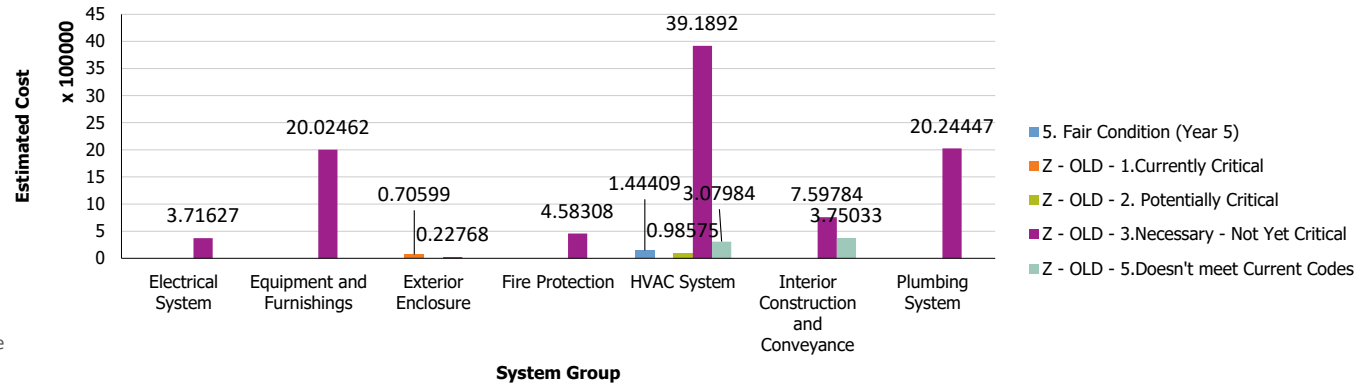
Brandon Hall DM Backlog by System Group



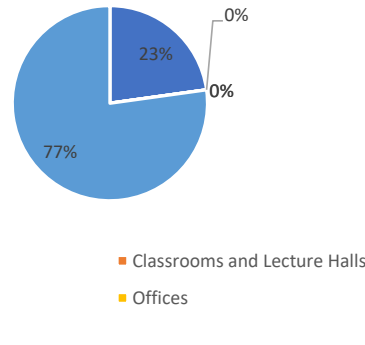
Age = 53 years (1968)

Replacement Value = \$29.14 M

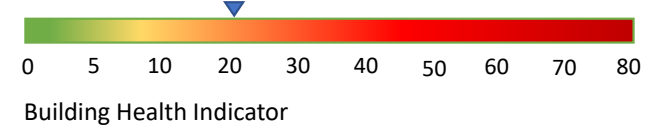
Brandon Hall - DM Priorities



Brandon Hall – Evolution



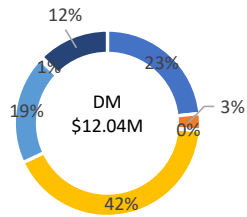
Brandon Hall Current Building Use



# Bates Residence (40)

## Deferred Maintenance – Dash Board

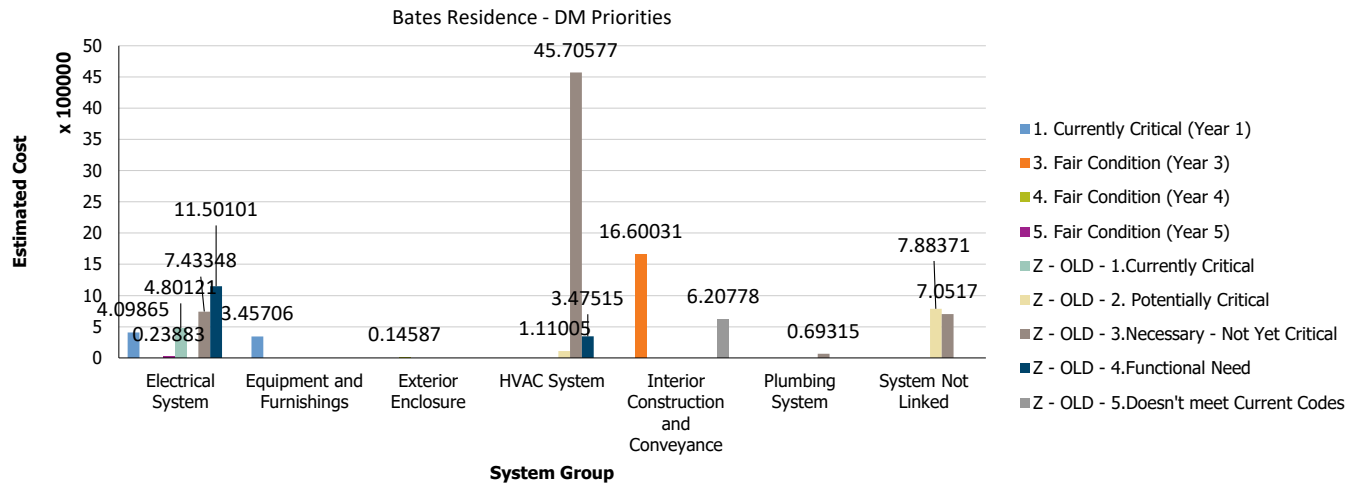
Bates Residence DM Breakdown by System Group



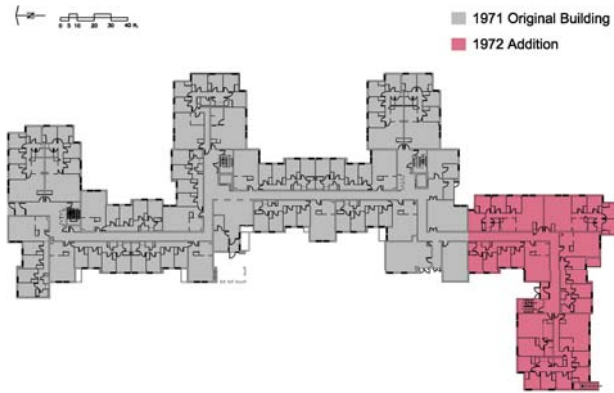
- Electrical System
- Equipment and Furnishings
- Exterior Enclosure
- HVAC System
- Interior Construction and Conveyance
- Plumbing System
- System Not Linked

Age = 50 years (1971)

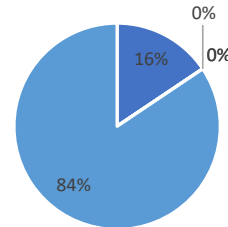
Replacement Value = \$61.75M



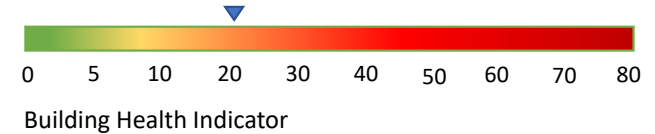
- 1. Currently Critical (Year 1)
- 3. Fair Condition (Year 3)
- 4. Fair Condition (Year 4)
- 5. Fair Condition (Year 5)
- Z - OLD - 1.Currently Critical
- Z - OLD - 2. Potentially Critical
- Z - OLD - 3.Necessary - Not Yet Critical
- Z - OLD - 4.Functional Need
- Z - OLD - 5.Doesn't meet Current Codes



Bates Residence – Evolution



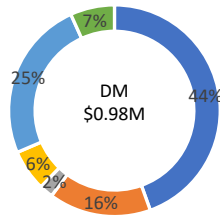
Bates Residence Current Building Use



# Hedden Hall (45)

## Deferred Maintenance – Dash Board

Hedden Hall DM Breakdown by System Group

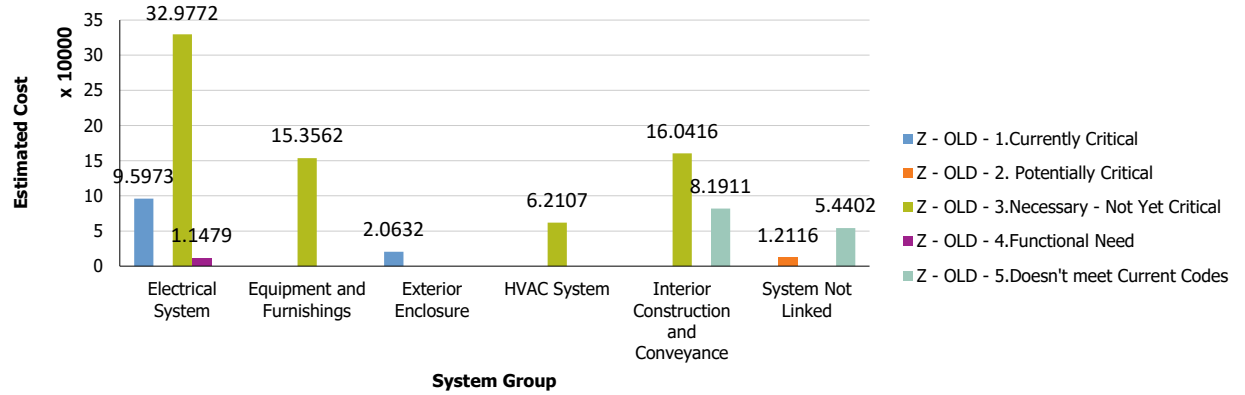


- Electrical System
- Equipment and Furnishings
- Exterior Enclosure
- HVAC System
- Interior Construction and Conveyance
- System Not Linked

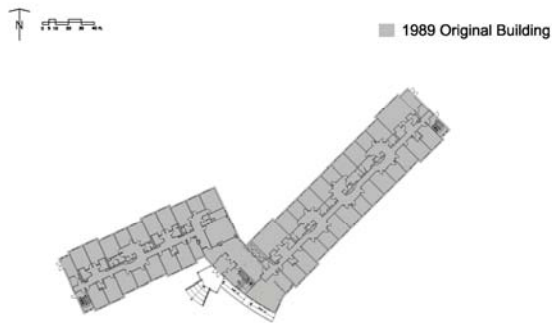
Age = 32 years (1989)

Replacement Value = \$22.38M

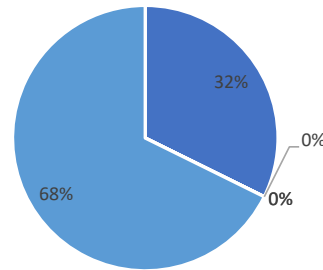
Hedden Hall - DM Priorities



- Z - OLD - 1.Currently Critical
- Z - OLD - 2. Potentially Critical
- Z - OLD - 3.Necessary - Not Yet Critical
- Z - OLD - 4.Functional Need
- Z - OLD - 5.Doesn't meet Current Codes

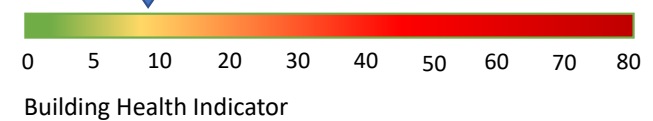


Hedden Hall – Evolution



- Service Space
- Classrooms and Lecture Halls
- Labs
- Offices
- Residences

Hedden Hall Current Building Use

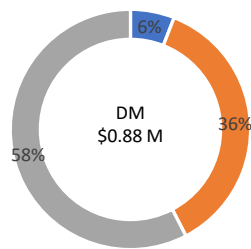




# Mary Keys Residence (50)

## Deferred Maintenance – Dash Board

Mary Keys Residence DM Breakdown by System Group

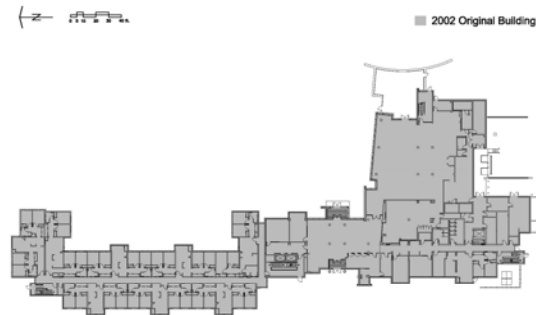
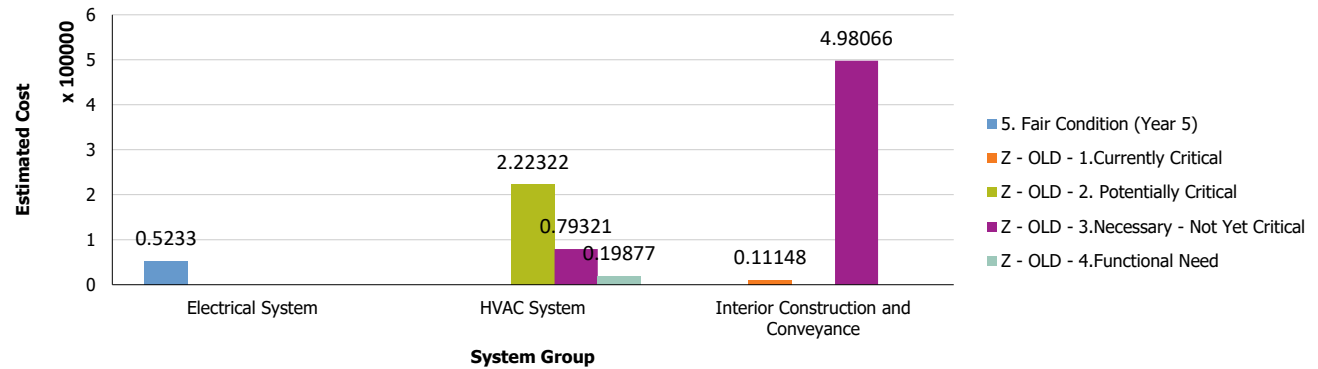


■ Electrical System ■ HVAC System ■ Interior Construction and Conveyance

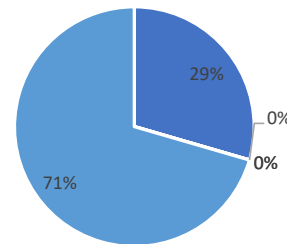
Age = 19 years (2002)

Replacement Value = \$39.36M

Mary Keys Residence - DM Priorities

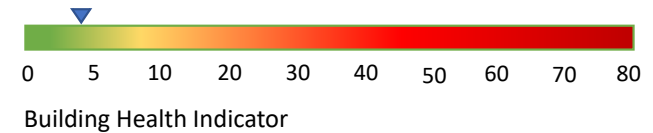


Mary Keys Residence – Evolution



■ Service Space ■ Classrooms and Lecture Halls ■ Labs ■ Offices ■ Residences

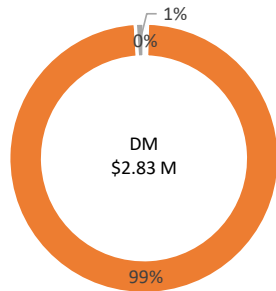
Mary Keys Residence Current Building Use



# Les Prince Hall (53)

## Deferred Maintenance – Dash Board

Les Prince Hall DM Breakdown by System Group



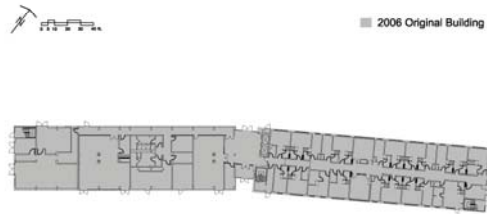
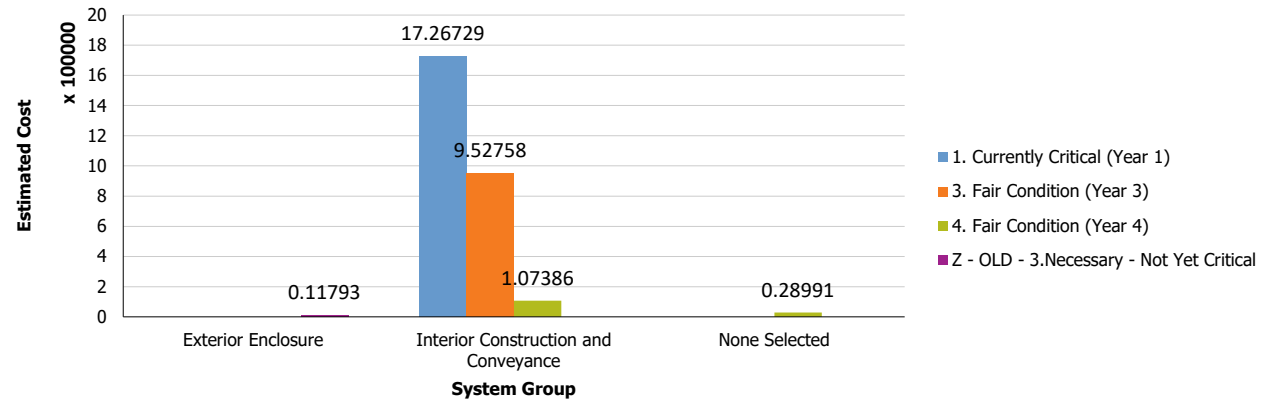
■ Exterior Enclosure ■ Interior Construction and Conveyance ■ None Selected

Age = 15 years (2006)

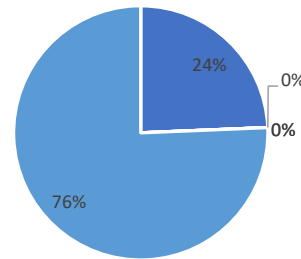
Replacement Value = \$36.24 M

Department: Science

Les Prince Hall - DM Priorities

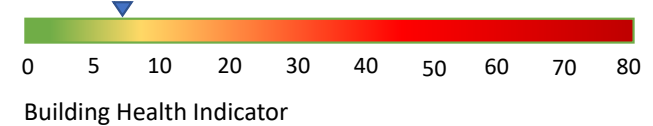


Les Prince Hall – Evolution



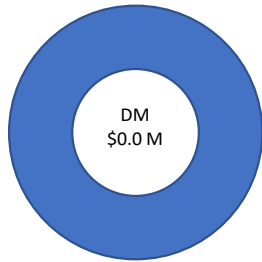
■ Service Space ■ Classrooms and Lecture Halls ■ Labs ■ Offices ■ Residences

Les Prince Hall Current Building Use



PGCLL - Residence (89)

Deferred Maintenance – Dash Board

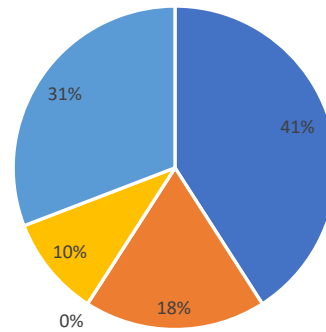
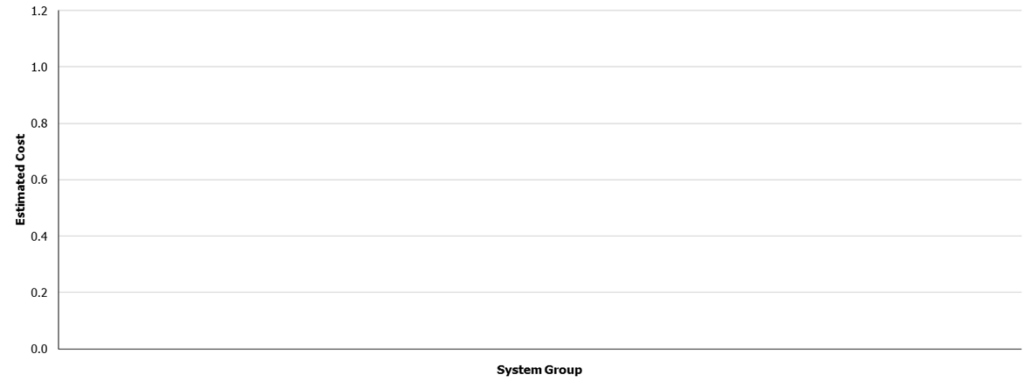


Age = 2 years (2019)

Replacement Value = \$46.50 M

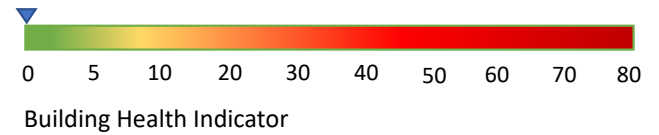
Department: Social Science, Humanities

PGCLL – Residence - DM Priorities



■ Service Space ■ Classrooms and Lecture Halls ■ Labs ■ Offices ■ Residences

PGCLL - Current Building Use



PGCLL – Evolution