

January 14, 2021

Michelle Gerner System Director, Capital Planning and Analysis Minnesota State 30 East 7th Street St. Paul, Mn 55101

Re: Project Name: Minnesota State University, Mankato – 2022 Armstrong Hall Replacement Predesign Update

Dear Michelle,

Armstrong Hall continues to be an important project for the campus and there are no significant changes to the project goals, program, and scope from the previously submitted 2020 Armstrong Hall Replacement Predesign document. Due to the 2-year delay, schedule and cost will impact the project design, construction, and budget as follows.

Schedule

Any references to schedule in the 2020 Armstrong Hall Predesign should be pushed back two years. Design would begin September of 2022 and construction for the new building would start in October 2024.

Cost Estimating Considerations

- A standard inflation rate has been applied across all costs to reflect the standard inflation based on the delayed schedule and updated to July 2021 dollars.
- A factor has been applied to new construction costs to cover changes in energy codes and B3 and SB2030 requirements. SB2030 Energy Target requires an 80% energy use reduction from baseline as opposed to 70% in 2018.
- The design team will use carbon emissions modeling to make datadriven decisions. Additionally, site and building provisions for animal habitat support will be integrated into the design, e.g. bird safe glazing strategies and site design strategies for endangered/threatened species
- Further, as technology has changed the traditional mode of operation, flexibility and personal preferences regarding in-person or remote learning and teaching will likely be an expectation of students, faculty, and staff going forward. The budget increase outlined in the Workbook addresses the additional infrastructure to augment classroom technology with microphones, video cameras, and large screen monitors.

Sincerely,

Paul Corcoran, AVP Facilities Management

> OFFICE OF FACILITIES MANAGEMENT 111 Wiecking Center • Mankato, MN 56001 Phone 507-389-2267 (V) • 800-627-3529 or 711 (MRS/TTY) • Fax 507-389-5862 A member of the Minnesota State Colleges and Universities System and an Alfirmative Action/Equal Opportunity University.



Provide this form at the beginning of Predesign Section 1.

Basic Information: 2022 State Appropriation Request							
Project Title:	Armstrong Hall Replacement Project						
Street address(es) of the	Armstrong Hall – 521 Ellis Ave, Mankato, Blue Earth County						
building(s) affected by	Clinical Sciences Building – 150 South Road, Mankato, Blue Earth County						
project, including county	Morris Hall – 500 South Road, Mankato, Blue Earth County						
name:	Performing Arts – 320 Maywood Ave, Mankato, Blue Earth County						
	Wiecking Center – 415 Malin Street, Mankato, Blue Earth County						

Project Scope							
New GSF:	100,000	100,000				5,000	
Renovated GSF:	70,000			nolished GSF:		145,000	
Note: Please indicate all request amounts in \$ thousands (for example, \$1,370,000 would be shown as							
\$1,370.)							
2022 Request (\$):	\$7,310	2024 Reque	st:	st: \$66,858 2026		6 Request:	\$33,564
Total project cost, all phases/biennia:	\$107,873		Will there be requests beyond 2026 for this project?			No	
Previous GO bonding appropriations for this project (do not include HEAPR)	No previous GO bonding for this project						

Project Timeline (all dates are approximate and subject to change)						
Proposed design start date:	September 2022					
Proposed bid/procurement date:	Sept 2023 – CSB Basement, July 2024 – New Building, July 2026 –					
	Renovation, March 2028 - Demolition					
Proposed construction start date:	Oct 2023 – CSB Basement, August 2024 – New Building, August 2026 –					
	Renovations, May 2028 - Demolition					
Proposed occupancy date:	April 2024 – CSB Basement, December 2025 – New Building, December					
	2027 - Renovations					

Facilities Data						
Current space utilization (%) for	33 weekly room	Anticipated space utilization (%)	38 weekly room			
classrooms/labs in the project area:	hours, 65% seat fill	resulting from this project:	hours, 75% seat fill			
Current Replacement Value (CRV)						
of the building(s) affected by	\$56,163,105	Backlog (\$) removed by project:	\$26,853,614			
project:						
Current FCI of building(s)/area(s)		Anticipated FCI resulting from this				
affected by project:	.48	project:	0.0			
Number of classrooms and/or labs	49 Classrooms, 11 teaching labs, 11 open labs, 7 research labs					
directly affected by this project:						



February 11, 2021

Paul Corcoran Assistant Vice President Facilities Management Minnesota State University, Mankato 111 Wiecking Center Mankato, MN 56001

Re: Project Name: Minnesota State University, Mankato – 2022 Armstrong Hall Replacement Predesign Update; DLR Project #: 40-21108-00

Dear Mr. Corcoran,

We are pleased to submit the 2022 Armstrong Hall Replacement Predesign Update. As priorities regarding this project have not significantly changed for Minnesota State University Mankato in the past two years, Armstrong Hall continues to be an important project for the campus and there are no significant changes to the project goals, program, and scope from the previously submitted 2020 Armstrong Hall Replacement Predesign document. However, due to the 2-year delay, schedule and cost will impact the project design, construction, and budget.

<u>Schedule</u>

Any references to schedule in the 2020 Armstrong Hall Predesign should be pushed back two years. Design would begin September of 2022 and construction for the new building would start in October 2024.

Cost Estimating Considerations

A standard inflation rate has been applied across all costs to reflect the standard inflation based on the delayed schedule. Construction on the new building is now estimated to begin in October 2024 and the mid-point of construction falls near September 2027.

In addition to standard inflation rates, a factor has been applied to new construction costs to cover changes in energy codes and B3 requirements. The new building is being considered for a net-zero approach and many initiatives are already in place. The campus has expressed interest in pursuing photovoltaics for this project, which includes an 80 kw solar array that will provide 3.5% of the estimated energy use for the total square footage (new construction and major renovation). This is an increase from the B3-required 2% energy use from renewables.

Sustainable concepts previously considered will likely be integrated into the design to ensure a highperformance building. These may include envelope R-value optimization, data driven window-to-wall ratio selection, dedicated outdoor air systems, energy recovery, numerous heating and cooling delivery options, demand-controlled ventilation, daylighting and receptacle load reduction.



<u>Codes</u>

Several regulatory requirements have been updated since the last predesign. These will require the selection of higher performing building materials and more energy-efficient systems such as the ones outlined above.

As of 2020, IECC 2018 and ASHRAE 90.1-2016 are the applicable energy codes. They are more stringent than the previous codes and mandate more energy efficient buildings.

The original 2020 Predesign was submitted under B3 Version 3.0 Guidelines. For 2022, the applicable guidelines are B3 Version 3.2. This results in several changes to the following Sections: Site and Water, Indoor Environmental Quality (updated in V3.1) and Energy and Atmosphere (updated in V3.2). Several of these new requirements that will impact design and construction are noted here. A new requirement for 2020 is an 80% Carbon Emissions reduction for building energy consumption. Similar to energy use modeling, the design team will use carbon emissions modeling to make data-driven decisions. Additionally, site and building provisions for animal habitat support will be integrated into the design, e.g. bird safe glazing strategies and site design strategies for endangered/threatened species – Dark Sky Compliant site and building lighting, species habitats – to meet new code requirements.

Finally, the Minnesota Sustainable Building 2030 (SB2030) Energy Target will now require an 80% energy use reduction from the Average Building Baseline (as opposed to 70% in 2018).

Technology

This year has seen many changes to the way institutions use technology. MSU Mankato has made enormous advancements to the technology in classrooms in a very short period. They have effectively transformed the campus into a flexible learning environment that can operate and adapt to both virtual and in-person scenarios, depending on the need. Looking forward, it will be important to maintain that sort of flexibility enabled by fully integrated technology solutions, like FlexSync, across campus. Smooth transitions between remote delivery and in-person class meetings allow for more productive time spent learning and working vs. figuring out how to work the technology instruments. Further, as technology has changed the traditional mode of operation, flexibility and personal preferences regarding in-person or remote learning and teaching will likely be an expectation of students, faculty, and staff going forward. The budget increase outlined in the Workbook addresses the additional infrastructure to augment classroom technology with microphones, video cameras, and large screen monitors. Thirty percent of the Armstrong Hall solution's program is dedicated to Shared General Classrooms and Multi-Use Labs; this increases to 37% when Library Classrooms are included. In addition, college-specific labs may have future needs for virtual-learning. Conference room technology and wireless access points throughout to enable every office to connect when instructors have virtual meetings, are also included in this budgetary line item.



Project Analysis References:

Section 1 – Integrated Planning

- 1.1 Academic priorities. Targets institutional, regional, and state academic priorities. Ref 3.2
- 1.2 Meets long-term space requirements for programs on a regional and multi-regional basis (including multiple campuses of a single institution) Ref 1.4; Ref 2.1
- 1.3 Project is described in the latest Comprehensive Facilities Plan (CFP)
 Ref 2.2 Armstrong Hall is the highest institutional planning priority in the 2014 Master Plan;
 The most recent CFP was completed in 2019 and lists the Armstrong Hall Solution project as the top priority seeking GO Bonding funds.
- 1.4 Supports the institution's Technology Plan Ref Section 8 and Cost Estimating Considerations above.
- 1.5 Addresses specific community, workforce, or campus cultural needs
 Ref 2.1 programs/depts optimally relocated; e.g. College of Education's (CoE) Dept of
 Counseling and Student Personnel occupies space at periphery of campus as a community-facing service
- 1.6 Includes space(s) to deliver programs that address continuing or emerging high demand fields Ref 2.3 – flexible and efficient multi-purpose labs, as well as new learning environments for College of Social & Behavioral Sciences (CoSBS) and College of Education (CoE)
- 1.7 Supports and enhances STEM (science, technology, engineering and math) programs Armstrong Hall Solution project will affect over 30% of general classrooms on campus, affecting nearly all programs at MSU, including STEM programs. General education classes, a requirement of STEM programs, will be held in the new classrooms.
- 1.8 Supports and enhances Minnesota Transfer Curriculum / general or liberal education core requirements courses (humanities, writing/communications, etc.)
 Ref 3.3 College of Arts and Humanities constitutes 13,539 sf of proposed program space.
- 1.9 Promotes or increases retention and completion within the Minnesota State system Ref 1.4, Ref 2.3. The new building will serve students in several ways that the existing Armstrong Hall cannot by providing much-needed collaboration and study space, promoting team-based learning and offering spaces for faculty to meet with students in more casual settings.
- 1.10 Improves baccalaureate opportunities Ref 1.4, 3.3
- 1.11 Advances cooperation among campuses to reduce costs and enables the sharing of administrative operations, academic programs, and academic support. Technology installations planned for both the formal and informal learning spaces provide connectivity between faculty and students both synchronous and asynchronous and opens the door for many opportunities between campuses to share instructional resources. The plan also includes adjacent locations for administrative offices of three campus Colleges to allow sharing of administrative operations and resources.
- 1.12 Incorporates more than one Minnesota State campus (including multiple campuses of a single institution).



While this project does not incorporate more than one campus, we would like it taken into consideration our campus is a very large and this project brings three Colleges and numerous academic departments together in a deliberate and planned way to encourage collaboration and sharing of resources.

Section 2 – Enrollment & Demographics

- 2.1 Improves areas for student services, academic advising, and tutoring. Ref 3.3 – general space includes Advising & Counseling Center
- 2.2 Project responds to ongoing changes in student demographics (gender identity, race, age, etc.) The Armstrong Hall Solution Project recognizes the importance of inclusive design. Classrooms, Labs, Offices, Collaboration spaces, etc. will be designed to accommodate the diverse and evolving needs of students, faculty, and staff.
- 2.3 Uses technology to make courses and services more accessible to a wide range of students. A move to online or hybrid course delivery allows courses and services to be more accessible to a wider range of students. Course information that is accessible and available beyond traditional "class hours" provides more flexible scheduling for students who are juggling other life priorities or challenges, including jobs, families, dependents, and/or transportation.
- 2.4 Project plans to use artifacts (such as signage, artwork, furniture, murals, etc.) to communicate diversity and inclusion as institutional values, and to communicate a sense of inclusion to a broad range of users.

Creating a welcoming and collaborative environment is of the utmost importance on our campus and is a key part of overall student success as well as student recruitment and retention. Student input regarding building esthetics will be sought out and incorporated during the design process.

2.5 Project is intended to improve campus enrollment.

Ref 2.7 Classroom Demand and Rightsizing – projected FYE enrollment growth was calculated in determining classroom demand.

Section 3: Flexibility, adaptability, and accessibility

- 3.1 Includes features that yield active learning spaces and help the campus transition from traditional classroom learning to collaborative, group learning methods.
 See 2.2 variety of teaching and learning spaces, improved technology in classrooms, collaboration oriented conference rooms, classroom-labs designed with flexibility and efficient layouts.
- 3.2 Includes spaces or features that promote inclusion (gathering in groups, seeing others using the space feels safe and welcoming); includes spaces that can be used for large group gatherings (not just study space) to address a sense of belonging.
 Ref 3.4 spaces planned for social gathering/learning, presentation stair.
- 3.3 Includes informal spaces (such as wider hallways or "niches" within circulation areas) where students and faculty can interact outside the classroom.



is reduced.

Ref 2.2, 2.3, 3.1, 3.4 – A project design goal is to provide informal learning and social learning spaces to facilitate community-building among students and encourage casual student/ faculty interaction.

- 3.4 Establishes the space as a shared campus asset, not owned by any one department Ref 1.4, Ref 3.3 – 11 Shared multi-use labs and 32 shared general classrooms.
- 3.5 Produces space for applied learning to occur on campus

Ref 2.2, 2.3 – specialized spaces for simulation and hands-on practice for the CoSBS and CoE.

- 3.6 Campus follows a written academic scheduling policy and uses it to maximize current space utilization and ease of class scheduling for students.
 Ref 2.4 Predesign Steering Committee recommended class schedule optimization through facility and policy improvements. Ref 2.10 set target to increase campus-wide classroom utilization from 32 hrs/wk to 38 hrs/wk. Since the Predesign submittal, MSU has implemented the Common Bell Schedule, which means the change in scheduling procedures will be well-established by the time Armstrong Hall is demolished and the overall campus classroom amount
- 3.7 Project includes flexible and adaptable features, including room types and furnishings, that allow for cost effective adaptability for future programs Ref 2.2, 2.11
- 3.8 Project plans to go beyond "code minimum" of ADA accessibility to provide Universal Design features that accommodate a wider range of disabilities.
 In addition to ADA Accessibility Requirements, the Armstrong Hall Solution will employ Universal Design Strategies such as designing for equity, flexibility, and tolerance for error.
- 3.9 Project uses alternative approaches to providing traditional, enclosed offices for faculty or staff Ref 3.3, 3.6
- 3.10 Project uses technology to create flexible/adaptable spaces or to improve the utilization of space Ref 2.7 – in-depth utilization study undertaken to align resources with needs to improve utilization and right-size classrooms.

Section 4: Infrastructure, sustainability, and energy efficiency

4.1 Project prioritizes renovation and repurposed space

Ref 1.8, 2.5, 2.9 - the Armstrong Hall Solution was proposed after every effort was made to renovate the existing Armstrong Hall and it was found that the benefit does not outweigh the cost because the backlog costs are too significant. The Armstrong Hall Solution also includes the renovation of multiple buildings.

4.2 Project addresses "adjacent needs" in, or near to, the project area, such as HEAPR- like work (roofs, HVAC, ADA accessibility improvements, etc.) or COPE issues, and demonstrates how the campus will use these improvements to reduce overall operating expenses Ref 1.8 – Direct project work includes backlog items in the Library. The biggest project need that will be addressed is eliminating the backlog associated with Armstrong Hall. This will greatly reduce overall operating expenses, freeing up funds for HEAPR work in Morris Hall, Wiecking



Center, and the Performance Center. Also directly related to the Armstrong Hall Solution project is addressing the backlog items in the Library.

- 4.3 Incorporates renewable energy systems in project for either academic or production purposes Ref 4.6 – solar photovoltaic system proposed for Library and the new building. Other options explored includes a geothermal system, passive energy reduction strategies, passive solar heating.
- 4.4 Is supported by the campus's existing campus infrastructure, utilities, technology, and transportation

Taking the existing Armstrong Hall offline eliminates a tremendous load off the central utility plant and freeing up existing resources for the new, smaller, and more energy efficient building. This will result in less energy use than the existing Armstrong Hall. The campus currently has sufficient excess capacity in chilled water to manage the transition to the new building with careful monitoring of peak loads. There is ample excess steam generation capacity to cover peak loads during the transition period.

Section 5: Financial Impact

- 5.1 Demonstrates ongoing or planned facilities improvements using alternative financing strategies. Examples may include use of utility-based rebates or grants, Guaranteed Energy Savings Program (GESP), re/retro-commissioning, or more broadly, improved HVAC scheduling or technology - all aimed at increasing overall campus energy and water efficiency. Ref 3.7 Mech Systems Narrative – Overall campus energy and water efficiency will be improved through the mechanical and electrical systems proposed for the new building. HVAC systems will have improved scheduling capabilities and smart automation to conserve energy when not in use; Ref 4.6 – proposed photovoltaic panels will provide energy for the new building and may feed back into the grid, providing energy for other parts of campus. The campus has performed some preliminary analysis on expanding solar photovoltaic capacity via GESP or power purchase agreement and looking toward advancing that opportunity as shown in the comprehensive facility plan.
- 5.2 Project accounts for special expenses relating to operations of new equipment or technology See Cost Estimating Considerations above. The campus also maintains a technology update and replacement plan on a regular schedule using a student technology fee.

Sincerely, DLR Group

the Mil

Nathan Miller, AIA, LEED AP Principal MN License No. 48122





2020 Predesign Armstrong Hall Solution



Prepared by:

DLR Group

520 Nicollet Mall, Suite 200 Minneapolis, MN 55402 Contact: Nathan Miller 612/977-3533 nmiller@dlrgroup.com

November 15, 2018



November 15, 2018

Brian Yolitz Minnesota State Associate Vice Chancellor of Facilities 30 7th St. E., Suite 350 St. Paul, MN 55101

Re: Minnesota State University, Mankato Armstrong Hall Solution Pre-Design Report

Dear Brian,

We are pleased to present our Armstrong Hall Solution pre-design to replace Armstrong Hall with a smaller more functional building for the 2020 Capital Budget process.

DLR Group has prepared this pre-design document in close collaboration with the campus community, key stakeholders and the administration in accordance with Minnesota State pre-design guidelines and design standards.

Our Facilities Master Plan strongly supports our request. The preferred building siting agrees with the first order of priority landscape and site recommendations to enhance the pedestrian nature of campus and close Ellis Ave north of Maywood to develop it into a pedestrian street and extend the pedestrian core to the north. The project also addresses the first priority recommendation in building development needs with the replacement of Armstrong Hall and removal of a large amount of deferred maintenance backlog.

In preparation for this request, the campus completed a comprehensive space analysis and reviewed academic scheduling practices to minimize the amount of building construction required. The result of this project is the demolition of Armstrong Hall and a net reduction of 44,000 GSF of campus space through reductions in classroom inventory and repurposing existing campus space.

OFFICE OF THE PRESIDENT 309 Wigley Administration Center

Mankato, MN 56001 Phone 507-389-1111 (V)

800-627-3529 or 711 (MRS/TTY)

Fax 507-389-6200 A member of the Minnesota State system and an Affirmative Action/Equal Opportunity University. We believe the completion of this project and implementation of the scheduling practices will position Minnesota State University, Mankato as the most efficient and highly utilized academic facility in the Minnesota State system and exceed all targeted metrics currently requested by the System Office.

We look forward to working with your team and your assistance with advancing this request for the 2020 Capital Budget request to the legislature.

Sincerely,

Richard Davenport Minnesota State University, Mankato President



November 15, 2018

Paul Corcoran Assistant Vice President Facilities Management Minnesota State University, Mankato 111 Wiecking Center Mankato, MN 56001

Re: Project Name: Minnesota State University, Mankato – Armstrong Hall Solution PD DLR Group Project No.: 40-18128-00

Dear Mr. Corcoran:

DLR Group is pleased to submit to you this Predesign Report for the Armstrong Hall Solution at Minnesota State University, Mankato.

This report has been prepared in accordance with the Minnesota State Predesign Guidelines for Campus Facilities Projects in conjunction with Minnesota State University, Mankato faculty, staff and administration. This report provides the professional expertise and analysis required for the University to establish the project rationale and space requirements, and to determine the relative complexity and phasing of the project as a means to develop probable construction costs, capital budget requests, and anticipated project schedules.

Sincerely, DLR Group

Natian Miller, AIA, LEED AP Senior Associate MN License No. 48122

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Introduction

Thank you for taking the time to review the information contained in this Predesign. The data and recommendations presented in this document are the result of 4+ years of collaboration between multiple stakeholders, the list below being the most recent. We understand that the amount of information presented within is substantial so we have taken the liberty of filling providing our opinion of the appropriate response to the scoring form by which the project predesign will be evaluated. These responses are attached as Appendix 9.11.

Predesign Committee

DLR Group facilitated an interactive process engaging multiple constituents. Members of the administration, faculty, staff, and student body all participated at different levels during the workshops.

The primary project committee includes:

Minnesota State Mankato

Assistant VP for Facilities Mgmt
Planning & Construction Director
Provost & Seniore VP for Academic Affairs
Associate Provost
Assoc. VP for Institutional Research Strategy & Effectiveness
Interim Dean of College of Social & Behavioral Sciences
Interim Dean of College of Social & Behavioral Sciences
Assistant to the Dean of Soc & Behavioral Sciences
Dean of College of Education
Dean of College of Arts & Humanities
Acting Dean of College of Social & Behavioral Sciences
Interim Dean of Library Services
Dean of College of Business
Director for Technology Consulting
Director of Student Health Services
Department Chair
Special Education Professor
Psychology Department Chair
Student Relations Coordinator CoSBS
Faculty Representzative

<u>Design Team</u>

Nathan Miller Katherina Yurko Krisan Osterby Alex Staneski Steve Siegel Matthew Streed Jonathan Murray Project Manager, DLR Group Programmer, DLR Group Campus Planner, DLR Group Space Analyst, DLR Group Designer, DLR Group Designer, DLR Group Estimator, Loeffler Construction

Armstrong Hall Solution | Minnesota State University, Mankato



SECTION 1: Introduction

Section 1: Summary | 1

Section 1: Summary

1.1 Description of Project

Armstrong Hall has been the academic workhorse of Minnesota State University, Mankato since it was constructed in 1964. It currently houses 49 of the campus' 106 classrooms, as well as 11 of its 85 teaching laboratories. Nearly every student pursuing an undergraduate degree since 1964 has attended class in this building. Armstrong Hall has served the campus well over the years, but now it constrains financial resources and 21st century curriculum delivery. The objective of this project is to replace the outdated and maintenance/repair plagued Armstrong Hall in the most effective, efficient and innovative way possible.

After vetting numerous options over the past 4+ years and reaching out to a variety of stakeholders, it is the recommendation of Minnesota State Mankato and the Predesign team to replace Armstrong Hall (145,000 SF) with a new, smaller building (100,000 SF) and renovate/renew approximately 75,000 SF of existing space on campus. The combination of the new building and existing space renewal will work to increase campus-wide classroom utilization and facilitate program efficiencies. The net result will be a reduction in campus square footage of approximately 45,000 SF. The new building will be constructed on a different site within the campus academic district, allowing Armstrong Hall to be utilized during this multi-phase construction and renovation project. Ultimately, Armstrong Hall will be demolished, opening up the central mall across the east/west campus axis.

Minnesota State University, Mankato, is requesting \$7.2 million in 2020 to design the entire project and to build out the lower level of Clinical Sciences. The project will result in a Total Project Cost of \$73.6 million (unescalated) over the next six years.

1.2 Project Funding

General Obligation Bonds have been identified as the primary funding source for the new construction and renewal projects. Three phases of Capital Budget Requests will be required for this project from 2020 to 2024. Minnesota State University, Mankato, seeks \$7.2 million in a 2020 General Obligation Bond Request to fund design services for the Armstrong Hall Solution projects.

1.3 Program Delivery

The primary goal of this project is to improve teaching and learning spaces across all academic disciplines. This goal requires a variety of activities and interaction modes across campus. This project will provide the new spaces necessary for project-based learning, collaborative learning, student and faculty discussions, and will foster connections with others off campus.

The Academic Master Plan presents sixteen strategic recommendations from the four Extraordinary Education Task Forces. Spaces included in the project directly support many of the strategies and recommendations.

TEACHING EXCELLENCE AND INNOVATION

- Engagement to transform effective teaching into excellent and innovative teaching.
- Become a partner for life in our students' education.
- Provide infrastructure & support for teaching and learning excellence & innovation.
- Ensure equity in educational opportunities.

ACADEMIC ADVISING

- Raise the visibility and importance of advising.
- Implement a university-wide academic advising model.
- Implement advising technological tools to full capacity.
- Develop a university-wide, consistent assessment process for academic advising.

ACADEMIC ENGAGEMENT PROGRAMS AND OPPORTUNITIES

- Ramp up the high-impact practices we are currently employing.
- Deepen efforts to support academic engagement within the classroom.
- Centralize academic advising and engagement: Advising as Engagement.
- Engage students in continuous dialogue about academic engagement.

RESEARCH, SCHOLARLY, AND CREATIVE ACTIVITY

- Increase the engagement of faculty in research, scholarly and creative activities.
- Infuse student involvement in research, scholarly and creative activities throughout their studies.
- Report, market, and assess research, scholarly and creative activities.
- Make targeted changes to the financial, physical, and organizational infrastructures supporting research, scholarly and creative activity.

1.4 Academic and Operational Program Impacts

This project will provide a logical migration of the departments currently housed in Armstrong Hall, and optimize the academic relationships within the campus academic core.

The following programs have been identified and included in strategic discussions and space planning:

- College of Arts & Humanities: English, World Languages & Cultures, Communication Studies, Philosophy
- College of Education: Elementary & Early Childhood Education, K-12 & Secondary Education, Counseling & Student Personnel, Aviation, Educational Leadership, Special Education, Center for School & University Partnerships, Center for Educator Support
- College of Social & Behavioral Sciences: Law Enforcement, Psychology, Geography, Gerontology, Gender & Women's Studies, Government, History, Sociology & Corrections,
- College Faculty/Staff Office Suites, Academic Advising & Counseling Center, Deans' Offices, Student Collaboration & Study Spaces
- College of Business classrooms
- General classrooms and labs shared across campus

The quality of instruction that is currently delivered in Armstrong Hall is a reflection of the University as a whole. Unfortunately, conditions within Armstrong Hall are no longer conducive to providing the quality of education that Minnesota State University, Mankato strives to provide. Many spaces, including classrooms and faculty spaces, are inadequately sized and inefficiently located. Laboratory environments lack adequate space and utility infrastructure for necessary equipment to support contemporary curriculum. Student spaces are all but nonexistent. Faculty offices ring around the exterior perimeter of the facility constraining collaboration, security, and student access.

The project program provides for modest increases in laboratories, with a few new laboratories that are not present today, and a combination of both large lecture classrooms and small to medium sized instructional space that are right sized for enrollment and seatfill trends/projections and flexible for both traditional and active learning. In addition much needed gathering, collaboration and social learning spaces are included in the program, none of which are provided for in the existing Armstrong

Hall. Faculty offices are programmed into larger collaboration suites of office space; Adjunct Faculty and GAs/TAs are programmed into flexible open-office co-labs at 1:3 and 1:5 stations per staff ratios - all of which will allow for better student access, sharing of office resources, and promoting faculty collaboration while minimizing the overall increase in building area devoted to offices.

1.5 Facility Issue Impacts

Deferred Maintenance / Renewal

Armstrong Hall represents just shy of 30% of Minnesota State University, Mankato's total deferred maintenance backlog. Armstrong Hall alone currently has a backlog in excess of \$24.5m with another \$3.2m scheduled by the time the building would be demolished. The current backlog equates to an FCI of 0.46. Roofing and the HVAC systems are the major concerns. The building cannot continue to operate without these systems in a functional state. There is risk of large scale failure if there is a delay in funding.

The Memorial Library + Addition is in much better shape at an FCI of 0.14 and 0.10 respectively, but they still have an impactful level of deferred maintenance. The renovations to the library that are part of this project are going to bring more students to the building and having up to date systems is important to the success of the project. Over \$6m is included in the renovation funding to address the current backlog. Combined with the roofing project that is currently under way, this will reduce the FCI of the Memorial Library to ~0.02 and the Addition to ~0.015. There are additional items scheduled to be in backlog by the time the project is funded that will be reevaluated at a later date.

Space Utilization Improvement

Armstrong Hall is the most heavily used instructional facility on campus. In terms of weekly student contact hours, Armstrong has more than double the next highest used facility (Trafton Science Center). However, Armstrong has a considerable number of course sections that do not meet the Minnesota State System standard seat fill rate of 65%. Further, 42 of Armstrong's 49 classrooms fall below the recommended metric of 22 ASF per student station, as established by the 2017 Campus Space Analysis. As part of the analysis surrounding instructional space utilization, specifically in Armstrong Hall, a Classroom Demand analysis was performed to determine an ideal count of classrooms needed by size. For the Armstrong Hall Solution, it was determined that nearly 10,000 ASF of classroom space could be saved by increasing these benchmark targets. This space savings can be realized by moving from 32 weekly room hours to 38, 65% seat fill rate to 75%, and 18 ASF per student station to 21. This reduced the overall number of classrooms in the project program from 49 to 33, while maintaining the same number of weekly student contact hours. See Section 2.7 for additional information on Minnesota State Mankato's plan for improving classroom utilization, including optimizing the class schedule.

Sustainability / B3 Guidelines Adherence / Renewable Energy

B3 compliance requirements will be inherent to our design process from the start of the project. The new building is intended to be renewable energy ready, including installation of roof mounted photovoltaic panels to satisfy 2% of the building energy needs. Cost effectiveness has been defined as a payback of 15 years of less. Wind turbines, geothermal and biomass systems were also explored and deemed not feasible in this application due to site and central plant constraints.

1.6 Project Cost and Schedule 🛩

Refer to Cover Letter for updates

3 Phases of Capital Budget Requests will be required for this project beginning in 2020. The envisioned multi-phase construction project includes:

2020 Phase 1 request for Design and Renovation	
2022 Phase 2 request for New Building construction fund	s
2024 Phase 3 request for Renovation & demolition funds	:

- \$ 7.2 million\$ 60.0 million
- \$ 28.2 million

The project schedule is in alignment with capital requests and outlined as follows:

Nov 2018	PreDesign Complete
Sep 2020	Design Begins
Oct 2021	Construction Start on Renovation of Clinical Sciences Basement- Move in April 2022
Aug 2022	Construction Start New Building - Move In Dec 2023
Aug 2024	Construction Start Multi-phase Renovation Projects - Move In Dec 2025
May 2026	Decommission & Demolish Armstrong Hall

1.7 Past GO Bond Appropriations

No GO Bonds have previously been appropriated to this project.

1.8 Backlog Reduction

The scale of the current backlog for Armstrong Hall is a major driver in the decision to tear it down and rebuild. The total backlog is currently \$24,691,000. This represents 46% of the building value (an FCI of 0.46). The backlog includes: roofing, exterior walls and windows, HVAC equipment, controls and distribution, electrical and plumbing systems. In addition to the current backlog, there will be an additional \$3,188,000 of backlog at the time of demolition which will raise the FCI to 0.52, over half the value of the building. The entire backlog of Armstrong Hall will be eliminated with the demolition of the building.

The library, which is where a significant portion of the renovations are happening, also has a fair amount of backlog. The Library is registered under two separate buildings, Memorial Library and Memorial Library Addition. Though nowhere near the value of the Armstrong Hall, the Memorial Library has \$8,687,000 (FCI of 0.14) and Memorial Library Addition has \$3,101,000 (FCI of 0.10) for a total of \$11,788,000.

This project is intended to increase traffic in and through Memorial Library with the addition of classrooms and student study space. Increasing traffic drives the need to improve the life safety elements of the building and as such, this project includes scope that will reduce the backlog of the Memorial Library. The current fire alarm system is in need of upgrade and the building is only partially covered by an automatic sprinkler system. This project will fix both of these issues resulting in a reduction of backlog of \$2,382,000.

Along with fire protection and alarm issue resolution, several library HVAC and plumbing backlog items will be addressed in parallel with the renovation. Controls will be upgraded on air handling unit systems, along with conversion to a variable air volume system. Three air handlers will be replaced. Ductwork with failing liners that pose an indoor air quality hazard will receive encapsulation. Unused chillers and cooling towers will be removed. Waste piping at public restrooms will be replaced, and the restrooms will be remodeled due to the amount of demolition involved with the piping work. Roof drainage piping will also be replaced, along with the addition of any code required secondary overflow drainage.

Minnesota State University, Mankato | Armstrong Hall Solution



Existing buildings Future buildings identified in the 2014 Master Plan Armstrong Hall, to be domolished. Proposed New Building Buildings to be partially remodeled

			Wiecking Center
			Renovate 1,200 GSF
ATTACK - TALLAR			
they wanted			
		Proposed Building	
		Construct 100 000 GSE	
		001311001100,000 001	Performing Arts
PERSONAL PROPERTY AND A			Renovate 2 000 GSE
			Memorial Library
			Renovate 52,600 GSF
C C C			
			Armstrong Hall
	Clinical Sciences		Demolish 145,000 GSF
	Interior Buildout 16 500 G	SF	
		51	
			Morris Hall
			Renovate 2,800 GSF
0	2	4	
32	02	02	
	N	2	

Minnesota State University, Mankato | Armstrong Hall Solution

Armstrong Hall Solution | Minnesota State University, Mankato



SECTION 2: Project Background Narrative

Section 2: Project Background Narrative | 1

Section 2: Project Background Narrative

2.1 Project Alignment with Campus Mission, Strategic and Academic Plans

The University's Mission states: "Minnesota State University, Mankato promotes learning through effective undergraduate and graduate teaching, scholarship, and research in service to the state, the region and the global community." Reflecting this overarching goal, this project aims to provide enhanced academic and social spaces for undergraduate & graduate students. In addition, research-based laboratory environments - some of which are for community-facing programs that offer services to the greater Mankato region – are integrated within the project and strategically positioned across new and renovated space in four campus academic facilities.

The University's Vision sets a high aspiration for its students, faculty and staff: "Minnesota State Mankato will be known as a university where people expect to go further than they thought possible by combining knowledge and the passion to achieve great things. Our foundation for this vision is our heritage of both dedicated teaching and the direct application of knowledge to improve a diverse community and world. We will achieve it by actively nurturing the passion within students, faculty and staff to push beyond possibility on the way to realizing dreams." To support this vision, the academic and social spaces in this project will impact three existing campus buildings (Memorial Library, Clinical Sciences, and Wiecking Center) in addition to a New Building. By pollinating the academic core with enhanced spaces, more opportunities for collaboration between diverse departments, disciplines and people can be achieved. Bringing together varied interests and passions in spaces that support knowledge-sharing will make Minnesota State Mankato's vision visible across campus.

The University's Strategic Plan, An Intentional Path Forward, Academic Master Plan 2015 - 2018, A Core Component of Our Integrated Strategic Planning, has identified a set of shared University values - all of which are reflected in our approach and program of this project.

- Liberal Arts and Applied Learning
- Entrepreneurial Thinking and Innovation
- Leadership & Global Awareness
- Student Engagement and Success
- Diversity and Equity
- Academic Advising and Mentoring
- Teaching Excellence and Innovation
- Research, Scholarly and Creative Activity
- Information Technology and Competency
- Fiscal Responsibility and Stewardship

Minnesota State University, Mankato has also identified twelve overarching areas of distinction in academic, research, and industry. In concert with Minnesota State Mankato leadership, many of these areas have been positioned to directly benefit from spaces included in the project. The key programs are highlighted in bold

- Agriculture, Food and Natural Resources
- Business, Management and Financial Services
- Creative and Performing Arts
- Data and Information Services
- Education and Human Services
- Engineering, Manufacturing and Technology
- Global Communication, Media and Information Technologies
- Health Care and Biomedical Sciences

- Integrative and Applied Disciplines
- Marketing, Sales and Professional Services
- Public Policy and Administration
- Transportation, Distribution and Logistics

Over the past two decades a wide range of studies have highlighted the challenges that students and faculty face within Armstrong Hall. A key driver of the project, in support of Minnesota State Mankato's Mission and Vision, is to elevate the student experience. There are many supporting aspects of the project that combine to positively impact student learning and socialization. Four of the University's largest academic colleges make up the primary users of Armstrong Hall. Almost every student that attends classes on the Mankato campus attends a course in Armstrong Hall during their academic path to degree completion.

By employing a strategy to renovate, repurpose and infill space across campus, the project ensures that programs and departments will be optimally located. For example, programs that engage the community and offer services and events that encourage public participation are proposed to occupy the lower level of the Clinical Sciences Building, located near the campus periphery, where there is convenient parking and easy way finding.

The proposed New Building location in near proximity to Memorial Library promotes student collaboration and utilization of existing study space within the existing library. The proposed renovations will further support the overall program of the project through updates to the existing floor plans to promote a range of scale and enclosure to rooms, new amenities, and enhanced finishes, technology, and furniture improvements.

The proposed New Building floor plan and massing is strategically envisioned to be dramatically different than Armstrong Hall. Planning and design drivers include a reduced footprint, a more vertical building that optimizes natural daylight in academic and student occupied spaces, a clean building layout with intuitive way finding that provides clear cues for interior orientation, corridors with campus views, and clear sight lines to minimize navigating complexities.

2.2 Project Alignment with the Comprehensive Facilities Plan

Now that the Clinical Sciences Building is complete, the Minnesota State Univesity, Mankato 2014 Master Plan indicates that Armstrong Hall (with its wide range of critical concerns regarding space quality, function and deferred maintenance) is the highest institutional planning priority. The Master Plan identifies a range of solutions to be explored, including renovation, building addition, demolition, and new building replacement.

The 2014 Master Plan also identifies the critical need to improve learning space for all Colleges, at all levels. It highlights a series of renovations and campus improvements to be carried out over time to meet this goal. The 60,000 SF of existing space in Memorial Library, the Performing Arts Center, Wiecking Center and Morris Hall targeted for renovation/repurposing will address the criteria identified in the Master Plan. The proposed improvements and new amenities to support students and faculty include the following strategies and recommendations:

- Install flexible furniture, marker boards and technology improvements in classrooms.
- Increase the variety of types of teaching and learning spaces throughout the campus by selective renovation, e.g. 'suites' with collaboration-oriented conference rooms, small group instruction, casual interaction/connection space in addition to standardizing classrooms, and additional laboratories to provide more specialized space for simulation and hands-on practice.

- Create shared spaces for research, collaboration, small group, conferencing, telepresence, storage.
- Create standardized office space for faculty and flexible/hotelling studio office space for graduate students, grad assistants and teaching assistants; quiet work/study space, collaboration/connections space

2.3 Program Delivery and Demonstrated Need

Whether in new, renovated or repurposed facilities, current national metrics and best practices advise increasing the ASF/seat projected for Classrooms, Class Laboratories, Open Laboratories, and Research Laboratories from current averages in Armstrong Hall. This approach is confirmed by the approach, data analysis and recommendation within the 2017 Campus Space Analysis Study.

New classrooms are programmed at an average of 21 ASF per student station, higher than the current Armstrong Hall average of 18 ASF, to allowing the University to shift a portion of their classrooms from traditional lecture classrooms with tablet arm chairs to active learning classrooms and classrooms with movable double occupancy tables and chairs. This metric remains below the 2017 Campus Space Analysis recommended 22 ASF per student station.

Following leading practices, class laboratory environments have been modestly increased for additional storage space, seat counts, function/flow. Labs with growth include:

- College of Education (CoE) Labs planned for Elementary & Early Childhood Education, K-12 & Secondary Education, Counseling & Student Personnel. These Laboratory spaces have been programed for educator preparation experiences and practice, such as simulations, practice with educative manipulatives, practice with lesson plan delivery, and skills-based simulations
- College of Social & Behavioral Sciences (CoSBS) Labs are planned for Corrections, Geology, and Psychology to replace their current labs in Armstrong Hall with an increase in SF/ seat for more efficient and flexible layouts, plus additional storage space. A Psychology Observation Room has been added to the program to provide oversight of simulated clinical psychology environments. This room will enable faculty to observe student practice, as well as students to learn from observing other student/patient simulated interactions. These types of observation environments have become a standard in Psychology education spaces.

A modest list of new environments is included in the program for the noted reasons below:

- CoE Elementary Ed Lab An Education Simulation Lab does not currently reside within Armstrong Hall. It is critically important that the CoE has access to a real-world environment that simulates an actual classroom and enables students to prepare for changing room arrangements and teaching methods that shift through the course of the day and with changing subject matter. This type of environment is being including across the state and country in Education programs.
- CoSBS Observation & Therapy Rooms There is no current area available in Armstrong Hall for these key types of learning spaces. The highest standard of instruction across the country includes these spaces to support curriculum delivery and prepare students for their career settings and experiences.
- Student Collaboration & Study Spaces This type of space is currently driving facility renovations across the country to support student academic success and degree attainment. It is directly tied to the transition in higher education to active, applied, and team-based learning.

There is very little space currently available in Armstrong Hall to meet this need. In the existing building students have nowhere to sit other than the floor before and after class as they wait to engage with faculty and work in project teams. The project program distributes these spaces throughout the proposed locations to promote these crucial activities.

2.4 Academic and Operational Program Impact

The distributed character of the project offers a terrific opportunity to "right-size" and optimize instructional space for current and evolving academic departments with new and improved existing facilities. It is important to maximize the number of programs affected by the project.

The essential programs affected positively include:

College of Arts & Humanities

- English
- World Languages & Cultures
- Communication Studies
- Philosophy

College of Education

- Elementary & Early Childhood Education
- K-12 & Secondary Education
- Counseling & Student Personnel
- Aviation
- Educational Leadership
- Special Education,
- Center for Ed Partnerships
- Center for Educator Support

College of Social & Behavioral Sciences

- Law Enforcement
- Psychology
- Geography
- Gerontology
- Gender & Women's Studies
- Government
- History
- Sociology & Corrections
- College Office Suites
- Advising & Counseling Center
- Deans' Offices
- Student Collaboration & Study Spaces
- College of Business

Optimizing class schedules is another important outcome that can be achieved through both facility and policy improvements. Based upon their review of current campus space utilization, as well as the programmatic and utilization benefits that can be achieved from shifting to centralized class times and scheduling, the Predesign Steering Committee is recommending to campus leadership and the Cabinet that the University implement a campus common bell schedule, space utilization guidelines, and utilization monitoring to target 38 hours/week and 75% classroom seat fill.

2.5 Existing Facility Systems Summary

Armstrong Hall's immediate infrastructure needs include: upgrade HVAC system, update interior finishes, address upcoming needs for roof replacement, increase plumbing fixture count to meet code and ADA requirements, and replace all domestic and waste water piping.

In 2008, HEAPR funding of \$1.3M was dedicated to exterior shell work around/over windows for Morris, Armstrong, and Wigley Halls, plus one boiler burner replacement.

Armstrong Hall has a history of HVAC-related problems, such as a lack of air flow and temperature control. Below is the summary of the existing systems issues:

 A 2007 engineering study summarized the issue as systems unable to provide the proper air volume, including outside air. Complete renovation/replacement was recommended, at an estimated cost of \$7 million for all levels.

- In 2012-13, a Predesign for the basement HVAC was carried out to address problems of significant air leakage, poor indoor air quality and comfort, and lack of controls. Renovation was recommended.
- Electrical feeders to individual floors are not adequate for loads, though service is adequate.
- Accessibility issues include primary entry stairs, restrooms, companion seating for wheelchair locations in the auditoriums, and lack of lever door hardware.
- With two rings of hallways, neither of which has views or daylight, orientation and way-finding are a challenge. The outer hallway serving the offices is very narrow.

The demolition of Armstrong Hall as part of this project will eliminate \$24.5 million in backlog, including failing exterior cladding, non-compliant restrooms and a failing roof. In addition, renovations and renewal of 75,000 SF of existing space on campus in the Library, Clinical Sciences, Morris Hall and Wiecking Hall will reduce backlog by an additional \$6m.

2.6 Planning Process

During the initial phase of the project, the Predesign team engaged the Minnesota State Mankato President, Departmental Stakeholders, and the Predesign Steering Committee to identify and review a wide range of site options. Ten different campus locations were identified as potential candidates for the New Building location. Five sites were narrowed down as the best candidates for the New Building location through meetings with campus leadership and the DLR Group team.

The four core principles of our iterative integrated planning process for the project include: Research, Create, Test & Evaluate, Record & Deliver. With that framework in place, we crafted our approach and workplan for the project with a focus on stakeholder engagement while meeting Minnesota State Colleges and Universities Predesign submittal guidelines and schedule for the Armstrong Hall Solution. Knowing that some campus-wide conversations had to take place surrounding issues like scheduling and space utilization, and that engagement would be key to the predesign solution's success, we got an early start on the Predesign and began the planning process in March of 2018 with a 9-month roadmap for completion in November of 2018. This timing was key to ensure proper stakeholder participation could take place in steering committee workshops and that additional stakeholder input could be captured in Focus Group sessions during the spring 2018 and Fall 2018 academic year.

Steering Committee Workshops: 7 Workshops were held with the Predesign Steering Committee throughout the duration of the project at three to four week intervals to ensure meetings occurred at a constant rhythm allowing the team to maintain focus on the project. Focus Group Meetings: 5 Focus Group meetings were scheduled to engage with specific user groups regarding the project as specific findings and solutions developed (i.e. Faculty, Library staff, Facilities, etc.)



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Project Schedule

Our Road Map...



Our workplan allowed for a concentration of creating, testing and evaluating to take place in between, during the summer of 2018. Knowing that every SF in the building program would be precious, we began our research with a deep analysis of the 2017 Campus Space Analysis Study to further explore operational policies and guidelines that could assist with increasing utilization campus wide.

Project Kick off meeting

- 1. Established 3-5 primary goals for the project
 - a. Character/Image: Be an inviting, unique place, connecting and connected, that students want to attend and return to each year

b. Academics: Promote collaboration in learning; provide choices for multiple effective

and current teaching and learning modes

c. Transportation/Environment/Safety: Showcase practices for safety, in energy

efficiency, resource efficiency and healthy living

d. Infrastructure: Incorporate ongoing renewal of site, buildings, furniture and technology

e. Growth: Plan for enrollment growth (experienced and projected) both on-campus and on-line 2. Reviewed schedule for 50%, 95% and final

3. Worked with the academic and facilities master plan goals, established project goals and sustainable design initiatives (B3) for the predesign.

4. Assessed existing/future program and space needs of Armstrong and Nelson Halls

Planning Workshop, Explore the big idea

1. Held multiple work shops with the Executive Committee and Predesign Taskforce to flesh out the big ideas for the predesign

2. Reviewed predesign and sustainable goals, along with the program and Space use initiatives, to validate the big ideas and provide recommendations and guidance to identify the best possible design options to pursue and begin thinking about what alternate opportunities lay within each.

Faculty & Staff Listening/Gathering Session

- 1. What do you hope to be doing differently?
- 2. How do you hope to interact with students?
- 3. Who are your students?
- 4. What does your classroom look like?...physical?...virtual?
- 5. What are your essential tools?
- 6. What does your work place look like?...physical?...virtual?

2.7 Space Utilization Analysis

Current utilization of Armstrong Hall classrooms and laboratories is another key driver of the project. Armstrong Hall is the most heavily used instructional facility on campus. In terms of weekly student contact hours, Armstrong has more than double the next highest used facility (Trafton Science Center). However, Armstrong has a considerable number of course sections that do not meet the Minnesota State standard seat fill rate of 65%. Further, 42 of Armstrong's 49 classrooms fall below the recommended metric of 22 ASF per student station, as established by the 2017 Campus Space Analysis More detailed utilization data can be found in that analysis, which is included in it's entirety in the appendix.

Classroom Capacity Grouping	No. of Rooms	No. of Seats	Average Room Size	Average ASF per Station	Average Section Size	Weekly Seat Hours	Average Weekly Room Hours	Hours in Use Student Station Occupancy %
20 and Under	1	15	477	32	6	1.4	4	35%
21 - 25	4	95	602	25	14	15.1	21	71%
26 - 30	16	457	573	20	19	17.3	27	64%
31 - 35	15	489	648	20	20	19.2	30	63%
36 - 40	20	765	755	20	27	23.5	33	72%
41 - 45	8	342	782	18	21	20.6	41	51%
46 - 50	14	677	883	18	30	19.5	32	60%
51 - 60	7	392	854	15	33	19.5	33	59%
61 - 75	5	324	1,109	17	40	19.8	33	61%
76 - 100	5	431	1,499	17	53	20.9	35	60%
101 - 150	5	611	1,971	16	96	29.6	37	80%
251 and Over	1	329	3,137	10	186	26.1	43	61%
Total No. of Rooms = 101	AV	ERAGE	866	19	31	21.7	32	64%

Figure 1-4 Classroom Utilization Analysis by Capacity

* From the 2017 Campus Space Analysis. Total Classrooms have increased to 106 since the time of this analysis. Refer to Appendix for the full report.

Armstrong Hall Data:

- Class Meetings: 12,540
- Class Hours: 19,358
- Average Utilization: 60.02%
- Average Estimated Enrollment: 1,699
- Average Active Enrollment: 1,299
- Max Capacity: 2,550

Enrollment Projections								
	2020	2021	2022	2023	2024			
Total FYE:	13,680	13,975	13,948	14,275	14,589			
Unduplicated headcount:	14,997	15,321	15,292	15,650	15,994			

Optimizing class schedules is another important outcome that can be achieved through both facility and policy improvements. Based upon their review of current campus space utilization, as well as the programmatic and utilization benefits that can be achieved from shifting to centralized class times and scheduling, the Predesign Steering Committee is recommending to campus leadership and the Cabinet that the University implement a campus common bell schedule, space utilization guidelines, and utilization monitoring to target 38 hours/week and 75% classroom seat fill.

Room ID	Space Use Code	Assignable Sq. Ft.	No. of Stations	Assignable Sq. Ft. Per Station	Average Enroll- ment	Weekly Student Contact Hours	Weekly Seat Hours	Weekly Room Hours	Hours in Use Student Station Occupancy %
Armstrong	Hall							No. 0	f Rooms = 49
AH 0001	110	481	28	17	8	162	5.8	21	28%
AH 0004	110	1,159	76	15	45	1,539	20.3	35	58%
AH 0007	110	1,693	70	24	33	1,247	17.8	37	48%
AH 0011	110	936	42	22	19	834	19.8	43	46%
AH 0013	110	956	48	20	31	1,025	21.3	33	64%
AH 0015	110	868	40	22	26	809	20.2	31	65%
AH 0039	110	790	50	16	30	965	19.3	33	58%
AH 0040	110	1,014	48	21	34	985	20.5	30	69%
AH 0101	110	1,784	139	13	136	5,654	40.7	42	97%
AH 0102	110	1,236	110	11	96	3,500	31.8	37	86%
AH 0123	110	626	40	16	17	535	13.4	31	43%
AH 0202	110	495	32	15	17	755	23.6	42	56%
AH 0205	110	750	40	19	32	1,071	26.8	34	80%
AH 0208	110	640	32	20	15	680	21.3	44	48%
AH 0209	110	734	40	18	30	857	21.4	29	75%
AH 0211	110	639	43	15	23	902	21.0	42	50%
AH 0213	110	875	56	16	41	1,474	26.3	36	73%
AH 0214	110	751	50	15	24	944	18.9	37	51%
AH 0215	110	575	36	16	21	862	23.9	41	58%
AH 0216	110	757	40	19	33	1,188	29.7	36	83%
AH 0217	110	497	29	17	16	461	15.9	31	51%
AH 0219	110	496	31	16	13	460	14.8	39	38%
AH 0220	110	757	40	19	29	1,005	25.1	35	72%
AH 0222	110	748	52	14	41	1,412	27.2	33	82%
AH 0223B	110	431	24	18	18	552	23.0	30	77%
AH 0231	110	749	49	15	26	900	18.4	33	56%
AH 0232	110	669	45	15	17	635	14.1	37	38%
AH 0233	110	662	43	15	30	1,097	25.5	37	69%
AH 0234	110	496	34	15	20	612	18.0	27	66%
AH 0302	110	499	30	17	19	698	23.3	36	65%
AH 0303	110	665	30	22	23	473	15.8	26	62%
AH 0304	110	673	40	17	26	815	20.4	29	70%
AH 0305	110	755	46	16	24	570	12.4	24	52%
AH 0306	110	876	54	16	22	768	14.2	35	40%
AH 0308	110	641	41	16	24	1,082	26.4	42	64%
AH 0310	110	502	27	19	21	653	24.2	32	76%
AH 0311	110	613	35	18	23	1,162	33.2	50	67%
AH 0314	110	755	42	18	19	793	18.9	28	66%
AH 0315	110	670	34	20	29	975	28.7	34	84%
AH 0316	110	665	38	18	25	1,198	31.5	47	68%
AH 0317	110	499	28	18	17	406	14.5	23	64%
AH 0319	110	499	29	17	22	568	19.6	26	74%
AH 0320	110	668	30	22	29	777	25.9	27	96%
AH 0321	110	664	30	22	18	447	14.9	25	60%
AH 0322	110	754	36	21	26	651	18.1	24	77%
AH 0323	110	876	39	22	31	1,178	30.2	37	82%
AH 0325	110	502	29	17	26	413	14.2	16	87%
AH 0326	110	502	28	18	19	431	15.4	22	69%
AH 0334	110	500	31	16	24	820	26.5	34	78%
	Average	736	43	18	28		22.8	33	65%
	Total	36,042	2,104			47,996		1,632	

Classroom Utilization by Building

*From the 2017 Campus Space Analysis. Refer to Appendix for the full report.

Common bell scheduling will give students more flexilibily when selecting courses by reducing start and end time overlaps and allowing more time to cross campus between classes.

Classroom Demand and Rightsizing

As part of the analysis surrounding instructional space utilization in Armstrong Hall, a Classroom Demand analysis was performed. This analysis established benchmark targets for classroom weekly room hours, seat fill rate, and ASF per student station, then mapped out the existing coursework into classrooms within classroom capacity groups. The result was an ideal count of classrooms needed by size. For the Armstrong Hall Solution program, it was determined that nearly 10,000 ASF of classroom space could be saved by increasing these benchmark targets. This space savings was realized by moving from 32 to 38 weekly room hours, 65% to 75% seat fill rate, and 18 ASF per student station to 21. (It is important to note that this metric is still below the 2017 Campus Space Analysis recommended 22 ASF per student station.) The Classroom Demand analysis findings provided the rationale and identified the means to reduce the overall number of classrooms in from 49 to 33, while maintaining the same number of weekly student contact hours (WSCH).

Calculating classroom demand is more than just looking at what size and type of classrooms are the most popular. It's about understanding the WSCH need by actual enrollment per course, establishing a seat fill target and then designing an optimal mix of classrooms that align class size, classroom capacity, and classroom type to best serve the University's current and future needs.

If we aligned Class sizes with Classroom sizes, what classrooms types and sizes would we really need? We look at Weekly Student Contact Hours and also Room Hours that are sorted by class size, then balance that data to find a suggested classroom mix.

- 1. The numbers below assume Armstrong Hall is offline.
- 2. We have considered projected FYE enrollment growth through 2025. We assume that enrollment growth will lead to added enrollment in existing courses, reducing the need for small classrooms and increasing the need for larger classroom
- 3. The 2018 analysis uses 65% seat fill, while the 2025 analysis uses 75%.

Classroom demand analysis based on WSCHs and enrollment size

	STARTING YEAR 201	8:		MEDIUM TERM: 2025		
CLASSROOM OCCUPANCY	SUGGESTED TOTAL CLASSROOMS	SUGGESTED TOTAL SEATS	CURRENT WSCHS PER ENROLLMENT SIZE	PROJECTED WSCHS PER ENROLLMENT SIZE	SUGGESTED TOTAL CLASSROOMS	SUGGESTED TOTAL SEATS
0 - 20	15	240	5,222	3,656	8	128
21 - 25	10	240	6,899	7,313	11	264
26-30	7	203	6,231	6,985	8	232
31-35	10	330	9,129	10,316	11	363
36-40	15	555	15,502	17,672	17	629
41-45	10	430	12,503	14,316	12	516
46-50	5	240	6,539	7,520	5	240
51-60	4	224	5,724	6,525	4	224
61-75	4	260	6,849	7,671	4	260
76-100	2	172	4,965	5,411	2	172
101-150	2	244	9,222	9,960	3	366
151-250	3	600	11,445	12,303	2	400
251+	1	329	6,113	6,540	1	329
	88	4,067	106,342	116,188	88	4,123

* For consistency of data, WSCHs were calculated based on enrollment reporting from Fall 2016, the same data set used for the Campus Space Analysis published in December 2017. Fall 2017 enrollment reporting showed a slight decrease in general classroom use from our baseline numbers.

** Note that the number of suggested seats only raises slightly from the 2018 baseline. This is due to increasing the seat fill from 65% to 75%

The results of the classroom demand analysis illustrate that many classes are being held in classrooms that are larger than they need to be. However, rather than simply reduce the size of the classrooms, as this analysis would suggest, Minnesota State Mankato intends to employ multiple strategies to increase class sizes, improve seat fill and, untimately, the financial viability of courses with enrollment below their minimum threshold.

SEATS PER ROOM	CLASSROOMS SUGGESTED	SEATS SUGGESTED	ASF PER SEAT
20	7	140	26
24	8	192	25
28	2	56	24
34	3	102	22
38	7	266	22
42	5	210	20
48	0	0	20
56	0	0	20
65	0	0	20
86	0	0	20
150	1	150	20
200	1	200	20
350	0	0	10

Aligning Resources with Needs to Improve Utilization

The classroom demand analysis provided a solid foundation for working with the University to design a successful classroom solution. After collaborative sessions with Minnesota State Mankato, including Academic Affairs, the following conclusions were made:

- The 200+ seat classroom needs suggested by the demand analysis could be served by smaller classroom sizes on par with the existing large classrooms in Armstrong Hall (110 seats and 140 seats). Classes that exceed these capacities can be held elsewhere on campus.
- For the purposes of this Predesign, we are going to use an average of 21 ASF per seat.
- The data reveals that there are several classes being held with under 20 students in classrooms that are larger than they need to be. This is confirmed by the seat fill data provided by the 2017 study. Reducing classroom capacities below a certain threshold would improve seat fill, but may limit future flexibility and threaten the financial viability of certain courses. Slightly larger classrooms are recommended to align with Minnesota State Mankato goals, with the understanding that additional strategies for improving seat fill will need to be employed to achieve the operational efficiency gains that are driving the 75% goal set by Minnesota State Mankato. Common strategies for improving seat fill:
 - Rightsize classrooms
 - Combine sections of courses offered at alternate times, giving students less options but increasing operational efficiency.
 - Actively campaign to increase enrollment of courses with higher growth potential.
 - Offer essential courses with lower growth potential in alternative learning environments, such as teaming rooms, conference spaces or online.
 - Use the excess seat fill capacity to accommodate enrollment growth.

Final Proposed Solution

Many labs in the replacement building for Armstrong Hall will be considered as multi-purpose labs that will have much greater flexibility than a typical lab with fixed, specialized equipment and time for prep and open lab to consider. Many of these labs will not only be able to serve multiple departments, but could also function in a classroom capacity. This gives reassurance that while we are reducing the overall number of general classrooms from the existing 54 to a proposed 32, there will be inherent capacity in the new building if unforeseen circumstances require additional classroom capacity.

	Existing	Proposed			
Capacities	Qty	Qty	Seats	SF/Seat	ASF
20	1	2	40	26	1,040
24	2	2	48	25	1,200
28	2	4	112	24	2,688
34	16	4	136	22	2,992
38	0	7	266	22	5,852
42	14	4	168	20	3,360
48	7	5,	144	20	2,880
56	8	1	56	20	1,120
65	0	1	65	20	1,300
150	4	1	150	20	3,000
200	0	1	200	20	4,000
Total	54	32	1,385		29,432

2.8 Sustainability Highlights

At a minimum the future project will comply with local energy code, which will require a high performance envelope, energy efficient lighting and controls, in addition to energy efficient HVAC and controls. The project will use simulation to forecast the impact of design decisions on predicted energy performance. In conjunction to registering and engaging in the Energy Design and Assistance program, this data will be used to identify the most impactful energy efficiency measures with the shortest payback. Sustainable concepts that will be considered include; envelope R-value optimization, data driven window to wall ratio selection, dedicated outdoor air systems, energy recovery, numerous heating and cooling delivery options, demand controlled ventilation, daylighting and receptacle load reduction.


2.9 Alternatives Considered

In 2014 Minnesota State Mankato and the Predesign team explored an option to transform Armstrong Hall with an extensive Renewal and New Building Addition project. In the end, the three phase \$119 million (in 2016 dollars) project cost was too great and the value of such scale of project was questioned.

In 2016 Minnesota State Mankato and the Predesign team explored a renewal option to tackle all maintenance and ADA issues along with some modest finish upgrades (e.g. paint walls, replace carpet, and replace acoustic ceilings). The sheer scale of 145,000 SF presented significant sequencing issues. It was impossible to find enough available swing space on campus which resulted in the need to break down construction into four phases , adding significant cost to the project. We quickly discovered that yet again, project cost would be a major issue for the project but it was an alternative option that we knew we had to test and see if it was a viable option. In the end the price tag of \$43.5 million (2016 dollars) was an astonishing amount to invest in a facility that, in the end would still not provide the types of 21st century educational environments that we see today and are now the standard on University campuses.





Site Location Options

During the initial phase of the project, the Predesign team engaged the Minnesota State University, Mankato President, Departmental Stakeholders, and the Predesign Steering Committee to identify and review a wide range of site options. Ten different campus locations were identified as potential candidates for the location of the new building. A location within the campus academic core – in concert with the 2014 Campus Master Plan and other previous studies – was determined to be the most important driver for the project. Two sites were identified as the top candidates for the New Building location. Both of the sites were previoulsy identified as new building sites in the 2014 Master Plan.

Site analysis showing walking distances, campus axis and green spaces. (Armstrong Hall not shown)





SUN PATH: JUNE 21ST



SUN PATH: DECEMBER 21ST





WND ROSE: JUNE 21ST

WND ROSE: DECEMBER 21ST



Connections

The demolition of Armstrong Hall will have a dramatic impact on the greenway connections on campus. The existing campus mall will extend East to Trafton Center and will nearly double in size.



In considering the pros and cons of different sites for constructing this new academic building on campus, several factors need to be considered in regards to the bigger picture involving the Comprehensive Facilities Plan. Site number 1, located adjacent to the existing Center for Performing Arts, is the preferred site for a number of reasons tied to the future overall campus plan. The University has long discussed the possibility of developing a pedestrian campus. This plan would allow for limited vehicle usage within the campus core, i.e., buses and a university facility vehicles only. A new building on Site 1 would be strategically located on the future pedestrian campus road and within the Academic district. It would also serve to connect Wiecking Center to the rest of the Academic District.

The campus as it exists today has several identifiable zones including:

A.The Student Life District:

This area consists of all of the residential halls, Centennial Student Union, and the new University Dining Center. These structures are all currently and intentionally located in the Western quadrant of the campus representing a unified plan. When the high-rise residence hall buildings (Gage Towers) were demolished several years ago on Stadium road, the goal was to centralize all residential life buildings in the Western quadrant of campus. This decision was intended to better serve the residential students and minimize the traffic hazards in crossing the busy Stadium Road. In fact, the new adjacent University Dining Center serves all of the residential students today. Located within the Student Life District, Site Number 2 is a logical location for a future student residence, student life or student services building.

B: The Academic District:

This district resides on the North side of Stadium Road and East of the Student Life District. This district includes all of the buildings wherin the primary uses are instructional in nature. This includes Morris Hall, Nelson Hall, Wissink Hall, Ford Hall, Trafton Science Center, the Clinical Sciences Building, The Center for Performing Arts and Wiecking Center. Site number 1 is a logical location for a future academic building, one that can serve as a bridge that connects Wiecking Center back to the core of the Academic District.

C: Academic Support District:

This district is ideally located at the core of campus and serves as a bridge between the Academic District and the Student Life district. Memorial Library is the only building in this district and is identified as such due to it's blend of instructional, study, social and student services components.

D. Athletic District:

The University has strategically located all of our outdoor athletic and intramural facilities on the South side of Stadium Road. The indoor athletic facilities are located on the North side of Stadium Road maintaining the integrity of the athletic district.

E. The Campus Mall:

After the demolition of Armstrong Hall, the primary Campus Mall that runs East to West will extend from Julia Sears Residentail Hall to the Trafton Science Center. Site number 1 is adjecent to a secondary mall that runs North / South from the Wigley Administration Building to Val Imm Drive.

SITE 1 FIT PLAN A





SITE 1 FIT PLAN B



Floor **3**





CLASSROOMS CIRCULATION / COLLABORATION OFFICE / CONFERENCE



SITE 2 FIT PLAN A



Floor 4









SITE 2 FIT PLAN B









CLASSROOMS CIRCULATION / COLLABORATION OFFICE / CONFERENCE

- 1. Proposed Building Site
- 2. Current Armstrong Hall Location (Shown Demolished)
- 3. Memorial Library
- 4. Center for Performing Arts
- 5. Morris Hall
- 6. Clinical Sciences
- 7. Wiecking Center







Proposed New Building Site - Looking Northeast toward Performance Center



Proposed New Building Site - Looking East Toward Performance Center

2.10 Classroom and Lab Scheduling

Current scheduling policies and procedures at Minnesota State University, Mankato have every college essentially managing the scheduling of their own classrooms. In this project, the University is setting a target to increase classroom utilization campus wide from an average of 32 hours/week to 38 hours/week. This can be accomplished with little impact to scheduling difficulty by implementing the following new scheduling protocols:

- Scheduling will remain by college; conversation was sparked about the future possibilities of Centralized Scheduling, but this is an initiative that would need to occur campus-wide. Conversations will continue in the coming years to identify if this is the best path forward.
- Establish and implement scheduling guidelines to be utilized by colleges that will mandate a minimum hourly usage of classrooms and minimum seat fill percentage of classrooms. If these metrics cannot be met, classrooms will get released for scheduling by other colleges
- Establish a Common Bell Schedule that will be applied to all classrooms and will encourage a full class schedule offering on Fridays.

Armstrong Hall Solution | Minnesota State University, Mankato

2.11 Photos and Floor Plans: Armstrong Hall





Exterior of Armstrong Hall



Exterior of Armstrong Hall at Central Entry



Exterior of Armstrong Hall at Overhang



Section 2: Project Background Narrative | 27

Minnesota State University, Mankato | Armstrong Hall Solution



Typical Corridor in Armstrong Hall



Typical Stair Landing in Armstrong Hall



Typical Office Corridor at Perimeter of Classrooms



Student Space / Forensic Lab in Armstrong Hall



Faculty Space in Armstrong Hall

Armstrong Hall Solution | Minnesota State University, Mankato







Spalling Limestone

Many of the classrooms in Armstrong Hall reflect the pedogogies and technologies that drove classroom design in the 1960s, the era during which Armstrong Hall was built.

Lecture style teaching:

- tablet arm chairs facing forward
- technology limited to an overhead projector, printed maps and chalkboards (markerboards)
- Minimize distractions, no windows.
- Students using books and notepads
- Direct lighting



Classroom in Armstrong Hall



Classroom in Armstrong Hall 30 | Section 2: Project Background Narrative



Typical 1960s classroom



Typical tiered 1960s lecture hall



Tiered Lecture Classroom in Armstrong Hall

Contemporary Classroom Examples



Example Scale-Up Classroom with direct/indirect lighting and visual connection to student spaces.



Example Seminar Classroom with flexible furniture and natural daylight.



Example Scale-Up Classroom with technology to support project based learning in Memorial Library.

2.11 Photos and Floor Plans: Clinical Sciences





Armstrong Hall Solution | Minnesota State University, Mankato







Section 2: Project Background Narrative | 33

2.11 Photos and Floor Plans: Memorial Library







Armstrong Hall Solution | Minnesota State University, Mankato







Section 2: Project Background Narrative | 35

2.11 Photos and Floor Plans: Wiecking Center







First Level Plan

2.11 Photos and Floor Plans: Performing Arts







Third Level Plan



Second Level Plan



2.11 Photos and Floor Plans: Morris Hall







Second Level Plan



First Level Plan



Lower Level Plan

2.11 Photos and Floor Plans: Wissink Center







Third Level Plan



Second Level Plan



First Level Plan

Minnesota State University, Mankato | Armstrong Hall Solution

Armstrong Hall Solution | Minnesota State University, Mankato



SECTION 3: Project Description

Section 3: Project Description | 1

Section 3: Project Description

3.1 Design Intent

Armstrong Hall is an academic building located at the campus core that houses the Colleges of Arts and Humanities, Education, and Social & Behavioral Sciences. The College of Business also regularly utilize classrooms in Armstrong Hall. The existing facility provides the majority of classrooms on campus, including two large scale auditoriums that seat 110 and 140 students.

Through previous studies, it has been established that Armstrong Hall has a significant backlog of building repair issues. Like many buildings of its construction era, its internal structure, floor plan depth, floor-to-floor heights, and utility infrastructure make it ill-suited for easy adaptation to modern pedagogical, student support, or faculty support needs. The significant funds required to retrofit these spaces, compared with the constrained quality of the results, does not warrant further investment in Armstrong Hall.

Based on EMS Campus Data:

- Class Meetings: 12,540
- Class Hours: 19,358
- Average Utilization: 60.02%
- Average Estimated Enrollment: 1,699
- Average Active Enrollment: 1,299
- Max Capacity: 2,550
- Seat Fill: 50.94%
- Area: 143,966 GSF
- Year Built: 1964
- Stories: 4
- FCI: .46
- Replacement Value: \$53,351,000
- Building Repair Backlog: \$24,691,000
- Current Uses: Classrooms, Administrative and Faculty Offices Equipment, Technology: Furniture needs upgrades; technology varies

The objective of this project is to replace Armstrong Hall with a smaller new building and renewing existing space in the Library, Clinical Sciences Building, Wiecking Center, and Morris Hall to increase campus-wide utilization and efficiencies. The new building will be constructed on a different site as an extension of the Academic District. Due to Armstrong Hall's significant size and high utilization, there is not enough swing space available on campus to allow it to be demolished prior to construction of the new replacement building. Rather, Armstrong Hall will be decommissioned over time as this multiphase new construction and renewal project takes place. Ultimately Armstrong Hall will be demolished, opening up the central campus mall.

The design of the building will focus on achieving these goals:

- Rightsizing classrooms to maximize utilization and efficiency, while acommodatingenrollment growth and supporting active learning.
- Flexible, efficient office space that supports collaboration between faculty and meaningful engagment with students.
- Adequate informal learning and social learning space to facility community building among students and encourage casual student/faculty interaction.
- Alignment with long term planning, such as the campus master plan and academic plan.

3.2 Purpose and Rationale

This project plays a significant role in contributing to the Strategic Framework for Minnesota State Colleges and Universities from both an economic growth and educational opportunity perspective. Project relevance and direct impacts are identified below:

MN State Colleges & Universities Strategic Framework	This project fullfills the Strategic Framework objectives in the following ways:			
Ensure access to an extraordinary education for all Minnesotans				
Our faculty and staff will provide the best education available in Minnesota, preparing graduates to lead in every sector of Minnesota's economy.	By providing enhanced academic environments and technologies for faculty and staff to deliver the best education available in MN to a substantial number of students with diverse studies and career interests in Arts and Humanities, Education, and Social and Behavioral Sciences.			
We will continue to be the place of opportunity, making education accessible to all Minnesotans who seek a college, technical or university education; those who want to update their skills; and those who need to prepare for new careers.	By providing quality academic environments that will be accessible to Minnesotan's who seek a university educational experience for both undergraduate and graduate studies as well as continuing education. The three colleges impacted by this project provide diverse career path options for students, for example: K12 and Special Education Teachers, Counselors, Language Interpretors, Public Speakers, Psychologists, Police Officers, Earth Scientists.			
Be the partner of choice to meet Minnesota's workforce and community needs				
Our colleges and universities will be the partner of choice for businesses and communities across Minnesota to help them solve real-world problems and keep Minnesotans at the leading edge of their professions.	Minnesota State Mankato is the partner of choice for businesses and communities in the Southeast region and across the state of Minnesota. This project will provide active learning environments, laboratories and collaboration spaces for faculty and students to continue their great work and enrich their programs with further research partnerships, hands-on learning experiences, and interdisciplinary studies that explore and solve real-world problems.			
Our faculty and staff will enable Minnesota to meet its need for a substantially better educated workforce by increasing the number of Minnesotans who complete certificates, diplomas and degrees.	By providing enhanced academic environments that expose and showcase a variety of educational studies to students so that they are aware of all the opportunities that exist for them to be valuable contributors to our communities. And providing collaborative study environments that support student's needs outside of the classroom so that they can succesfully accomplish their academic goals, degree completion and join the Minnesota workforce.			
Deliver to students, employers, communities and taxpayers the highest value / most affordable option				
Our colleges and universities will deliver the highest value to students, employers, communities and taxpayers.	By providing quality active learning environments and interdisciplinary colllaboration spaces where students can refine their soft skills and learn how to work with others to solve problems to best prepare for their careers in the real world. These spaces will be healthy, flexible, multi-purpose, and highly utilized to deliver the highest value to students, employers, communities and taxpayers.			
We will be the highest value / most affordable higher education option.	Our project has explored a variety of options over the past four years to ensure that the facility projects we are proposing are of the highest value, sustainable over time, and respectful of financial resources in Minnesota.			

3.3 **Space Program and Needs Inventory**

The following Program and Space Needs Inventory has been created through workshop sessions with the Predesign Committee.

	Proposed				
Units	· · · · · · · · · · · · · · · · · · ·			Total SF	
College of Arts & Humanities					13.539 SF
English					6.234
Office - 120sf: Department Chair	1	Ø	120	SF	120 SF
Office - 90sf: Faculty	27	@	90	SF	2,430 SF
Open Office - 60sf: Administrative	1	@	60	SF	60 SF
Open Office - 40sf: TAs/GAs; 1 station / 5	7	@	40	SF	280 SF
Reception	0.42	@	600	SF	252 SF
Conference (6)	1	@	150	SF	150 SF
Conference (12)	0.51	@	1,200	SF	612 SF
Collaboration/Circulation	0.51	@	3,840	SF	1,958 SF
Break	0.51	@	400	SF	204 SF
Storage	0.42	@	400	SF	168 SF
*Labs are listed below under Shared Shared Labs & Classrooms					
Communication Studies					2,927
Office - 120sf: Department Chair	1	@	120	SF	120 SF
Office - 90sf: Faculty	13	@	90	SF	1,170 SF
Open Office - 60: Administrative	1	@	60	SF	60 SF
Open Office - 40: TAs/GAs; 1 station / 5	4	@	40	SF	160 SF
Reception	0.22	@	1 200	SF	132 SF
Conterence (12)	0.22	@	1,200	SF	264 SF
Collaboration/Circulation	0.22	<u>w</u>	3,840	SF SF	040 SF
Storago	0.22	e e	400	OF OF	00 OF 00 SE
Philosophy	0.22	w	400	3F	1 727
Office - 120sf: Department Chair	1	0	120	SE	120 SE
Office - 90sf: Eaculty	7	@	90	SF	630 SF
Open Office - 60sf: Administrative	1	@	60	SF	60 SF
Open Office - 40sf: TAs/GAs: 1 station / 5	2	@	40	SF	80 SF
Reception	0.13	@	600	SF	78 SF
Conference (12)	0.13	@	1,200	SF	156 SF
Collaboration/Circulation	0.13	@	3,840	SF	499 SF
Break	0.13	@	400	SF	52 SF
Storage	0.13	@	400	SF	52 SF
World Language & Cultures					2,002
Office - 120sf: Department Chair	0	@	120	SF	0 SF
Office - 90sf: Faculty	9	@	90	SF	810 SF
Open Office - 60sf: Administrative	1	@	60	SF	60 SF
Open Office - 40sf: TAs/GAs; 1 station / 5	2	@	40	SF	80 SF
	1	@	150	SF	150 SF
Reception	0.14	@	600	SF	84 SF
Conterence (12)	0.14	@	1,200	SF	108 SF
Collaboration/Circulation	0.14	<u>w</u>	3,840	SF SF	038 SF
Storago	0.14	e e	400	OF OF	50 SF
*Labs are listed below under Shared Shared Labs & Classrooms	0.14	W	400	01	50 51
Other CoA&H					649
Existing Seats (enclosed or open office space)					040
Open Office - 40sf: Adjunct English: 1 station / 3	9 67	0	40	SF	387 SF
Open Office - 40sf: Adjunct Comm Studies: 1 station / 3	2.67	õ	40	SF	107 SF
Open Office - 40sf: Adjunct Philosophy: 1 station / 3	2.67	@	40	SF	107 SF
Open Office - 40sf: Adjunct World Lang & Cultures; 1 station / 3	0.33	ĕ	40	SF	13 SF
Reception		@		SF	0 SF
Collaboration/Circulation		ē.		SF	0 SF
Break		ē.		SF	0 SF
Storage	0.09	@	400	SF	36 SF

			F	Propose	ed		
Units					Total SF	Total SF	
College of Education					19.977 S	F	
Teaching & Learning: K-12 & Secondary Pgrms					2.930		
K-12 Lab	1	@	750	SF	750 SF	F	
Materials Storage	1	@	120	SF	120 SF	-	
Office - 120sf: Department Chair	1	@	120	SF	120 SF	F	
Office - 90sf: Faculty	9	@	90	SF	810 SF	F	
Open Office - 60sf: Administrative	2	@	60	SF	120 SF	E	
Open Office - 40sf: TAs/GAs; 1 station / 5	0.6	@	40	SF	24 SF	-	
Reception	0.18	@	600	SF	108 SF	-	
Conference (12)	0.18	@	1,200	SF	216 SH	_	
Collaboration/Circulation	0.18	@	2,880	SF	518 SH	_	
Break	0.18	@	400	SF	72 SH	_	
Storage	0.18	@	400	SF	72 SH	-	
Teaching & Learning: Elem & Literacy Ed	4	0	4 4 0 0	05	5,870	_	
Elementary Lab	1	<u>w</u>	1,120	SF OF	1,120 Sr	-	
Elementary Lab	1	@	800	SF OF	800 St	-	
Elementary Lab	1	<u>w</u>	1 0 2 0	SF OF	800 Sr	-	
Elementary Ed Simulation Classrooms	1	<u>w</u>	1,020	SF SF	1,020 Sr	_	
Maleriais Storage	1	<u>w</u>	200	SF SF	200 Sr 120 Sr	_	
	1	<u>w</u>	120	OF OF	120 Sr	_	
Once - 9051. Faculty Once Office - 60st: Administrative	9	۵	90 60	OF OF	60 SI	=	
Open Office - 40st: Administrative	0.2	۵	40	OF OF	00 51	=	
Pocontion	0.2	e	40 600	OF QE	102 80	=	
Conference (12)	0.17	e	1 200	OF QE	204 8	=	
Collaboration/Circulation	0.17	e	2 00	OF QE	204 31	=	
Break	0.17	e Ø	2,000	SE	490 SI	=	
Storage	0.17	@	400	SE	68 SF	=	
Teaching & Learning: Special Education Dpt	0.17	œ	400	01	2.401		
Special Ed Lab	1	0	800	SF	800 SF	=	
Office - 120sf: Department Chair	1	<u>@</u>	120	SF	120 SF	F	
Office - 90sf: Faculty	7	<u>@</u>	90	SF	630 SF	F	
Open Office - 60sf: Administrative	1	@	60	SF	60 SF	F	
Open Office - 40sf: TAs/GAs; 1 station / 5	0.6	@	40	SF	24 SF	F	
Reception	0.14	@	600	SF	84 SF	F	
Conference (12)	0.14	@	1,200	SF	168 SF	F	
Collaboration/Circulation	0.14	@	2,880	SF	403 SF	F	
Break	0.14	@	400	SF	56 SF	F	
Storage	0.14	@	400	SF	56 SF	F	
Counseling and Student Personnel					5,056		
Teaching Lab - 12 seats	1	@	1,100	SF	1,100 SF	F	
Teaching Lab - ? Seats	1	@	400	SF	400 SF	F	
Media Production	1	@	400	SF	400 SF	F	
Demonstration	1	@	400	SF	400 SF		
Media Production	1	@	400	SF	400 SF		
Office - 120sf: Department Chair	1	@	120	SF	120 SF		
Office - 90st: Faculty	9	@	90	SF	810 SF	-	
Open Office - 60st: Administrative	1	@	60	SF	60 SF	-	
Open Office - 40st: I As/GAs; 1 station / 5	3	@	40	SF	120 SF	-	
Conterence (6)	1	@	150	SF	150 SF	-	
Reception	0.2	@	600	SF	120 SF	-	
Conterence (12)	0.2	@	1,200	SF	240 SF	-	
	0.2	@	2,880	55	5/6 SI	-	
Diedk	0.2	a Ø	400	or or	80 St	-	
Slorage	0.2	w	400	or	80 St	-	
Units Total SF College of Education 19,977 SF	F						
--	---						
College of Education 19,977 SF	F						
Aviation 995							
Office - 120sf: Department Chair 1 0 120 SF 120 SF Office - 90sf: Faculty 3 90 SE 270 SE	:						
Open Office - 60sf. Administrative 1 @ 60 SF 60 SF	=						
Open Office - 40sf Adjunct 1 station / 3 13 @ 40 SE 52 SE	=						
Reception 0.09 @ 600 SF 54 SF	-						
Conference (12) 0.09 @ 1.200 SF 108 SF	=						
Collaboration/Circulation 0.09 @ 2,880 SF 259 SF	-						
Break 0.09 @ 400 SF 36 SF	-						
Storage 0.09 @ 400 SF 36 SF	-						
Educational Leadership 770							
Office - 120sf: Department Chair 1 @ 120 SF 120 SF	2						
Office - 90sf: Faculty 2 @ 90 SF 180 SF	-						
Open Office - 60sf: Administrative 1 @ 60 SF 60 SF	-						
Open Office - 40sf: TAs/GAs; 1 station / 5 0.67 @ 40 SF 27 SF	-						
Reception 0.07 @ 600 SF 42 SF	-						
Conference (12) 0.07 @ 1,200 SF 84 SF	-						
Collaboration/Circulation 0.07 @ 2,880 SF 202 SF	-						
Break 0.07 @ 400 SF 28 SF	-						
Storage 0.07 @ 400 Sr 26 Sr							
Office of Assessment & Research							
Office - 120: Center Director 1 @ 120 SE 120 SE	=						
Office - 90: Administrative 1 @ 90 SF 90 SF	=						
Office of Field & International Experience							
Office - 120: Center Director 1 @ 120 SF 120 SF	-						
Open Office - 60: Administrative 2 @ 60 SF 120 SF	-						
Center for Educator Support							
Office - 120: Center Director 1 @ 120 SF 120 SF	5						
Open Office - 60: Administrative / Adjunct 1 @ 60 SF 60 SF	-						
Center for Educator Partnerships & Student Support	_						
Office - 120: Center Director 1 @ 120 SF 120 SF	-						
Office - 90: Administrative 1 @ 90 SF 90 SF	-						
Open Onice - bu: Administrative i @ bu Sr 00 Sr 00 Sr	_						
Perenting 0.15 @ 600 SE 00 SE	=						
Conference (12) 0.15 @ 1200 SF 180 SF	=						
Collaboration (12) Collaboration 015 @ 2,880 SE 432 SE	=						
Break 0.15 @ 400 SF 60 SF	=						
Storage 0.15 @ 400 SF 60 SF	-						
Other CoE 83							
Existing Seats (enclosed or open office space)							
Open Office - 40sf: Adjunct; 1 station / 3 / Dept? 0.5 @ 40 SF 20 SF	-						
Open Office - 40sf: Adjunct T&L K12 & Second; 1 station / 3 0.3 @ 40 SF 12 SF	-						
Open Office - 40st: Adjunct T&L Elem & Lit; 1 station / 3 0.3 @ 40 SF 12 SF	-						
Open Office - 40st: Adjunct T&L Spec Ed; 1 station / 3 0.3 @ 40 SF 12 SF	-						
Open Office - 40st: Adjunct Counsel & SP; 1 station / 3 0.67 @ 40 SF 27 SF	-						
Open Onice - 40si: Adjunci Ed Leadership; i station / 3 0 (2) 40 SF 0 SF	-						
New Public Conference (12) O SF U SF O SF <tho< th=""> SF O</tho<>	-						
	-						
Break Reak Real	-						
Storage @ SF 0 SF	:						

			F	Proposed	
Units					Total SF
College of Social & Behavioral Sciences					17,730 SF
Sociology & Corrections					4,587
Law Enforcement Lab (AH014B, AH039C)	1	@	400	SF	400 SF
College Qualitative Lab (AH122)	1	<u>@</u>	400	SF	400 SF
Office - 120sf: Department Chair	1	@	120	SF	120 SF
Office - 120sf: Director	2	@	120	SF	240 SF
Office - 90sf: Faculty	17	@	90	SF	1,530 SF
Open Office - 60sf: Administrative	0	@	60	SF	0 SF
Open Office - 40sf: TAs/GAs; 1 station / 5	1.6	@	40	SF	64 SF
Conference (6)	1	@	150	SF	150 SF
Reception	0.33	@	600	SF	198 SF
Collaboration/Circulation	0.33	@	2,800	SF	924 SF
Conference (12)	0.33	@	900	SF OF	297 SF
Sterage	0.33	<u>w</u>	400	or or	132 SF
Storage	0.33	W	400	Sr	132 SF
Psychology Lab (WC2528252A)	1	0	1 400	QE.	1,400 SE
Psychology Lab (WC333&335A) $Psychology Lab (AH020 AH020B)$	1	e Ø	1,400	SE	1,400 SF
Psych Observ Room	1	0	1,200	SE	1,200 SI 400 SE
Office - 120sf: Department Chair	1	@	120	SE	120 SF
Office - 90sf: Faculty	19		90	SF	1 710 SF
Open Office - 60sf: Administrative	0	@	60	SF	0 SF
Open Office - 40sf: TAs/GAs: 1 station / 5	4.4	@	40	SF	176 SF
Conference (6)	1	@	150	SF	150 SF
Reception	0.36	@	600	SF	216 SF
Collaboration/Circulation	0.36	@	2,800	SF	1,008 SF
Conference (12)	0.36	@	900	SF	324 SF
Break	0.36	@	400	SF	144 SF
Storage	0.36	@	400	SF	144 SF
*Additional Labs listed below under Shared Category					
Geography					4,053
Weather/Soils Lab - 18 seats	1	@	1,050	SF	1,050 SF
	1	<u>w</u>	450	or or	400 SF
Office 120sf: Department Chairs	1	<u>w</u>	1,010	OF OF	1,010 SF
Office Office Office Office	l Q	e Ø	00	SE	720 SF
Open Office - 60sf: Administrative	0	@	60	SE	0 SF
Open Office - 40sf: TAs/GAs: 1 station / 5	1	@	40	SE	40 SF
Reception	0.13		600	SF	78 SF
Collaboration/Circulation	0.13	@	2.800	SF	364 SF
Conference (12)	0.13	@	900	SF	117 SF
Break	0.13	õ	400	SF	52 SF
Storage	0.13	@	400	SF	52 SF
History					1,970
Office - 120sf: Department Chair	1	@	120	SF	120 SF
Office - 90sf: Faculty	10	@	90	SF	900 SF
Open Office - 60sf: Administrative	0	@	60	SF	0 SF
Open Office - 40sf: TAs/GAs; 1 station / 5	0.8	@	40	SF	32 SF
Reception	0.18	@	600	SF	108 SF
	0.18	@	2,800	SF	504 SF
Conference (12)	0.18	@	900	5F 8F	162 SF
Storage	0.10	<u>w</u>	400	OF OF	72 SF 72 SE
Other CoS&BS	0.10	W	400	01	128
Existing Seats (enclosed or open office space)					.20
Open Office - 40sf: Adjunct Sociology & Correct: 1 station / 3	2.33	@	40	SF	93 SF
Open Office - 40sf: Adjunct Psychology: 1 station / 3	0	@	40	SF	0 SF
Open Office - 40sf: Adjunct Geography; 1 station / 3	0	õ	40	SF	0 SF
Open Office - 40sf: Adjunct History; 1 station / 3	0.67	@	40	SF	27 SF
Conference (12)		@		SF	0 SF
Reception		@		SF	0 SF
Collaboration/Circulation		@		SF	0 SF
Break		@		SF	0 SF
Storage	0.02	@	400	SF	8 SF

			F	Propos	ed	
Units					Total S	SF
Shared Multi-use Labs					3,240	SF
Multi-use Labs	11				3,240	SF
Mutli-use Lab	1	@	660	SF	660	SF
Mutli-use Lab	1	<u>@</u>	450	SF	450	SF
Mutli-use Lab	1	<u>@</u>	480	SF	480	SF
Mutli-use Lab	1	<u>@</u>	350	SF	350	SF
Mutli-use Lab	1	<u>@</u>	250	SF	250	SF
Mutli-use Lab	1	<u>@</u>	250	SF	250	SF
Mutli-use Lab	1	<u>@</u>	200	SF	200	SF
Mutli-use Lab	4	@	150	SF	600	SF
Shared General Classrooms					31,287	SF
Classrooms	32				31,287	SF
Classroom 20 seats	2	@	520	SF	1,040	SF
Classroom 24 seats	2	0	600	SF	1,200	SF
Classroom 28 seats	4	@	672	SF	2,688	SF
Classroom 34 seats	4	0	748	SF	2,992	SF
Classroom 38 seats	7	0	836	SF	5,852	SF
Classroom 42 seats	4	@	840	SF	3,360	SF
Classroom 48 seats	5	0	960	SF	4,800	SF
Classroom 56 seats	1	0	1,120	SF	1,120	SF
Classroom 65 seats	1	0	1,235	SF	1,235	SF
Classroom 150 seats	1	0	3,000	SF	3,000	SF
Classroom 200 seats	1	0	4,000	SF	4,000	SF
Library Renovated Spaces					7,522	SF
Space impacted by Renovations	4				7,522	SF
Classroom X seat (ML0XX Collaboration Lab)	1	@	1,900	SF	1,900	SF
Classroom X seat (ML047 Global Learning Lab)	1	ō.	1,755	SF	1,755	SF
Classroom 50 seat (ML109)	1	@	1,667	SF	1,667	SF
Other	1	õ	2,200	SF	2,200	SF
		-				

			F	Proposed	i	
Units					Total S	ЪF
General					19,650	SF
Misc	6				1,600	SF
Storage	4	@	200	SF	800	SF
Recycling	2	@	400	SF	800	SF
Student	29				14,150	SF
Entry/Great Hall	1	@	4,000	SF	4,000	SF
Coffee Shop	1	@	500	SF	500	SF
Collaboration Hub	4	@	900	SF	3,600	SF
Social Learning	10	@	250	SF	2,500	SF
Just Ask' Faculty/Staff Desk	2	@	500	SF	1,000	SF
Adult Student w/ Children Study Suites	1	@	600	SF	600	SF
Small Group (6)	7	@	150	SF	1,050	SF
Small Group (12)	3	@	300	SF	900	SF
Joint Dean's Office	19				2,240	SF
CoAH Office - 140: Dean	1	@	140	SF	140	SF
CoAH Office - 120: Assistant Dean	1	@	120	SF	120	SF
CoAH Office - 90: Communications Director	1	@	90	SF	90	SF
CoAH Open Office - 60: Administrative	1	@	60	SF	60	SF
CoE Office - 140: Dean	1	@	140	SF	140	SF
CoE Office - 120: Assistant Dean	1	@	120	SF	120	SF
CoE Office - 90: Admin: Teacher Licensing	1	@	120	SF	120	SF
CoE Office - 60: Communications Coordinator	1	@	60	SF	60	SF
CoE Open Office - 60: Administrative	1	<u>@</u>	60	SF	60	SF
CoE Open Office - 40sf: TAs/GAs; 1 station / 5	1	œ,	40	SF	40	SF
CoSBS Office - 140: Dean	1	<u>@</u>	150	SF	150	SF
CoSBS Office - 120: Assistant Dean	1	<u>@</u>	120	SF	120	SF
CoSBS Office - 60: Communications Coordinator	1	@	60	SF	60	SF
CoSBS Open Office - 60 [°] Administrative	1	Ő	60	SF	60	SF
Recention	1	Ő	300	SF	300	SF
Conference (12)	1	Ő	300	SF	300	SF
Storade	3	@	100	SF	300	SF
Joint Advising Center	8	œ.		0,	1,660	SF
Advising / Coordinator Office (2 SBS, 2 A&H, 1 COE)	5	@	120	SF	600	SF
CoSBS Open Office - 60: Administrative	1	õ,	60	SF	60	SF
Study Room	1	œ,	800	SF	800	SF
Conference Room	1	õ	200	SF	200	SF
		_				
ASF Total					112,946	SF
Net-to-Gross (circulation, walls, mech/service, etc)					112,946	SF
GSF Total	PROP	POSEI	D		175,111	SF









10 | Section 3: Project Description







College of Education









Storage 28 sf

(1)

Collaboration /

Circulation

202 sf

Office - 90: Faculty

90 sf (2)



College of Education Centers Office of Assessment Research 12-0 15-0 Office - 120: Center Director Office - 90: Administrative Conference (6) Reception 120 sf (1) 90 sf (1) 150 sf (1) 90 sf (1) 20-0 Office of Field & International Experience 12-0 12-0 15-0 2 Conference (12) Office - 120: Center Director Open Office - 60: Collaboration / 180 sf (1) 120 sf (1) Administrative Circulation 60 sf (2) 432 sf Center for Educator Support 12-0 10-0 S. Office - 120: Center Director Open Office - 60: Break 60 sf Storage 60 sf 120 sf (1) Administrative (1) (1) 60 sf (1) Center for Educator Partnership & Student Support 12-0 Office - 120: Center Director Office - 90: Administrative Open Office - 60: 120 sf (1) 90 sf (1) Administrative 60 sf (1) Other CoE 8 8 8 8 Open Office -40 Adjunct 40 sf (5)

College of Social and Behavioral Sciences



Feet 0 50

100





Shared Multi-use Labs



Shared General Classrooms



Library Renovated Spaces





General





Proposed Department Locations

Section 3: Project Description | 19

Circulation, walls, mech, etc.

Minnesota State University, Mankato | Armstrong Hall Solution

		-							
Department:	Serving All Depa	artments							
Snace Name [.]	Traditional Clas	eroom for 20)						
opuee nume.	Traultional Glas		,						
Area:	680 SF			Occupant L	oa	d:	20		
Quantity:	5			Description	۱ of	Activity:	Туріс	al Classroom	
Total Area				Adiacencie	s.	,	Class	srooms	
	3,400 SF				0.		01000		
ARCHITECTURAL		COMMUN	IICATIONS			MECHANIC	AL		
Access	Secure	Voice	yes			Temperatur	e	70-75	
Noise Control	Yes	Data	yes			Heating		Chilled Beam	
Doors	HM	Wireless	yes			Cooling		Chilled Beam	
Walls	Gyp	Projector	1			Humidity Co	ontrol	DOAS	
Ceiling	ACP	Speakers	yes			Exhaust		DOAS	
Floors	CPT	Other	-			Controls		BAS	
Base	RB					Other		DCV	
Windows		PLUMBIN	G						
Other		Sink	-			SPECIALTIE	ES		
		Kitchenet	te -			Casework		-	
		WC	-			Teaching St	tation	1	
FURNITURE / EQU	IPMENT	Shower	-			Projection S	Screen	1	
Table	8					Marker Boa	rd	1	
Chairs	20	Lighting				Chalkboard		-	
Desk	-		ype LE			Tackboard		-	
File Cabinet	-		iptions Dir	ппаре		Other		-	
Computer	1	Task Ligh	ling inc						
Printer	-	Zoned Lig	nung Ye	S					
Copier	-	Outlets	Ye	5					
Other	-	Security	NC						
		Uther	-						





Space Name:	Traditional Classr	room for 24						
Area: Quantity: Total Area:	685 SF 6 4,110 SF			Occupan Descripti Adjaceno	it Load: ion of Ac cies:	ctivity:	24 Typical Classrc	Classroom ooms
ARCHITECTURAL Access Noise Control Doors Walls Ceiling Floors Base Windows Other	Secure Yes HM Gyp ACP CPT RB	COMMUNICATIONS Voice Data Wireless Projector Speakers Other PLUMBING Sink Kitchenette	S yes yes 1 yes -			MECHAN Tempera Heating Cooling Humidity Exhaust Controls Other SPECIAL Casewor	VICAL iture / Control TIES	70-75 Chilled Beam DOAS DOAS BAS DCV
FURNITURE / EQU	IPMENT	WC Shower	-			Teaching Projectio	g Station on Screen	1
Table Chairs Desk File Cabinet Computer Printer Copier Other	12 24 - - 1 - -	ELECTRICAL Lighting Type Lighting Options Task Lighting Zoned Lighting Outlets Security Other	LED Dimma No Yes Yes No	ble		Marker B Chalkboa Tackboa Other	Board ard rd	1 - -







Armstrong Hall Solution | Minnesota State University, Mankato

Minnesota State University, Mankato | Armstrong Hall Solution

Department: Space Name:	Serving All Departi Traditional Classro	ments oom for 32				
Area:	840 SF		Occupant Load:	ctivit	32 tv: Typical Cla	assroom
Quantity: Total Area:	10 8 400 SE		Adjacencies:		Classroon	ns
			2			
ARCHITECTURAL Access Noise Control Doors Walls Ceiling Floors Base Windows Other	Secure Yes HM Gyp ACP CPT RB	COMMUNICATION Voice Data Wireless Projector Speakers Other PLUMBING Sink Kitchenette WC	S yes yes 1 yes -	 - 	MECHANICAL Temperature Heating Cooling Humidity Control Exhaust Controls Other SPECIALTIES Casework Teaching Station	70-75 Chilled Beam DOAS DOAS BAS DCV
FURNITURE / EQU	IPMENT	Shower	-	1	Projection Screen	1
Chairs Desk File Cabinet	32 - -	ELECTRICAL Lighting Type Lighting Options	LED Dimmable	(Chalkboard Tackboard Other	-
Computer Printer Copier Other	1 - -	Task Lighting Zoned Lighting Outlets Security Other	No Yes Yes No			





Section 3: Project Description 23

Department: Space Name:	Serving All Depart Active Learning C	tments lassroom for 56						
Area:	1,400 SF		Occupant Load:		56			
Quantity:	2		Description of Activ	vity	: Active Learn	ing Classroom		
Total Area:	2,800 SF		Adjacencies:		Classrooms			
ARCHITECTURAL		COMMUNICATIONS	3	[MECHANICAL			
Access	Secure	Voice	yes		Temperature	70-75		
Noise Control	Yes	Data	yes		Heating	Chilled Beam		
Doors	HM	Wireless	yes		Cooling	Chilled Beam		
Walls	Gyp	Projector	1		Humidity Control	DOAS		
Ceiling	ACP	Speakers	yes		Exhaust	DOAS		
Floors	CPT	Other	-		Controls	BAS		
Base	RB				Other	DCV		
Windows		PLUMBING		ĺ				
Other		SINK	-		SPECIALITES			
		Kitchenette	-		Casework	-		
	DMENT	WC	-		Teaching Station	1		
Toblo		Shower	-		Morker Boord	1		
Choire	60	ELECTRICAL			Challkhoord	Z		
Chairs	00	Lighting Type	LED		Tackboard	-		
Desk File Cohinet	-	Lighting Options	Dimmable		Monitor	-		
	-	Task Lighting	No	l	WUHILUI	0		
Drintor	I	Zoned Lighting	Yes					
Copier	-	Outlets	Yes					
Other	-	Security	No					
Uner	-							

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Typical Room Layout



Other



Department: Space Name:	Serving All Depar Lecture Hall	tments			
Area: Quantity: Total Area:	2,900 SF 1 2,900 SF		Occupa Descrip Adjace	ant Load: otion of Activity: I ncies:	140 ecture hall
ARCHITECTURAL Access Noise Control Doors Walls Ceiling Floors Base Windows Other	Secure Yes HM Gyp ACP CPT RB	COMMUNICATION Voice Data Wireless Projector Speakers Other PLUMBING Sink Kitchenette WC	S yes yes 2 yes -	MECHANICAL Temperature Heating Cooling Humidity Control Exhaust Controls Other SPECIALTIES Casework Teaching Station	70-75 Chilled Beam, Displacement Chilled Beam DOAS DOAS BAS DCV -
FURNITURE / EQUI Table Chairs Desk File Cabinet Computer Printer Copier Other	PMENT - 150 tablet arm 1 1 - 1	Shower ELECTRICAL Lighting Type Lighting Options Task Lighting Zoned Lighting Outlets Security Other	- Dimmable No Yes Yes Yes	Projection Screer Marker Board Chalkboard Tackboard Other	1 2 4 - - -





Department: Space Name:	College of Educat Elementary Educa	ion ation Simulation	Lab					
Area: Quantity: Total Area:	800 to 1,120 SF 4 3,740 SF			Occupan Descript Adjaceno	nt Load: ion of Ad cies:	ctivity:	24 Simulat Restroc	ion Lab oms, Storage
ARCHITECTURAL Access Noise Control Doors Walls Ceiling Floors Base Windows Other	Secure Yes HM Gyp ACP CPT RB	COMMUNICATIONS Voice Data Wireless Projector Speakers Other PLUMBING Sink	yes yes yes 1 yes -			MECHAN Tempera Heating Cooling Humidity Exhaust Controls Other	IICAL ture Control	70-75 Chilled Beam Chilled Beam DOAS DOAS BAS DCV
FURNITURE / EQUI Table Chairs Desk	PMENT 24 24 1	WC Shower ELECTRICAL Lighting Type Lighting Options	- - LED Dimma	hle		Teaching Projectio Marker B Chalkboar Tackboar	Station n Screen oard ard rd	- 1 6 -
File Cabinet Computer Printer Copier Other	- 1 1 1 Play Equipment	Task Lighting Zoned Lighting Outlets Security Other	No Yes Yes No	DIC		Uther		-





Department: Space Name:	College of Soci Therapy Lab	al & Behavioral Scier	nces					
Area & Quant	tity: 4 @ 150 SF	Therapy Room	Occupant I	Loa	d:	20		
	1 @ 600 SF (Observation Room	Description	n of Activity: Simu			Ilation Lab	
Total Area:	1,000 SF		Adjacencie	es:		Class	Classrooms	
ARCHITECTURAL		COMMUNICATION	S		MECHANI	CAL		
Access	Secure	Voice	yes		Temperatu	ire	70-75	
Noise Control	Yes	Data	yes		Heating		Chilled Beam	
Doors	HM	Wireless	yes		Cooling		Chilled Beam	
Walls	Gyp	Projector	1		Humidity C	Control	DOAS	
Ceiling	ACP	Speakers	yes		Exhaust		DOAS	
Floors	CPT	Other	-		Controls		BAS	
Base	RB				Other			
Windows		PLUVIDING	2			F0		
Other		SITIK	?		SPECIALII	ES	a la a la sina ni	
		Kitchenette	?		Casework)tatian	sneiving	
		VVC Chauvar	-		Draigation	Caraan	-	
Toble		Shower	-		Projection Marker De	Screen	-	
Chaira	0	ELECTRICAL				aiu	0	
Deal	10	Liahtina Type	LED		Taakbaard	J	-	
LUESK	-	Lighting Options	Dimmable		Monitor		62	
	yes 1	Task Lighting	Yes		WUTITO		01	
	1	Zoned Lighting	No					
Copier	1	Outlets	Yes					
Othor	I	Security	No					
	-	Other	-					







Department: Space Name:	General Advising & Couns	eling Center			
Area: Quantity: Total Area:	2,030 SF 1 suite (8 offices; stu 2,030 SF	udy, conf)	Occupant Load: Description of Act Adjacencies:	19 ivity: advising & co student servi	ounseling offices ces
ARCHITECTURAL Access Noise Control Doors Walls Ceiling Floors Base	Secure Yes HM Gyp ACP CPT RB	COMMUNICATIONS Voice Data Wireless Projector Speakers Other PLUMBING	yes yes yes 1 yes -	MECHANICAL Temperature Heating Cooling Humidity Control Exhaust Controls Other	70-75 Chilled Beam Chilled Beam DOAS DOAS at copier BAS DCV in conf
Other	PMENT	Sink Kitchenette WC Shower	-	SPECIALTIES Casework Teaching Station Projection Screen	yes - -
Chairs Desk File Cabinet Computer Printer Copier Other	8 office chairs 8 8 8 1 1	ELECTRICAL Lighting Type Lighting Options Task Lighting Zoned Lighting Outlets Security Other	LED Dimmable No Yes Yes Yes	Chalkboard Tackboard Other	- - Monitor (conf)





4 8 16 3 CALE: 3/32" = 1'=0" Minnesota State University, Mankato | Armstrong Hall Solution

Department: Space Name:	General Dean's Office Suite					
Area: Quantity: Total Area:	1,690 SF 1 suite (6 offices - 1,930 SF	+ 1 conf)	Occupant Load: Description of A Adjacencies:	ctivity	19 : Dean's of student s	fices, meeting ervices, storage
ARCHITECTURAL Access Noise Control Doors Walls Ceiling Floors Base Windows Other	Secure Yes HM Gyp ACP CPT RB	COMMUNICATIONS Voice Data Wireless Projector Speakers Other PLUMBING Sink Kitchenette WC	yes yes - yes - - - - -	ME Ter Hea Coo Huu Exh Cor Oth SPI Cas Tea	CHANICAL mperature ating bling midity Control naust ntrols her ECIALTIES sework aching Station	70-75 Chilled Beam DOAS DOAS at copier BAS DAS in conf
FURNITURE / EQUI Table Chairs Desk File Cabinet Computer Printer Copier Other	PMENT 1 conf rm 8 office chairs 8 8 8 1 1 -	Shower ELECTRICAL Lighting Type Lighting Options Task Lighting Zoned Lighting Outlets Security Other	- LED Dimmable No Yes Yes Yes Yes	Prc Ma Cha Tac Oth	jection Screen rker Board alkboard ckboard ner	- - - Monitor (conf)







Department: Space Name:	General Faculty/ Admin O ⁻	ffice Suite				
Area: Quantity: Total Area:	4,380 SF estimated to be app 36,500 SF admin sp	brox 8 bace	Occupant Loa Description of Adjacencies:	d: Activit	44 y: offices and r	meeting space
ARCHITECTURAL Access Noise Control Doors Walls Ceiling Floors Base	Secure Yes HM Gyp ACP CPT RB	COMMUNICATIONS Voice Data Wireless Projector Speakers Other	S yes yes - yes -		MECHANICAL Temperature Heating Cooling Humidity Control Exhaust Controls Other	70-75 Chilled Beam Chilled Beam DOAS DOAS at copier BAS DCV in conf
Other		Sink Kitchenette WC Shower	1 yes -		SPECIALTIES Casework Teaching Station Projection Screen	yes - -
Table Chairs Desk	1 conf rm 31 office chairs 31	ELECTRICAL Lighting Type Lighting Options	LED Dimmable		Marker Board Chalkboard Tackboard Other	- - - Monitor (conf)
Computer Printer Copier Other	31 2 2 -	Zoned Lighting Outlets Security Other	Yes Yes Yes			



3.4 Graphics and Maps

While not a prerequisite for this pre-design, the design sketches on the following pages memorialize ideas derived from workshops with faculty and staff as well as internal charrettes that may prove to be valuable for discussion when the project moves forward into design.



Ground Floor Plan Concepts



connection to campus and visual impact

Second Floor Plan Concepts



Third and Fourth Floor Plan Concepts



3.5 Codes and Standards

The Minnesota Department of Labor and Industry defines the applicable codes for the project. Applicable codes will need to be reviewed as funding is available. The current applicable codes are as follows:

- Minnesota Building Code Administration
- Minnesota Provisions to the State Building Code
- Minnesota Building Code
- Minnesota Elevator and Related Devices Code
- Minnesota Conservation Code for Existing Buildings
- Minnesota Energy Code
- Minnesota Accessibility Code
- Minnesota Mechanical and Fuel Gas Code
- Minnesota Plumbing Code
- National Electrical Code

3.6 Special Issues and Concerns

Collocating and Standardizing Office Space

Currently within each department administration, faculty and staff offices are fragmented and spread across numerous buildings with some located in Armstrong Hall, Morris Hall or Wiecking Center. This often happens over time as office space is assigned to individuals wherever there is space available at the time the spaced is needed. In the early planning phase of projects like this, there is an opportunity to re-align office layouts and locations to better support the needs of students and create space efficiencies through adjacencies and synergies. This project prioritizes that opportunity and includes a collocation of all offices for every department that was located or partially located in Armstrong Hall. Knowing that change is inevitable in our world, we recommend a non-suite style office concept or a larger multi-department suite concept to provide a flexible solution that will allow for departments to flex – grown and reduce in size as needed – without isolating and fragmenting departments.

In addition to the irregular location of offices in several buildings on campus, the size of offices fluctuated greatly ranging from 58 SF up to 180 SF and there is not any collaboration space provided in the existing buildings. Most of the offices on the smaller end, were originally not intended to be offices, but as departments grew over time, storage and custodial closets were repurposed as offices. Given the existing condition, to simply provide a one size fits all approach of say a 120 SF office for every faculty and staff member 24 hours a day would increase the replacement project SF greatly, significantly impact the project budget, not provide for any space for collaboration, and not be an efficient use of space or resources. The design team came up with office and furnishing options that explored guidelines for reducing office sizes/quantities and provides quality space to support faculty, staff, and their engagement with students.

The solution details include:

- Deans will be provided an assigned enclosed office at 140 SF each
- Deans Assistants will be provided an assigned enclosed office at 120 SF each
 - [°] Locations for all Deans and Dean's Assistants across the three Colleges will be collocated in a single location.
- Advising Staff will be provided an assigned enclosed office at 120 SF each.
 - Locations for all Advising Staff across the three Colleges will be collocated in a single location
- Faculty Department Chairs will be provided an assigned enclosed office at 120 SF each.
 - [°] Department Chair positions are term based, as such these offices will turn over as the Chair position changes.
 - [°] Locations will be collocated with departments
 - Fulltime faculty and Directors will be provided an assigned enclosed office at 80 to 90 SF each
 - [°] Locations will be collocated with departments
- Adjunct faculty will be provided a hoteling shared office or workstation that is approximately 40 SF (5'x4'). Desk spaces will be provided 1:3 – one desk space per every three adjunct faculty. Lockable storage for supplies and belongings will be provided.
 - ° Locations can be anywhere on campus
- Teaching Assistants (TAs) and Graduate Assistants (GAs) will be provided a hoteling workstation that is approximately 40 SF (5'x4'). Desk spaces will be provided 1:5 – one desk space per every five TAs/GAs. A large studio bull-pen style environment with a team collaboration table is preferred.
 - [°] Locations will be near department faculty or laboratories
 - Fulltime Administrative Staff will be provided an assigned workstation that is approximately 60 SF (6'x8') in an open office collaborative environment

3.7 Building Summary Forms and Narrative

MINNESOTA STATE

Predesign Building Summary Form | Existing Building Data

ARMSTRONG HALL

Code Information						
Occupancy group(s) (existing):	B: Education above	B: Education above 12th grade, A-3: Lecture Halls				
Primary space types (office, classroom, etc.):	Classrooms, offices					
Type of construction (per current MN Building Code):	II-A					
Building Size (GSF):	Allowable Height:	5 stories	Actual Height:	3 stories + basement		
	Allowable area / floor:	37,500	Actual area / floor:	~40,000sf		
	Total building Area:	187,500	Space efficiency (%):			

Building Systems (describe type of system & current condition)				
Roofing type(s):	Built-up			
Structural system type(s):	Cast-in-place Concrete			
Mechanical system type(s):				
Electrical system type(s):				
Fire protection type(s):	Automatic Sprinkler System			
Exterior wall type(s):	Brick exterior with clay masonry back-up			
Interior wall type(s):	Glazed block, steel stud with GWB			
Conveying system(s):	Elevator			

Metrics			
Current backlog:	\$24, 691,000	Current renewal:	
Current space utilization:	33 hrs/wk	Proposed space util.:	38 hrs/wk

MINNESOTA STATE

Memorial Library + Addition

Ŵ

Code Information				
Occupancy group(s) (existing):	A-3: Libraries			
Primary space types (office, classroom, etc.):	Library			
Type of construction (per current MN Building Code):	1-B			
Building Size (GSF):	Allowable Height:	11 stories	Actual Height:	3 stories + basement
	Allowable area / floor:	Unlimited	Actual area / floor:	~60,000sf
	Total building Area:	Unlimited	Space efficiency (%):	

Building Systems (describe type of system & current condition)				
Roofing type(s):	Built-up			
Structural system type(s):	Cast-in-place Concrete			
Mechanical system type(s):	Constant Air Volume			
Electrical system type(s):				
Fire protection type(s):	Partial Automatic Sprinkler System			
Exterior wall type(s):	Brick exterior with concrete masonry back-up			
Interior wall type(s):	CMU, steel stud with GWB			
Conveying system(s):	Elevator			

Metrics			
Current backlog:	\$11,788,000	Current renewal:	
Current space utilization:	22 hrs/wk	Proposed space util.:	38 hrs/wk



PROPOSED BUILDING

Code Information						
Occupancy group(s):	B: Education above	B: Education above 12th grade, A-3: Lecture Halls				
Primary space types (office, classroom, etc.):	Classrooms, offices					
Type of construction (per current MN Building Code):	II-B					
Building Size (GSF):	Allowable Height:	3 stories + increases	Actual Height:	4 stories		
	Allowable area / floor:	23,000sf + increases	Actual area / floor:	25,000sf		
	Total building Area:	69,000 + increases	Space efficiency (%):			

Building Systems	
Roofing type(s):	Built-up
Structural system type(s):	TBD
Mechanical system type(s):	TBD
Electrical system type(s):	TBD
Fire protection type(s):	Automatic Sprinkler System
Exterior wall type(s):	Masonry Cavity Wall with Brick Veneer
Interior wall type(s):	Steel Stud with GWB
Conveying system(s):	Elevator
Life expectancy of building & systems:	50+ years
Technology systems:	TBD
Sustainability / energy:	TBD
Notes on proposed FF&E:	New FF&E

Construction Schedule			
Construction start date:	August 2024	Occupancy date:	January 2026

Mechanical Systems Narratives

Clinical Sciences

Mechanical scope in the Clinical Sciences Building will consist of modifying the shell fire protection system to suit the finished space; extending and modifying plumbing as required to suit the finished spaces; and extending and modifying the shell HVAC system for the finished spaces. When finishing the HVAC system, careful attention shall be paid to ensure proper ventilation, temperature asymmetry near exterior walls, and appropriate zoning.

Memorial Library

Mechanical scope in the Memorial Library will consist of extending the existing fire protection system throughout the entire building; modifying plumbing as required to suit the renovation; and extending and modifying the existing HVAC system for the renovation. When modifying the HVAC system, careful attention shall be paid to ensure proper ventilation, integration with long term maintenance plans for the main equipment, and minimizing disruption in operations to areas outside the scope of work. As part of the HVAC work, some of the air handling systems may be changed from constant volume to variable air volume with digital controls. Modifications to the fire protection system will require consideration of existing sprinkler supply flow and pressure, zoning, and protection of collections possibly requiring a pre-action system.

New Building

The primary HVAC system for the new building shall be a Dedicated Outside Air System (DOAS) coupled with chilled beams and other heating/sensible cooling terminal devices. The DOAS units will be variable air volume and feature chilled water coils, hot water coils, enthalpy energy recovery wheels, and a passive desiccant wheel running between the exhaust and supply air streams (known as a parallel configuration). The passive desiccant wheel can reduce peak cooling load by over 30% while also providing significant dehumidification and minimizing summer reheat. When feasible, floor mounted chilled beams with displacement air supply will be used - taking advantage of displacement ventilation's indoor air quality, comfort, and acoustic benefits. Other occupied areas will receive ceiling or bulkhead mounted chilled beam, as dictated by architectural design. Spaces where chilled beams are not appropriate (computer labs, electrical rooms, vestibules) will be served by fan coil units, fan powered VAV boxes, or other traditional systems as appropriate. All classrooms, meeting rooms, and other gathering spaces will have demand controlled ventilation and independent zone control. A dry fluid cooler will be used in the winter to generate chilled water as needed. The chilled water system will be laid out to maximize the temperature differential between entering and leaving chilled water, and the heating water system will tie into campus steam via a heat exchanger. The entire building shall be controlled via a Building Automation System. The building will be fully sprinkled. Plumbing systems shall be per Minnesota State standards and state code. Domestic hot water shall be generated by a steam-hot water heat exchanger, tied into the campus steam plant.

Electrical Systems Narratives

Clinical Sciences

Power to mechanical equipment, general receptacles and owner equipment. Interior lighting will be LED for both general and specialty lighting. Occupancy sensors will be utilized for primary control of the lighting. Daylight sensors will be utilized where appropriate to further reduce energy consumption. Backbone and horizontal data cabling per campus standards connecting to existing infrastructure. Code and campus compliant fire alarm devices connecting to existing fire alarm system. AV, clock and security will be per Campus standards and integrated into existing system.

Memorial Library

Power distribution panel for entire facility to replace aging panels retaining the wiring. Power to mechanical equipment, general receptacles and owner equipment. Interior lighting will be LED for both general and specialty lighting. Occupancy sensors will be utilized for primary control of the lighting. Daylight sensors will be utilized where appropriate to further reduce energy consumption. Backbone and horizontal data cabling per campus standards connecting to existing infrastructure. Code compliant full digitally addressable fire alarm system for entire facility to replace aging system retaining the wiring infrastructure of the existing. AV, clock and security will be per Campus standards and integrated into existing system.

New Building

Electrical service will be served from the campus 15KV distribution system. Exterior pad mounted primary switch and transformer will feed an interior 1600 Amp, 277/480V/3P/4W switchboard. Electrical rooms will be located on each floor containing both 277/480V/3P/4W panels and 120/208V/3P/4W panels power to mechanical, general and owner equipment. Interior lighting throughout the facility will be LED for both general and specialty lighting. Occupancy sensors will be utilized in all areas for primary control of the lighting. Daylight sensors will be utilized where appropriate to further reduce energy consumption. Data closets will be located on each floor for the distribution of data infrastructure including backbone and horizontal data cabling. All exterior building and area lighting will be LED. Fire alarm system will be a code compliant fully digital addressable. AV, clock and security will be per Campus standards.

Structural Systems Narrative

Memorial Library

The original library was constructed in three main phases (drawings dated 1965, 1966 & 1990). The structural system is a cast-in-place concrete waffle slab and columns founded on shallow foundations with an allowable bearing capacity of 2,000 psf. All floors were designed for 150 pounds per square foot live load which would be typical of a library stack room loading in current Minnesota State Building Code. Given the robustness of the structure, proposed modifications of floor area to classrooms, offices, corridors and similar is not expected to require structural modifications. Additionally items like folding partitions would likely be able to hang from the existing structure with minimal supplementary steel supports. Small openings for mechanical chases and similar penetrations should be relatively easy through the waffle slab if the size fits between existing two-way joists.

One of the possible alternatives for meeting renewable energy targets is adding solar photovoltaic panels to the Library roof. The existing waffle slab was designed for a minimum of 40 pounds per square foot snow load. It is likely that the existing concrete waffle slab structure could support the additional 5-10 pounds per square foot required by the solar PV panels without structural strengthening.

New Building

A four-story building with possible mechanical penthouse is proposed to be sited to the West of the Center for Performing Arts. The floor structural system could be either steel beams and columns with composite concrete slabs on metal deck, cast-in-place concrete slabs (flat slabs, pan joists or waffle slabs) and concrete columns, or precast concrete slabs (hollowcore) and steel columns/ beams depending on market conditions and span requirements. The roof structural system could be

either cast-in-place/precast concrete or steel bar joists/beams and metal roof deck. Foundations are likely to be conventional shallow spread footings with net allowable bearing capacity of 2,000-3,000 psf based on geotechnical reports for recent construction of the Clinical Sciences Building . The new building is expected to have a partial basement with cast-in-place concrete walls and foundations. All footings are recommended to be at minimum frost depth of 3'-6" below exterior grade. Actual foundation recommendation will be made by a qualified geotechnical engineer after a soil boring exploration has taken place.

Other features that may be part of the new building include a cast-in-place concrete tunnel or steel framed skyway across Maywood Avenue and large classrooms requiring long floor spans and deep structural girders.

Physical Conditions and Deferred Maintenance Data

Armstrong Hall represents just shy of 30% of Minnesota State University, Mankato's total deferred maintenance backlog. Armstrong alone currently has a backlog in excess of \$24.5m with another \$3.2m scheduled by the time the building would be demolished in 2026. The current backlog equates to an FCI of 0.46. Roofing and the HVAC systems are the major concerns. The building cannot continue to operate without these systems in a functional state. There is risk of large scale failure with delayed funding.

The Memorial Library + Addition is in much better shape at an FCI of 0.14 and 0.10 respectively, but they still have an impactful level of deferred maintenance. The renovations to the library that are part of this project are going to bring more students to the building and having up to date systems is important to the success of the project. Over \$6m is included in the renovation funding to address the current backlog. Combined with the roofing project that is currently under way, this will reduce the FCI of the Memorial Library to ~0.02 and the Addition to ~0.015. There are additional items scheduled to be in backlog by the time the project is funded that will be reevaluated at a later date.

Campus	Building Name	Bldg No	CRV(000's)	GSF	Year Built	FCI	Subsystem Name	Backlog	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Minnesota State University - Mankato	Armstrong Hall	071S0663	\$53,351	143,966	1964	0.46	a.5. Roofing - Builit-up, Membrane, Cedar	\$1,492	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,492
Minnesota State University - Mankato	Armstrong Hall	071S0663	\$53,351	143,966	1964	0.46	b.1. Building Exteriors (Hard)	\$4,746	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,746
Minnesota State University - Mankato	Armstrong Hall	071S0663	\$53,351	143,966	1964	0.46	d.2. HVAC - Controls	\$589	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$589
Minnesota State University - Mankato	Armstrong Hall	071S0663	\$53,351	143,966	1964	0.46	d.1. HVAC - Equipment	\$4,467	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,467
Minnesota State University - Mankato	Armstrong Hall	071S0663	\$53,351	143,966	1964	0.46	e.1. HVAC - Distribution	\$8,859	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$8,859
Minnesota State University - Mankato	Armstrong Hall	071S0663	\$53,351	143,966	1964	0.46	f.1. Electrical Equipment	\$1,467	\$0	\$0	\$0	\$0	\$0	\$0	\$453	\$0	\$0	\$0	\$1,921
Minnesota State University - Mankato	Armstrong Hall	071S0663	\$53,351	143,966	1964	0.46	g.1. Plumbing Fixtures	\$614	\$0	\$0	\$0	\$0	\$0	\$68	\$0	\$0	\$0	\$0	\$682
Minnesota State University - Mankato	Armstrong Hall	071S0663	\$53,351	143,966	1964	0.46	g.2. Plumbing Rough-in	\$1,985	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,985
Minnesota State University - Mankato	Armstrong Hall	071S0663	\$53,351	143,966	1964	0.46	j.1. Fire Detection Systems	\$0	\$0	\$620	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$620
Minnesota State University - Mankato	Armstrong Hall	071S0663	\$53,351	143,966	1964	0.46	k.1. Built-in Equipment	\$471	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$471
Minnesota State University - Mankato	Armstrong Hall	071S0663	\$53,351	143,966	1964	0.46	I.2. Interior Finishes	\$0	\$1,044	\$0	\$0	\$1,003	\$0	\$0	\$0	\$0	\$0	\$0	\$2,047
Minnesota State University - Mankato	Armstrong Hall	071S0663	\$53,351	143,966	1964	0.46	TOTAL BY BUILDING	\$24,691	\$1,044	\$620	\$0	\$1,003	\$0	\$68	\$453	\$0	\$0	\$0	\$27,880

Campus	Building Name	Bldg No	CRV(000's)	GSF	Year Built	FCI	Subsystem Name	Backlog	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Minnesota State University - Mankato	Memorial Library	071S0865	\$63,065	166,181	1967	0.14	b.1. Building Exteriors (Hard)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,375	\$0	\$1,375
Minnesota State University - Mankato	Memorial Library	071S0865	\$63,065	166,181	1967	0.14	d.2. HVAC - Controls	\$1,418	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,418
Minnesota State University - Mankato	Memorial Library	071S0865	\$63,065	166,181	1967	0.14	d.1. HVAC - Equipment	\$3,013	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,013
Minnesota State University - Mankato	Memorial Library	071S0865	\$63,065	166,181	1967	0.14	e.1. HVAC - Distribution	\$0	\$0	\$0	\$0	\$3,019	\$0	\$0	\$0	\$0	\$0	\$0	\$3,019
Minnesota State University - Mankato	Memorial Library	071S0865	\$63,065	166,181	1967	0.14	f.1. Electrical Equipment	\$616	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$677	\$0	\$1,293
Minnesota State University - Mankato	Memorial Library	071S0865	\$63,065	166,181	1967	0.14	g.1. Plumbing Fixtures	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$788	\$0	\$788
Minnesota State University - Mankato	Memorial Library	071S0865	\$63,065	166,181	1967	0.14	g.2. Plumbing Rough-in	\$0	\$0	\$0	\$0	\$1,719	\$0	\$0	\$0	\$0	\$0	\$0	\$1,719
Minnesota State University - Mankato	Memorial Library	071S0865	\$63,065	166,181	1967	0.14	i.1. Fire Protection Systems	\$1,010	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,010
Minnesota State University - Mankato	Memorial Library	071S0865	\$63,065	166,181	1967	0.14	j.1. Fire Detection Systems	\$716	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$716
Minnesota State University - Mankato	Memorial Library	071S0865	\$63,065	166,181	1967	0.14	k.1. Built-in Equipment	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,361	\$0	\$1,361
Minnesota State University - Mankato	Memorial Library	071S0865	\$63,065	166,181	1967	0.14	I.2. Interior Finishes	\$1,914	\$0	\$71	\$0	\$0	\$0	\$0	\$0	\$189	\$0	\$0	\$2,174
Minnesota State University - Mankato	Memorial Library	071S0865	\$63,065	166,181	1967	0.14	TOTAL BY BUILDING	\$8,687	\$0	\$71	\$0	\$4,738	\$0	\$0	\$0	\$189	\$4,201	\$0	\$17,885

Campus	Building Name	Bldg No	CRV(000's	GSF	Year Built	FCI	Subsystem Name	Backlog	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Minnesota State University - Mankato	Memorial Library Addition	071S2090	\$29,715	80,184	1992	0.10	a.5. Roofing - Builit-up, Membrane, Cedar	\$1,105	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,105
Minnesota State University - Mankato	Memorial Library Addition	071S2090	\$29,715	80,184	1992	0.10	b.1. Building Exteriors (Hard)	\$0	\$0	\$0	\$0	\$829	\$0	\$0	\$0	\$0	\$0	\$0	\$829
Minnesota State University - Mankato	Memorial Library Addition	071S2090	\$29,715	80,184	1992	0.10	c.1. Elevators	\$0	\$0	\$0	\$0	\$311	\$0	\$0	\$0	\$0	\$0	\$0	\$311
Minnesota State University - Mankato	Memorial Library Addition	071S2090	\$29,715	80,184	1992	0.10	d.2. HVAC - Controls	\$656	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$656
Minnesota State University - Mankato	Memorial Library Addition	071S2090	\$29,715	80,184	1992	0.10	d.1. HVAC - Equipment	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,106	\$0	\$1,106
Minnesota State University - Mankato	Memorial Library Addition	071S2090	\$29,715	80,184	1992	0.10	f.1. Electrical Equipment	\$0	\$0	\$0	\$0	\$1,486	\$0	\$0	\$0	\$0	\$0	\$0	\$1,486
Minnesota State University - Mankato	Memorial Library Addition	071S2090	\$29,715	80,184	1992	0.10	g.1. Plumbing Fixtures	\$0	\$0	\$0	\$0	\$372	\$0	\$0	\$0	\$0	\$0	\$0	\$372
Minnesota State University - Mankato	Memorial Library Addition	071S2090	\$29,715	80,184	1992	0.10	i.1. Fire Protection Systems	\$310	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$310
Minnesota State University - Mankato	Memorial Library Addition	071S2090	\$29,715	80,184	1992	0.10	j.1. Fire Detection Systems	\$346	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$346
Minnesota State University - Mankato	Memorial Library Addition	071S2090	\$29,715	80,184	1992	0.10	k.1. Built-in Equipment	\$0	\$0	\$0	\$0	\$656	\$0	\$0	\$0	\$0	\$0	\$0	\$656
Minnesota State University - Mankato	Memorial Library Addition	071S2090	\$29,715	80,184	1992	0.10	I.2. Interior Finishes	\$684	\$0	\$0	\$0	\$0	\$285	\$0	\$114	\$57	\$0	\$0	\$1,140
Minnesota State University - Mankato	Memorial Library Addition	071S2090	\$29,715	80,184	1992	0.10	TOTAL BY BUILDING	\$3,101	\$0	\$0	\$0	\$3,655	\$285	\$0	\$114	\$57	\$1,106	\$0	\$8,318
Armstrong Hall Solution | Minnesota State University, Mankato



SECTION 4: Sustainability / Energy

Section 4: Sustainability and Energy

The projects associated with the Armstrong Hall Solution will be in full compliance with applicable B3 criteria. B3 benchmarking and building benchmarking will be part of the project quality assurance process to ensure holistic sustainable designs.

As the GESP modernizes existing building stock, Armstrong Hall will set the new benchmark for high performing new buildings on campus.

LED Lighting Upgrades	The end result provided a more open and brighter space. Improved night-time visibility and safety
Control Upgrades (Library VFDs & Economizer Programming)	Pump Speed Reduction = Energy Savings
Boiler #4 Control Upgrades	Removed unsupported, outdated controls with latest technology
Central Boiler Plant Improvements	Improved Feedwater and Deaerator Controls
Belimo Energy Valves	Precise Control of Chilled Water to "Free-Up" Chiller Capacity
Chiller #2 VFD	Precise and clean installation, Chiller Modulation for Improved Performance

4.1 Campus B3 Benchmarking Data

There are three buildings affected by this series of projects that have differing levels of data available.

Clinical Sciences is quite new, opened in 2017, so it was designed and constructed within modern guidelines, including B3, thus benchmarking data is available (below).



Armstrong Hall and the Memorial Library are not as recently constructed. Many of their utilities are on a campus wide metering system so benchmarking data is not available. The following data regarding electricity and steam usage is what we have available specific to these buildings.

Armstrong Hall currently has an EUI of 109 kBtu/SF as shown in the tables below, presenting the most recent 12 months.

Month	Energy (KWh)	Monthly Cost	Energy Rate (\$/kWh)
January	88,520	\$6,984.2280	\$0.08
February	84,223	\$6,838.9076	\$0.08
March	84,547	\$6,408.6626	\$0.08
April	78,590	\$6,577.9830	\$0.08
May	73,287	\$5,555.1546	\$0.08
June	71,165	\$5,778.5980	\$0.08
July	78,073	\$6,495.6736	\$0.08
August	89,016	\$7,326.0168	\$0.08
September	92,837	\$7,807.5917	\$0.08
October	93,858	\$7,095.6648	\$0.08
November	76,554	\$6,369.2928	\$0.08
December	72,353	\$6,019.7696	\$0.08
Total	983,023	\$79,258	\$0.08
Total KWh/ft2	6.78	\$79,257.543	
Total KBtu/ft2	23.14		

Electricity consumption is relatively consistent across the last 12 months and trend lines do not seem to fluctuate because of external fluctuations in temperature.



Month	therms	Monthly Cost	Energy Rate (\$/therm)
January	15,105.0	\$8,223	0.54
February	13,857.8	\$4,759	0.34
March	13,498.7	\$4,635	0.34
April	12,083.4	\$4,149	0.34
May	3,774.5	\$1,296	0.34
June	7,355.1	\$2,526	0.34
July	8,235.3	\$3,380	0.41
August	9,753.1	\$4,329	0.44
September	8,400.4	\$3,729	0.44
October	8,201.5	\$3,434	0.42
November	10,239.4	\$9,433	0.92
December	14,040.8	\$9,172	0.65
Total	124,545	\$59,066	\$0.47
Total therms/ft2	0.86	\$0.4073	
Total KBtu/ft2			

Minimal Natural Gas Consumption is expected in summer time where heating is not required. Trendlines indicate significant Natural Gas Consumption in winter with an average increase in gas consumption of 30% compared to 2017.



At the current utility rates this should equate to a revised annual energy cost of approximately \$90,000 per year including the consumption from the Clinical Sciences and Library which are already operational. The new building alone would be anticipated to consume approximately \$50,000 worth of energy annually.

4.2 Compliance Plan

A dedicated Performance Design professional will be responsible for managing team B3 compliance documentation. This individual will conduct a B3 Kickoff Meeting, where all stakeholders will be in attendance. During this meeting the stakeholder team will be educated on the B3 process, documentation requirements per phase, in addition to individual discipline responsibilities. Throughout the design process B3 compliance will be a regular agenda item on team meetings, with additional meetings to be coordinated as necessary.

Challenges foreseen for compliance are linked to the redistribution of program into existing buildings; analysis will be conducted to determine if there is a need for the existing buildings to conduct building upgrades and/or modifications. The new building design will focus on optimized performance.

4.3 Energy Design Initiatives

— IECC 2018, ASHRAE 90.1-2016 (for 2020)

Current state energy code references IECC 2012 or ASHRAE 2010. In order to achieve reduction beyond code, the design team will use our net zero approach to building optimization which focuses on reducing the amount of energy the building needs to operate by using energy conservation strategies in the Programing, Envelope, Lighting HVAC and Controls design phases.

In addition to the design initiatives listed in the table below, it would be recommended that a pathway for ongoing performance assessment be established to ensure design intent is realized after building

Programming	Optimize Orientation
	Locate all regularly occupied areas along perimeter to maximize daylight access
	Locate any high internal heat gain rooms on the north façade
	Explore passive solar heat gain opportunities
Envelope	Increase Roof R-Value
	Increase Wall R-Value
	Increase Slab R-Value
	Reduce Window U-Value
	Reduce Window SHGC
	Reduce Window VLT
	Reduce Thermal Bridging
	Design for Air Tightness
	Optimize Window to Wall Ratio
Lighting	Reduce Lighting Power Density
	Provide bi-level switching
	Design for Daylighting
HVAC	Explore decoupling outdoor air load from thermal load
	Explore Energy Recovery
	Design for appropriate load matching with turndown control
	Explore innovative systems with increased energy efficiency opportunities
Controls	Demand Control for Ventilation
	HVAC Night Setback
	HVAC Static Pressure Reset
	Daylighting
	Occupancy & Vacancy Sensors
	Consider installing a monitoring based commissioning system over the Building
	Automation System
Renewables	Consider Photovoltaics for supplemental electricity
	Consider Solar Hot Water Heating opportunities

4.4 Low Cost Efficiency Measures

Sustainable concepts that will be considered include; envelope R-value optimization, data driven window to wall ratio selection, dedicated outdoor air systems, energy recovery, numerous heating and cooling delivery options, demand controlled ventilation, daylighting and receptacle load reduction. Existing buildings will be analyzed to determine whether there are opportunities to improve operation through controls strategies such as nigh setback and effective turndown or turnoff of equipment during unoccupied modes. In addition daylighting and occupancy/vacancy controls will be explored, with a focus on ensuring equipment is switched off when not needed.

4.5 Waste Management and Recycling

To minimize use of resources and negative environmental impacts through design decisions and careful reduction and management of waste generated during the construction process and building occupancy, a waste management plan will be established for this project. The plan will include:

- 1. A plan to adaptively reuse an existing structure or salvage and reuse materials from an existing structure being demolished or deconstructed onsite.
- 2. A plan to select materials with appropriate durability for service life. In many cases, statefunded buildings are intended to have a 50–100 year service life for the structure and envelope.
- 3. A plan to specify the use of prefabricated products, preassembled products, and/or modular building units to minimize construction waste onsite.
- 4. A plan that addresses both partial deconstruction (for renovations) and total deconstruction (for end-of-life removal) of the building to maximize the reuse and recycling of building components and materials. Indicate specific strategies to facilitate disassembly.
- 5. A construction waste management plan that includes the following:
 - Specification of materials to be diverted from disposal by efficient usage, recycling, reuse, manufacturer's reclamation, or salvage for future use, donation or sale.
 - Specification of the percentage of materials to be diverted; calculate by weight or volume, but not both. Include separate average percentages for those materials collected by construction and demolition materials processing facilities that end up as alternative daily cover and incineration.
- 6. An operational waste plan that includes the following:
 - Description of waste streams and discuss how waste will be minimized and diverted from disposal (recycled, composted, reverse distribution).
 - Description of the collection plan including a collection plan for consumables and durables (this can be done at a campus or organization scale).

At least 75% of nonhazardous construction and demolition waste will be diverted from landfill. The percentage of materials diverted will be calculated by either weight or volume, but not both. Calculations will include:

- 1. All materials delivered to the site and intended for installation prior to the issuance of the certificate of occupancy, including related packaging
- 2. Construction materials and waste removal during demolition or razing.

Calculations will not include land-clearing debris (including trees, rocks, and vegetation), excavated soils, and fill and base materials such as topsoil, sand, and gravel. Waste used as alternative daily cover or in waste-to-energy incineration will not be counted as diverted material.

June 2018

Armstrong Hall

COMPARATIVE DATA - ELECTRICITY Negative variances are favorable

Month	kWh 2018	kWh 2017	kWh Variance	Cost per kWh 2018	Cost per kWh 2017	Cost Variance	Peak Demand kW 2018	Peak Demand kW 2017
Jan	88,520	86,057	2.9 %	\$0.0789	\$0.0748	5.5 %	200	184
Feb	84,223	81,654	3.1 %	\$0.0812	\$0.0667	21.7 %	196	204
Mar	84,547	89,006	-5.0 %	\$0.0758	\$0.0735	3.1 %	192	204
Apr	78,590	88,700	-11.4 %	\$0.0837	\$0.0892	-6.2 %	172	200
May	73,287	91,307	-19.7 %	\$0.0758	\$0.0758	0.0 %	156	188
Jun	71,165	75,726	-6.0 %	\$0.0812	\$0.0874	-7.1 %	140	160
Jul		78,073			\$0.0832		0	160
Aug		89,016			\$0.0823		0	216
Sep		92,837			\$0.0841		0	220
Oct		93,858			\$0.0756		0	220
Nov		76,554			\$0.0832		0	192
Dec		72,353			\$0.0832		0	168
Y-T-D	480,332	512,450	-6.3 %					

COMPARATIVE DATA - STEAM

Negative variances are favorable

Month	lbs 2018	lbs 2017	lbs Variance	Cost per lbs 2018	Cost per lbs 2017	Cost Variance
Jan	1,265,077	986,522	28.2 %	\$0.0065	\$0.0050	30.0 %
Feb	1,160,619	770,692	50.6 %	\$0.0041	\$0.0056	-26.8 %
Mar	1,130,548	851,326	32.8 %	\$0.0041	\$0.0059	-30.5 %
Apr	1,012,012	593,096	70.6 %	\$0.0041	\$0.0050	-18.0 %
May	316,123	419,582	-24.7 %	\$0.0041	\$0.0041	0.0 %
Jun	616,003	474,227	29.9 %	\$0.0041	\$0.0037	10.8 %
Jul		689,724			\$0.0049	
Aug		816,840			\$0.0053	
Sep		703,552			\$0.0053	
Oct		686,892			\$0.0050	
Nov		857,573			\$0.0110	
Dec		1,175,946			\$0.0078	
Y-T-D	5,500,382	4,095,444	34.3 %			

Memorial Library

June 2018

COMPARATIVE DATA - ELECTRICITY Negative variances are favorable

Month	kWh 2018	kWh 2017	kWh Variance	Cost per kWh 2018	Cost per kWh 2017	Cost Variance	Peak Demand kW 2018	Peak Demand kW 2017
Jan	170,145	221,452	-23.2 %	\$0.0789	\$0.0748	5.5 %	312	472
Feb	161,549	216,775	-25.5 %	\$0.0812	\$0.0667	21.7 %	308	460
Mar	177,389	182,266	-2.7 %	\$0.0758	\$0.0735	3.1 %	312	368
Apr	183,453	176,618	3.9 %	\$0.0837	\$0.0892	-6.2 %	336	340
May	164,413	157,662	4.3 %	\$0.0758	\$0.0758	0.0 %	328	336
Jun	147,867	143,418	3.1 %	\$0.0812	\$0.0874	-7.1 %	292	308
Jul		140,366			\$0.0832		0	300
Aug		154,102			\$0.0823		0	316
Sep		162,430			\$0.0841		0	328
Oct		172,238			\$0.0756		0	328
Nov		161,886			\$0.0832		0	332
Dec		146,334			\$0.0832		0	328
Y-T-D	1,004,816	1,098,191	-8.5 %					

COMPARATIVE DATA - STEAM

Negative variances are favorable

Month	lbs 2018	lbs 2017	lbs Variance	Cost per lbs 2018	Cost per lbs 2017	Cost Variance
Jan	1,931,560	1,363,371	41.7 %	\$0.0065	\$0.0050	30.0 %
Feb	1,704,068	926,379	83.9 %	\$0.0041	\$0.0056	-26.8 %
Mar	1,620,768	1,120,718	44.6 %	\$0.0041	\$0.0059	-30.5 %
Apr	1,374,450	731,291	87.9 %	\$0.0041	\$0.0050	-18.0 %
May	383,513	495,302	-22.6 %	\$0.0041	\$0.0041	0.0 %
Jun	744,036	553,362	34.5 %	\$0.0041	\$0.0037	10.8 %
Jul		540,117			\$0.0049	
Aug		584,433			\$0.0053	
Sep		541,367			\$0.0053	
Oct		776,689			\$0.0050	
Nov		1,182,110			\$0.0110	
Dec		1,620,601			\$0.0078	
Y-T-D	7,758,395	5,190,423	49.5 %			

4.6 Renewable Energy

MN 16B.323: Cost/benefit analysis of solar energy system for new buildings

In order to determine the capacity needed to satisfy 2% of the future Armstrong Hall Program energy needs, the redistribution of the current 145,000 SF program into 3 buildings; new construction, use of Clinical Sciences and the Memorial Library. Assumptions were made for the predicted new construction EUI based on current energy code, energy data was available for the Clinical Sciences Building on the MNB3 Database, and utility bill data was provided by the client for the Memorial Library.

Program Location	Program Area	EUI (kBtu/SF)	Total Forecasted Energy (kBtu)
New Construction	100,000	36.00	3,600,000.00
Clinical Sciences	16,500 1 3,000	71.52	1,180,080 929,760.00
Library Wiecking + F	52,600 4 5,000 Performing Arts 3,200	50.00 55.00	2,630,000 2,250,000 176,000
Morris Hall	2,800 158,000 175,100	70.00	196,000 6,779,760 7,782,080

The anlaysis of the data indicates an estimated future annual energy expenditure of \$110, 317 for the proposed program. This results in a B3 recommended 40 MW solar photovoltaic system. Consultants have been contacted to determine the installed cost of this system, and proposals are due momentarily.

Consultant's proposal below:

Utility Data	Cost		
Electricity (\$/kWh)	\$	0.08	
Nautral Cost (\$/Therm	\$	0.47	
Blended Rate (\$/kBtu)	\$	0.01	
Assumed Annual Energy Expenditure	\$	- 47,688.82	54,739.13
Solar Capacity Needed (kWh)		39,741	45,616
Solar Capacity Needed (kW)		-40-	46
Implementation Cost - Proposal #1 (\$)	\$	208,800	
Implementation Cost - Proposal #2 (\$)	NA		
Simple Payback - Proposal #1 (Years)		4	
Simple Payback - Proposal #2 (Years)	NA		

Assuming solar installation costs of approximately \$2-4/W this size installation should payback within 4 years. Under B3 Guidelines a simple payback threshold of 15 years is deemed cost effective.

12 years is now the required payback period

MN 16B.326: Geothermal ofrsolar energy heating & cooling system plan

The new building could be served by a geothermal system with a wellfield area of approximately 1 to 2 acres. While a feasible approach for the individual building, it is likely not the best approach for the building as a component of a campus. As an institution with a central plant serving the majority of the campus heating and cooling loads, a holistic strategy enveloping new construction and future remodel/ retrofits is a better path to energy use intensity reduction and net zero energy use. A recommended approach would be to build the new building with an HVAC system appropriate for both the current central plant and a possible future central plant using warmer chilled water and cooler heating water for increased energy efficiency. This flexible approach allows for a highly efficient base design that is "future-proofed", especially when coupled with passive energy reduction strategies such as siting and shading to minimize summer solar heat gain, integration of passive solar heating, photovoltaics, and other efficiency measures.

Net Zero Considerations

In order to make a building Net Zero ready, the typical energy use per square foot would b 20 kBtu/SF which would be require the new Armstrong Hall to be 50% better than energy code. This is not pout of the realms of possibility and could be explored with the dedicated building simulation specialist on the team. The challenge for MSU Mankato specifically is that all buildings rely on a central plant; requiring a campus based approach to net zero.

This is a challenge and an opportunity; the challenge is that the central plant would need to eventually be replaces in order to achieve net zero, the opportunity is that MSU could take a campus solar approach also which would increase the areas for solar behond rooftop installations on the new Armstrong Hall. Instead solar PV could be incorporated throughout the campus where most feasible. The first step in the campus approach to net zero is to quanityf the performance of each building in isolation, determine the energy optimization potential, which has somewhat been explored under the Guaranteed Energy Savings Program and then determine the additional optimization needed to get to a campus energy use intensity of 20 kBtu/SF 'Net Zero Ready' goal.



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SECTION 5: Financial Information Capital Expenditures

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Refer to Project Workbook for updates

Section 5: Financial Information

5.1 Estimate of Capital Expenditure

Funding for the Armstrong Hall Solution at Minnesota State University, Mankato is being requested over multiple bonding cycles.

2020

The request in 2020 totals approximately \$7.0m (escalated). This request includes:

- Design fees. including state and non-state management, to advance the design for the entire project through design development.
- Design fees for construction documents for construction phases 1 and 2 (Clinical Sciences basement and the new building respectively.)
- Design fees for bidding and construction administration of the Clinical Sciences basement.
- Construction funding for the Clinical Science basement.

2022

2022 will include the largest request of the three bonding cycles. The scope included in this phase will require \$60.0m (escalated) and includes:

- Design fees for bidding and construction administration of the new building.
- Construction funding for the new building.
- Fees to advance the design of the renovation of the Memorial Library through construction documents.

2024

The funding requested in 2024 will conclude the Armstrong Hall Solution project. The request is for \$28.2m (escalated) for the following scope items:

- Design fees for bidding and construction administration of the renovation of the Memorial Library and for demolition of Armstrong Hall and associated infrastructure and landscape repair. Smaller renovations in the Performing Arts Center, Wiecking and Morris Halls are also included.
- Construction dollars for the renovation of the Memorial Library and for demolition of Armstrong Hall and associated infrastructure and landscape repair. Smaller renovations in the Performing Arts Center, Wiecking and Morris Halls are also included.

Armstrong Hall currently serves as a major thoroughfare between the student housing located on the north side of campus and the academic and student services buildings on the south, especially in the winter months. Maintaining a weather protected connection between Nelson and Morris halls is included in the demolition and landscape. This would come at an approximately price tag of \$3m.

GSF costs broken down by new construction, renovation and renewal costs are included in the Capital Budget Workbook. In summary, there is approximately:

- 100,000sf of new construction at \$325/sf
- 70,000sf of renovation/interior fit out at \$125/sf
- 5,000sf of renewal at \$50/sf

5.2 **Procurement and Delivery**

The recommended procurement and delivery method is Construction Manager as Constructor. The Construction Manager will carry a fee during the design phases but and argument can be made that this fee will save the project money in the long run through early involvement of the contractor to price and provide constructability reviews. In addition, the selection of the construction manager is a best value selection ensuring the involvement of a builder with experience in the project type.

5.3 Construction Budget Considerations

Furniture, fixtures, and Equipment (FF&E): The FF&E budget is set at 8% of the construction budget. This is to cover new furniture in the classrooms, labs and offices within this program. It will also include audio-video equipment for the academic spaces, many of which are technology rich. The major systems in the library are not intended to be impacted. They will remain in use thus are not included in this budget.

IT/technology: The technology budget is 1% of the construction budget. This is primarily phone and data cabling and equipment.

Security: Security has a separate line item in the budget of 1% of the construction budget.

Utilities: Required utilities exist in the street to either the west or south of the site and should be sufficient to handle the load of the new building. Storm sewer service will likely need to come from the Ellis Avenue side, sanitary sewer and water can likely come from either Ellis Ave or Maywood Avenue, chilled water will likely need to come from Maywood Ave.

Mechanical/Electrical: The mechanical & electrical systems for the new building are pretty typical and are covered within the construction budget.

Hazardous Materials: There are known hazardous materials in Armstrong Hall that will need to be abated prior to demolition. The hazardous materials report and estimate for this scope are included in the Appendix. Memorial Library also has known hazardous materials but at a much smaller scale. It is primarily limited to pipe fittings and flooring adhesives. The renovation of the Memorial Library and the demolition of Armstrong Hall are both in the final phase of the project. \$500,000 is being carried to cover the abatement of hazardous materials.

2/11/21 Update Comment - Response to Private Use Questionnaire

Pre-design program includes a 500 sq.ft. space for a coffee shop/kiosk type space that would be operated (if approved by current vendor) by the campus food service vendor with similar rates/costs per the campus wide food service contract of the time.

Campus rents classroom and auditorium space to outside users during off hours at a rate of \$50/day per classroom and \$350/day. This is not a common request (typically a couple times per year) and classroom rentals is not a significant income stream to the university.

T-Mobile currently rents space on the roof of the existing Armstrong Hall. We do not have any current agreements to extend this lease to the new facility but would like to keep the option open for when the appropriate time comes when Armstrong Hall is to be demolished in 2026-27. Current lease revenue is \$17,120 annually.

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SECTION 6: Financial Information Ongoing Operating Expenditures

___ Refer to Project Workbook for updates

Section 6: Ongoing Operating Expenditures

6.1 Cost of Ownership

Quantify total ownership cost of project, accounting for the estimated lifespan of building/site elements affected by the project. (95%)

6.2 Operating Budgets

Quantify the project's effects on operating budgets associated with the occupancy and operation of the project area. (95%)

Ongoing Building Repair, Replacement and Maintenance

The budget for ongoing building repair, replacement and maintenenace will be impacted by this project. In the short term it will rise as the new building comes online while Armstrong is still operational. Once renovations are complete and Armstrong is taken offline the ongoing repair budget would drop significantly in the short term while the building is new and stay lower long term due to reduced SF and more efficient energy systems. The proposed numebrs are available in the Capital Budget Workbook.

6.3 5 Year Projections

IMPACT ON CAMPUS OPERATING COSTS	Current	Projected Costs (Without Inflation)		tion)	
(in thousands; \$137,500 = \$138)	Cost	FY 2020-21	FY 2022-23	FY 2024-25	FY2026-27
Building Operating Expenses					
Utilities (electric, gas, other)	209	209	323	323	114
Maintenance (routine)	265	265	265	265	265
Repairs (planned / estimated)	288	288	288	0	200
Waste removal (standard, hazardous)	5	5	9	4	4
Annual building servicing (elevators, fire, etc)	9	9	16	7	7
Lease Expenses					
Equipment	0	0	0	0	0
Real Estate (off campus) Lease Expenses/(Savings)	0	0	0	0	0
Debt Service					
Projected Debt Service Expenses	0	0	0	0	0
Expenditure Subtotal	776	776	901	599	590
Revenue Offsets; attach explanation	0	0	0	0	0
TOTAL	776	776	901	599	590
Change from Current FY 2018-19		0	125	-302	-9
Change in F.T.E. Personnel		0	0	0	0

6.4 Staffing and Operating Costs

At the conclusion of the Armstrong Hall Solution project campus square footage will have dropped by 45,000 sf, 100,000 sf of aging facilities will have been replaced with a brand new building with new equipment and energy conscious design and aging systems in the Memorial Library will have been replaced. This will all lead to a reduction in Operations and Maintenence costs.

6.5 Debt Capacity

The current debt service projected for Minnesota State Mankato in 2019 is \$1,244,248. Added Max Debt Service due to this project is estimated to be \$1.2 in FY2026 with an average of \$1.0 million per year over the life of the bond. Some of this new debt will be offset by a reduction in operating costs with the demolition of Armstrong Hall.

		Avg added
Request	Request	Debt
Year	Amount	Payment
2020	\$7,000,000	\$79,771
2022	\$60,000,000	\$693,750
2024	\$28,200,000	\$321 <i>,</i> 363
Totals:	\$95,200,000	\$1,094,884

When looking at current debt service of \$1,244,248 through the next several years there is a debt bubble peak at FY2026 at \$2,225,255 with a fairly steep decline in the next five years to \$1,474,352 in FY2033. The campus plans to strategically use some campus reserves to support the 4 year debt bubble FY2026-2030.

When looking at current debt service of \$1,244,248 through the next several years there is a debt bubble peak at FY2026 at \$2,225,255 with a fairly steep decline in the next five years to \$1,474,352 in FY2033. The campus plans to strategically use some campus reserves to support the 4 year debt bubble FY2026-2030.

Minnesota State University, Mankato is not subject to a financial recovery plan.

Armstrong Hall Solution | Minnesota State University, Mankato



SECTION 7: Schedule

Section 7: Schedule Refer to Cover Letter and Project Workbook for updates

7.1 Graphic Schedule

The schedule on the following pages responds to the funding cycle and aligns campus intensive tasks with semester breaks.

7.2 Phasing and proposed funding sequence

Three phases of capital budget requests will be required for this project beginning in 2020 with the last request in 2024. The envisioned multi-phase construction project includes:

2020 Phase 1 request for design funds and clinical sciences.	\$ 7.0 million
2022 Phase 2 request for new buildng construction funds.	\$60.0 million
2024 Phase 3 request for renovation and demolition funds	\$28.2 million

The project schedule is in alignment with capital requests and outlined as follows:

- Nov 2018 PreDesign Complete
- Sep 2020 Design Begins

Jun 2021 Clinical Sciences fit out begins - Move in May 2022

Oct 2022 Construction start new building - Move in Dec 2023

Oct 2024 Construction start multi-phase renovation projects - Move In Dec 2025

Dec 2025 Decommission & Demolish Armstrong Hall





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SECTION 8: Technology Plan / Budget

Section 8: Technology Plan and Budget

8.1 Technology Plan and IT Infrastructure

Every classroom in the Armstrong building has an integrated technology infrastructure. This includes:

- Five technology-enhanced collaborative labs
- One highly technical Counseling Lab with six counseling spaces, each of which have recording capacity
- Eight computer lab spaces
- All other learning spaces will have integrated AV technology systems.

Although every classroom has a technology infrastructure to support teaching, the technology instruments are not integrated into the spaces as well as they could be.

8.2 Technology Applications

- The proposed project will greatly improve the integration of technology into pedagogy.
- The project will integrate technology as a critical component of the design. For example, a majority of existing technology throughout Armstrong was installed compromising sight lines, power connections, and accessibility. A new building will allow the University to create much better learning environments with designed with technology in mind, based on the higher education best practices.
- The campus currently runs into difficulties due to Armstrong's limited power infrastructure with great frequency. This is a challenge when a majority of our students need access to power for the personal technology tools they bring to class.
- The placement of networking closets is not ideal. A well thought out design would improve wireless internet distribution and coverage. The networking closets are not big enough and could be expanded to hold networking and other technology support equipment for both teaching and learning.
- New lighting systems will enable variable settings in support of technology and classroom teaching methods.

8.3 Impact of Technology Improvements

Proposed improvements will impact both initial and long-term operating costs in the following manner:

- The expansion of networking closets to include a rack for technology equipment used in teaching could dramatically reduce the cost of technology in the classroom.
- Integrating new building systems based on advanced controls, such as occupancy sensors and HVAC systems programmed to coincide with space use, could save on long-term utility costs.
- The storage requirements for paper documents would be reduced by the increased use of digital scans and electronic storage.
- Learning spaces that are easy to use with up-to-date equipment that is environmentally friendly.
- Students will have the access to power and the internet that they expect.

Creating a technology budget will usually result in compromise between those who wish to provide updated technology that the faculty expect and the students demand. Additionally, there may be budgetary constraints on our abilities to meet all needs. A great thing to remember is that while the cost of any given technological tool has historically decreased over time, the availability of more tools that are newer, faster, more efficient will continue to provide choices with very real financial impacts. The overall result is increased technology budget requests each year.