Fall 2019

Fiscal Year 2021 Budget Information

5-Year Capital Request Planning and Capital Outlay Request

Submitted by:

MICHIGAN STATE UNIVERSITY

MICHIGAN STATE
UNIVERSITY

October 31, 2019

Mr. Chris Kolb
State Budget Director
State Budget Office
State of Michigan
Lansing, Michigan 48909

Dear Mr. Kolb,

In accordance with the State Budget Office instructions, an update of Michigan State University's Five-Year Capital Plan and SFY2021 Capital Outlay request, Appendix G, is posted at the following institutional website: https://opb.msu.edu/info-insight.html. The SFY2021 Capital Outlay request has also been submitted via SIGMA as instructed by your office. The Five-Year Capital Planning document follows from your instructions and the academic direction of the university.

The STEM Teaching and Learning Facility that was authorized as part of Public Act 207 of 2018, is on schedule for completion Fall 2020. We sincerely appreciate the state's partnership with this project and look forward to its positive impact on student teaching and learning, opportunities for research, and economic development and sustainability as it relates to the use of mass timber and the transformation of a former power plant. The project reflects innovation both programmatically, and in its design and construction.

While we provide an expanded list of capital investment needs, our ***top priority*** for a funding partnership with the State is: ***Greenhouses – Renovation of Existing and Addition – Research Expansion and Learning.*** MSU is a global leader in plant sciences supporting agriculture and plant research in Michigan and across the globe. Agriculture is the second largest contributor to the Michigan economy with approximately $104 billion in revenue attributed annually to food and agriculture. This project will modernize and expand a core research and teaching resource and provide the tools necessary to address one of the major challenges of the 21st century to double food production and maintain global food security in the face of a growing population. Accomplishing these goals requires reliable, modern, and energy-efficient greenhouse facilities and services.

The university's Five-Year Capital Plan brings forward projects that support programs with strong national reputations, expanding research bases, and high enrollment demand that will advance the university and sustain its contributions to Michigan. Emphasis is placed on renovation and addition of facilities that focus on supporting current and future programmatic initiatives with an emphasis in science, technology, engineering and mathematics, including biomedical, biological and engineering sciences; computation and data sciences; water and energy. We believe that investment in these critical resources will achieve advancements in engineering and the sciences, support and facilitate innovation; interdisciplinary learning, and research collaborations, and pay dividends now and in the long term, both economically and intellectually for the citizens of Michigan and beyond.

We remain committed to Michigan businesses, students, and families, and continue to be a critical partner in advancing Michigan's economic transformation.

Sincerely,

Samuel L. Stanley Jr., M.D.
President

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Preface

The Capital Planning Framework and the Campus Land Use Master Plan guide Michigan State University's capital planning. The Capital Planning Framework integrates academic, support, human resources, fiscal, and facility infrastructure planning and informs the Campus Land Use Master Plan. This Plan provides a flexible framework for guiding the physical organization of the MSU campus, and includes overarching campus planning principles, specific system recommendations, the University Zoning Ordinance; and works in concert with other planning frameworks such as utilities and infrastructure, energy conservation, and mobility. Institutional participation in the planning process ensures consideration is given to relevant issues and that decisions reflect the fundamental mission and direction of the university.

The planning process includes near to long-term strategy development to ensure the university has the space and facility resources necessary to carry out its mission. This is accomplished within the context of continuing to identify ways to best utilize our resources of people, dollars, and space. Strategy development takes into consideration internal and external challenges and opportunities, the capacity to be flexible and nimble allowing for responsiveness to new opportunities, and the dynamic and evolving nature of higher education.

The following *Capital Planning Principles* are guided by the *Core Values* of the university: Quality, Inclusiveness, and Connectivity and the six imperatives of the *Bolder by Design* strategic framework: Enhance the Student Experience; Enrich Community, Economic, and Family Life; Expand International Reach; Increase Research Opportunities; Strengthen Stewardship; and Advance our Culture of High Performance.

Guiding Principles and Overarching Goals

- *Create an Environment that Supports Research, Innovation, and Scholarship* – MSU continues to ensure that research programs grow, providing an impetus for economic development and graduate education while creating a culture of innovation and creativity that advances the University's international competitiveness. Intention-based research is central to MSU's mission. Thus, MSU must provide state-of-the-art facilities and infrastructure that will help attract and retain top-quality faculty and researchers and provide the necessary tools to continue to be competitive now and well into the future.

- *Create an Environment that Supports Teaching, Learning and Student Success* – MSU is committed to providing world-class opportunities for success and to making those opportunities available to a broad spectrum of talented students from across Michigan and around the world. MSU provides increasingly diverse learning experiences that blend the theoretical with the practical. The educational experience is focused on preparing "T-shaped" graduates who are prepared not just for their first job, but for a lifelong career. The approach to teaching has become more interactive across all disciplines. There is active promotion and use of technology-enabled teaching/learning models as well as an initiative to provide facilities that support evolving pedagogies including student-centered and collaborative learning.
- *Create an Environment that Supports Safety, Security, and Health and Wellness* – MSU will advance its commitment to fostering a healthier, more diverse and inclusive community by developing and sustaining a campus environment that encourages and cultivates health, wellness, and resilience among its students, staff, and faculty.
- *Create an Environment that Supports Stewardship, Sustainability, and a High Performing Culture* – New construction and renovation of existing facilities are planned so a project's financial investment actively reflects the life cycle of the facility in relation to the needs of the program, while providing flexibility in the structure to accommodate potential changes over time. Emphasis is placed on strategic allocation of space to meet program objectives, inclusive design, accessibility, integration of technology, and energy conservation. Attention is given to creating places that are welcoming, inspiring, promote the exchange of ideas, and enhance the Spartan Experience.

I. Mission Statement

For more than 160 years, Michigan State University has been advancing knowledge and transforming lives through high-impact, innovative teaching, research, and outreach initiatives. Today, as it continues to help students become responsible, knowledgeable, and productive citizens, MSU is a major public research university with global reach and extraordinary impact.

We are an inclusive, academic community known for our traditionally strong academic disciplines and professional programs and our liberal arts foundation. Our cross- and interdisciplinary enterprises connect the sciences, humanities, and professions in practical, sustainable, and innovative ways to address society's rapidly changing needs.

As a public, research-intensive, land-grant university, funded in part by the State of Michigan, our mission is to advance knowledge and transform lives by:

- providing outstanding undergraduate, graduate, and professional education to promising, qualified students in order to prepare them to contribute fully to society as globally engaged citizen leaders

- conducting research of the highest caliber that seeks to answer questions and create solutions in order to expand human understanding and make a positive difference, both locally and globally
- advancing outreach, engagement, and economic development activities that are innovative, research-driven, and lead to a better quality of life for individuals and communities, at home and around the world.[1]

Since the mid-1960's, MSU has been recognized as a top academic institution and is a member of the prestigious Association of American Universities, consisting of a group of elite research universities in the United States and Canada. MSU is one of only 20 public land-grant universities with membership in the Association of American Universities. MSU's success is further evidenced by its consistent inclusion among the top 100 universities in the world and in its acclaimed programs with 28 featured in the top 25 nationally, including nine rated number one.

In 2005, at the launch of our 150th Anniversary, we made a commitment to be recognized worldwide as the leading land-grant research university in the nation. This commitment was framed in our Boldness by Design strategy. Beginning in 2012, we refined and expanded this framework to refresh our strategic vision, now articulated as Bolder by Design. At the heart of Bolder by Design are the original five imperatives of Boldness by Design, plus a sixth one that reflects the urgency and acceleration demanded by today's higher education environment to maintain a culture of high performance. This sixth imperative applies to every area of our mission providing high-impact, high-value results, experiences, and services. Together, we will focus and excel in:

- Enhancing the student experience
- Enriching community, economic, and family life
- Expanding international reach
- Increasing research opportunities
- Strengthening stewardship
- Advancing our culture of high performance

In addition, we continuously re-affirm our commitment to the land-grant movement through: **access** to a quality post-secondary education; **inclusion,** not only of diverse populations, but of practical, applied knowledge with the classics throughout the curriculum; and **connectivity** with society to disseminate knowledge widely to meet the needs of individuals, communities and the world at large.

We continue to make great progress despite pressing constraints. MSU's design was never just about survival but rather resilience, and we have achieved it, sparking innovation in every area of our enterprise during a time when many individuals, communities, and organizations have been held at a standstill. Whether through job-creating innovations and life-saving research or world-class education and talent development, MSU's full impact is often immeasurable, but can be quantified in one sense with an annual economic impact of more than $5.8 billion. Additionally, in 2016, MSU's Translational Research and Commercialization Program was designated as an

[1] See http://president.msu.edu/advancing-msu/msu-mission-statement.html

"innovation hub," the first university in the state to receive such a designation. This designation is recognition of the years of successful work in the areas of technology transfer, start-up support, and a portfolio of dedicated business and community partnerships.

MSU continues to ensure that research programs grow, providing an impetus for economic development while creating a culture of innovation and creativity that maintains the University's international competitiveness. MSU is a leader in creating knowledge for the 21st century, routinely receiving in excess of $600 million in sponsored awards annually, focused in areas such as food systems; plant sciences; health sciences; computational sciences emphasizing biology and food/food-chain; and population and the environment, including food, water, and energy. To enhance these efforts and maintain its position as a world-class research university, in 2014 MSU committed to hiring approximately 100 additional faculty members over the five-year period of 2015-2020, with 87 hired to date. These faculty are being hired in some of the highest demand disciplines and research areas to help accelerate finding solutions to the world's "Grand Challenges" in areas including: computation (aka "Big Data"), advanced engineering, cybersecurity, genomics, plant sciences, antibiotic resistance, and precision medicine.

Our value proposition is to make high-quality education accessible to qualified students, ensuring access and investing in Michigan's future. This fall, MSU enrolled 31,698 in-state resident undergraduate students. Approximately 1 out of every 6 enrolled undergraduate students in Michigan enrolls at MSU, the largest number of any Michigan public university. At the same time, MSU draws students from all over the state, country and world. This year, MSU enrolled individuals from all 83 counties in Michigan, all 50 states in the United States, and more than 130 countries. In an ongoing effort to uphold its commitment to access, MSU has established strong and substantial financial aid programs to assure student access to high-quality MSU programs. MSU routinely enrolls in excess of 8,500 Pell Grant recipients, representing 22 percent of the undergraduate population, while at the same time keeping both the average debt amount and the proportion of students graduating with debt below state and national averages. MSU administers in excess of $700 million in financial aid annually, with more than 65 percent of freshmen receiving some form of aid. Budgetary increases to financial aid routinely outpace increases to tuition as MSU carefully monitors family income distribution, financial aid distribution, debt measures, and other financial aid metrics.

MSU is committed to creating a national model for student success with particular emphasis on closing the opportunity gaps for lower-income, first-generation, and underrepresented minority student populations.

Additionally, we remain focused on helping students reduce the time to and cost of their degree. The Go Green Go 15 initiative is one way we are tackling these challenges, seeking to create higher rates of credit momentum (i.e., enrolling in 15 credits per semester) among our students that strongly correlates to higher levels of student academic success. The percent of first-semester students attempting 15 or more credits increased from 28% to 50% since the launch of the campaign. This initiative is simply

the latest in a comprehensive set of projects under the university's Student Success Collaborative focused on delivering high quality educational experiences for all students. To reinforce the momentum of our programs and our students' success, the university implemented it's first-ever two-year budget for academic years 2018-19 and 2019-20. This two-year budget included a tuition freeze for all resident undergraduates for the 2019-20 academic year. MSU has also adopted a flat-rate tuition structure beginning with the 2019-20 academic year, a structure that will incentivize students to complete their degrees in four years and, thereby, keeping expenses as low as possible.

MSU provides diverse learning experiences that blend the theoretical with the practical, combines curricular and co-curricular experiences, and instills an entrepreneurial mindset in its students. Student learning experiences include study abroad, hands-on research engagement, service learning, internships, co-ops, field placement, student teaching, and clinical placement during their degree program. All complement a variety of classroom experiences to provide rich learning opportunities. The entrepreneurial ethos fits hand-in-glove with our progressive pedagogy and approach to developing "citizen scholars" and what we and our partners at IBM call "T-shaped" scholars: students who are prepared for real-world careers demanding both technical and disciplinary expertise along with connective soft skills. Curricular and co-curricular experiences aim to help students develop both deep knowledge within a specific content area as well as a broad set of skills across content areas focused on critical thinking, analytical reasoning, and communication.

To ensure MSU remains at the forefront of innovation, we launched the Hub for Innovation in Learning and Technology (The Hub) in 2015 to create and accelerate new ways to collaborate, learn, research, and deliver instruction. Ongoing projects include launching a cohort-based, interdisciplinary learning experience for first year students, linking math, arts and humanities, social science, and biological courses in a themed sequence to create a common intellectual experience for students; development of quantitative literacy courses; moving to a proactive student advising environment; and the launch of a Learning Analytics Group to use quantitative and qualitative methods to examine MSU's policies, practices and norms that may undermine student success. Additionally, MSU continues to enhance its offerings to students interested in entrepreneurship. In 2019, MSU launched the Burgess Institute for Entrepreneurship & Innovation, a more streamlined and holistic resource for students to provide them with tools through training, coursework, experiential programs and direct mentorship and coaching. MSU's position as an entrepreneurship and innovation hub earned global accolades by the 2018 Global Consortium of Entrepreneurship Centers, earning its prize for Outstanding Contributions to Venture Creation, surpassing nationally recognized entrepreneurship centers.

Our collective efforts aimed to enhancing the student experience has resulted in MSU's graduation rate exceeding the *U.S. News and World Report* predicted graduation rate by 7.7 percentage points. Additionally, more than 90% of MSU graduates are employed or continuing their education within nine months of graduation, approximately 10 percent above the national average. Further, MSU's efforts have been recognized nationally. MSU is ranked 59th by Money Magazine based upon the combination of educational

quality, affordability, and alumni success, placing us 7th among Big Ten Universities and ahead of such institutions as Cornell, Columbia, Dartmouth, and Georgetown.

MSU fulfills the mission of the Morrill Act in the 21st century by taking the best of Michigan to the world and bringing the best of the world to Michigan. Thinking globally has always been a priority at MSU. MSU is recognized as a top 100 global university, helping MSU recruit top students and faculty from around the world, generate revenue and funding from international and internationally focused donors, and position MSU as a leader on the world stage. MSU ranks eighth in the nation for study abroad participation and ranks eighteenth in the country for international student enrollment. MSU's international student population contributes more than $310 million to the Greater Lansing economy. More than 1,400 faculty members are involved in international research, teaching, and service projects and programs, and MSU maintains partnerships with more than 325 international institutions in 80 countries. We continue to expand our reach around the globe through:

- The Alliance for African Partnership is developing a collaborative and cross-disciplinary platform for addressing today's global challenges. The Alliance is developing new models of engagement for shared research while enhancing the resources and capacities of African universities, institutions, and scholars. Formally launched in May 2016, this alliance builds off MSU's longstanding work in Africa and will serve as a model for Africa-led partnerships, cross-disciplinary research, and applying science and the humanities to development challenges.
- The Asia Hub is a platform to convene the wide range of MSU faculty, students, and administrators with interests in Asia through its initiatives in research, education, student recruitment, capacity building, and alumni engagement. The Asia Hub has two initial geographic partnership models focused on the South Asia Partnership and the Food-Energy-Water Nexus, the latter supported by a realigned and newly staffed Office of China Programs.
- The Global Youth Advancement Network (GYAN) is a coordinating platform for research and engagement activities related to the education, mentorship, and leadership training of young people around the world. GYAN's three core objectives are convening youth around the world for thought leadership, capacitating youth-serving institutions and content/knowledge development through action-oriented research. GYAN connects faculty at MSU with faculty in partner countries to engage in collaborative research and program development related to youth employment and entrepreneurship.
- MSU plays a leading role in the federal government's Feed the Future initiative to help fight global hunger and poverty and create sustainable and safe agricultural opportunities in developing countries. A few examples of MSU's work in this area include a $10 million grant from the U.S. Agency for International Development (USAID) to lead the Feed the Future Innovation Lab for Food Security Policy. This is a partnership with the International Food Policy Research Institute in Washington, D.C. and South Africa's University of Pretoria; a $16.3 million federal grant from the Borlaug Higher Education Agricultural Research and Development program to train a new generation of agricultural scientists in

developing countries; and a $13.6 million research and capacity building program funded by USAID grant that focuses on grain legumes.

- In 2019, the Peace Corps announced that MSU ranked No. 25 among large schools for the agency's Top Volunteer-Producing Colleges and Universities list. There are 36 Spartans currently volunteering worldwide. Peace Corps volunteers make an impact in communities around the world and return to the United States with new, highly sought-after skills and an enterprising spirit that leverages their education and strengthens their communities.

Michigan State University is committed to providing world-class opportunities for success and to making those opportunities available to a broad spectrum of talented students from across Michigan and around the world. The institution manages its resources effectively to ensure it continues to provide an education that allows graduates to take on leadership roles in the 21st century and be a successful "citizen scholar."

II. Instructional Program and Structural Needs

As one of 62 members of the prestigious Association of American Universities in the U.S. and Canada, a Carnegie Research University (highest research activity) institution, and Michigan's land-grant university, Michigan State is dedicated to reflecting its mission in its instructional offerings.

The continuing high quality of MSU's educational offerings has led to a steady increase in demand from students in Michigan and around the world. Indicators of this increased demand include:

- MSU received more than 44,000 first time undergraduate applications this year. Total enrollment for fall 2019 is 49,809.
- Median high school grade point average (GPA) of entering students is 3.76 and reflects a steady increase over the past ten years.
- MSU welcomed its largest entering class in history, for a total 8,570 undergraduate students, including 2,067 students of color and 656 international students. Total graduate enrollment, including graduate professional students, is 10,633, of which 1,828 are new graduate masters and PhD students and 597 are new graduate-professional students.
- MSU continues to have an outstanding record of students earning prestigious national and international scholarships. MSU has produced 19 Rhodes Scholars, 46 Goldwater Scholars, 18 Churchill Scholars, 16 Marshall Scholars, 16 Truman Scholars, 12 Udall Scholars, 7 Hollings Scholars, 4 Gates Scholars, 4 Mitchell Scholars, and 9 Presidential Fellows.

Michigan State offers more than 200 programs of study, many of them nationally ranked, to meet the needs of Michigan citizens and students from across the country and around the world. MSU's undergraduate Supply Chain Management Program ranks #1 and the Broad College of Business is ranked 12th among public universities for undergraduate

business programs according to *U.S. News & World Report*. Five MSU graduate programs: elementary education, secondary education, rehabilitation counseling, curriculum and instruction, and supply chain/logistics are ranked #1 nationally by *U.S. News & World Report*. In addition, *U.S News* mentions MSU as home to one of the nation's only environmental journalism organizations, a solar car racing team and a student-run organic farm.

To ensure MSU remains a best value for students and other stakeholders, the university monitors its standing against relevant regional, national, and international peers. Areas of importance include academic quality, efficiency and value, affordability and access, and economic impact. To remain competitive, MSU must be an effective steward of its resources. As an operational baseline, in addition to targeted reductions, MSU imposes a one percent funding reduction annually on all units to encourage operating efficiency and create resources to invest in new initiatives. With resources focused on mission-centric areas of the institution, MSU continues to preserve its academic rigor with a competitive student-faculty ratio (16:1) that is consistent with the Big Ten public universities' average. Major initiatives supported through strategic investments include restructuring the student services model, including the implementation of student success-focused campus neighborhoods, and a five-year re-design of the university's biology curriculum, which impacts thousands of students yearly. Further investments include: expansion of our medical colleges' programs, including developing deeper ties in Flint, Grand Rapids, and metro Detroit along with East Lansing-based programs; creation of two new academic departments – the Department of African American and African Studies, and the Department of Orthopedics; and opening two new institutes - Institute for Quantitative Health Science and Engineering and the Plant Resilience Institute.

As we maintain and enhance the academic quality of our program offerings, we must also be vigilant about the quality, flexibility, and expansion needed for our academic and instructional space. Intention-based research is central to MSU's mission and to building a mid-Michigan "talent center" as is providing learning opportunities that take place in and outside of the classroom and employ progressive pedagogy. MSU must provide state-of-the-art facilities and infrastructure that will help attract and retain top-quality students, faculty, and researchers. This is vital to remaining competitive in key fields, both nationally and internationally. Through entrepreneurship and a systems approach, MSU research moves rapidly from classrooms and laboratories to create new products, new industries, and new jobs. Examples of facilities that are attracting researchers and professionals include:

- The new Interdisciplinary Science and Technology Building opened in September of 2019. Construction began on the project in August 2017. This $100 million, 170,000 square-foot facility is crucial to attracting top researchers and in landing multidisciplinary grants from the National Science Foundation and the National Institutes of Health. The building's six stories include wet bench laboratories, computational research space, offices, core and collaborative space, including areas for shared equipment. Its location, adjacent to the Bio Engineering and Life Science buildings and other core research facilities on campus, will allow the

new facility to play an integral role in MSU's development of a neighborhood of scientific research in the biomedical and biological sciences.

- In April 2019, construction began on renovations to approximately 24,000 square feet of space at Wonders Hall. The renovations will provide undergraduate instructional space that supports teaching and learning experiences both in and out of class. The "Toolbox" for the College of Engineering Residential Experience (CoRE) will include spaces where ideas can be generated and fabricated in a hands-on approach to learning. The renovations will also provide opportunities for experimental teaching and learning as curriculum and pedagogy continue to evolve.
- In August of 2018, MSU broke ground on a new STEM Teaching and Learning Facility. The facility will include modern teaching laboratories that incorporate active learning principles and foster cross-disciplinary teaching and learning, as well as support developing and evolving changes in related curriculum and its delivery. The project is part of the Strategic Academic Development Initiative – a framework to continue investments supporting student success, aligning with state and national priorities to graduate more students in STEM-related fields. The facility is funded in part through the state capital outlay appropriation, which awarded $29.9 million for construction costs.
- In conjunction with the STEM Teaching and Learning Facility, MSU also commenced the renovation of the former Shaw Lane Power Plant. The power plant will serve as the central core of the complex bookended by the STEM facility on its north and south facades. The renovations will return a building to active use and functionally provide a shared commons area with the STEM facility. It will also include a student help center for multiple disciplines, student studio space for self-guided and hands-on learning, as well as a new home for MSU's HUB for Innovation in Learning and Technology. The former Shaw Lane Power Plant also includes an addition that will house two large format learning spaces that will support curriculum revision, emerging teaching and learning methods, and improve the overall university learning environment.
- Demonstrating the breadth of programs and people at Michigan State are two significant facilities projects in our professional programs. The Minskoff Pavilion, named after alumnus Edward J. Minskoff, opened this fall at the Broad College of Business. The $62 million Business Pavilion covers 100,000 square feet and will house undergraduate and graduate programs. The Pavilion is designed around spaces dedicated to collaboration, teamwork, and state-of-the-art technology that reflect changes in curriculum and pedagogy. In 2018 we broke ground on a 37,000-square-foot Music Pavilion that will increase the total facility space by more than 40 percent. The last major addition to the Music Building was in 1956. This new Pavilion, expected to be complete by the Fall of 2020, coupled with renovations to Cook Recital Hall and Fairchild Theatre on campus, is the next logical step in creating high-quality teaching, practice, rehearsal, and research spaces that meet the needs of 21st century musicians.

- Michigan State University will broaden its research and education partnership with McLaren Health Care, as the medical provider looks to build a new hospital near the university's campus. McLaren announced that it will combine two of its Lansing hospitals into a new $450 million facility that will be located on land purchased from the MSU Foundation in the University Corporate Research Park. This new facility will help MSU recruit top physicians and researchers to the region by providing access to tools and data that will build a healthier society and develop new life-saving therapies and treatments.
- Michigan State University in collaboration with Science Gallery International launched Science Gallery Lab Detroit in fall 2017. As part of the Global Science Gallery Network, this new location, the first in North America, hopes to inspire and ignite a passion for science, technology, engineering, art and math in Detroit's young adults. The goal is to reach youth ages 15-25 who are making important decisions about college and careers and show them what interesting and creative ideas emerge when different disciplines collaborate. Science Gallery works with scientists, researchers, artists and designers to develop unique and innovative ways to tackle some of the world's largest problems, something MSU has been doing for more than a century. In addition to inspiring youth to pursue careers in science and the arts, it will be used by MSU researchers and students. All Science Gallery Lab programs, exhibitions and events are free and open to the public. Over 30,000 people have attended exhibitions in its first two years of operation.
- This fall, WKAR Public Media, Michigan State University and the College of Communication Arts and Sciences opened the NextGen Media Innovation Lab. In 2018, WKAR was the first public broadcasting station in the U.S. to be granted an experimental license by the FCC to broadcast in ATSC 3.0 technology, or NextGen TV. To develop the new technology, the NextGen Media Innovation Lab was constructed inside WKAR studios, located at MSU's College of Communication Arts and Sciences. The innovative space will serve as a collaborative hub for students, faculty, and researchers to explore the future of television and other applications, combining the capabilities of broadcast technology and high-speed internet. NextGen TV offers broadcasters a way to distribute highly customized, accessible and interactive content over the airways.
- The MSU Detroit Partnership for Food, Learning and Innovation construction began summer 2019 with anticipated completion in early 2020, at the site of the former Houghton Elementary School in the Riverdale neighborhood. Urban-focused research areas envisioned for the center include soil sampling and pollution cleanup, pest and crop disease management, forestry, innovative growing systems and community food systems development. The center will enhance efforts to open opportunities for urban agriculture entrepreneurship and offer new partnerships for community and youth development. Although this is the university's first urban-based center focused on food research, MSU Extension offers educational opportunities at 13 other AgBioResearch centers throughout the state as well as at numerous locations in every Michigan county. The new center will host the fourth MSU Extension office in Detroit.

- The University has identified a need for additional Biological Safety Level-3 (BSL-3) research laboratory capacity. Harmful pathogens have emerged in recent years that affect both animals and humans and are a cause for concern for the health of the nation and world. To support the current growth of research in this area, additional BSL-3 capacity will be created by leveraging the utilization of existing space through renovation and Campus Animal Resource operations. Construction began in Fall of 2019 with anticipated completion summer of 2020.

- In 2019, MSU announced moving forward with the next phase of its Grand Rapids Research and Innovation Park. A ground lease was signed for continued development of the MSU's Grand Rapids Research Center site. This includes construction for a medical innovation building and parking structure. The new building will focus on driving innovation through public-private partnerships by encouraging relationships across tenants, and as a result, bring new discoveries to market. Anticipated outcomes of the collaboration include research, testing and commercialization of new therapies and devices. A donor gift will fund the establishment of a radiopharmacy that will serve as the foundation for a new Molecular Imaging and Translational Theranostics program. This program will provide groundbreaking, world-class research leading to transformative health care related to oncology, neuroscience, and mental health.

MSU is among a group of 53 universities Times Higher Education calls "international powerhouses" — institutions with exceptional research output that have the best chance of catching up with or overtaking the world's best universities. MSU's faculty bring in significant new grants for far-reaching projects. Most have substantial implications for lab space, equipment, and facilities. Examples include:

- In 2009, MSU's National Superconducting Laboratory was awarded the Department of Energy federal science project in nuclear research titled: Facility for Rare Isotope Beams (FRIB). FRIB will be a new U.S. Department of Energy Office of Science national user facility for nuclear science research. The centerpiece of the new user facility will be a superconducting linear accelerator that will increase dramatically the reach of rare isotope research in the United States. The accelerator will produce isotopes that normally exist only in the most extreme environments in the universe and will expand the usefulness of isotopes in a broad range of applications from modeling stars to understanding the workings of nanoscale electronic devices.

  FRIB is a critical project for American science and the State. It not only will keep MSU on the cutting edge of nuclear science but will also ensure the training of the nuclear scientists of tomorrow while bolstering the economies of mid-Michigan and the entire State. FRIB will cost $730 million to design and build. In FY14, the State made a commitment to bond and service the community cost share of $94.5 million. Construction began in 2014 and will be completed by 2022, with current forecasts anticipating early completion in 2021. It is projected to create hundreds of jobs in mid-Michigan while bringing in more than $1 billion of economic activity to Michigan in the next 10 years. MSU looks forward to

continuing its partnership with the State of Michigan to assure the successful completion of this project.

- MSU AgBioResearch encompasses the work of more than 330 scientists in seven colleges with grants more than $82 million. These researchers, in on-campus laboratories and at 13 outlying research centers across the state, investigate topics that range from agricultural production, alternative energy and biofuel production, food safety and environmental stewardship to childhood obesity, community development, and the quality of life of Michigan youth and families.
- MSU is a lead contributor to the research and development of autonomous vehicles through a project known as CANVAS (Connected and Autonomous Networked Vehicles for Active Safety). Scientists are focusing their energy on several key areas, including traditional radars, laser radars (lidars), computer software, and development of artificial intelligence algorithms that allow an autonomous vehicle to maneuver in its environment. By utilizing the entire canvas of sensing, networking, machine- and deep-learning, communication, security, privacy, mobility and transportation services, traffic modeling and infrastructure planning, CANVAS can create a clear picture of the interwoven systems affecting vehicles, their passengers, and the entire transportation system.
- MSU's recently established Plant Resilience Institute will work to meet the challenge of needing to double agricultural production by 2050 to feed the world's growing population. The institute will conduct fundamental research to identify mechanisms that contribute to plant resilience and impact plant productivity. Research will include understanding how plants cope with environmental conditions associated with climate change.
- MSU, along with the University of Michigan and Wayne State University, is receiving $9 million through 2021, as part of a new statewide center dedicated to understanding the treatment of Alzheimer's disease and related dementia, with funding coming from the U.S. National Institutes of Health.
- MSU and the University of Wisconsin-Madison continue to partner in the Great Lakes Bioenergy Research Center. The GLBRC was established in 2007 and in 2017 was awarded an additional 5 years of Department of Energy funding to develop sustainable alternatives to transportation fuels and products currently derived from petroleum. Since its inception, the GLBRC has received roughly $267 million in DOE funding.
- In 2018, MSU became the home of the new Feed the Future Legume Systems Research Innovation Lab, uniting researchers from universities around the United States with international collaborators to improve nutrition, sustainability and economic opportunities for legume farmers, especially women and youth, across the globe. Funded through a $13.6 million award from the U.S. Agency for International Development, or USAID, the new lab will focus on profitable and environmentally sustainable systems for edible legumes, such as common beans, cowpeas (including black-eyed peas) and pigeon peas while investigating crop production systems that fortify soil fertility.

- In 2019, the Michigan State University Food Security Group (FSG), based in the MSU Department of Agricultural, Food and Resource Economics, has received an $11 million grant from the U.S. Agency for International Development (USAID) to implement a new Feed the Future Innovation Lab for Food Security Policy Research, Capacity and Influence. With additional funding from USAID offices in Africa, Asia and Latin America, the total value of this five-year award could reach $38 million. The new lab builds on previous work done by FSG, but takes a big step forward in working with local agricultural policy research organizations to strengthen their ability to carry out rigorous research on food security policy, and incorporate this research into policymaking.

- In September 2019, Michigan State University plant scientists were awarded a four-year $2.6 million National Science Foundation grant to study tuber evolution. The study labs will use cutting-edge genomics tools to unearth the mechanisms of tuber development. The grant will support undergraduate researchers as well as outreach activities at MSU's 4-H Children's Garden.

- Michigan State University was awarded a four-year, $2.5 million grant in 2019 from The Andrew W. Mellon Foundation to support further development in the research and teaching of less commonly taught languages (LCTLs), with an emphasis on Indigenous languages. The multi-university initiative seeks to transform the way LCTLs are taught by leveraging cutting-edge research and advances in instructional technology with the aim of creating sustainable and effective models of instruction.

- An MSU researcher, who is part of the Global Impact Initiative, was awarded a five-year $5 million NIH grant in 2019 to investigate the role pesticides might play in olfactory impairment and their relevance to diseases such as Alzheimer's and Parkinson's. This research will aid in the ultimate goal of understanding the early stages of neurodegenerative diseases and factors involved.

Our continued success in meeting our value proposition of high-quality programs with access to qualified students demands that we continue to provide high quality, collaborative, flexible, technology enabled and expanded academic and instructional spaces. These teaching and learning environments need to support emerging pedagogies including those that support development of the "T-shaped" scholar, curriculum revisions, student-centered, collaborative learning, and self-guided learning. The learning environments coupled with the changing pedagogies and curriculums provide opportunities for research on and leadership in instructional methods and foster innovation through a technology-rich environment.

The approach to teaching has become more interactive across all disciplines, and the use of instructional technology has changed significantly what faculty and students accomplish in classrooms, teaching labs, and informal learning environments. All areas of research, instruction, and outreach incorporate technology and the underlying infrastructure that makes them possible. There is active promotion and use of technology-enabled teaching/learning models for on-campus and off-campus students,

as well as an initiative to provide facilities that support evolving pedagogies including student-centered, collaborative and self-guided learning. Over 100 university classrooms have been renovated to support active learning principles and emerging technology that are necessary to facilitate the exchange of ideas and collaborative interactions that are essential to engaged learning and facilitating student success. Quality support services, such as libraries, technology integration, specialized labs, field stations, clinics, informal learning areas, and state-of-the-art equipment also need to be sustained at a level commensurate with support of nationally competitive research and scholarship efforts that are consistent with instructional goals. The convergence of these factors calls for increased investment in the facilities and equipment that support these developments. It also calls for the creation of new learning environments that support the significant increase in STEM student credit hours and our commitment to educate, train, and graduate more students in STEM, as well as provide more opportunities for informal and self-guided learning. The STEM Teaching and Learning Facility that broke ground in August 2018 begins, in a more significant way, to address this need.

As a result of these many factors, MSU has examined the capital assets necessary to support academic programs and identified needs that involve renovation, additions, new construction, comprehensive renewal, reprogramming of selected facilities, and renewal of major subsystems in other facilities.

The institution's assessment of existing facilities shows that the infrastructure components of many campus buildings have aged significantly. Despite ongoing maintenance and repair, which in most cases has extended the expected usable life of components well beyond the industry standard, many buildings are now at a point where they require significant investment or may need to be replaced.[2]

The demands placed upon building systems by updated building codes and more sophisticated programs, many of which are equipment and ventilation-intensive, have resulted in facilities that act as a barrier rather than a support to program success. For example, higher environmental protection and safety standards place pressure on day-to-day maintenance and in some cases exceed the capacity of particular systems.

The proliferation and advancements in technology across disciplines requires updating of data resources and distribution systems. The configuration of older building spaces limits the efficient use of the areas available to programs and can hinder collaboration and interactions, which is increasingly important in today's learning, research, and work environments. Increasingly complicated and environmentally sensitive equipment places higher demands on power for operating and climate control for proper functioning.

In summary, renovation and additions are necessary to provide capacity, improve quality, and align infrastructure and programmatic needs for both instruction and research. This is especially true when current facilities are either too costly to renovate compared to the benefits realized and/or inadequate in the amount of space provided.

[2] See Appendix C: Map of Campus Buildings by Age.

The needs for existing facilities include repairing and replacing internal building systems, such as electrical, plumbing, mechanical, and structural renewal; reworking interiors to increase the utilization and functionality of the space; and attending to the building envelope in order to maintain the integrity of the building. In some cases, the improvements are needed for only selected aspects of a facility; in others, total renovation and/or replacement of the building is warranted.

Following a very detailed and carefully conceived master planning process, it was estimated that the University would need a 10 percent increase in building space over the next 20 years. The growth in space is driven by a planned increase in the number of faculty and increase in funded scientific research, new academic programs, increased enrollments, selective and qualitative changes in academic teaching programs, the enhancement of common facilities that enrich campus life and the sense of community, and the consolidation and upgrading of operational support facilities.

III. Staffing and Enrollment

For 2019, fall enrollment at Michigan State University totaled 49,809. These numbers represent careful and deliberate enrollment management in an effort to maintain academic quality and to continue to provide the optimal classroom and laboratory environments for all students. 72% percent of the overall students at MSU are Michigan residents, representing every county in the state; 78% percent of the undergraduate students are Michigan residents. Over the last five years the entering class high school grade point average has steadily improved.

A summary of enrollments for fall 2019 by college and level can be found in Appendix D. Based on Michigan demographic data, enrollment management practices at the University, and current faculty/staff and physical infrastructure resources, enrollment patterns over the next five years are projected to remain stable.

While the University currently offers bachelor's or bachelor's completion programs and master's programs off campus and the Virtual University continues to increase access to programs through web-supported and entirely web-based courses, it is important to note that the vast majority of students utilize the facilities of MSU's East Lansing campus to complete their degree programs. The University will continue to expand opportunities to offer instruction that complements more traditional academic programs, but it is expected that the majority of enrolled students will continue to utilize the main campus.

The full-time equivalent faculty and academic staff count for fall 2019 is approximately 5,300. Of that total, a significant percentage is engaged in instruction, with the rest distributed across research, public service, academic and student support services, and other institutional support areas. To enhance these efforts and maintain its position as a world-class research university, in 2014 MSU committed to hiring approximately 100 additional faculty members over the five-year period of 2015-2020, with 87 hired to date.

The current average class size for lower division undergraduate classes is approximately 47 students. The average class size is approximately 34 for upper

division undergraduate classes and 15 for graduate classes. The most recent calculation of the student/faculty ratio is 16:1, which is consistent with the Big 10 public average.

IV. Facilities Assessment

In addition to seeking and retaining high-quality faculty, staff, and students, MSU recognizes that its physical infrastructure requires ongoing evaluation, maintenance, and renovation in a manner that is consistent with the high quality of its personnel and programs. As one of MSU's most important assets, the built environment supports the institution's academic mission of teaching, research, and outreach, creates a sense of place for the campus and surrounding communities, and facilitates the successful performance of students, faculty, and staff. Perceptions of the built environment are a significant component in the overall campus experience.

- The physical infrastructure of Michigan State University broadly encompasses buildings; the utility generation and distribution system; the campus grounds, including the natural and built landscape, sidewalks, roadways, and paved parking; and the electronic network and security systems.

  To better understand and plan for the campus capital infrastructure, a Geographic Information System (GIS) is utilized. This spatial and tabular database tool brings together, in a logical framework, data that record a description of the capital infrastructure. The GIS continues to evolve and increase in sophistication. At present, data such as condition, use, special planning characteristics, and other related information support ongoing assessment, cross-unit planning, and more effective allocation of limited dollars to institutional priorities.

- The campus grounds, including the natural and built landscape, are a principal aspect of the campus infrastructure. The main East Lansing campus approximates 5,200 acres, or eight and a half square miles. The developed campus approximates 2,000 acres, and the experimental research farm area approximates 2,700 acres with the remaining supporting auxiliary activities.

  Yet, despite this rich land area, the master planning process recognizes that land resources are finite and should be conserved for future generations. As a result, the Campus Land Use Master Plan adopted an approach of compact campus development. While allowing for some horizontal expansion across the campus, this approach protects the capacity and contiguity of the farm areas and uses a strategy of carefully conceived "infill" on the developed campus.

- The developed campus is recognized as one of the nation's most beautiful campuses. This is particularly true of the North Campus "Circle Area" where the University first developed. The open space quality of this area, the Red Cedar River corridor, and the Sanford and Baker woodlots is very highly regarded and reinforces the social and intellectual vitality of the campus. Currently, the campus arboretum has over 950 different taxa, represented by more than 20,100 individual trees, and innumerable shrubs and vines, which serve as a vast collection for research, teaching, and demonstration, as well as to provide landscape value.

The developed landscape has an estimated replacement value exceeding $372 million.

- There is also an extensive transportation system of approximately 82 lane miles of university-owned roadways with a replacement value of $42.9 million.

  Currently, the condition of the roads is estimated to be 1 percent poor; 18 percent fair; 23 percent good; and 58 percent excellent. A significant emphasis is put on improving safety for vehicles, pedestrians, bicyclists, and other motorized transport as streets are rebuilt.

- The University owns eight bridges on campus; three are for pedestrians only, three are for both vehicles and pedestrians, and two are for trains. The bridges have a replacement value of $20.5 million. One bridge is in fair condition, four are in good condition, and three are in excellent condition.

- By MSU Board of Trustees policy, the parking system of approximately 27,000 spaces for students, faculty, staff, and visitors is self-supporting and has a replacement value of approximately $280 million: $133 million for seven parking structures and $147 million for surface parking. One parking structure is in poor-to-fair condition, two are in good condition, and four are in excellent condition. The condition of the approximately 21,200 surface parking spaces breaks down to 5 percent in poor condition, 27 percent fair condition, 28 percent good condition and 40 percent excellent condition.

- There are 124 miles of walkways valued at $46.7 million.

- As a continuation of the planning process, the All University Traffic and Transportation Committee addresses the issues related to parking access, the associated cost implications, and ways to increase use of mass transit and non-motorized transportation. MSU continues its partnership with the Capital Area Transport Authority to provide service for on-campus and surrounding area routes, a collaboration that first began in 1998. In early 2017, the Executive Vice President for Administration initiated a mobility planning[3] effort that will work to develop a robust campus mobility plan that connects current initiatives, engages stakeholders, builds on the Campus Land Use Master Plan, and provides the framework to improve campus mobility for all.

- Main campus inter-building communications is comprised of an underground fiber optic distribution system that supports network data, VoIP telephone, contact center, cable television, cellular, two-way radio dispatch and other specialized services. The fiber optic system interconnects 236 unique structures on campus. Wireless equipment provides connections for additional structures in the south-campus farm district; however, planning is under way to replace this legacy service with direct fiber optic connections. This effort will also include well water pump facilities and other critical infrastructure equipment and will bring the total unique structures with high capacity underground fiber optic connections to 297.

[3] http://www.adminsv.msu.edu/mobility/

In addition to the fiber optic distribution system, each building has internal cabling infrastructure and equipment with approximately 75 percent in need of significant infrastructure and equipment upgrades to keep up with operational demands. WiFi service is provided by over 12,000 wireless access points. Approximately 50 percent of main campus buildings have full WiFi coverage, 30 percent have partial WiFi coverage and 20 percent have little or no Wi-Fi coverage. All residence halls have WiFi service in student rooms, cafeterias and related gathering places.

The estimated replacement value of campus data network infrastructure is over $62 million and annual maintenance costs exceed $10 million.

Off-campus sites in the Lansing metropolitan area are connected to the MSU data network via a 45-mile fiber optic ring operated by Zayo Enterprise Networks. Facilities across the state, those outside of Lansing, are connected via Merit Network, Inc. or other local service providers.

External data network connectivity from the main East Lansing campus is provided via redundant links to the commodity Internet and to the research-focused Internet2 network via Merit Network, Inc.

Two-way radio services are being transitioned from a stand-alone system to the State of Michigan MPSCS hosted two-way radio system.

- Cellular infrastructure from all four national cellular carriers is installed on a myriad of main campus building rooftops and other structures. This carrier-owned equipment provides enhanced service coverage and capacity for the public and university employees alike, including during large campus events.
- Michigan State University's campus comprises approximately 24 million gross square feet of building space in 563 structures, including both general-fund and self-supporting facilities. The replacement cost of the buildings is calculated at $5.15 billion. University general-fund buildings account for approximately 14 million square feet of space representing $3.45 billion in replacement cost, and Residential and Hospitality Services and other self-supporting facilities account for approximately 10 million square feet and the remaining $1.70 billion.

  Facility condition appraisals, including the utility distribution system, are updated on an ongoing basis using input from University maintenance and custodial staff, users of the buildings, and external consultants. College and program units also provide programmatic facility reviews and forward needs through the annual program planning and review process.

  Building capital renewal needs are identified on many campuses utilizing the "industry-expected useful life" of the various significant building components. At MSU, this approach substantially overstates needs, since the effective maintenance program typically results in building components lasting much longer than the industry standard.

  MSU manages and forecasts major maintenance needs through its capital renewal program. The program prioritizes facility needs that address life safety, accessibility, asset performance, resource efficiency, and renewal of critical

building systems. This process considers the age of major building components, adjusted to account for each component's maintenance history and current condition based on field observations. The five-year major maintenance facility needs (apart from the utility distribution system) for general-fund facilities is approximately $320 million[4], or an average of $64 million per year.

- The utility generation and distribution systems are also major components of the campus infrastructure. The generation system includes the T. B. Simon Plant, a modern gas-fired cogeneration power plant with an interconnection to the national electrical power grid that serves the campus energy needs. This utility generation approach coupled with the stoppage of coal use in 2017 are key contributors to our decrease in greenhouse gas emissions. The replacement value of this facility is $306.2 million.

  The distribution system includes approximately 74 miles of water lines, approximately 27 miles of steam lines in tunnels, approximately 3 miles of direct buried steam lines, of approximately 168 miles electrical conduit and cable, approximately 112 miles of communication cable and fiber, approximately 158 miles of storm and sanitary sewers, and more than 7 miles of chilled water distribution. The replacement value of the utility system is approximately $333 million.

  While we have made significant investment to update the north campus steam and electric utility systems, the south campus systems have deteriorated and need repairs to provide reliable service, and meet the service demands of the overall campus community. Improvement needs over the next five-year period are calculated at approximately $142 million; and power plant modernization at approximately $88 million.

- MSU has a long history of demonstrated energy conservation. Since the energy crisis of the 1970's the university has continued to reduce consumption using a central building energy management system, combined heat and power energy generation with an underground utility micro-grid on main campus, and enhanced construction standards which incorporate the United States Green Building Council Leadership in Energy and Environmental Design requirements for sustainability. In 2017, MSU entered into a power purchase agreement to purchase the electricity generated by a 10.5 MWatt solar array constructed as carports over five parking lots on campus. This photovoltaic array was completed and commissioned in December 2017. In recognition of this effort the U.S. Environmental Protection Agency awarded MSU with a 2018 Green Power Leadership award.

  In April of 2012 the MSU Board of Trustees adopted the Energy Transition Plan setting goals to reduce greenhouse gas emissions 30 percent by 2015 and increase renewable energy 15 percent by 2015. The long-range energy strategy approved by the MSU Board of Trustees will help prepare the University to be a responsible global citizen and become a model community of economic sustainability. As a commitment towards this sustainable model, the university

[4] See Appendix E for capital renewal needs.

had its last firing of coal as a fuel source in spring of 2016. Progress on the energy transition plan includes reduced greenhouse gas emissions by over 25 percent since 2010 and uses 10 percent less heating units (BTU) per person than it did in 2006. Upon completion of the solar carport arrays increased renewables by 11.3 percent from baseline fiscal year 2010.

As part of its environmental stewardship, the university joined the Department of Energy's (DOE) Better Buildings Challenge (BBC), which is an initiative to reduce energy consumption in commercial buildings across the nation. The university pledged to reduce energy consumption by 20 percent in 20 million square feet of facilities by the year 2020. As part of this commitment, MSU along with the other Better Building partners, publish their goals and yearly progress updates on the DOE's Better Buildings website. To date, through a comprehensive approach to energy efficiency and conservation, the university has reduced campus-wide energy use intensity by approximately 22 percent (weather adjusted).

A ten-year plan to retro-commission 115 major campus buildings in approximately 16 million square feet of space was completed at the end of FY2018. The scope of work for building analysis included mechanical system retro-commissioning and whole building energy audits. The program was successful in identifying and facilitating the approval of over $20M in energy conservation measures resulting thus far in a greater than 20% reduction in utilities (steam and electricity) across the fleet of buildings included in the analysis. Further, the program was instrumental in the development of a campus-wide steam trap management program whereby device failures were improved from a 20 percent rate of failure to less than 3% over a 6-year period across a steam trap population of 14,000 devices. Collectively, this work has driven an avoidance of over $7M in utility costs based on fuel-only rates. Additionally, in preparation for the future, and through leveraging our existing HVAC building control system, an analytics-based fault detection and diagnostics (FDD) software platform has been connected to 20 campus facilities for the real-time identification and monetization of maintenance and energy related mechanical system issues. Through an alignment of focused re-commissioning and FDD technology, a robust foundation to ongoing commissioning has been laid to retain the significant reduction in energy consumption across campus.

All major buildings on campus have smart electrical metering for viewing real time data at http://energydashboard.msu.edu. In addition, an interactive energy dashboard is available in the lobby of Emmons Hall and Brody Hall to raise student awareness of consumption. On-line access to monthly and annual reports on energy consumption and waste/recycling efforts by building are also available.[5] Access to this data is part of the University's effort to educate the campus community about its consumption and encourage conservation.

MSU is committed to being good stewards of our resources by reducing consumption and greenhouse gas (GHG) emissions and increasing recycling.

[5] See http://energydashboard.msu.edu/

The commitment to recycling is supported by the MSU Surplus Store and Recycling Center that has facility capacity to support a comprehensive recycling program and will allow the university to expand recycling collection to all occupied buildings on campus.

- The college and program units provide programmatic facility reviews and forward space needs, including alteration and improvement requests, and major capital planning needs through the annual program planning and review process. This process identifies the high-priority programmatic needs of the campus through an annual, systematic approach.

  Because of the dynamic nature of academic and academic-support programs, the planning horizon for these requests is typically five years. The types of projects forwarded through this process include, for example, the comprehensive renovation of a research lab to support current research foci and sophisticated research equipment and modifications to office and dry research space for improved efficiency and program functionality. This process also helps inform the broader capital needs by identifying programmatic areas that would benefit from new construction or major renovations.

  Based on the most recent planning cycle, approximately 20.0 million is needed in fiscal year 2020 to address high priority, selected programmatic improvements. It is anticipated that this magnitude of annual funding need will continue through fiscal year 2025 and beyond, given the limited resources, age of the physical plant, growth in research including the hiring of approximately 100 (87 to date) additional faculty over the five-year period of 2015-2020, and changes in curriculum and evolution of teaching and learning methods and student learning experiences.

  This also enables the University to coordinate projects and assemble the work scope in a way that reduces overall project costs by coupling programmatic alteration needs with infrastructure improvements and the removal of maintenance items. As a result, limited building improvement funds are expended more effectively.

- A primary component of the teaching and learning environment is the University's instructional space. The University maintains approximately 320 centrally scheduled classrooms and lecture halls, and approximately 700 departmentally assigned instructional spaces. These spaces range from centrally scheduled classrooms that can be utilized by any discipline to more specialized spaces, such as teaching laboratories with fume hoods and wet-bench space. As part of the University's main campus facilities, the instructional space accounts for approximately 1 million assignable square feet.

  For fall semester 2018, utilization of these instructional spaces by scheduled instructional periods ranges as high as 78 percent of the available hours, and averages 65 percent across all rooms for centrally scheduled classrooms, excluding events. The seat utilization ranges as high as 73 percent of the available capacity and averages 61 percent across all rooms. One-time events, such as help sessions, department and student organization meetings, on

average increases utilization by 15 percent, for an average overall utilization of 80 percent.

Departmentally scheduled class laboratory spaces that are scheduled regularly for courses averages 33 percent across all rooms and disciplines, and ranges as high as 46 percent of the available hours. This utilization does not include prep or clean-up time, open lab time for tutoring, or student research use. The seat utilization ranges as high as 82 percent of the available capacity and averages 41 percent across all rooms and disciplines. The level of utilization is indicative of the highly specialized nature of these room types.

Currently, approximately 40 percent of the instructional space is in fair condition and 10 percent in poor condition, with the remaining in good to excellent condition. Rooms in need of upgrade require either comprehensive or selected renovation, and may include replacement of furniture, ceiling, and lighting, painting; upgrade of power and data; and replacement of lab benches and fume hoods. Rooms requiring upgrades are identified through a multiyear improvement plan that is informed by on-site reviews of each room, input from users, and analysis of room utilization, as well as the academic program planning process. In addition to these needs, the investments in instructional space must incorporate the shift to more learner-centric environments; curriculum revision, the continuous evolution of technology and its role in teaching and learning; variations in pedagogy and delivery methods such as hybrid, flipped, self-guided, and engaged and active learning.

The quality of these rooms is essential to the teaching and learning process. These rooms are intended to support a range of learning methods from lecture to active learning environments; curricular and co-curricular activities; and self-guided learning. While the university continues to make significant improvements, further investment is necessary in order to keep pace with the changes in learning methods, to continue to add value, and remain competitive in our recruitment and retention of high quality students and faculty and increase participation at both the undergraduate and graduate levels. To address these needs, it is estimated that $60M over 5 years, or $12 million annually, would make a substantial improvement in the condition of the existing university instructional environment through renovation and or replacement and improve alignment with changes in curriculum and learning methods.

- University properties beyond the East Lansing campus cover more than 21,000 acres and contribute to the built environment with 13 AgBioResearch research centers across the state (the Kellogg Biological Station and Saginaw Valley Research and Extension Center are examples). Other agricultural field research locations include the South Campus Farms teaching and research centers. Sites supporting other programs include facilities for engineering research in Okemos; the BioEconomy Research and Development Center in Holland; conference facilities, such as Tollgate Education Center in Novi, the Management Education Center in Troy, and WaWaSum in Grayling; Hidden Lake Gardens in Tipton; and the Secchia Center and Grand Rapids Research Center in Grand Rapids. The

replacement value for the facilities located at these sites is calculated at more than $363 million.

At nearly all the research facilities, there is a continuing need to upgrade existing research space to meet current technological, regulatory, and operational requirements of researchers and funding organizations. Research maintenance items consist of both wet and dry lab upgrades and equipment replacement, while conference facilities require continual improvements and expansion as they relate to extension and outreach. General Maintenance and infrastructure improvements include exterior repair/replacement, technology and security upgrades, environmental enhancements directed at storm water and process water management, energy efficiencies, regulatory requirements and mechanical upgrades that include electrical, plumbing, and heating, ventilation, and air conditioning (HVAC). Other facility repairs include well and septic systems that require continual maintenance and periodic repair of roadways and parking areas. With more than 265 buildings located at various off-campus research, teaching, and extension facilities, the items listed above are placed on a 5 to 10-year maintenance schedule, valued at $1.5M per year.

While the University has obtained facility improvement funds by issuing bonds, the University's general revenues secure these debt instruments and the facilities are not encumbered. The exceptions to this are the completed Chemistry Building renovations; Biomedical and Physical Sciences Building; Diagnostic Center for Population and Animal Health (now named the Veterinary Diagnostic Laboratory) laboratory building; and the Bio Engineering Facility. These facilities were funded in part with bonds issued by the Michigan Department of Treasury, State Building Authority (SBA) and secured by mortgages on the facilities.

V. Implementation

Michigan State University's approach to capital planning employs a continuous process that integrates academic, support, human resources, fiscal, and facility infrastructure planning. Institutional participation in the planning process ensures that consideration is given to relevant issues and that decisions reflect the fundamental mission and direction of the University.

Capital needs are informed by the University's Capital Planning Framework, Campus Land Use Plan, and planning activities that occur within major components of the institution at regular cycles throughout the year. These components include the annual academic program planning and review, administrative support planning and review, deferred capital renewal, technology, utility systems, energy and sustainability planning, as well as planning for transportation (roads and sidewalks), parking, and open space. Within this context, budgetary and fiscal analyses at the local, state, and federal levels are considered.

Within each component of planning, several more detailed issues are reviewed and examined relative to their impact on facilities over the short- and long-term. One approach used for this more detailed planning is the Campus Infrastructure Planning

Work Group. Bringing together a comprehensive cross section of University constituents, the group evaluates infrastructure projects on several dimensions to ensure thoroughness of planning, conformance with master planning principles adopted by the MSU Board of Trustees, and impact across the University.

As a matter of operating philosophy and practice, facility planning encompasses the following issues:

- Renovations, as well as maintenance of existing campus facilities, and new construction are focused to support programs that are central to the academic mission of the University.
- A fundamental guiding principle is that planning is holistic and comprehensive. In addition to capital renewal of existing facilities, academic program needs are considered, and facility adaptation is planned accordingly. A premium is placed on reuse of existing facilities, on conservation of open space, energy conservation, and on health, safety, security, and regulatory requirements. Barrier-free modifications are given priority, and needs related to technology are incorporated. Where appropriate, fixed building equipment, particularly for laboratories and instructional spaces, is included in the plans.
- New construction, additions and renovation of existing facilities are planned so a project's financial investment actively reflects the life cycle of the facility in relation to the needs of the program, while providing flexibility in the structure to accommodate potential changes over the longer term. Through the least life cycle cost analysis, facilities are positioned to be responsive to immediate programmatic needs, as well as longer-term adaptation needs brought about by changes in programs, advances in technology, and related issues.
- The least life cycle cost analysis also enables project development to focus on designs that reduce the ongoing maintenance cost of facilities. Within this context, MSU's high-quality construction standards intentionally create plans and assemble materials that "design out" as much near and long-term maintenance as possible.

  In summary, the anticipated expenses of a facility over its life cycle are carefully considered in relation to the initial investment in design and materials.

Through facility-planning activities, Michigan State University recognizes that campus programmatic and facility capital renewal issues are significant and constantly changing. As a result, needs exist simultaneously in three major areas:

1. Renovations and Additions
2. New Construction
3. Major Systems Maintenance and Utilties

Many more needs exist than can be addressed at any one time. However, within this context and informed by the planning processes described above, the "Greenhouses - Renovation of Existing and Addition - Research Expansion and Learning" is the

institutions top priority request, as noted in Section I of the following table[6]. Other projects included in Section I of the table reflect the institutions anticipated capital project needs during the upcoming 5-year planning framework. Projects listed in Section II are currently in active planning or in process, with funding primarily from institutional resources. Within the context of this planning and the capital outlay process, Appendix H[7] contains information regarding FRIB and the community cost share provided by the state.

[6] See Appendix G for the State Fiscal Year 2021 Capital Outlay Project Request – "Greenhouses – Renovation of Existing and Addition – Research Expansion and Learning."
[7] See Appendix H for FRIB.

Capital Planning and Major Maintenance SFY21-25
Planning Timeframe: One to Five Years

Section I: MSU Capital Outlay SFY20 Request and 5-Year Planning	
	FY20 Est. (mil.)
MSU SFY21 Capital Outlay Request – Renovation and Addition	
• Greenhouses - Renovation of Existing and Addition - Research Expansion and Learning	$ 20.9
MSU 5-Year Capital Planning **Renovations and Additions**	
• Biomedical Frontier	
○ Biomedical Animal Resources – Provision for Large Animal ($15.7M - 21.9M)	
▪ Housing and Surgery	$ 11.3 – 16.5
▪ Imaging	$ 4.4 – 5.4
○ Clinical Center A-Wing – Renovate for Research Expansion	$ 65.0 – 75.0
○ Clinical Center B-Wing – Renovate for Research Expansion & Learning	$ 15.0 – 20.0
○ Research Laboratory Renovation – Various (STEM and ISTB Related Backfill)	$ 15.0 – 18.0
• BSL-3 - Research Expansion Multi-Species Flexible Housing/Procedure Space (Ph. 2)	$ 9.5 – 10.5
• Detroit Initiative - MSU Places of Learning	TBD
• Engineering - New Construction/Addition/Renovation	TBD
• Healthy Campus – Recreation, Fitness, Sport	
○ IM Circle – Convert former Pool to Multi-Purpose Space	$ 10.0 – 11.0
○ IM Fields – Service Road Synthetic Turf	$ 9.5 – 10.5
• Large Animal - Teaching and Learning Support	TBD
• Learning Spaces	
○ Learning Space Improvements – Annual Investment for Updates and Improvements (5-Year need, $12.0 annually)	$ 60.0
○ Library Improvements – Learning and Collections Support	$ 5.0 – 8.0
• Life Science Building (A & B) HVAC replacement and related (phased approach)	TBD
• MSU Chapel and Columbarium - Renovation and Accessibility	TBD
• Music Building – Renovation of Existing for Improved Program Support	$ 9.4 – 33.3
• Old Botany – Comprehensive Renovation	$ 9.6 – 10.6
• Plant Biology Building – Comprehensive Renovation	$120.0 – 130.0
• Single Occupant/ADA Restrooms - High Priority Buildings	TBD
• 600 Crescent Road - Modifications to 1st and 2nd floors for IT Services space consolidation	TBD
• Student Services Building – Renovate for Student Support	$ 8.8 – 35.5
New Construction - New Building	
• MSU Health Care - Medical Services Building	TBD
• Transportation Services and Mobility Research Center	$ 20.0 – 22.0
Major Systems Maintenance & Utilities	
• 20MW Solar Array Installation (material change to the landscape and long-term lease)	NA
• Capital Renewal (5-Year need, $35.0 annually)	$ 175.0
• Farm Lane Infrastructure and Mobility Upgrades including Bridge Replacement	$ 35.0 – 40.0
• Service Road and Service/Bogue Intersection Reconstruction	$ 6.0 – 7.0
• Utilities (5-year) – Power Plant Modernization	
○ Battery Energy Storage System	TBD
○ Combustion Turbine Rotor and Engine - Replace Unit 6	TBD
○ Electrical Centrifugal Chillers – 8,400 tons	TBD
○ Shared Natural Gas Pipeline	TBD

Section II: Projects in Active Planning or In Process/Funding from Other Resources		
Projects Authorized by the Board of Trustees for Construction (Arranged Alphabetically)		
• 2016-2017 Major Maintenance Projects		
Student Services Building – Replace Windows and Air Handling Units	$	7.3
• 2017-2018 Major Maintenance Projects		
Wells Hall - Replace Induction Units (Phase 2 of 2)	$	3.5
• Administration Building – Ground Floor – Convert former Data Center to Office Space	$	1.35
• Biological Safety Level-3 Research Laboratory (Ph. 1 of 2)	$	3.5
• Cowles House – Accessibility and Interior Renovations	$	6.0
• Duffy Daugherty - SAAC – Alterations to Skandalaris Football Offices and the Demmer Family Hall of History	$	6.7
• Eli Broad College of Business - Addition No. 2 - Pavilion	$	62.0
• Food Science – Fruit and Vegetable Laboratory Renovation	$	3.5
• FRIB – Cryogenic Assembly Building	$	12.4
• FRIB – High Rigidity Spectrometer and Isotope Harvesting Experimental Vault	$	22.5
• ICECUBE Laboratory Renovations at Biomedical Physical Sciences	$	1.0
• Interdisciplinary Sci. and Tech. Building – Strategic Acad. Development Initiative	$	100.0
• Hubbard Hall - Exterior Masonry Repair (Phase IV of IV)	$	2.7
• Music Building – Addition – Program Expansion and Needs	$	41.5
• Munn Ice Arena – Expansion	$	18.8
• STEM Teaching and Learning Facility ($72.5M) and Former Shaw Lane Power Plant Renovation ($25.0M) – Strategic Acad. Development Initiative	$	110.1
• T.B. Simon Power Plant – Reconfigure House Service and Install Spare Breakers	$	1.8
• Utilities – Power Plant Modernization		
Reciprocating Internal Combustion Engines (RICE)	$	47.0
Reverse Osmosis System	$	1.0
• Veterinary Medical Center - Alterations to Second Floor Locker Rooms	$	1.6
• Water Distribution - Campus Water System Improvements	$	23.0
• Wells Hall – Replace Induction Units in Building Sections C and D (16-17 Major Maint.)	$	6.0
• Wonders Hall – Teaching, Learning, Student Support Renovation	$	18.0
Projects Authorized for Planning (In Design, Arranged Alphabetically)		
• 2017-2018 Capital Renewal Program – Projects		
Veterinary Medical Center – Replace HVAC-1 & 2	$	1.6 – 2.0
• Administration Building – Renovations to the Third Floor (selected area)	$	3.1 – 3.7
• Biochemistry - Replace Power Service - Capital Renewal	$	1.3 – 1.4
• Business College Complex - Eppley Center - Student Support, Capital Renewal, and Building Envelope (revised planning request)	$	18.0 – 21.0
• Hannah Administration Building – Renovations to the Fourth Floor	$	1.5 – 2.0
• Hidden Lake Gardens - Observation Tower and Canopy Walk	$	2.2
• IM West Outdoor Pool Replacement (on-hold planning completed)	$	8.5
• IM West Outdoor Pool Enclosure	$	7.0 – 9.0
• Library – West Wing HVAC Zone Level Upgrade	$	1.5 – 2.0
• Kellogg Biological Station - Bird Sanctuary Renovation	$	2.5 – 3.5
• Outdoor Seasonal Ice Rink	$	2.3 – 3.0
• Owen Graduate Hall – Replace Deteriorating Main Water Supply Lines	$	1.435
• Owen Graduate Hall – Visiting Scholars Housing Project	$	1.5 – 2.0
• Sexual Assault Nurse Examiner (SANE) - Renovation at Student Services Building	$	1.0 – 1.5
• Swine Teaching and Research Center Addition - (Footprint Change)	$	0.5 – 0.8
• T.B. Simon Power Plant - Site Modifications		
Security fence/cameras		TBD
• Utilities - Power Plant Modernization		
Medium Pressure Steam Boiler		TBD
Replace U4 Cyclone Refractory	$	1.0 – 1.5
• Wilson Hall – Replace Deteriorating Main Water Supply Lines	$	2.1

Addressing the above projects within the next five-year timeframe is extremely important, not only to the effectiveness of the academic programs but also to the operational efficiency of the institution. Finally, funding these projects is consistent with the University's commitment to responsible stewardship of critical state resources. It will also ensure that the capital infrastructure is available to carry out our commitment to intellectual leadership in developing new knowledge and to conveying and applying that knowledge to students and the public in practical ways.

VI. Capital Outlay Planning[8]

The capital outlay request and capital priorities support programs that have strong national reputations, expanding research bases, and high enrollment demand that will sustain the university and its contributions to Michigan. Funding of these requests will provide economic development in the state, now and in the long term.

Our capital outlay request is for renovation and addition of plant science greenhouses to modernize and expand this capital asset that supports research, and teaching and learning. Michigan State University is a global leader in plant sciences supporting agriculture and plant sciences in Michigan and across the globe. Further, agriculture is the second largest contributor to the Michigan economy with approximately $104 billion in revenue attributed annually to food and agriculture. Investment in this core research and teaching resource will support our continued efforts in the plant sciences and provide the tools necessary to address a grand challenge facing the world --- to safely and securely feed the world in the 21st century and beyond.

One of the major challenges of the 21st century is to double food production and maintain global food security in the face of a growing population. Meeting that challenge will require the development of crops that are regionally adapted to future environmental conditions, including numerous abiotic and biotic stressors, and are more resilient to greater variation in their environment. This pressing societal need intersects with some of the most important questions in modern plant science and emphasizes the need for a better understanding of the interaction of genes and the environment. Accomplishing these goals requires reliable, modern, and energy-efficient greenhouse facilities and services.

The future success of agricultural research and teaching and learning is dependent on maintaining and expanding the overall quality and functionality of our experimental plant rearing facilities. Renovations of the existing greenhouses, coupled with addition of new state of the art greenhouses with modern environmental control capacity, are necessary to provide increased research capacity in this strategic area of the MSU research mission, support the shift of fundamental plant sciences from small scale model plant systems to agronomic crops, and address aging infrastructure. The current greenhouse infrastructure limits the university's ability to meet the needs of the Michigan agricultural

[7] See Appendix G for the State Fiscal Year 2019 Capital Outlay Project Request – "Greenhouses - Renovation of Existing and Addition - Research Expansion and Learning"

community, the region, our global reach; conduct critical research, and provide student learning in modern facilities that reflect real world experiences.

Renovations and additions

Renovations and/or additions address extensive programmatic and maintenance improvements required by buildings previously funded by the state. They are necessary to reconfigure and or expand space in order to support the work of the programs housed in those facilities; create core/shared research support facilities and modern learning spaces; and in some instances, adaptive re-use or modernization of aging buildings including alignment with current codes and provisions for accessibility.

Major renovations and/or additions include the plant sciences-bioeconomy, biological and biomedical sciences, music and learning facilities.

Major systems replacement

Current forecasts anticipate general fund capital renewal (deferred maintenance) and utility needs of approximately $401 million over the next five years. In view of the extensive facility needs it faces, MSU has drawn upon an increasing amount of internal university resources to address the most critical facility maintenance and programmatic requirements. Self-funding these capital improvements is not sustainable without negative impacts on other programs.

The university seeks funding for more targeted and specific building systems maintenance and utilities. Examples of systems in need of repair or replacement include roofing, windows, electrical, mechanical, chiller, refrigeration, steam, fire, security, and barrier-free access.

VII. Conclusion

Michigan State University's programmatic strategy is premised on the foundation of advancing the common global good with the uncommon will and seeks to further education and research in Science, Technology, Engineering, and Math as well as other curricular priorities to expand economic impact locally, regionally, and internationally. MSU routinely receives more than $600 million in sponsored awards annually, focused in areas such as food systems; plant sciences; health sciences; computational sciences emphasizing biology and food/food-chain; and population and the environment, including food, water, and energy. Additionally, MSU's programmatic investments seek to improve technology and teaching, prioritize interdisciplinary study, the narrowing of graduation gaps amongst various student groups, and fostering a healthier campus.

More than 90 percent of MSU's graduates were employed or continuing their education within nine months of graduation, and a similar percentage rated their educational experience as excellent and would choose MSU again if starting their experience over. Of 2018 graduates with employment, approximately 65 percent remained in Michigan, with an additional 14 percent employed in other regional states.

Michigan State University has an annual economic impact of more than $5 billion and seeks to instill an entrepreneurial and high-performance mindset in its students, faculty, and staff.

MSU is deeply engaged in the cities of Flint, Detroit, and Grand Rapids, working collaboratively to provide expertise and a network of resources in education, food, water, health, and sustainability. MSU Extension's presence extends to all 83 Michigan counties, availing all Michigan residents to the resources and expertise they need to advance the state and its economy. Agribusiness is among the fastest growing economic sectors in the state, and the MSU AgBioResearch and MSU Extension contribute to Michigan's economy with significant research, educational programs and a community presence to boost economic development and growth related to agriculture and natural resources, community vitality, entrepreneurship, and career preparation for young people.

Michigan State University is recognized around the world as a leading academic institution with world-class faculty, top graduate school programs, a powerful research portfolio, and an engaged, entrepreneurial spirit. To maximize its impact and fiscal responsibility, MSU continues to build on its partnerships with local, state and federal government agencies and with the private sector while maintaining its core values and commitments. Leadership continues to balance increasing the value of MSU's work and ensuring it matches the high quality expected of MSU. We engage our partners, our students, our faculty and the stakeholders and communities we serve, both locally and globally, to shape a shared future of sustainable prosperity.

Fall 2019

Appendices

Fiscal Year 2021 Budget Information

5-Year Capital Request Planning and Capital Outlay Request

Submitted By:

MICHIGAN STATE UNIVERSITY

Fall 2019

Appendix A: Mission Statement

Fiscal Year 2021
Budget Information

5-Year Capital Request Planning and Capital Outlay Request

Submitted By:

MICHIGAN STATE UNIVERSITY

MSU Mission Statement

The following statement was approved by the Board of Trustees on April 18, 2008

Michigan State University, a member of the Association of American Universities and one of the top 100 research universities in the world, was founded in 1855. We are an inclusive, academic community known for our traditionally strong academic disciplines and professional programs, and our liberal arts foundation. Our cross- and interdisciplinary enterprises connect the sciences, humanities, and professions in practical, sustainable, and innovative ways to address society's rapidly changing needs.

As a public, research-intensive, land-grant university, funded in part by the State of Michigan, our mission is to advance knowledge and transform lives by:

- providing outstanding undergraduate, graduate, and professional education to promising, qualified students in order to prepare them to contribute fully to society as globally engaged citizen leaders

- conducting research of the highest caliber that seeks to answer questions and create solutions in order to expand human understanding and make a positive difference, both locally and globally

- advancing outreach, engagement, and economic development activities that are innovative, research-driven, and lead to a better quality of life for individuals and communities, at home and around the world

Fall 2019

Appendix B: Campus Land Use Master Plan

Update February 2017

Fiscal Year 2021
Budget Information

5-Year Capital Request Planning and Capital Outlay Request

Submitted By:

MICHIGAN STATE UNIVERSITY

Michigan State University

Campus Land Use Master Plan: Update 2017

February 2017

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PREFACE

PURPOSE OF THE CAMPUS LAND USE MASTER PLAN

The Campus Land Use Master Plan provides a flexible framework for guiding the physical organization of the Michigan State University (MSU) campus. The plan includes overarching campus planning principles, specific system recommendations, and the University Zoning Ordinance. The plan is updated every five years to provide University administration with a current and relevant decision-making tool in concert with additional planning documents that include but are not limited to:

- Mobility Plan (under development)
- Five-Year Plan and Capital Outlay Request
- Capital Renewal (deferred maintenance) Priorities
- Residential and Hospitality Services Strategic Plan
- Utility and Infrastructure Plans (water, steam, electric, gas, storm water)
- Power Plant Master Plans
- Storm Water Permit
- Barrier Free Accessibility Plan
- Energy Conservation Plan
- Well Head Protection Plan

Given the size and complexity of the campus's physical composition, coordinating the land use plan with a mobility plan will facilitate the University's ability to achieve its mission within a culture of high performance. Together, the land use and mobility plans will enable the connections, collaboration, and conversations required to drive academic success and research innovation. To this end, President Simon has directed the Executive Vice President for Administrative Services to lead the effort in developing a mobility plan.

SIGNIFICANT ACCOMPLISHMENTS SINCE THE 2011 UPDATE

Over the past five years, the Campus Land Use Master Plan: Update 2011 informed the implementation of the following major projects.

- Major building projects completed or under construction include: NSCL/FRIB (various projects), Brody Neighborhood (various projects), Bott College of Nursing Education, Case Hall Addition and Renovation, Shaw Hall Addition and Renovation, Old College Field (various projects), Wells Hall Addition, Molecular Plant Science, Landon Hall Addition and Renovation, Endocrine Research, Spartan Stadium North End Zone Addition, MSU Performing Arts and Teaching Lab, Parking Ramp 7, Bio Engineering Research, Breslin Center Upgrades and Hall of History, Intercollegiate Golf Facility, Poultry-Laying Hen Research, Sheep Lambing and Research, and 1855 Place.
- Close adherence to the University Zoning Ordinance, with only 5 projects requiring a zoning variance.
- Completion of the RHS Dining Services Master Plan.
- Major enhancements to the campus open space system including removal of parking to create open space adjacent to Shaw Hall and the Munn Field artificial turf field.

- Receipt of a Silver Bicycle Friendly University Award from the League of American Bicyclists. Today more than 68% of campus roads have bike lanes. The campus has six do-it-yourself fix-it stations in the residential neighborhoods and two secure bicycle storage facilities with fix-it stations (Grand River and Communication Arts Garages) and one secure storage facility within the FRIB complex. Nearly 60% of the MSU River Trail (dedicated bicycle and pedestrian trail) has been constructed from Harrison Road to Farm Lane.
- Completed the four-year West and East Circle Drive infrastructure enhancement project that improved non-motorized and motorized circulation within the North Academic District.
- Completed the Chestnut Road reconstruction from Shaw Lane north to Red Cedar Road.
- Reconfigured the Bogue Street and Shaw Lane intersection, removing the last vehicular traffic circle on campus along with closing the Bogue Street segment between Shaw Lane and Wilson Road to accommodate the FRIB project.
- Completion and full operation of the Capital Gateway Multimodal Transit Center operated by CATA.

CAMPUS PLANNING PRINCIPLES

INTRODUCTION

The University is committed to a comprehensive and continuous land use planning process that results in a flexible framework to guide future decision making. The University will consider the use of resources from environmental, regulatory, operational, economic, historic, and cultural perspectives in support of its teaching/learning, research, and outreach mission.

The following planning principles will guide future planning for, and development on, the Michigan State University campus. The principles are organized in the following categories: General Principles, Land Use and Facilities, Environmental Sustainability, Open Space, Parking, Circulation, and Utility Infrastructure.

GENERAL PRINCIPLES

- Arrange campus buildings, open space, circulation and utility systems to:
  - establish positive interactions among academic, research, outreach, cultural, and operational activities;
  - protect and strengthen the campus as a living-learning resource integral to the University's mission;
  - protect and enhance campus beauty;
  - enhance environmental stewardship;
  - minimize energy impacts and increase/retain energy efficiencies; and
  - optimize safety and facilitate risk management.

PLANNING PRINCIPLES RELATED TO LAND USE AND FACILITIES

- Organize the campus in logical districts of compatible land uses.

- Implement compact campus development to achieve the following benefits:
  - preserve and protect existing natural areas and systems to support teaching and research;
  - conserve land and maximize land productivity;
  - protect contiguous agricultural teaching and research land;
  - encourage social interactions and vitality;
  - encourage collaboration, partnering, and interdisciplinary connections;
  - reinforce ties between research and undergraduate teaching;
  - control utility, transportation, parking, and infrastructure costs;
  - enhance functional efficiencies;
  - maximize efficient energy use; and,
  - minimize utility distribution extensions, which are inefficient and costly to maintain.

- Provide intramural recreation fields in locations that balance accessibility for both on- and off-campus participants.

- Protect and enhance campus open space, providing an appropriate balance (qualitative and quantitative) to the built environment.

- Protect the land south of Mount Hope Road from development to support AgBio Research and the College of Agriculture and Natural Resources' teaching, research, and outreach mission.

- Protect existing and future drinking water well locations in the Agricultural District in accordance with the Well Head Protection Plan.

- Favor reuse, renovation, and repurposing of existing buildings after carefully assessing programmatic alignment, functionality, long-term capital renewal (deferred maintenance), historic significance, location, energy efficiency, and replacement costs.

- Organize the arrangement and design of campus buildings and exterior spaces to encourage human interaction and to foster a sense of shared community among the University's diverse population. This may include, for example, incorporating "transitional spaces" outside of classrooms for pre- and post-class collaboration and "blended spaces" where food service, study space, and general meeting resources coexist.

- Design new buildings and renovations to be architecturally compatible with the best features of existing adjacent buildings and to be harmonious with their contextual surroundings.

- Maximize flexibility in the design of new and renovated space to accommodate changing needs and functions over time.

- Recognize historically significant aspects of the campus and the heritage of the campus as a park and as a living and learning laboratory.

- Acknowledge that the campus is part of the larger surrounding community. Build compatible land use relationships and circulation patterns.

- Consolidate support service facilities into the Services District as defined by the University Zoning Ordinance.

- Organize land uses, facilities, and infrastructure to encourage physical activity.

PLANNING PRINCIPLES RELATED TO ENVIRONMENTAL SUSTAINABILITY

- Minimize environmental impacts and maximize resource conservation through prudent and compact land use, protecting sensitive environmental systems, and incorporating low-impact development guidelines.

- Minimize negative impacts to the water quality of the Red Cedar River Watershed; incorporate Best Management Practices for storm water.

- Acknowledge the intrinsic value of biodiversity and enhance natural system integrity by creating, restoring, and maintaining large-block natural areas and improving their interconnections.

- Provide a suite of transportation options that maximize the movement of people and minimize the movement of cars, thus reducing congestion, vehicle miles traveled, and greenhouse gas emissions.

- Continuously pursue building and utility systems that encourage renewable resource use and that decrease waste and hazardous materials.

- Recognize land use issues associated with climate vulnerability including storm water management, flooding, snow removal, temperature extremes, and storm intensity.

PLANNING PRINCIPLES RELATED TO OPEN SPACE

- Protect and extend the park-like character of the historic circle campus in order to reinforce and enhance the University's distinctive physical identity.

- Enhance the landscape quality south of the Red Cedar River.

- Promote efficient land use that protects existing, and creates new, green space.

- Protect, maintain, and develop the campus as an arboretum to support the University's teaching/learning, research, and outreach mission.

- Provide opportunities for academic and social interaction.

- Provide a variety of open spaces that accommodate the full range of outdoor activity, for example, large athletic fields to intimate spaces for personal reflection and meditation.

- Preserve and protect existing natural areas and enhance their interconnectivity.

- Integrate public art appropriate to surrounding context (excluding Natural Areas).

PLANNING PRINCIPLES RELATED TO PARKING

- Safely and efficiently meet the parking needs of faculty, staff, students, and visitors.

- Integrate parking facilities into the campus setting in an aesthetically pleasing manner consistent with its park-like setting.

- Utilize a variety of parking resources including surface lots, decks, and parking garages; emphasize parking on the campus perimeter.

- Provide conveniently located barrier-free spaces across campus.

- Reclaim surface lots for green space and future building sites when appropriate.
- Relocate parking that contributes to unsafe traffic, bicycle, and pedestrian conditions.
- Minimize the loss of open space for small inefficient surface parking lots.
- Connect the campus transit system to major parking facilities.

PLANNING PRINCIPLES RELATED TO CIRCULATION

- Emphasize personal safety in the circulation system's planning and design.
- Design all roads as complete streets (designed and operated to enable safe, attractive, and comfortable access and travel for all legal users).
- Provide a safe, efficient, and effective transportation network that enhances the overall quality of life on the campus.
- Incorporate traffic-calming measures where appropriate.
- Plan and design for the following circulation priorities:
  - pedestrians first;
  - bicycles and other forms of non-motorized transportation second;
  - mass transit and service vehicles third; and,
  - private vehicles last.
- Design for the safety of persons with disabilities in accordance with the Americans with Disability Act.
- Reduce private vehicular traffic in academic and residential districts.
- Effectively integrate with the regional transportation system.
- Establish a coordinated bicycle system including bike lanes within roadways, dedicated pathways and/or shared-use pathways, and convenient and appropriately sized storage facilities where appropriate.
- Enable an effective and efficient mass transit system including developing residential neighborhood transit centers to gain transit efficiencies.

PLANNING PRINCIPLES RELATED TO UTILITY INFRASTRUCTURE

- Develop campus buildings and infrastructure to foster energy conservation.
- Use centralized utility systems wherever feasible to maximize production efficiencies and to minimize life-cycle operational costs.

- Establish consolidated distribution corridors that co-locate utilities and accommodate maintenance with minimal campus disruptions.

- Provide adequate protection and security for critical system components including electric, steam, chilled water, potable water, existing and future water wells, fiber, and natural gas.

- Provide redundancy for steam, electric, water, and communication utilities.

- Enable resource conservation and management through appropriate system design and controls.

- Prepare for developing technologies and their integration into the campus infrastructure.

- Implement practices, install systems, and develop procedures that prolong the capacity of the power plant, increase reliability, protect health and wellness, reduce greenhouse gas emissions, while managing affordability.

LAND USE RECOMMENDATIONS

PROGRAMS AND FACILITIES

Academic and Planning Imperatives

The University's Bolder by Design strategic initiative employs six imperatives to guide the institution's teaching/learning, research, and outreach mission. The campus's physical organization directly and indirectly supports these imperatives.

- Enhancing the student experience
- Enriching community, economic, and family life
- Expanding international reach
- Increasing research opportunities
- Strengthening stewardship
- Advancing a culture of high performance

The Campus Land Use Master Plan recognizes that land utilization must be optimized to support the academic mission; that extensive infrastructure systems are expensive to maintain; and that land conservation, especially in the research farms area, is mission critical. As a result, the plan centers on these smart growth principles:

- Establishing a compact campus composition
- Providing a variety of transportation choices
- Preserving open space, farmland, and critical environmental areas
- Developing a mix of land uses
- Creating a walkable community

Facilities Planning Principles

The University continually examines the capital assets necessary to support academic programs and physical needs that involve new construction, comprehensive renewal, renovation, reprogramming of selected facilities, and renewal of major subsystems in other facilities. The assessment of existing facilities shows that the infrastructure components of many campus buildings have aged significantly. Despite ongoing maintenance and repair that extends the expected usable life of components well beyond industry standards, many buildings are now at a point where they require either significant investment or replacement.

Space planning seeks to support student success, growth of the research enterprise, infrastructure stewardship, and operational efficiencies by:

- aligning space resources with academic framework;
- allocating and utilizing space strategically;
- supporting a range of teaching and research methodologies;
- leveraging emerging technology;
- effecting operational efficiencies and cost effectiveness;
- anticipating evolving teaching and research environments;
- forecasting changes in demand and aging infrastructure;
- providing accessibility based on universal design and inclusion; and
- assessing strategic property acquisitions.

Projected Facility Needs

Michigan State University, through the Office of Planning and Budgets, employs a continuous capital planning process that integrates academic, support, fiscal, and physical planning. Institutional participation in the planning process ensures that consideration is given to relevant issues and that decisions support the University's direction and mission.

Following a very detailed and carefully conceived planning process, it was estimated that the University will need a 10 percent increase in building space over the next 20 years. The growth in space is driven by a planned increase in the number of faculty and the anticipated increase in funded scientific research, selective and qualitative changes in academic teaching programs; enhancement of common facilities that enrich campus life and community; and consolidation and upgrading of operational support facilities.

Capital needs are informed by the Campus Land Use Master Plan and planning activities that occur within major components of the institution at regular cycles throughout the year. These components include the annual academic program planning and review, administrative support planning and review, deferred capital renewal, technology, utility systems, energy and sustainability planning, as well as planning for motorized and non-motorized circulation and open space. In this context, budgetary and fiscal analyses at the local, state, and federal levels are taken into account.

Within each component of planning, a number of more detailed issues are reviewed and examined relative to their impact on facilities over the short and long term. One approach used for this more detailed planning is the Campus Infrastructure Planning Work Group. Bringing together a comprehensive cross section of University constituents, the group evaluates major construction projects on a number of dimensions to ensure conformity with the Campus Land Use Master Plan's planning principles, physical recommendations, and the University Zoning Ordinance as adopted by the Board of Trustees.

As a matter of operating philosophy and practice, facility planning encompasses the following issues:

- Renovations, as well as maintenance of existing campus facilities and new construction, are focused to support programs that are central to the University's academic mission.
- A fundamental guiding principle is that planning is holistic and comprehensive. In addition to capital renewal of existing facilities, academic program needs are considered and facility adaptation is planned accordingly. A premium is placed on reuse of existing facilities, on conservation of open space, energy conservation, and on health, safety, security, and regulatory requirements. Barrier-free modifications are given priority, and needs related to technology are considered. Where appropriate, fixed building equipment, particularly for laboratories and classrooms, is included in the plans.
- New construction and renovation of existing facilities are planned so a project's financial investment actively reflects the life cycle of the facility in relation to the needs of the program, while providing flexibility in the structure to accommodate

potential changes over the longer term. Through the "least life cycle cost analysis," facilities are positioned to be responsive to immediate programmatic needs, as well as longer-term adaptation needs brought about by changes in programs, advances in technology, and related issues.

- The least life cycle cost analysis also enables project development to focus on designs that reduce the ongoing maintenance cost of facilities. Within this context, MSU's high-quality construction standards intentionally create plans and assemble materials that "design out" as much near and long-term maintenance as possible. In summary, the anticipated expenses of a facility over its life cycle are carefully considered in relation to the initial investment in design and materials. Project decisions made within the context of MSU's construction standards may, in some cases, be viewed as more expensive initially but, in practice, actually reduce the total cost of ownership.

Future Building Opportunities

Future building opportunities are depicted on two graphics. The first entitled Building Framework, illustrates future opportunities that do not require major demolition of existing facilities. The second graphic, entitled Major Redevelopment Opportunities, explores additional development parcels that will require careful assessment of existing facilities relative to highest and best land use, program relocation, deferred maintenance needs, and facility replacement costs. Both graphics employ the smart growth strategy of carefully conceived building "infill" to maximize land use capacity through greater building density.

The plans illustrate where future buildings can be assimilated into the campus context while reinforcing the Campus Planning Principles and University Zoning Ordinance. As such, the plans do not dictate when and where growth will occur, rather they identify development opportunities that can be evaluated to address specific programmatic needs when a project is identified and funding secured.

Each numbered site is measured and a potential building gross square foot yield is estimated by incorporating zoning allowances and important contextual features. Where development opportunity land areas are too large, and architectural speculation is not definable, a floor area ratio planning metric is assigned to estimate future building square footage.

Based on this assessment, the following quantifies future building opportunities for the campus lands north of Mount Hope Road. The estimated net potential represents future building opportunities less any existing building demolition. The campus has historically added, on average, approximately 2.0 million gross square feet (MGSF) every decade. At that rate, the net opportunities support nearly 58 years of future growth assuming each site is developed to its optimal capacity and all redevelopment zones are strategically implemented.

The following identifies future development potential based on opportunities that do not require significant redevelopment or removal of existing facilities.

Zoning Designation	Estimated Gross Potential	Estimated Net Potential
North Academic District	405,350 GSF	405,350 GSF
Central Academic District	1,832,615 GSF	1,832,615 GSF
South Academic District	2,457,686 GSF	2,457,686 GSF
Mixed Use District	4,538,950 GSF	3,733,890 GSF
Athletic/Recreation District	429,800 GSF	429,800 GSF
Service District	835,100 GSF	824,235 GSF
Residential District East	130,000 GSF	130,000 GSF
Total Opportunity (w/o redevelopment)	**10,638,715 GSF**	**9,813,576 GSF**

Adding in all redevelopment opportunities, the estimated future development potential increases as noted below.

Zoning Designation	Estimated Gross Potential	Estimated Net Potential
North Academic District	845,350 GSF	532,340 GSF
Central Academic District	3,560,115 GSF	3,169,583 GSF
South Academic District	2,457,686 GSF	2,457,686 GSF
Mixed Use District	4,538,950 GSF	3,733,890 GSF
Athletic/Recreation District	524,300 GSF	524,300 GSF
Service District	901,850 GSF	873,143 GSF
Residential District East	642,750 GSF	231,582 GSF
Total Opportunity (with redevelopment)	**13,480,215 GSF**	**11,522,524 GSF**

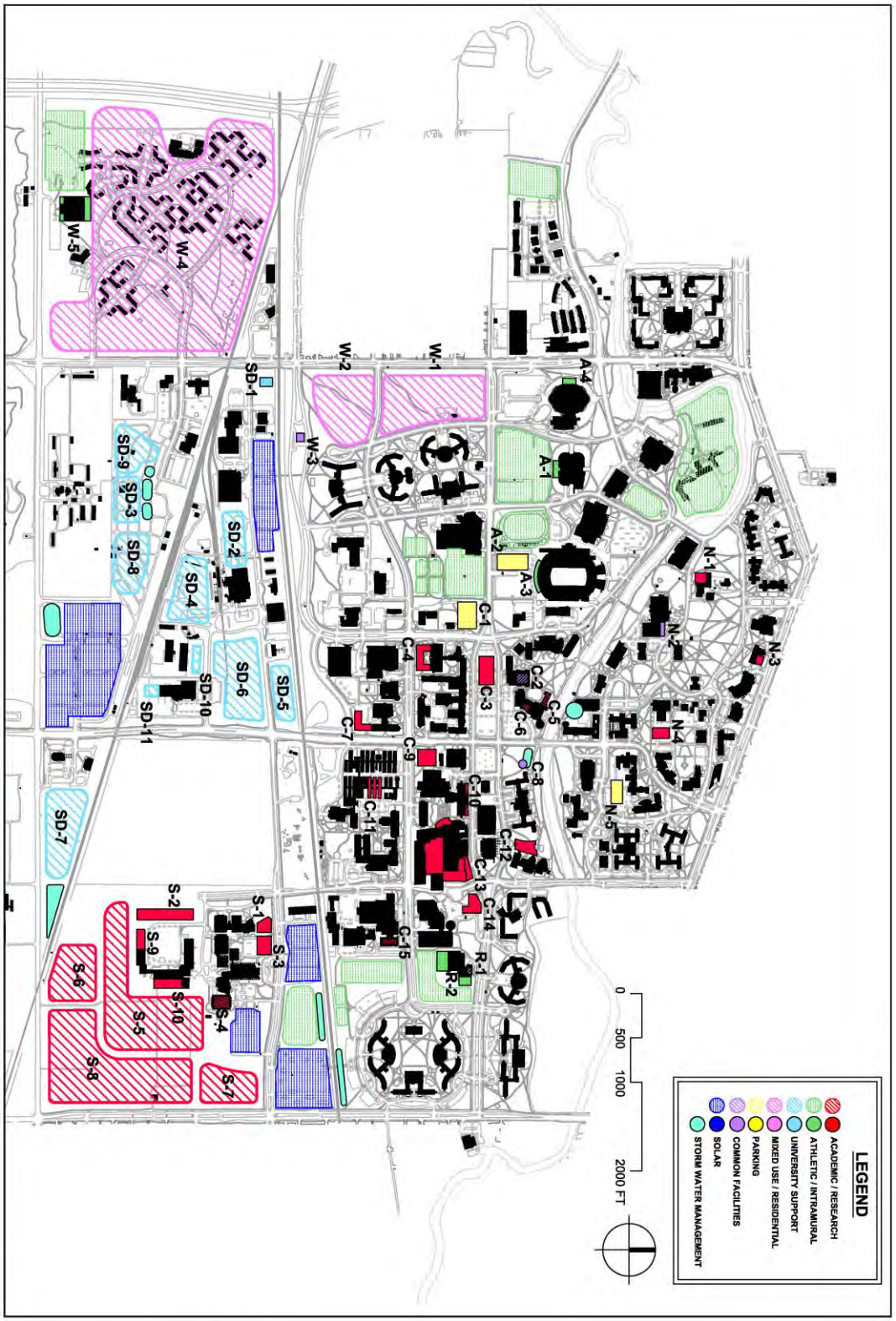
STRATEGIC LAND ACQUISITION

The University continually assesses land adjacent to the campus for acquisition to meet academic and research needs. The existing USDA Avian Disease and Oncology Lab at Harrison and Mount Hope Roads is a land acquisition priority due to its strategic location within the contiguous campus boundary. The University has communicated its intent to reacquire this parcel to congressional representatives and will communicate with the United States Department of Agriculture when a formal decision to relocate the facility is announced.

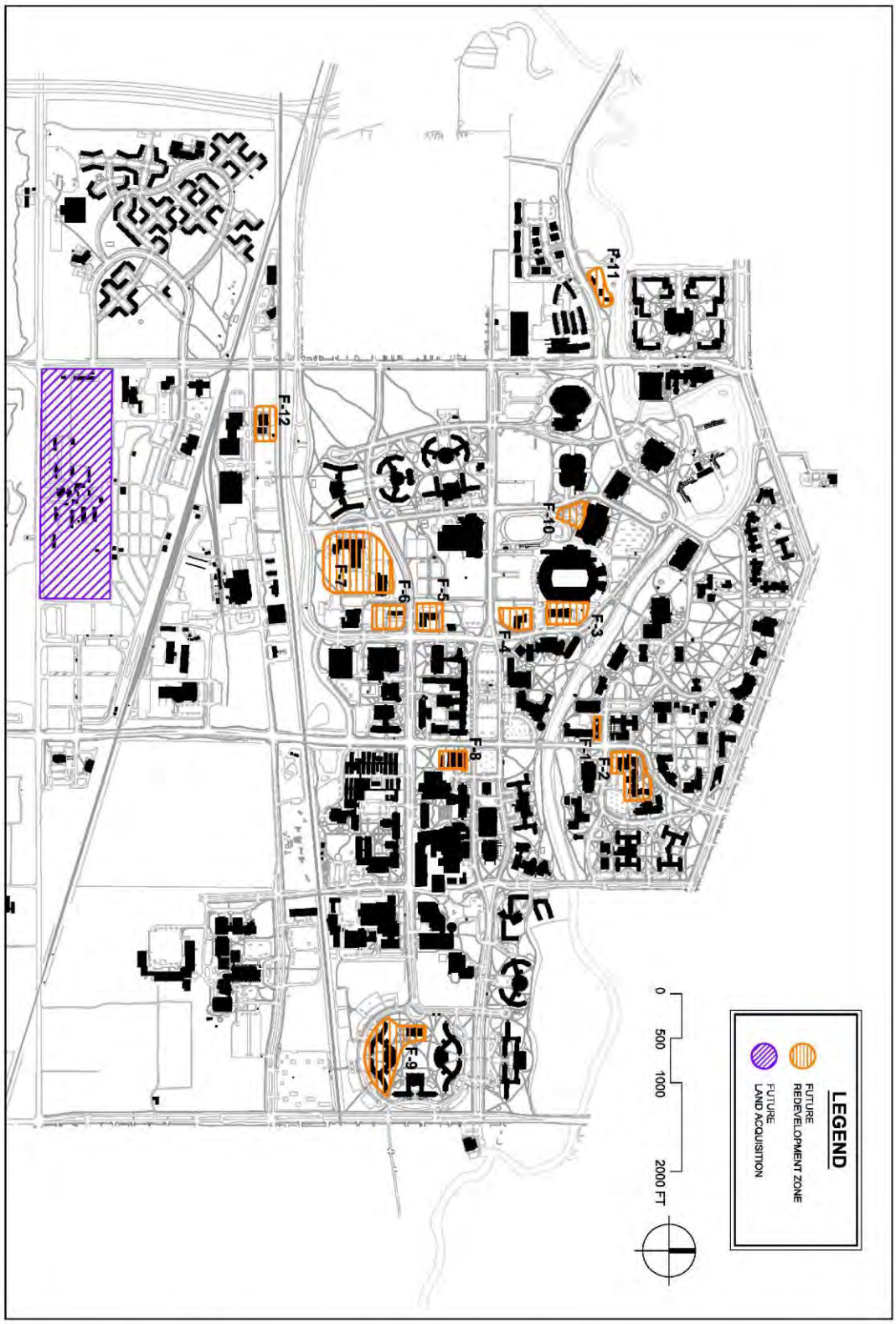
100-YEAR FLOODPLAIN AND STORM WATER MANAGEMENT

Campus land is reserved to provide future storm water management facilities that will address municipal storm water regulations under the Clean Water Act. Individual building projects are evaluated by the University Engineer and a technical work group to assess its ability to meet current storm water management regulations on site. If a project cannot meet its requirements on site, due to existing development constraints or other unique project attributes, then the University has the option of utilizing a sub watershed facility in another location on campus per Michigan Department of Environmental Quality agreements.

Two important Campus Land Use Master Plan recommendations will help reduce the impact on the Red Cedar River. First, the removal/relocation of Parking Ramp #2 (Auditorium Road) will convert a sizeable amount of land back to its function as floodplain. Second, the removal and relocation of approximately 1,000 surface parking spaces in the Central Academic District will remove an existing land use that has negative impacts both in terms of storm water quantity and quality.



1 OF 1	CAPITAL PROJ. NO.	BUILDING FRAMEWORK	MICHIGAN STATE UNIVERSITY | Infrastructure Planning and Facilities



MAJOR REDEVELOPMENT OPPORTUNITIES

MICHIGAN STATE UNIVERSITY | Infrastructure Planning and Facilities

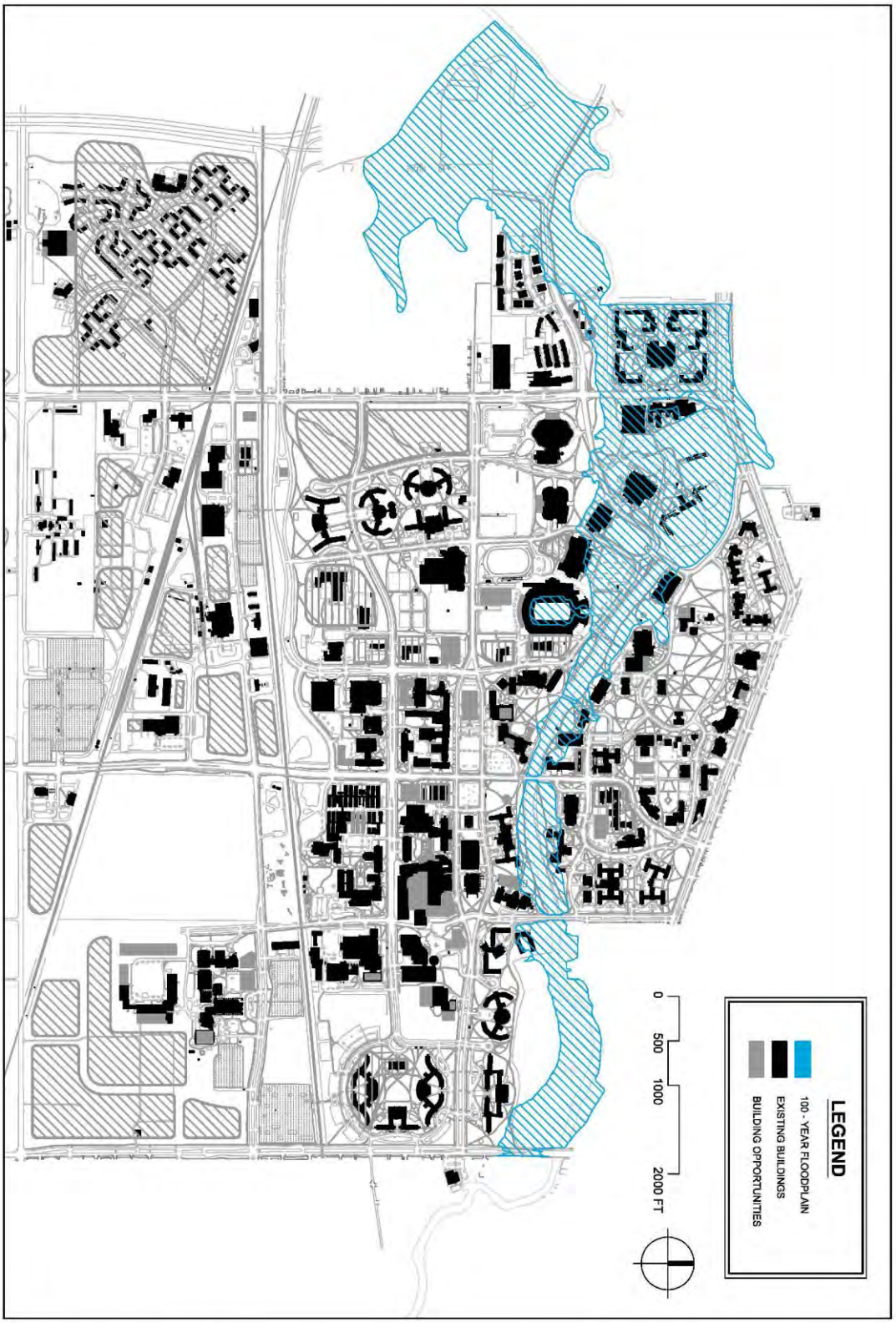
Campus Master Plan - Update 2016
Building Opportunity Framework Plan
Updated 12/19/2016

District	#	Project	Estimated Envelope	Proposed Envelope Utilization (%)	Potential Footprint	Footprint Demolition	Proposed Height	Potential GSF	GSF Demolition	GSF Net New	Notes
NORTH ACADEMIC DISTRICT											
A	1	College of Music Addition	14,200	0.75	10,650		4	53,250		53,250	Restrict buildings from Adams Field
N	2	Library Addition	8,400	1	8,400		4	42,000		42,000	
N	3	Human Ecology Expansion	7,700	1	7,700		4	38,500		38,500	
N	4	New Academic Building	22,000	0.8	17,600		4	88,000		88,000	
N	5	Parking Garage	34,000	0.9	30,600		6	183,600		183,600	750 spaces approx.
F	1	Bessey Hall Office Wing Redevelopment	20,000	1	20,000	-20,000	4	100,000	-60,000	40,000	Demolish Bessey Hall north wing
F	2	New Academic Building	170,000	0.4	68,000	-55,974	4	340,000	-253,010	86,990	Demolish Giltner Hall
		District Subtotal			**162,950**			**845,350**		**532,340**	
CENTRAL ACADEMIC DISTRICT											
C	1	Parking Garage	63,000	0.9	56,700		6	340,200		340,200	1100 spaces approx.
C	2	International Center Vert. Expansion	10,000	1	10,000		1	10,000		10,000	
C	3	New Academic Building	53,000	0.75	39,750		6	278,250		278,250	
C	4	Engineering Addition	34,000	0.75	25,500		6	178,500		178,500	
C	5	Erickson Office Vertical Expansion	8,800	1	8,800		2	17,600		17,600	
C	6	Erickson Front Vertical Expansion	7,000	1	7,000		2	14,000		14,000	
C	7	Natural Resources Addition	24,000	0.9	21,600		6	151,200		151,200	
C	8	Special Feature	6,000	1	6,000		1	6,000		6,000	Possible amphitheater/stage
C	9	New Academic Building	38,000	0.75	28,500		6	199,500		199,500	
C	10	Chemistry Additions (East & West)	7,500	1	7,500		6	52,500		52,500	
C	11	Greenhouse Expansion	28,000	1	28,000		1	28,000		28,000	
C	12	Business College Graduate Pavilion	24,000	1	24,000		4	96,000		96,000	Per LMN program
C	13	FRIB Expansion	123,037	1	123,037		2	261,365		261,365	Per B. Bull
C	14	New Academic Building	32,000	0.75	24,000		6	168,000		168,000	
C	15	Veterinary Oncology Vert. Expansion	17,500	0.9	15,750		2	31,500		31,500	
F	3	New Redevelopment Zone	107,000	0.25	26,750	-22,922	1	275,000	-70,035	204,965	Demolish Central Service, per HOK study
F	4	Shaw Power Plant Redevelopment	80,000	0.25	20,000	-13,234	6	140,000	-40,661	99,339	Repurpose or demolish existing plant
F	5	New Academic Building	87,000	0.25	21,750	-18,634	6	152,250	-47,013	105,237	Demolish existing UPLA building
F	6	New Academic Building	93,000	0.25	23,250	-6,700	6	162,750	-19,896	142,854	Demolish Oyer Speech and Hearing
F	7	New Academic Zone	482,000	0.25	120,500	-88,371	6	723,000	-131,298	591,702	Demo IPF and LS
F	8	New Academic Building	61,000	0.75	45,750	-47,352	6	274,500	-81,629	192,871	Demolish Farrall Hall and Storage Building
		District Subtotal			**684,137**			**3,560,115**		**3,169,583**	
SOUTH ACADEMIC DISTRICT											
S	1	Life Science Addition	23,000	0.9	20,700		6	144,900		144,900	
S	2	New Academic Building	76,000	0.75	57,000		2	171,000		171,000	Assume two-story or high-bay massing
S	3	New Academic Building	33,000	0.75	24,750		6	173,250		173,250	
S	4	Radiology Vertical Expansion	30,000	1	30,000		1	30,000		30,000	
S	5	New Academic Zone	912,000	0.75	228,000		1	684,000		684,000	Assume FAR @ 0.75 with surface parking
S	6	New Academic Zone	300,000	0.75	75,000		1	225,000		225,000	Assume FAR @ 0.75 with surface parking
S	7	New Academic Zone	234,000	0.75	58,500		1	175,500		175,500	Assume FAR @ 0.75 with surface parking
S	8	New Academic Zone	1,085,000	0.75	271,250	-3,724	1	813,750	-9,214	804,536	Assume FAR @ 0.75, remove misc. structures
S	9	Automotive Research Addition	21,000	0.9	18,900		1	18,900		18,900	No basement
S	10	Fraunhofer Addition	34,000	0.9	30,600		1	30,600		30,600	No basement
		District Subtotal			**814,700**			**2,466,900**		**2,457,686**	
RESIDENTIAL DISTRICT EAST											
R	1	IM East Vertical Expansion	4,000	1	4,000		1	4,000		4,000	
R	2	IM East Additions	42,000	0.75	31,500		3	126,000		126,000	
F	9	Fee Hall Redevelopment	293,000	0.25	73,250	-94,055	6	512,750	-411,168	101,582	Demo Conrad and Fee Hall
		District Subtotal			**108,750**			**642,750**		**231,582**	
MIXED USE DISTRICT											
W	1	New Mixed use	618,000	0.75	tbd		1	463,500		463,500	Assume FAR @ 0.75 with surface parking
W	2	New Mixed use	447,000	0.75	tbd		1	335,250		335,250	Assume FAR @ 0.75 with surface parking
W	3	Visitor Center Expansion	8,000	0.9	7,200		1	7,200		7,200	No basement
W	4	New Mixed Use	4,940,000	0.75	tbd	-396,132	1	3,705,000	-793,857	2,911,143	Assume FAR @ 0.75, demo apts.
W	5	Tennis Center Addition	28,000	1	28,000		1	28,000		28,000	No basement
F	11	Demolition Zone	63,000	0.5	0	-8,149	0	0	-11,203	-11,203	Flood plain limitations, no basement
		District Subtotal			**35,200**			**4,538,950**		**3,733,890**	
ATHLETIC AND RECREATION DISTRICT											
A	1	Munn Addition	25,000	1	25,000		2	50,000		50,000	Per athletic's program
A	2	Parking Garage	62,000	0.9	55,800		6	334,800		334,800	1,000 spaces approx.
A	3	South Stadium Addition	35,000	1	35,000		1	35,000		35,000	Per athletic's program
A	4	Breslin Addition	10,000	1	10,000		1	10,000		10,000	
F	10	IM West Expansion/Renovation	63,000	0.75	47,250		2	94,500		94,500	Expansion of IM West
		District Subtotal			**173,050**			**524,300**		**524,300**	
SERVICE DISTRICT											
SD	1	New Support Building	14,000	0.85	11,900		4	59,500		59,500	
SD	2	Simon Power Plant Addition	138,000	0.75	103,500		1	103,500		103,500	
SD	3	Future Development Zone	142,000	0.35	49,700	-4,620	1	49,700	-4,872	44,828	Assume FAR @ 0.35, demo misc. structures
SD	4	Future Development Zone	260,000	0.35	91,000		1	91,000		91,000	Assume FAR @ 0.35
SD	5	Future Development Zone	125,000	0.35	43,750		1	43,750		43,750	Assume FAR @ 0.35
SD	6	Future Development Zone	396,000	0.35	138,600		1	138,600		138,600	Assume FAR @ 0.35
SD	7	Future Development Zone	350,000	0.35	122,500		1	122,500		122,500	Assume FAR @ 0.35
SD	8	Future Development Zone	232,000	0.35	81,200	-4,778	1	81,200	-4,786	76,414	Assume FAR @ 0.35, demo misc. structures
SD	9	Data Center	181,000	0.35	63,350	-1,207	1	63,350	-1,207	62,143	Assume FAR @ 0.35, demo misc. structures
SD	10	Future Development Zone	24,000	0.75	18,000		4	72,000		72,000	
SD	11	Recycling Center Addition	10,000	1	10,000		1	10,000		10,000	
F	12	New Academic Zone	89,000	0.75	66,750	-17,792	1	66,750	-17,842	48,908	Assume FAR @ 0.75, demolition of housing office
		District Subtotal			**800,250**			**901,850**		**873,143**	
		TOTAL GSF			**2,779,037**			**13,480,215**		**11,522,524**	

Key:

Academic / Research
Athletic / Intramural
University Support
Mixed Use / Residential
Parking
Common Facilities
Solar
Stormwater Management
Future Redevelopment Opportunities

Potential building GSF includes above ground stories as indicated plus basement unless indicated.



100 - YEAR FLOODPLAIN

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OPEN SPACE AND LANDSCAPE

THE CAMPUS AS AN ARBORETUM

In 1980, President John A. Hannah remarked, *"Long ago it was planned that the campus should be an outdoor laboratory, with all the variety of trees, shrubs, and woody plants that could be made to grow in Michigan, labeled and tagged not only for students in botany and silviculture and landscape architecture, but for all students and faculty and people in the community."*

President Hannah was reflecting on Professor William Beal's 1872 proposal for a campus arboretum. Professor Beal hoped this would lead to a more formalized campus tree planting program. At the time, trees were grown in an arboretum located between what are today, Mary Mayo and Campbell Halls; from there they were transplanted across campus. Professor Beal conducted the first inventory of campus trees in the 1880's and began the labeling program identifying trees by common name, scientific name, family, and geographic origin, a program which continues today (Telewski 2010). As envisioned by Professor Beal, the campus arboretum serves as a valuable resource for teaching, research, and outreach.

The MSU campus is renowned and beloved by students, faculty, staff, alumni, and visitors. As such, detailed recommendations are required to protect and enhance its open space and landscape aesthetic while maintaining an appropriate balance with the evolving built environment.

The Campus Land Use Master Plan provides a unifying vision for the campus open space and landscape aesthetic. The plan directs stewardship and preservation of the historic campus park and guides future enhancement of the built environment, including the campus as an arboretum for teaching, research, and public outreach.

PROTECTED GREEN SPACE

Based on a detailed classification for the open space system, the following areas are deemed sensitive to development and are subject to protection from any new building footprint or material change to the campus landscape under the definitions and regulations of the University Zoning Ordinance.

Component 1 areas identify and protect landscape areas that have an ecological or historic aspect. *Component 2* areas identify and protect green space that provides a unique programmatic or research land use.

DISTRICT CHARACTERISTICS AND PLANNING GUIDELINES

Historic and Historic Contributing

The park-like setting that students, alumni, and visitors endear is directly influenced by the historic campus landscape(s). The West Circle Drive area from Grand River Avenue to the Red Cedar River and from the Beal Entrance to the Lab Row building group is the site of the

original built campus founded in 1855. The prairie-style landscape and informal grouping of buildings provides a picturesque campus park, unique among American college campuses. The trees and undulating lawns within the West Circle Drive area were recognized by O.C. Simonds as "sacred space" (circa 1905). The historic landscape shall be protected from future development and enhanced through landscape stewardship.

Park-Like Academic

The academic districts of campus, comprised of a diverse collection of trees and shrubs, lend themselves to supporting teaching, research, and student life activities.

The Prairie School patterning of "sun openings" is prevalent in the North Academic District. This concept consists of creating alternating areas of deep shade and sunlit lawns that are reminiscent of the indigenous savannah that once covered much of the northern Midwest. The trees and undulating lawns within the Circle Campus area were recognized by O.C. Simonds as "sacred space" (circa 1905) and remain so today.

The extensive roadway network and large building massing within the Central Academic District creates an intensive built aesthetic that requires substantial landscape interventions to mitigate for human comfort. Much of what a pedestrian perceives is strongly influenced by the adjacent roadways and architectural design. Therefore, a strong streetscape and front-yard landscape is essential to mitigate these elements and to properly transition the landscape scale from the roadway to the building entrances. Special focus should be on safety and providing a pleasant experience and sense of scale along pedestrian walkways.

The South Academic District is defined by large architectural structures that collectively do not provide a sense of place or a pleasant relationship with the pedestrian realm. This requires that the landscape mitigate for this poor composition; creating a comfortable pedestrian environment. The landscape needs to be strengthened to better unify the visual aesthetic and to provide places for social interaction, academic collaboration, and personal health/relaxation.

Park-Like Residential

Approximately 17,500 students call the University's seven residential neighborhoods home. The landscape design for the neighborhoods must address a wide variety of issues including: scale transition, screening of service functions, providing room for informal recreation, and more intimate areas for relaxation and mental restoration. Transitioning the scale from large roadway spaces to more intimate building entrances is important in the front yards. Recreational amenities and areas for personal relaxation are appropriate in the back yards.

Park-Like Service

The Campus Land Use Master Plan strategizes consolidating support services south of the Canadian Northern railroad tracks. The landscape should reinforce this area as a vital part of the overall campus, while acknowledging its purpose and functionality.

Athletic and Recreation

Intercollegiate athletics and intramural recreation activities require a landscape capable of handling large volumes of people, heavy foot traffic, and various activities that can stress the landscape (e.g., event parking on intramural fields). While the venues themselves require a very utilitarian design, this must be balanced with the fact that they are also gateways for thousands of visitors each year, and as such, must present a high quality aesthetic that properly represents the University along with mitigating for each venue's architectural scale.

River Corridor

The Red Cedar River is an iconic campus element that is a core attribute of the campus park. It is an active natural system that is constantly impacting the campus landscape. A large collection of ash trees inhabit the river corridor and with the ongoing destruction by the Emerald Ash Borer, most of these will not survive. The University needs to invest in the river corridor from a historic, cultural, aesthetic, and environmental perspective.

Signature Landscapes

Signature landscapes are focal points throughout the campus. They vary in size and purpose; are associated with a heightened design aesthetic; utilize high-quality materials; are often associated with public art, fountains, or historic features; include irrigation; and, demand elevated maintenance standards and practices. They are important for encouraging community interaction and can be considered as eddies within the larger campus park wherein people can slow down and enjoy a more intimate sense of scale. Signature landscapes require either priority or elite maintenance levels.

Gardens and Arboreta

These areas are delineated and overseen by a curator or established administrative group. They are actively designed, planted, and managed - not naturalized. A primary goal for the use of these areas is education and research with elite maintenance required to sustain the integrity of the plantings and collections.

Natural Areas

The natural areas are designated by Board of Trustee action and are overseen by the Campus Natural Areas Committee. They are classified into three categories of protection and academic use based on their overall quality and their potential for sustained use. They serve as protected examples of Michigan's native landscape and wildlife.

Conservation and Demonstration

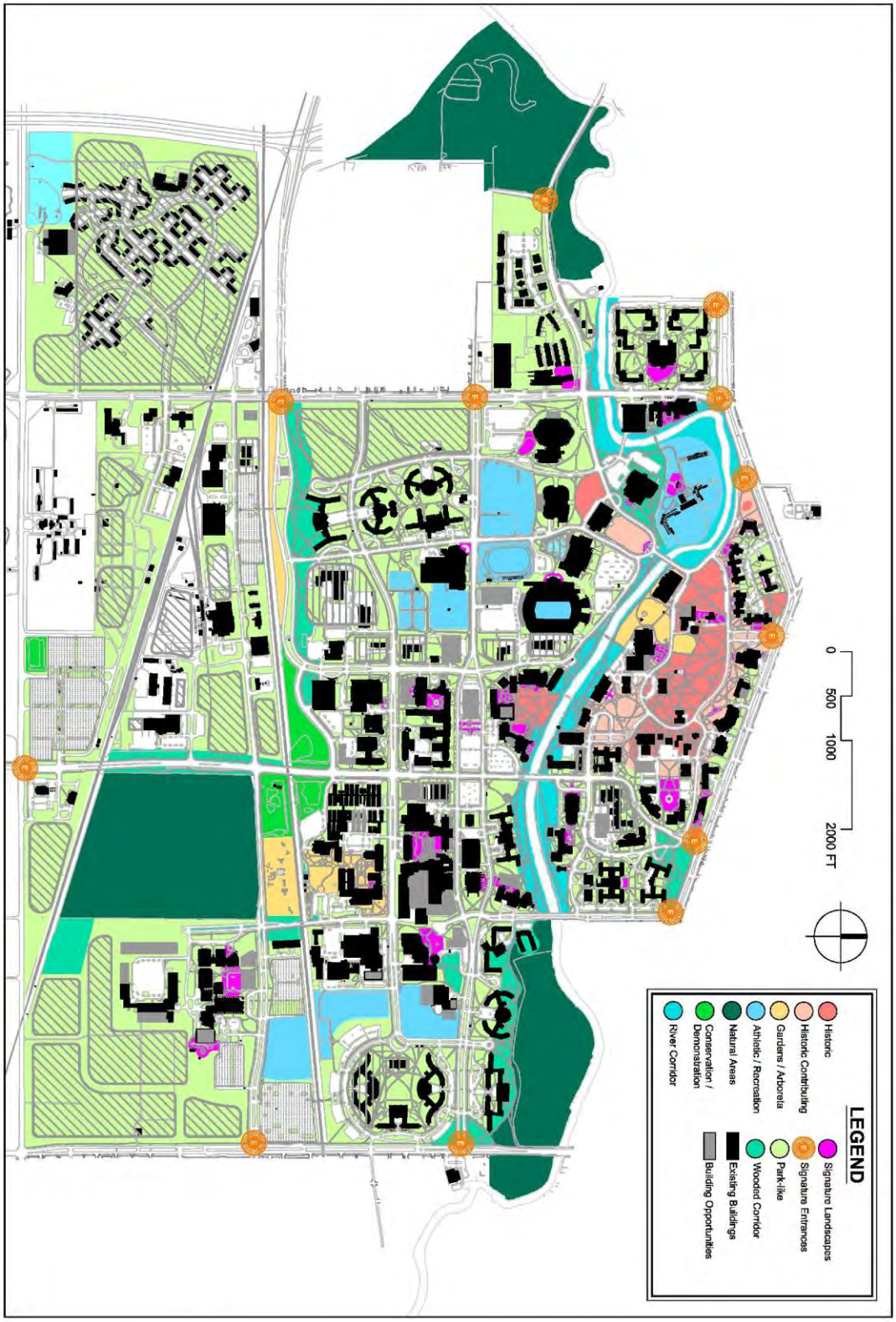
Conservation and demonstration areas are built landscapes for the purpose of storm water management, education, and research. They are actively designed, planted, and managed, requiring a moderate amount of maintenance to ensure integrity of the plantings and operation of the storm water management features.

Campus Entrances

Campus Entrances (vehicular and pedestrian) provide an opportunity to strengthen the University's image and reinforce its reputation for excellence. High quality landscape design and maintenance practices (elite and priority) are required. Consistent signage and a homogeneous landscape treatment are desirable for assisting visitor wayfinding and the efficient movement of goods and services.

Streetscapes

The campus roadway system provides approximately 18 miles of opportunity to establish a quality image for the University. The streetscape (the landscape setting adjacent to the road) must address numerous design issues, including safety, image, environmental sustainability, and wayfinding all within what is often a harsh growing condition.



OPEN SPACE FRAMEWORK

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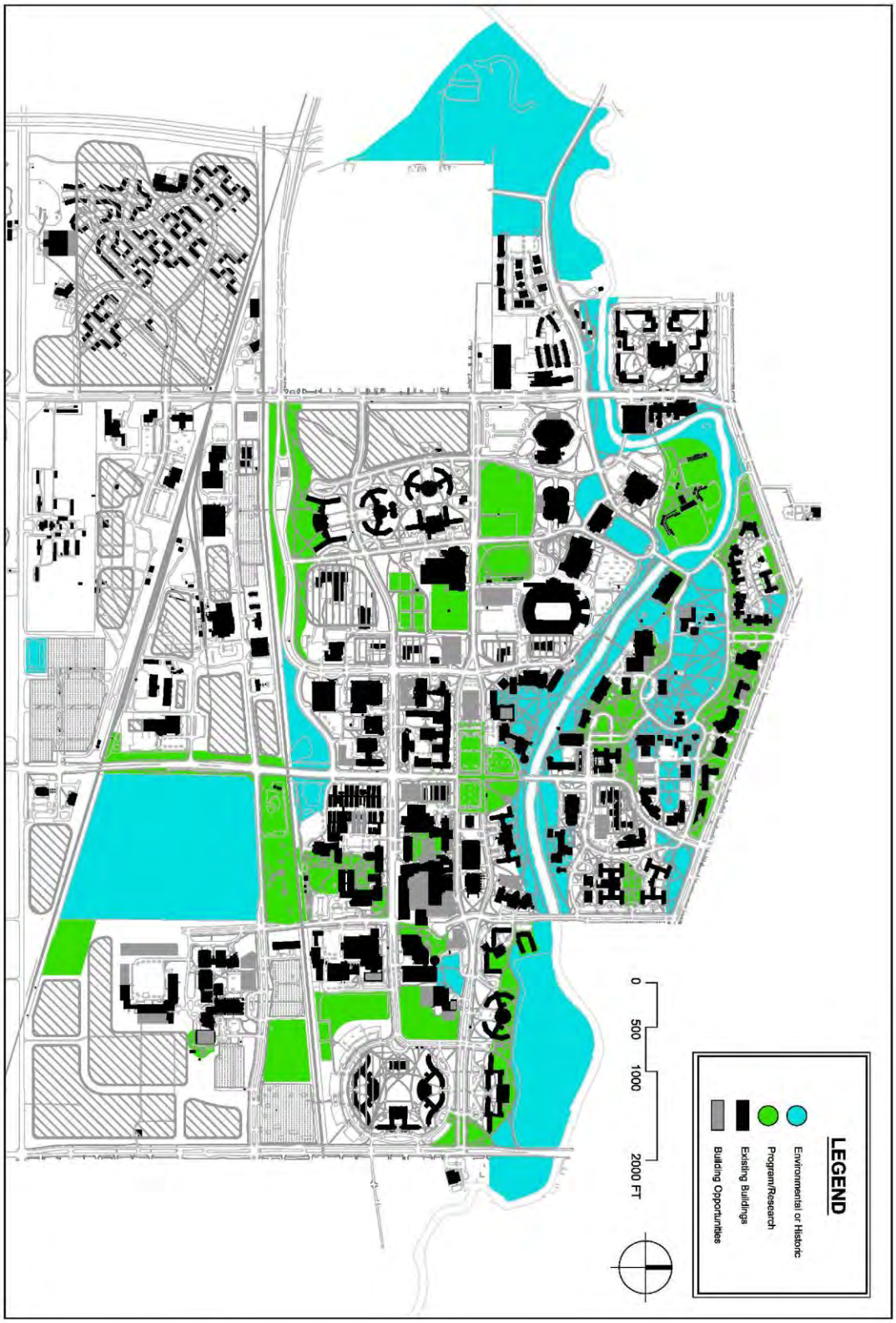

PROTECTED GREEN SPACE

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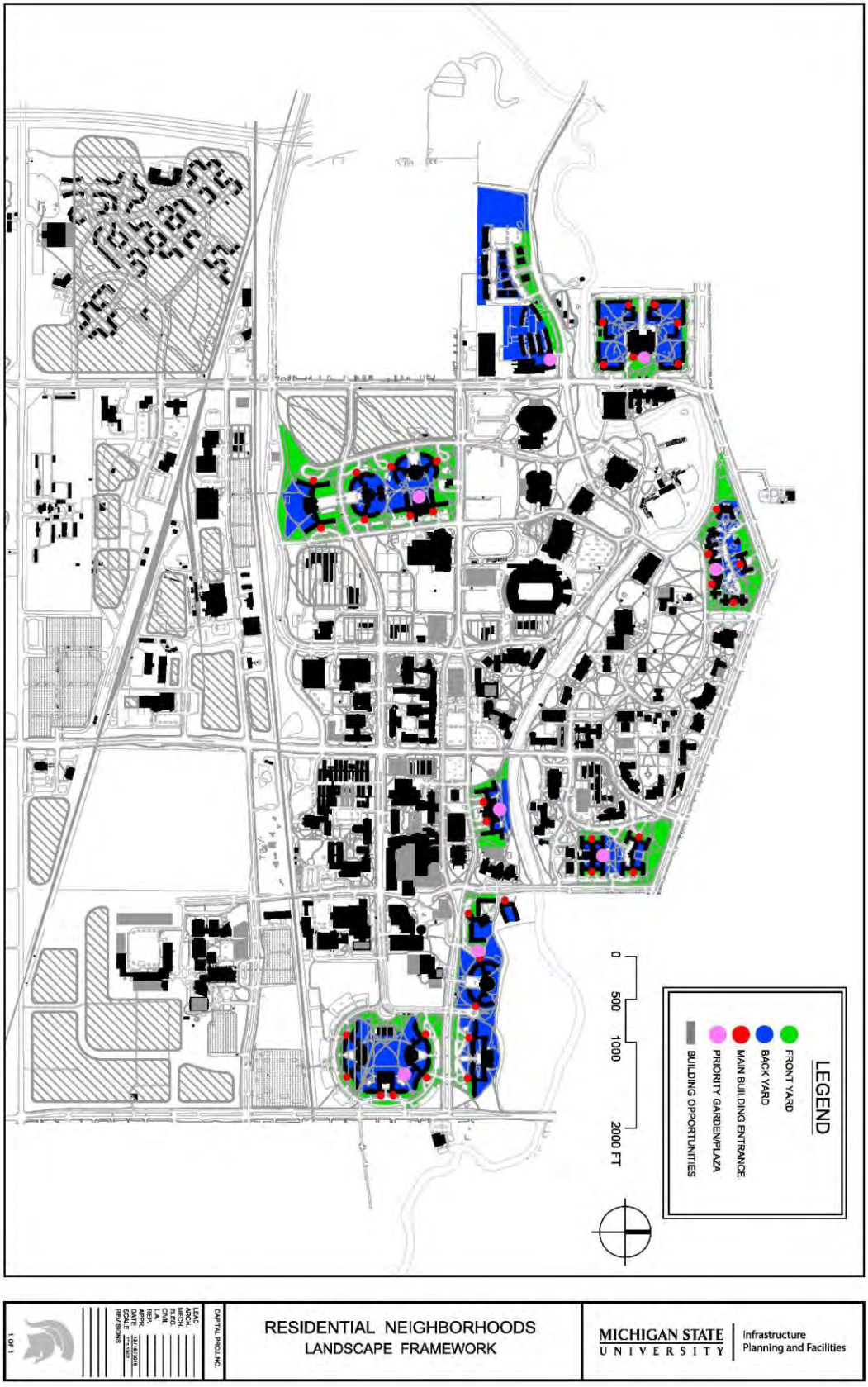

LEGEND
FRONT YARD
BACK YARD
MAIN BUILDING ENTRANCE
PRIORITY GARDEN/PLAZA
BUILDING OPPORTUNITIES
0
500
1000
2000 FT
RESIDENTIAL NEIGHBORHOODS
LANDSCAPE FRAMEWORK
MICHIGAN STATE UNIVERSITY
Infrastructure Planning and Facilities

MOTORIZED CIRCULATION FRAMEWORK

NEAR-TERM PRIORITIES

The following motorized projects and initiatives are anticipated in the near term (five- to ten-year planning horizon).

- Develop a comprehensive mobility plan that addresses the movement of people to, from, and around campus.
- Extend Wilson Road to Hagadorn Road with the goal of improving safety by reducing traffic within the East Residential District, relocating parking adjacent to Fee Hall, and providing a signalized intersection to aid pedestrians crossing Hagadorn Road.
- Remove Parking Ramp #2 when engineering analysis directs and restore the river floodplain. Address parking replacement consistent with the mobility plan (under development) and planning principles guiding more parking on the campus periphery.

LONGER-TERM OPPORTUNITIES

The following projects should be considered in long-range planning to address various motorized circulation issues.

- Redesign the Farm Lane and Grand River intersection including a new traffic signal at East Circle Drive to improve operational efficiency and safety.
- Reconstruct the section of Farm Lane between North and South Shaw Lane to provide appropriate vehicular turning movements and bike lanes.
- Extend Bogue Street through the South Academic District as a two-lane roadway with center-turn lane as required.
- Redesign the Bogue Street and Service Road intersection, removing the awkward transition from the boulevard cross section.
- Extend East Crescent Road through the former Agriculture Exposition site.
- Reconfigure Red Cedar Road to provide greater distance from the Kalamazoo and Beal Streets intersection.
- Close the segment of North Shaw Lane between Red Cedar and Science Roads to private automobile traffic, change South Shaw Lane into a two-way street, and relocate surface parking.

NON-MOTORIZED CIRCULATION

NEAR-TERM PRIORITIES

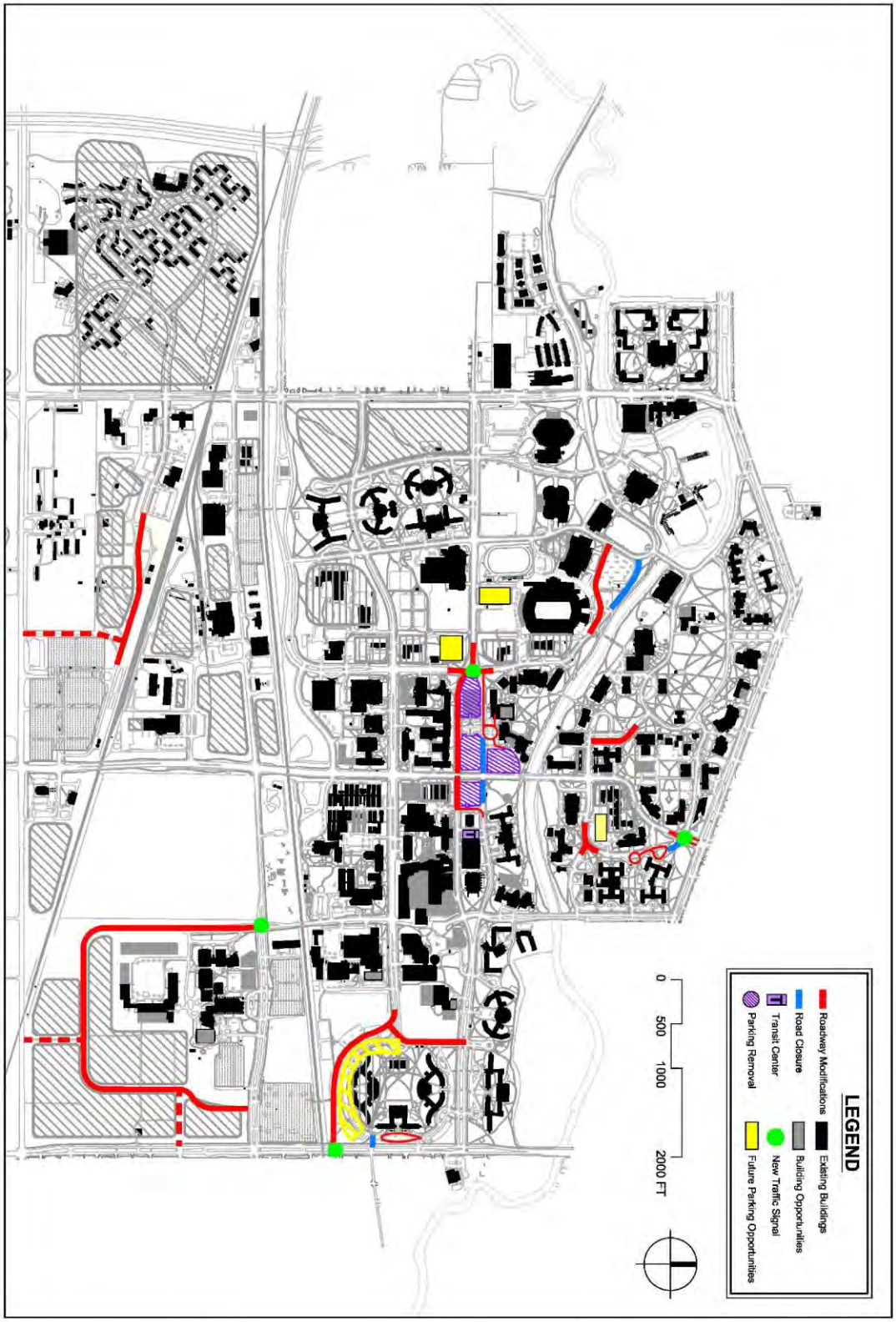
The following non-motorized projects and initiatives are anticipated in the near term (five- to ten-year planning horizon).

- Continue to design all roadways as complete streets in accordance with State of Michigan Public Acts 134 and 135 of 2010 wherein all roadways are to be planned and designed to meet the needs of all legal users.
- Continue to meet the needs of persons with disabilities working through the Accessibility Committee that includes IPF, FPSM, RCPD, RHS, and athletics.
- Continue bringing crosswalk pathway ramps up to ADA standards (e.g., maximum slopes, truncated domes).
- Provide infrastructure to support a suite of transportation options that discourage single-occupancy vehicle trips to, from, and around campus (e.g., CATA Clean Commute and Zipcar car-sharing programs) in alignment with the mobility plan.
- Fund and construct the final segments of the MSU River Trail.
- Enhance and expand bicycle parking within the academic and residential districts with a goal to accommodate 30% of the resident population.

LONGER-TERM OPPORTUNITIES

The following projects should be considered in long-range planning to address various non-motorized circulation issues.

- Study and implement site improvements at the southwest corner of Chestnut Road and Shaw Lane to curtail existing J-walking and to enhance pedestrian safety.
- Convert dirt-worn paths to permanent walkways.
- Continue working with the City of Lansing, City of East Lansing, and Meridian Township on interconnecting campus and municipal trail systems.
- Construct an accessible route from Bessey Hall under the Farm Lane Bridge to Auditorium Field.
- Continue working with the City of East Lansing on reconstructing the Bogue Street bridge over the river and incorporating the MSU River Trail along the river and east of Van Hoosen Hall.
- Develop a system of sidewalk shared-use pathways along major bicycle travel routes not adjacent to roadways.
- Establish a pedestrian and bicycle pathway along with the North Shaw Lane road closure between Red Cedar Road and Science Drive.
- Consider protected bike lanes where enhanced safety is required.



MOTORIZED
CIRCULATION FRAMEWORK

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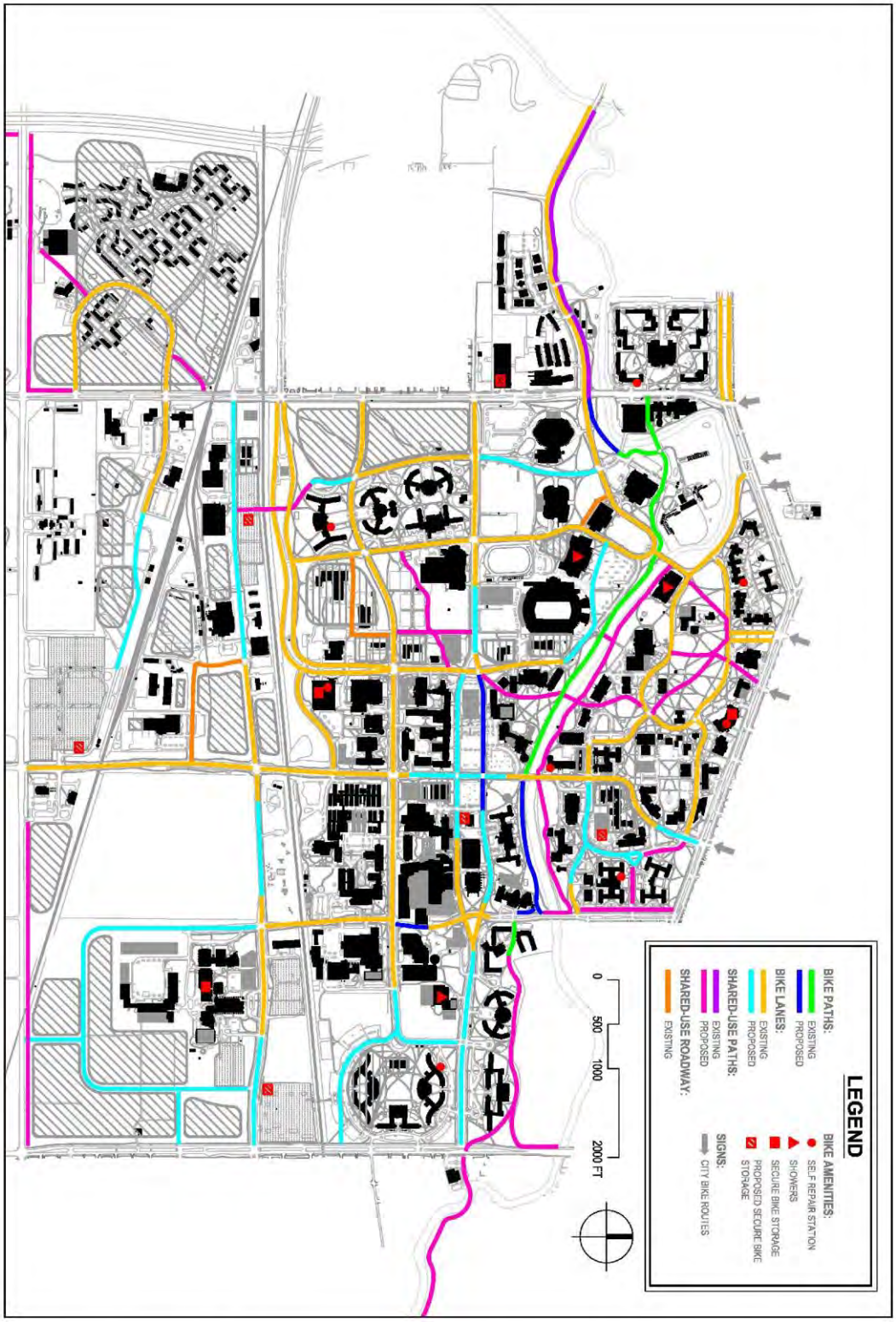

NON - MOTORIZED CIRCULATION FRAMEWORK

MICHIGAN STATE UNIVERSITY | Infrastructure Planning and Facilities

MICHIGAN STATE UNIVERSITY ZONING ORDINANCE

CERTIFICATION

I HEREBY CERTIFY that the following Act to Codify Regulations Affecting Campus Planning, Designating Land Area Uses, Establishing a Campus Land Use Master Plan, and Providing for the Administration Thereof, for the Benefit and Protection of the Property of the Board of Trustees of Michigan State University, was passed by the Board of Trustees at a meeting duly called and held at East Lansing, Michigan, on the seventeenth day of February, 2017, at which a quorum was present and voted.

_____

Bill Beekman, Vice President and Secretary of the Board of Trustees

Dated: April 19, 1968

Revision Date: February 17, 2017

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AN ACT TO CODIFY REGULATIONS AFFECTING CAMPUS PLANNING, DESIGNATING LAND AREA USES, ESTABLISHING A MASTER PLAN, AND PROVIDING FOR THE ADMINISTRATION THEREOF, FOR THE BENEFIT AND PROTECTION OF THE PROPERTY OF THE BOARD OF TRUSTEES OF MICHIGAN STATE UNIVERSITY, PURSUANT TO AUTHORITY CONFERRED BY THE CONSTITUTION AND STATUTES OF THE STATE OF MICHIGAN.

1.00 - STATEMENT OF PURPOSE

1.1 The Board of Trustees of Michigan State University believes that regulations are essential to preserve the campus environment of spaciousness and landscape beauty, promote order and unity, and minimize congestion on the property governed by the Board, and to provide guidelines affecting the improvement thereof, the Board hereby adopts the following provisions:

2.00 - EFFECTIVENESS OF ORDINANCE

2.1 This ordinance became effective at 12:01 a.m. September 1, 1968. This Ordinance is coordinated with and becomes an integral part of the Campus Land Use Master Plan and all updates.

3.00 – AUTHORITY OF BOARD OF TRUSTEES

3.1 This ordinance is enacted by the Board of Trustees of Michigan State University pursuant to, and in accordance with, the authority and responsibility of said Board contained in the Constitution of the State of Michigan and Public Acts relating thereto.

4.00 – DEFINITIONS

4.1 The term “institution” pertains specifically to Michigan State University at East Lansing, Michigan.

4.2 The term “academic use” encompasses any building or portion thereof that is used for the teaching of classes, research facilities and administrative and operational facilities, or any similar function and use for the educational and research purposes of the institution.

4.3 The term “building” refers to principal-use and accessory structures, and all attached architectural elements including stairs, areaways, ramps, and retaining walls that are integral to the design and function of the building.

4.4 The term “accessory building” includes a subordinate building or portion of a main building, located within the same block or district, which is secondary in nature to the principal use.

4.5 The term “accessory use” refers to a use that is subordinate to the principal use within the same block or district, comprising purposes secondary in nature to those of the principal use.

4.6 The term “ground area of a block” includes all land from the centerline of adjacent streets and roads or abutting use area established by description on the Zoning District Map. Such lines may be established by curb lines, section lines, institution property lines, other property lines, or those lines as shown and described on the Zoning District Map which is a part of this ordinance.

4.7 The term “curb line” is defined by the back of curb on either side of a road that is used for the general movement of motor vehicles, and encompasses those existing or extended, but does not include the curb line of parking bays, bus turnouts or similar variations. If no curb exists, the location of a proposed curb will be considered as the curb line. All setbacks are measured from the back of curb.

4.8 The term “nearest roadway” means that road which lies nearest any side of a building that is used for the general movement of motor vehicles, and does not include service drives or related variations thereof.

4.9 The term “non-conforming use” includes any building or land occupied and used at the time of the original adoption of this zoning ordinance which use does not conform with the use regulations established therefore.

4.10 The term “coverage” refers to the amount of ground area covered by buildings within a specified block of land defined by the adjacent roadway centerlines.

4.11 The term “protected green space” includes any land area essentially kept in an open lawn, wooded or landscaped condition, that is free of parking and buildings, and reserved for the general use and enjoyment by students, faculty, staff, alumni, and the general public. Protected green space areas may include recreation fields, walkways, bicycle paths, bicycle parking, bridges, sculpture, pavilions, amphitheaters and other related structures that are compatible with the purpose of these areas.

4.12 The term “service use” refers to any building or land area that is primarily involved with utility services and functions, and other accessory uses essential to the operation of the institution.

4.13 The terms “story” and “story height” refer to that portion of a building that is included between the surface of any floor and the surface of the next floor above it.

4.14 The term “setback” refers to the dimension between a building and the adjacent roadway curb line.

4.15 The terms “footprint” and “footprint change” refers to existing buildings or the modification of any existing building’s footprint.

4.16 The term “material change to the campus landscape” refers to all new buildings. It also refers to new constructed site features deemed of significant impact to the campus landscape by the Zoning Administrator.

5.00 - GENERAL REGULATIONS

5.1 Footprint Change: The modification of any existing building footprint requires BOT review.

5.2 Material Change to the Campus Landscape: All new buildings require BOT review. Any non-building project that has a significant impact on the campus landscape, and not already covered by the BOT project authorization process, will be identified by the Zoning Administrator and referred to the Vice President and Secretary of the Board of Trustees for clarification regarding the need for BOT action.

5.3 Districts Established: In order to regulate and restrict the location of buildings and other structures erected or altered for specified uses, the campus is hereby divided into the following Zoning Districts:

AC-N	North Academic District
AC-C	Central Academic District
AC-S	South Academic District
R	Residential District
AR	Athletic and Recreation District
SE	Service District
N	Natural Areas District
AG	Agricultural and Natural Resources District
MU-N	North Mixed Use District
MU-S	South Mixed Use District

5.4 Area Boundaries: The boundaries of Zoning Districts are established on the Zoning District Map attached hereunto and made a part hereof, and all notations, references, and other descriptions contained thereon are made a part of this ordinance.

5.5 Compliance: Except as herein provided, no land shall be used, and no building shall be erected, converted, enlarged, reconstructed, or substantially altered, which does not comply with the district regulations established by this ordinance for the district in which the building or land is located.

5.6 Essential Utility Services: Structures required in conjunction with the distribution and maintenance of essential utility services may be permitted in any location when approved by the Zoning Administrator (refer to Section 7.0 Administration), who shall submit a determination of necessity to the Vice President and Secretary of the Board of Trustees for clarification regarding the need for BOT action.

5.7 Except as provided herein, no buildings, roads or parking spaces shall be located in the Protected Green Space areas designated within the Zoning Districts as shown on the Protected Green Space map. The design of all elements proposed within the protected areas shall be approved by the Zoning Administrator. Such elements include walkways, bridges, sculpture, pavilions, amphitheaters, bicycle storage, essential utility services, storm water management features, and modifications to pre-existing disallowed elements such as parking lots, roads, and service drives. Expansion of existing buildings that abut Protected Green Space areas requires approval from the Zoning Administrator and shall be allowed only when other alternatives are proven to be unreasonable and when the expansion will only cause a minor change in the character of the Protected Green Space.

6.00 - DISTRICT REGULATIONS

6.1 "AC" Academic Districts: The following provisions shall apply to the Academic Districts AC-N, AC-C, and AC-S:

6.1.1 Permitted Uses: Permitted Uses for the AC Districts shall include the following Principal and Accessory Uses. All uses not listed are not permitted in the AC Districts unless otherwise provided for in this ordinance:

6.1.1.1 Principal Uses and Buildings:

- Teaching facilities, including classrooms, lecture halls, instructional laboratories, and similar facilities used for general educational purposes.
- Research laboratories, general student facilities other than student housing, faculty offices, public/private business incubators, and facilities for administrative and operational functions.

6.1.1.2 Accessory Uses and Buildings:

- Surface parking and parking garages.
- Uses and structures necessary for the operation of the principal uses and buildings.
- Recreation fields and buildings.
- Solar or wind power generation and storage.

6.1.2 Building Height Requirements:

6.1.2.1 All buildings shall be limited to six stories of occupied space plus any required rooftop equipment in Districts AC-C and AC-S, and to four stories of occupied space plus any required rooftop equipment in AC-N.

6.1.2.2 Teaching facilities shall be located in the lowest floors possible, and not above the fourth floor of any building.

6.1.2.3 Parking garages shall be limited to six parking levels above and including the ground level.

6.1.2.4 Accessory buildings shall be no higher than necessary to accommodate the proposed use, and under no circumstances shall exceed the height of principal uses in the district.

6.1.3 Set Back Requirements: All buildings shall be set back a minimum of 40 feet from the nearest curb line of the nearest roadway.

6.1.4 Building Coverage:

6.1.4.1 Buildings shall not cover more than 30% of the ground area of any given block within the AC District unless otherwise specified herein.

6.1.4.2 Buildings shall not cover more than 35% of the ground area of any given block within the specific area defined by Red Cedar Road to the west, the CN Railroad to the south, the Residential District to the east, and South Shaw Lane to the north unless otherwise specified herein.

6.1.4.3 Buildings shall not cover more than 42% of the ground area for the block of land defined by South Shaw Lane to the north, Farm Lane to the west, Wilson Road to the south, and the Residential District to the east.

6.2 "R" Residential District: The following provisions shall apply to the Residential District:

6.2.1 Permitted Uses: Permitted Uses for the "R" District shall include the following Principal and Accessory Uses. All uses not listed are not permitted in the R District unless otherwise provided for in this ordinance:

6.2.1.1 Principal Uses and Buildings:

- Residence halls and facilities used to provide associated services, such as food services, and health and wellness.
- Multiple unit dwellings.
- Primary schools, daycare centers, playgrounds, and other outdoor recreation facilities.

6.2.1.2 Accessory Uses and Buildings:

- Limited academic uses.
- Limited retail, recreation, and commercial uses to serve residents.
- Other uses necessary to the operation of the principal uses and buildings.
- Surface parking and parking garages.

6.2.2 Building Height Requirements:

6.2.2.1 Residence Halls: Height shall be limited to six stories plus any required rooftop equipment.

6.2.2.2 Accessory Uses and Buildings: Height shall be limited to three stories.

6.2.2.3 Parking garages shall be limited to six levels above and including the ground level.

6.2.3 Set Back Requirements: All buildings shall have a set back of a minimum distance of 50 feet from the nearest curb line of the nearest roadway.

6.2.4 Building Coverage: Buildings shall not cover more than 20% of the ground area within any given block in the "R" Districts.

6.3 "AR" Athletic and Recreation District: The following provision shall apply to the Athletic and Recreation District:

6.3.1 Permitted Uses: Permitted Uses for the "AR" District shall include the following Principal and Accessory Uses. All uses not listed are not permitted in the AR District unless otherwise provided for in this ordinance:

6.3.1.1 Principal Uses and Buildings:

- Facilities related to recreational, intramural, and sporting events.

6.3.1.2 Accessory Uses and Buildings:

- Other uses and buildings necessary to the operation of the principal uses and buildings.
- Surface parking and parking garages.

6.3.2 Building Height Requirements:

6.3.2.1 All buildings shall be limited to four stories in height or to the height necessary to accommodate the particular sport function and design.

6.3.2.2 Parking garages shall be limited to six levels above and including the ground level.

6.3.3 Set Back Requirements:

6.3.3.1 All recreation, intramural, or sport fields and courts shall have a set back of a minimum distance of 50 feet from the nearest curb line of the nearest roadway.

6.3.3.2 All buildings shall have a set back of a minimum distance of 65 feet from the nearest curb line of the nearest roadway.

6.3.4 Building Coverage: Buildings shall not cover more than 25% of the ground area within any given block in the "AR" District.

6.4 "SE" Service District: The following provisions shall apply to the Service District:

6.4.1 Permitted Uses: Permitted Uses for the "SE" District shall include the following Principal and Accessory Uses. All uses not listed are not permitted in the SE District unless otherwise provided for in this ordinance:

6.4.1.1 Principal Uses and Buildings:

- Power plants, including solar or wind energy generation and storage.
- Maintenance centers.
- Water storage and treatment facilities.
- Institutional stores.
- Storage facilities.

- Recycling facilities.
- Office buildings.

6.4.1.2 Accessory Uses and Buildings:

- Other uses and buildings necessary or similar to the principal uses and buildings pertinent to the operation of the institution.
- Surface parking.

6.4.2 Building Height Requirements: All buildings shall be limited to six stories in height. The only exceptions allowed will be power plant chimneys, water storage, and similar accessory uses.

6.4.3 Set Back Requirements: All buildings shall have a set back of a minimum distance of 50 feet from the nearest curb line of the nearest roadway or from the edge of the pavement where curbs do not exist.

6.4.4 Building Coverage: Buildings shall not cover more than 30% of the ground area within any given block of the "SE" District.

6.5 "N" Natural Areas District: The following provisions shall apply to the Natural Areas District:

6.5.1 Permitted Uses: Permitted Uses for the "N" District shall include the following Principal and Accessory Uses. All uses not listed are not permitted in the N District unless otherwise provided for in this ordinance:

6.5.1.1 Principal Uses:

- Permitted uses include observation, nature study, teaching, research and demonstration in Category I, II, and III Natural Areas as defined by the Campus Natural Areas Committee and shown on the most recent version of the MSU Campus Natural Areas Map and Zoning District Map.

6.5.2 Special Provisions: The Natural Areas District shall remain undeveloped. No buildings, roads, improved walks, utility, or other structures and alterations are permitted in the Natural Areas District.

6.6 "AG" Agricultural and Natural Resources District: The following provisions shall apply to the Agriculture and Natural Resources District:

6.6.1 Permitted Uses: Permitted Uses for the "AG" District shall include the following Principal and Accessory Uses. All uses not listed are not permitted in the AG District unless otherwise provided for in this ordinance:

6.6.1.1 Principal Uses and Buildings:

- Program-related single-family dwellings.
- Agricultural and natural resources research, teaching, and outreach facilities for plants and animals.
- Farm areas for experimentation, teaching, outreach, and cultivation or production of plants and animals for institutional use.
- Associated agricultural facilities not operated by the institution.

6.6.1.2 Accessory Uses and Buildings:

- Other uses and buildings that are necessary to the operation of the principal uses and buildings, such as silos, wells, and pumping stations. Potable water storage and treatment, and maintenance facilities shall be allowed.
- Surface parking.
- Solar or wind energy generation and storage.

6.6.2 Building Height Requirements: All buildings shall be limited to a height of two stories, with the exception of silos and similar structures that are necessarily of greater height.

6.6.3 Set Back Requirements: All buildings shall be set back a minimum distance of 100 feet from the centerline of the nearest public roadway.

6.7 "MU" Mixed Use Districts: The following provisions shall apply to the two independent mixed-use districts, MU-N and MU-S:

6.7.1 Permitted Uses: Permitted uses for the MU Districts shall include the following Principal and Accessory Uses. All uses not listed are not permitted in the MU Districts unless otherwise provided for in this ordinance:

6.7.1.1 Principal Uses and Buildings MU-N:

- Teaching facilities, including classrooms, lecture halls, instructional laboratories, general student facilities, and similar facilities used for general educational purposes.
- Research laboratories.
- Public/private business incubators.
- Student and visiting faculty housing.
- Faculty and administrative offices.
- Health and wellness facilities.
- Academic support.
- Auxiliary retail services.

6.7.1.2 Principal Uses and Buildings MU-S

- Research laboratories.
- Public/private business incubators.
- Student, faculty, and alumni retirement housing.
- Administrative offices.
- Health and wellness facilities.
- Auxiliary retail services.

6.7.1.3 Accessory Uses and Buildings:

- Surface parking and parking garages.
- Uses and structures that are necessary to the operation of the principal uses and buildings.
- Athletic/recreation fields and buildings.
- Solar or wind energy generation and storage.

6.7.2 Building Height Requirements:

6.7.2.1 All buildings in the MU-N District shall be limited to six stories of occupied space plus any required rooftop equipment. Buildings within the MU-S District that incorporate parking, office space, and housing space are limited to eight stories of occupied space plus any required rooftop equipment.

6.7.2.2 Teaching facilities shall be located in the lowest floors possible, and not above the fourth floor of any building.

6.7.2.3 Parking garages shall be limited to six parking levels above and including the ground level.

6.7.2.4 Accessory buildings shall be no higher than necessary to accommodate the proposed use and under no circumstances shall exceed the height of the principal use buildings in the district.

6.7.3 Set Back Requirements: All buildings shall be set back a minimum of 40 feet from the nearest curb line of the nearest roadway.

6.7.4 Building Coverage: Buildings shall not cover more than 30% of the ground area of any given block within the MU-N District and 35% of the ground area of any given block within the MU-S District.

6.8 Non-Conforming Uses and Buildings:

6.8.1 Non-conforming uses: The use of any land area existing at the time of the adoption of this ordinance, or any amendment to it, may be continued although such use does not conform to the provisions thereof.

6.8.2 Non-conforming buildings: The use of any building existing at the time of the adoption of this ordinance, or any amendment to it, may be continued although such use does not conform to the provisions thereof. Such non-conforming use may be extended throughout a building.

7.00 - ADMINISTRATION

7.1 The Campus Planner shall serve in the role of Zoning Administrator and shall be responsible for the administration of this ordinance, the District Map, the Protected Green Space map, and the Campus Land Use Master Plan, all as hereafter amended and modified.

7.1.1 The Campus Planner is specifically granted authority to:

7.1.1.1 Assure that University projects are in compliance with the University Zoning Ordinance and Campus Land Use Master Plan, including Campus Planning Principles.

7.1.1.2 Approve the extension, reduction, revision, or interpretation of a zoning district or building coverage block boundary.

7.1.1.3 Approve the reconstruction of a non-conforming building that has been destroyed or partially destroyed.

7.1.1.4 Approve the erection and use of a building or the use of land in any location for an essential utility service, or allow for the enlargement, extension or relocation of these existing uses.

7.1.1.5 Interpret the provisions of this ordinance where the street layout actually on the ground varies from the street layout as shown on the Zoning District Map.

7.1.1.6 Determine whether the use of a planned building is permitted in the district in which it is to be erected, and whether the planned building will cause the ground area covered by the buildings to exceed the maximum percentage allowed within the block in which it is to be erected.

7.1.1.7 Approve the design of all building and site features, modifications, and improvements within Protected Green Space areas when a variance has been authorized.

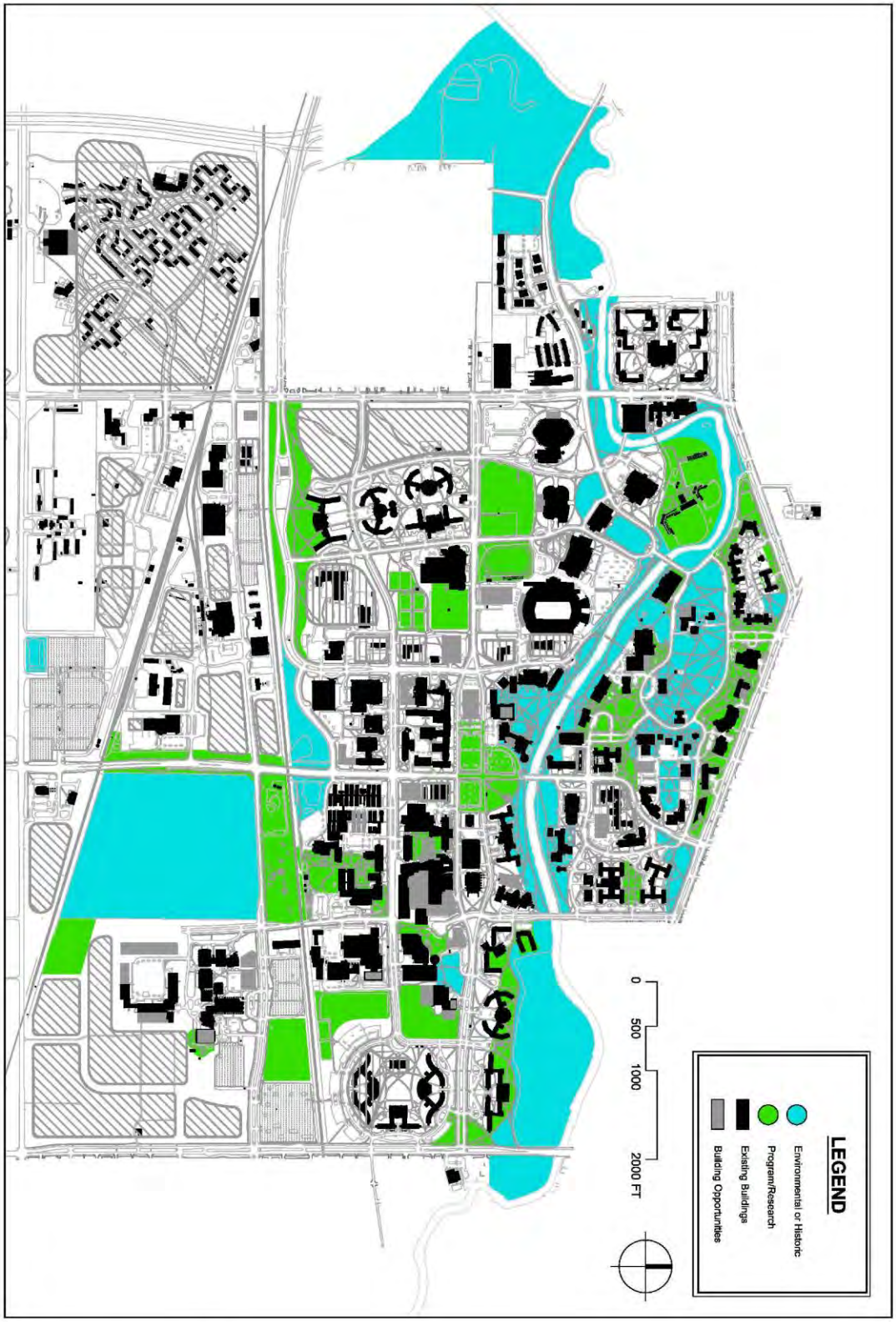
7.1.1.8 Refer any specific request for a variance to the Vice President and Secretary of the Board of Trustees for clarification regarding the need for BOT action.

8.00 - AMENDMENTS

8.1 This ordinance may be amended through approval by the Board of Trustees.

End


North Academic District
Central Academic District
South Academic District
Residential District
Natural Areas District
Athletic and Recreation District
Agriculture District
Service District
North Mixed Use District
South Mixed Use District



PROTECTED GREEN SPACE

MICHIGAN STATE UNIVERSITY | Infrastructure Planning and Facilities

Fall 2019

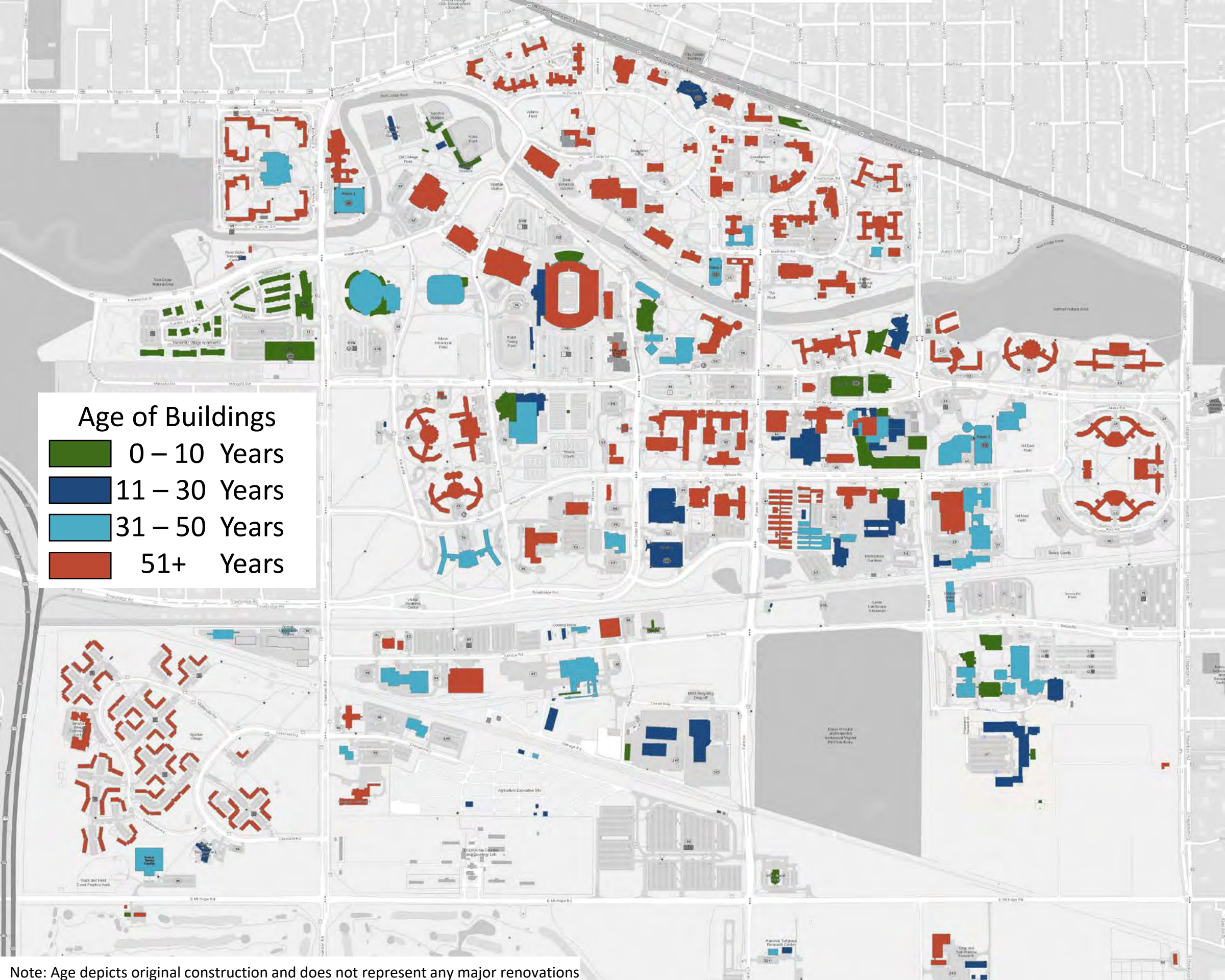
Appendix C: Buildings by Age

Fiscal Year 2021
Budget Information

5-Year Capital Request Planning and Capital Outlay Request

Submitted By:

MICHIGAN STATE UNIVERSITY



Note: Age depicts original construction and does not represent any major renovations

Fall 2019

Appendix D: Student Enrollments Fall Semester 2019

Fiscal Year 2021
Budget Information

5-Year Capital Request Planning and Capital Outlay Request

Submitted By:

MICHIGAN STATE UNIVERSITY

Michigan State University
Office of the Registrar
Comparison of Student Enrollments

FALL 2019

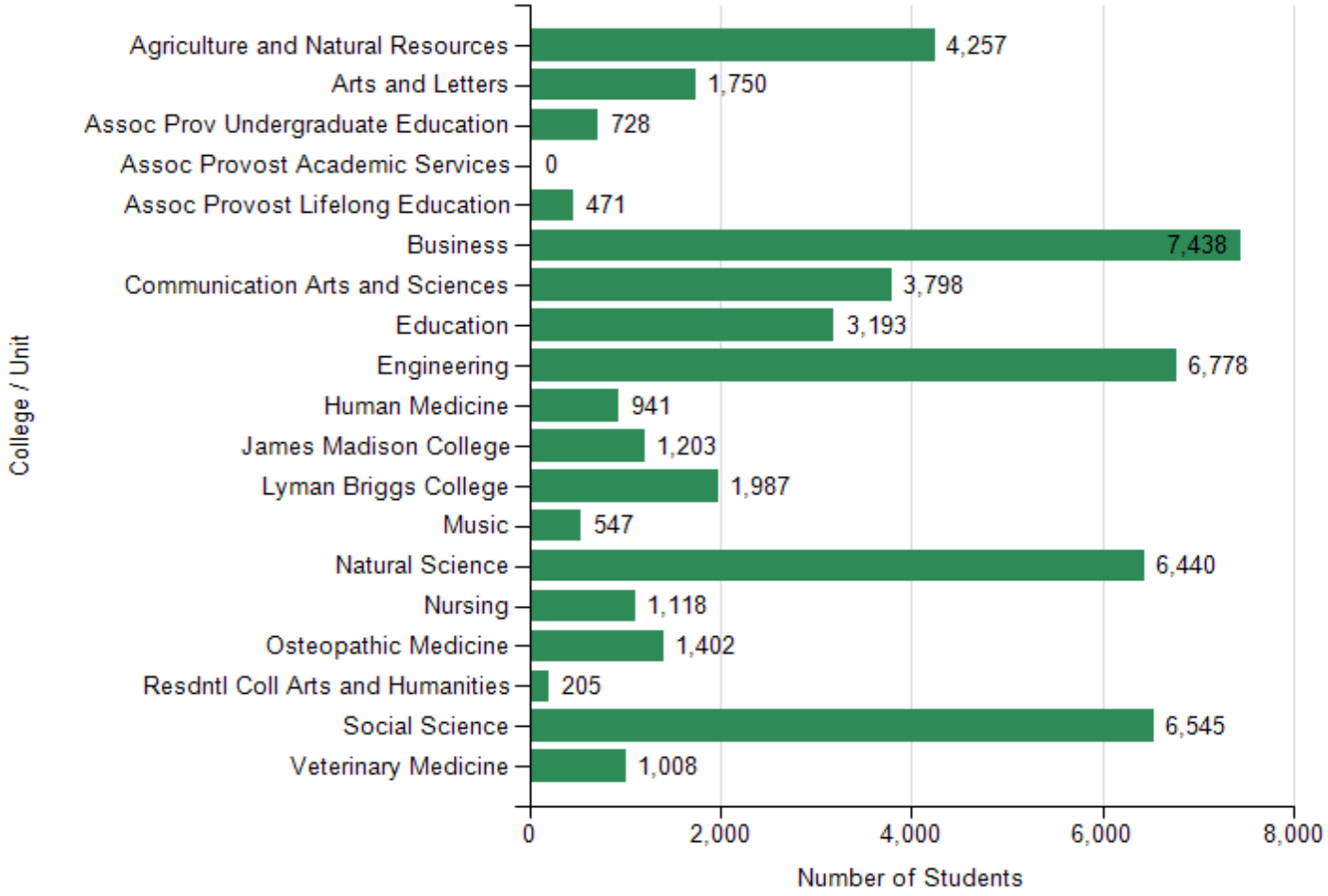
COLLEGE/UNIT	Students Enrolled		Full Time Students		Fiscal Year Equated		Teaching College Course	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Agriculture and Natural Resources	4,257	8.5%	3,659	8.4%	2,924	6.6%	15,678	7.3%
Arts and Letters	1,750	3.5%	1,523	3.5%	5,475	12.4%	22,554	10.5%
Resdntl Coll Arts and Humanities	205	0.4%	191	0.4%	98	0.2%	394	0.2%
Business	7,438	14.9%	6,554	15.0%	4,170	9.5%	23,161	10.8%
Communication Arts and Sciences	3,798	7.6%	3,344	7.7%	2,411	5.5%	12,184	5.7%
Education	3,193	6.4%	2,549	5.8%	2,198	5.0%	11,208	5.2%
Engineering	6,778	13.6%	6,235	14.3%	3,237	7.3%	15,187	7.1%
Human Medicine	941	1.9%	798	1.8%	1,063	2.4%	3,693	1.7%
James Madison College	1,203	2.4%	1,109	2.5%	517	1.2%	1,934	0.9%
Lyman Briggs College	1,987	4.0%	1,857	4.3%	653	1.5%	2,846	1.3%
Music	547	1.1%	498	1.1%	454	1.0%	3,206	1.5%
Natural Science	6,440	12.9%	5,787	13.2%	9,690	22.0%	49,185	23.0%
Nursing	1,118	2.2%	1,011	2.3%	425	1.0%	1,589	0.7%
Osteopathic Medicine	1,402	2.8%	1,232	2.8%	1,257	2.9%	6,848	3.2%
Social Science	6,545	13.1%	5,711	13.1%	8,481	19.2%	37,116	17.3%
Assoc Prov Undergraduate Education	728	1.5%	713	1.6%	156	0.4%	1,220	0.6%
Veterinary Medicine	1,008	2.0%	762	1.7%	750	1.7%	5,602	2.6%
Assoc Provost Academic Services	0	0.0%	0	0.0%	143	0.3%	321	0.2%
Assoc Provost Lifelong Education	471	0.9%	160	0.4%	0	0.0%	0	0.0%
Total University	**49,809**		**43,693**		**44,103**		**213,926**	
CLASS/LEVEL								
Doctoral	3,490	7.0%	3,331	7.6%	2,528	5.7%	6,827	3.2%
Masters	3,973	8.0%	1,885	4.3%	2,437	5.5%	12,341	5.8%
Total Graduate	**7,463**		**5,216**		**4,965**		**19,168**	
Freshman	9,493	19.1%	9,322	21.3%	9,187	20.8%	44,023	20.6%
Junior	9,410	18.9%	8,851	20.3%	8,926	20.2%	44,738	20.9%
Senior	10,524	21.1%	8,339	19.1%	8,901	20.2%	45,466	21.3%
Sophomore	9,038	18.1%	8,753	20.0%	8,740	19.8%	42,335	19.8%
Total Undergraduate	**38,465**		**35,265**		**35,755**		**176,562**	
Graduate Professional	2,501	5.0%	2,421	5.5%	2,501	5.7%	14,304	6.7%
Total Graduate Professional	**2,501**		**2,421**		**2,501**		**14,304**	
Non-Degree	1,380	2.8%	791	1.8%	882	2.0%	3,892	1.8%
Total Non-Degree	**1,380**		**791**		**882**		**3,892**	
Grand Total	**49,809**		**43,693**		**44,103**		**213,926**	
Percent of Total Students		100.0%		87.7%		88.5%		

Average Student Course: 4.3 Course Enrollments

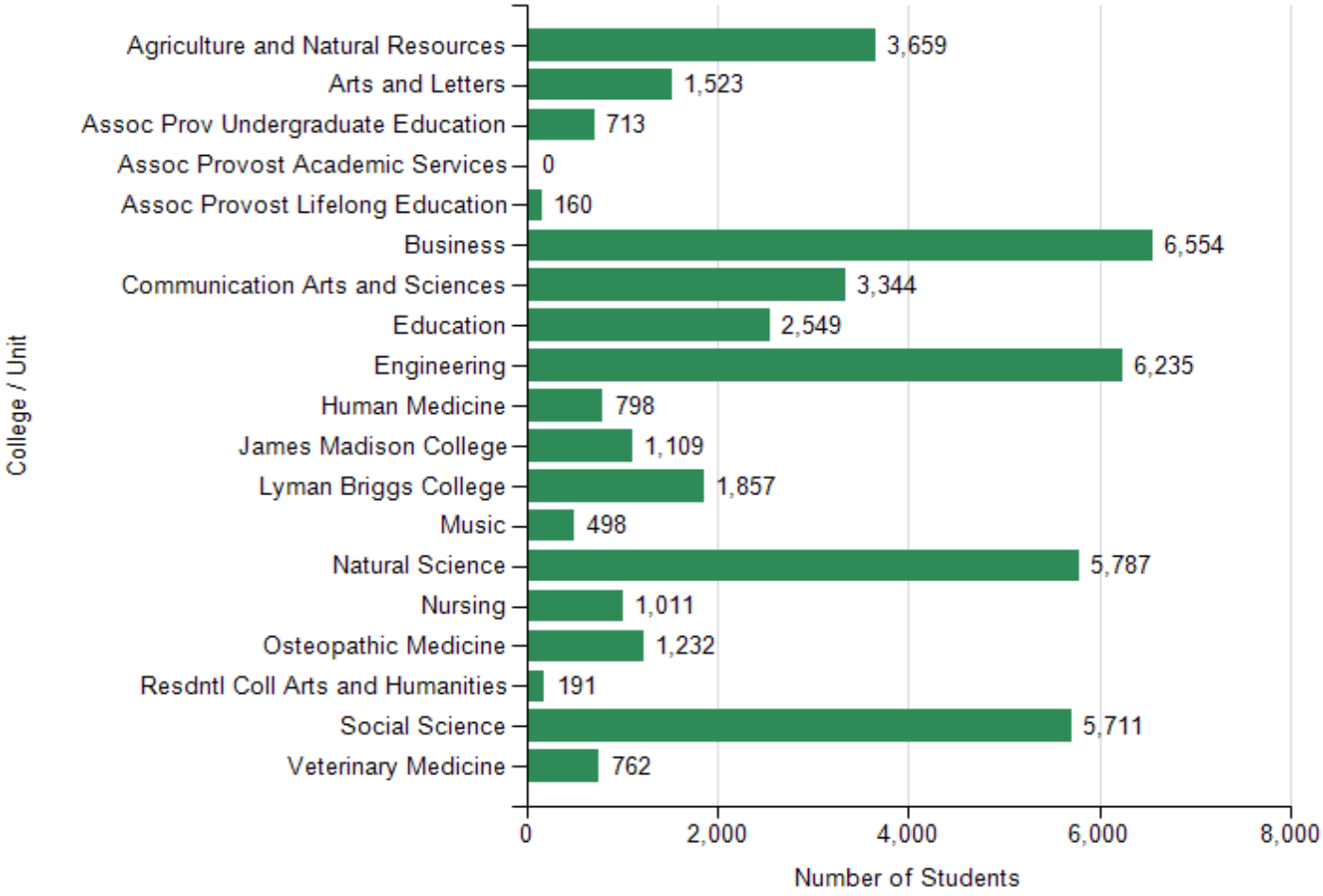
Full-Time Students column: A head count of students who are carrying minimum credits for full-time status: Undergraduate-12; Masters-9; Doctoral-6; and Graduate Professional-12.

Fiscal Year Equated students column: Calculated by dividing the total number of credit hours by the number of credits carried by a full-time student (full-time status: Undergraduate-15 (prior to FS99, 15 1/2 credits); Masters-12 credits; Doctoral-8 credits; and Graduate Professional-head count).

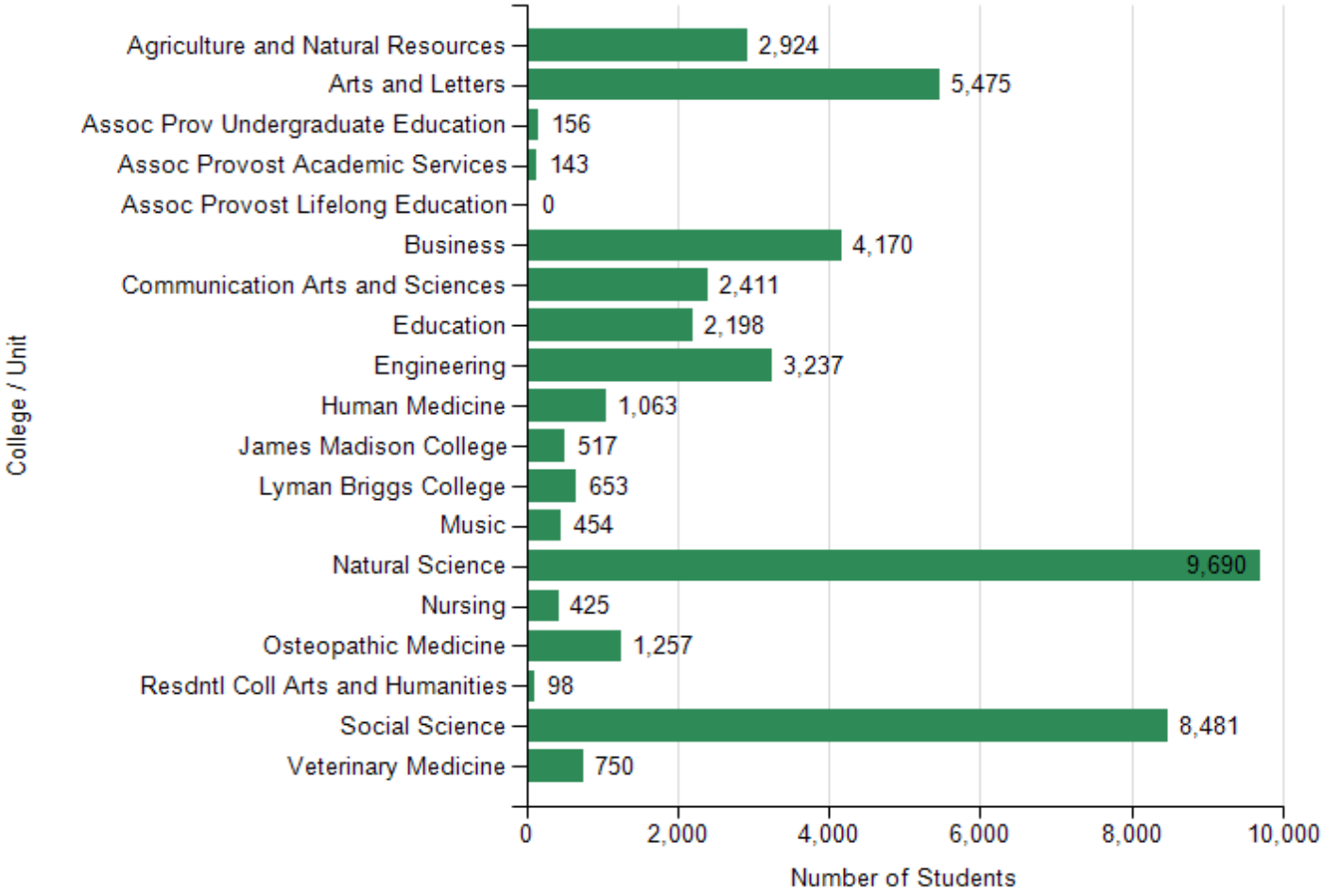
Comparison of Student Enrollments By College / Unit: Students Enrolled



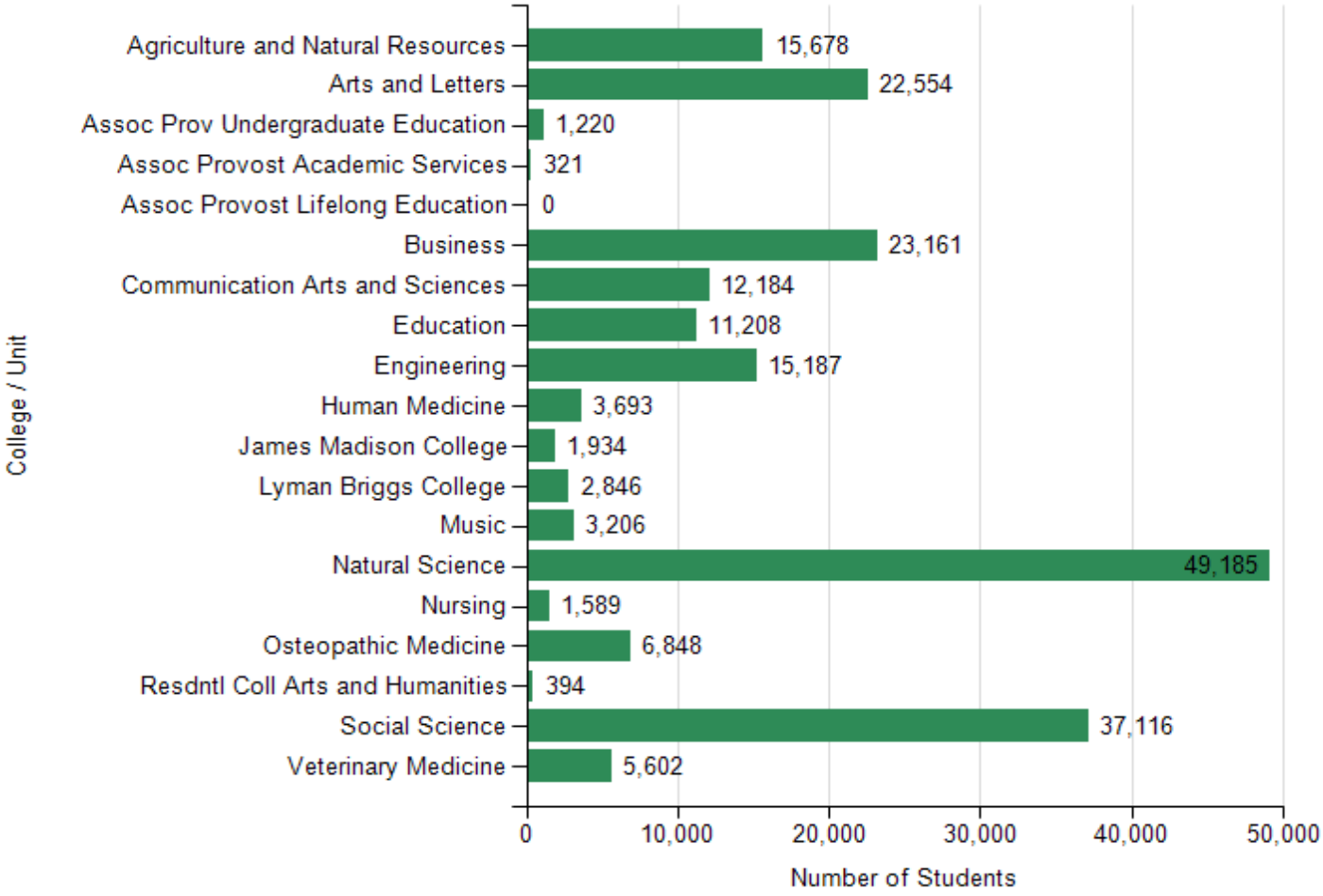
Comparison of Student Enrollments By College / Unit: Full Time Students



Comparison of Student Enrollments By College / Unit: Fiscal Year Equated



Comparison of Student Enrollments By College / Unit: Teaching College Course



Fall 2019

Appendix E: Building Condition Assessment

Fiscal Year 2021
Budget Information

5-Year Capital Request Planning and Capital Outlay Request

Submitted By:

MICHIGAN STATE UNIVERSITY

MSU Capital Renewal Maintenance by Building FY2021-2025 (Including Deferred)

Building Name	Bldg	Work Plan Year	Type	Description (Title)	Total Estimate
ABRAMS PLANETARIUM	0165	2019	BUILDING SYSTEMS	REPLACE HVAC #1	$ 752,000
					$ 752,000
AG EXPO EXHIB-STORAGE 1 EAST	0402	2017	BUILDING ENVELOPE	ROOF #1	$ 22,000
					$ 22,000
ALUMNI CHAPEL	0030	2010	BUILDING ENVELOPE	EXTERIOR WATERPROOFING AND MASONRY RESTORATION	$ 96,000
ALUMNI CHAPEL	0030	2010	BUILDING SYSTEMS	REPLACE LIGHTING PANELS IN BASEMENT STORAGE ROOM ($5800), REPLACE OLD INCANDESCENT FIXTURES ($5800)	$ 20,000
ALUMNI CHAPEL	0030	2010	BUILDING ENVELOPE	STAINED GLASS WINDOW REPAIR AND PROTECTION	$ 41,000
ALUMNI CHAPEL	0030	2020	BUILDING ENVELOPE	ROOF REPLACEMENT/RESTORATION, BUILT-UP ROOFING, SLATE REPAIR, COPPER REPAIRS, ROOFS 2 AND 3.	$ 35,000
ALUMNI CHAPEL	0030	2025	BUILDING SYSTEMS	ALUMNI CHAPEL - REPLACE ORIGINAL STEAM WATER HEATER	$ 52,000
					$ 244,000
ANGELL UNIV SERVICES	0133	2014	BUILDING INTERIOR	REPLACE EXTERIOR DOOR HARDWARE AND SELECTED INTERIOR DOORS.	$ 33,000
ANGELL UNIV SERVICES	0133	2017	BUILDING SYSTEMS	REPLACE CONTROL AIR COMPRESSOR	$ 36,000
ANGELL UNIV SERVICES	0133	2018	BUILDING SYSTEMS	HVAC EQUIPMENT - AHU	$ 1,076,000
ANGELL UNIV SERVICES	0133	2018	BUILDING SYSTEMS	LIGHTING FIXTURES	$ 221,000
ANGELL UNIV SERVICES	0133	2019	BUILDING SYSTEMS	REPLACE CHILLED WATER PUMPS	$ 67,000
ANGELL UNIV SERVICES	0133	2019	BUILDING SYSTEMS	REPLACE HOT WATER HEAT PUMPS	$ 70,000
ANGELL UNIV SERVICES	0133	2020	BUILDING SYSTEMS	REPLACE MECHANICAL CHILLER	$ 323,000
ANGELL UNIV SERVICES	0133	2020	BUILDING SYSTEMS	VAV SYSTEM	$ 229,000
ANGELL UNIV SERVICES	0133	2024	BUILDING SYSTEMS	SECURITY & EMERGENCY SYSTEMS/ TIME CLOCKS - FIRE ALARM	$ 125,000
					$ 2,180,000
ANTHONY HALL	0132	2017	BUILDING SYSTEMS	VAV SYSTEM	$ 324,000
ANTHONY HALL	0132	2018	BUILDING SYSTEMS	REPLACE ENTIRE FIRE SPRINKLER PROTECTION SYSTEM	$ 2,830,000
ANTHONY HALL	0132	2019	BUILDING INTERIOR	DOORS - INTERIOR	$ 2,339,000
ANTHONY HALL	0132	2020	BUILDING SYSTEMS	COOLING TOWERS	$ 290,000
ANTHONY HALL	0132	2020	BUILDING SYSTEMS	COOLING TOWERS	$ 332,000
ANTHONY HALL	0132	2020	BUILDING SYSTEMS	REPLACE PUBLIC RESTROOM FAUCETS AND TRIM, URINAL FLUSH VALVES AND TOILET FLUSH VALVES	$ 41,000
ANTHONY HALL	0132	2021	BUILDING ENVELOPE	ANTHONY HALL - EXTERIOR ENVELOPE RENEWAL PHASE 1 OF 2	$ 2,400,000
ANTHONY HALL	0132	2022	BUILDING ENVELOPE	ANTHONY HALL - EXTERIOR ENVELOPE RENEWAL PHASE 2 OF 2	$ 500,000
ANTHONY HALL	0132	2022	BUILDING ENVELOPE	ANTHONY HALL - EXTERIOR ENVELOPE RENEWAL PHASE 2 OF 2	$ 500,000
ANTHONY HALL	0132	2022	BUILDING ENVELOPE	ANTHONY HALL - EXTERIOR ENVELOPE RENEWAL PHASE 2 OF 2	$ 500,000
ANTHONY HALL	0132	2022	BUILDING ENVELOPE	ANTHONY HALL - EXTERIOR ENVELOPE RENEWAL PHASE 2 OF 2	$ 500,000
ANTHONY HALL	0132	2022	BUILDING ENVELOPE	ANTHONY HALL - EXTERIOR ENVELOPE RENEWAL PHASE 2 OF 2	$ 500,000
ANTHONY HALL	0132	2022	BUILDING ENVELOPE	ANTHONY HALL - EXTERIOR ENVELOPE RENEWAL PHASE 2 OF 2	$ 500,000
ANTHONY HALL	0132	2022	BUILDING ENVELOPE	ANTHONY HALL - EXTERIOR ENVELOPE RENEWAL PHASE 2 OF 2	$ 500,000
ANTHONY HALL	0132	2022	BUILDING ENVELOPE	ANTHONY HALL - EXTERIOR ENVELOPE RENEWAL PHASE 2 OF 2	$ 500,000
ANTHONY HALL	0132	2022	BUILDING ENVELOPE	ANTHONY HALL - EXTERIOR ENVELOPE RENEWAL PHASE 2 OF 2	$ 500,000

MSU Capital Renewal Maintenance by Building FY2021-2025 (Including Deferred)

Building Name	Bldg	Work Plan Year	Type	Description (Title)	Total Estimate
ANTHONY HALL	0132	2022	BUILDING SYSTEMS	CHILLER AND COOLING TOWER REPLACEMENT - #1 ABSC955	$ 2,067,000
ANTHONY HALL	0132	2022	BUILDING SYSTEMS	REPLACE CHILLER #2 AND COOLING TOWER	$ 1,968,000
					$ 17,091,000
AUDITORIUM	0031	2014	BUILDING SYSTEMS	REPLACE STAGE LIFT ELEVATOR	$ 1,022,000
AUDITORIUM	0031	2016	BUILDING SYSTEMS	AUDITORIUM ROOFTOP UNIT	$ 211,000
AUDITORIUM	0031	2017	BUILDING SYSTEMS	REPLACE DOMESTIC WATER HEATER	$ 69,000
AUDITORIUM	0031	2018	BUILDING SYSTEMS	REPLACE PUBLIC RESTROOM - LAVATORY FAUCETS AND TRIM, TOILET SEATS AND	$ 39,000
AUDITORIUM	0031	2022	BUILDING ENVELOPE	REPLACE ROOF #15	$ 46,000
					$ 1,387,000
BAKER HALL	0182	2014	BUILDING ENVELOPE	EXTERIOR MASONRY REPAIRS AND CAULKING	$ 55,000
BAKER HALL	0182	2018	BUILDING SYSTEMS	REPLACE LAVATORY FAUCETS AND TRIM, TOILET FLUSH VALVES, URINAL FLUSH VALVES, AND TOILET SEATS	$ 44,000
BAKER HALL	0182	2020	BUILDING SYSTEMS	REPLACE DOMESTIC COLD WATER SHUT OFF VALVES AND WATER METER WHERE WATER ENTERS BUILDING	$ 26,000
BAKER HALL	0182	2020	BUILDING INTERIOR	REPLACE STAIR TREADS IN BAKER HALL	$ 70,000
					$ 195,000
BEEF CATTLE RESEARCH-ANIMAL	0471I	2022	BUILDING ENVELOPE	REPLACE ROOFS #1	$ 109,000
					$ 109,000
BEEF CATTLE RESEARCH-MAIN	0471A	2013	BUILDING ENVELOPE	EXTERIOR PAINTING - DOOR TRIM & FROM OF OFFICE BUILDING	$ 46,000
BEEF CATTLE RESEARCH-MAIN	0471A	2018	BUILDING SYSTEMS	REPLACE LIGHTING FIXTURES, LIGHTING PANELS, WIRING, AND SERVICES.	$ 487,000
BEEF CATTLE RESEARCH-MAIN	0471A	2020	BUILDING ENVELOPE	ROOF REPAIR/REPLACEMENT BLDG 471 - ROOF #A-2, A-1, C, H, K	$ 370,000
					$ 903,000
BERKEY HALL	0002	2011	BUILDING SYSTEMS	REPLACE FAUCETS, GRID DRAINS, P-TRAPS, SHUTOFF VALVES, FAUCET HANDLES ON PUBLIC RESTROOM LAVATORIES.	$ 20,000
BERKEY HALL	0002	2014	BUILDING ENVELOPE	REPLACE EXTERIOR WOOD DOORS	$ 140,000
BERKEY HALL	0002	2015	BUILDING ENVELOPE	EXTERIOR MASONRY AND CAULKING	$ 88,000
BERKEY HALL	0002	2017	BUILDING SYSTEMS	REPLACE MECHANICAL CHILLER	$ 412,000
BERKEY HALL	0002	2018	BUILDING SYSTEMS	REPLACE BRANCH CIRCUIT WIRING W/ CLOTH INSULATION	$ 31,000
BERKEY HALL	0002	2019	BUILDING INTERIOR	MENS AND WOMENS RESTROOM DOORS AND HARDWARE	$ 39,000
BERKEY HALL	0002	2025	BUILDING SYSTEMS	REPLACE CONTROL CABINET 4 (MEC)	$ 35,000
BERKEY HALL	0002	2025	BUILDING SYSTEMS	REPLACE CONTROL CABINET 5 (MEC)	$ 35,000
					$ 800,000
BESSEY HALL	0079	2015	BUILDING SYSTEMS	BASEMENT AIR PLENUMS-REMOVE ALL ASBESTOS PIPE INSULATIONS & REINSULATE WITH NON-ASBESTOS.	$ 141,000
BESSEY HALL	0079	2015	BUILDING ENVELOPE	REPLACE WINDOWS AND EXTERIOR DOORS	$ 2,214,000
BESSEY HALL	0079	2016	BUILDING ENVELOPE	BESSEY EXTERIOR MASONRY AND CAULKING REPAIRS	$ 83,000
BESSEY HALL	0079	2017	BUILDING SYSTEMS	BESSEY HALL - REPLACE STEAM DOMESTIC WATER HEATER	$ 65,000
BESSEY HALL	0079	2018	BUILDING SYSTEMS	VAV SYSTEMS	$ 132,000
BESSEY HALL	0079	2019	BUILDING SYSTEMS	REPLACE 200 TON CHILLER AND COOLING TOWERS	$ 1,845,000
BESSEY HALL	0079	2019	BUILDING INTERIOR	REPLACE STAIR TREADS IN BESSEY HALL	$ 49,000

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Building Name	Bldg	Work Plan Year	Type	Description (Title)	Total Estimate
BESSEY HALL	0079	2020	BUILDING SYSTEMS	REPLACE DUPLEX CONTROL AIR COMPRESSOR	$ 33,000
BESSEY HALL	0079	2020	BUILDING SYSTEMS	REPLACE PUBLIC RESTROOM LAVATORY FAUCETS AND TRIM, TOILET FLUSH VALVES,	$ 103,000
BESSEY HALL	0079	2024	BUILDING SYSTEMS	ELEVATOR - 1	$ 416,000
					$ 5,081,000
BIOCHEMISTRY	0168	2010	BUILDING ENVELOPE	EXTERIOR PAINTING	$ 20,000
BIOCHEMISTRY	0168	2010	BUILDING SYSTEMS	PROVIDE CONNECTION POINT FOR PORTABLE GENERATOR TO POWER CAR AREAS.	$ 32,000
BIOCHEMISTRY	0168	2014	BUILDING ENVELOPE	REPLACE EXTEROR ALUMINUM DOORS AND HARDWARE	$ 39,000
BIOCHEMISTRY	0168	2015	BUILDING SYSTEMS	REPLACE BOOSTER COILS, VAV AND VALVES THAT SERVE ANIMAL ROOMS	$ 21,000
BIOCHEMISTRY	0168	2019	BUILDING SYSTEMS	COOLING TOWERS - CT3	$ 3,078,000
BIOCHEMISTRY	0168	2019	BUILDING SYSTEMS	REPLACE HORIZONTAL COLD WATER MAIN PIPING AND VALVES	$ 639,000
BIOCHEMISTRY	0168	2024	BUILDING SYSTEMS	REPLACE DUAL SYSTEM ELEVATOR 1 & 2	$ 946,000
BIOCHEMISTRY	0168	2025	BUILDING SYSTEMS	REPLACE DOMESTIC WATER BOOSTER PUMP DUPLEX, VFD DRIVE	$ 66,000
					$ 4,841,000
BIOMEDICAL PHYSICAL SCIENCES	0160	2015	BUILDING SYSTEMS	UPGRADE 3 DDC PANEL SERVING CAR AREA	$ 70,000
BIOMEDICAL PHYSICAL SCIENCES	0160	2018	BUILDING SYSTEMS	REPLACE 4 CHILLED WATER PUMPS FOR CAR ANIMAL AREA	$ 103,000
BIOMEDICAL PHYSICAL SCIENCES	0160	2020	BUILDING SYSTEMS	PROVIDE CONNECTION POINT FOR PORTABLE GENERATOR TO POWER CAR AREAS.	$ 32,000
BIOMEDICAL PHYSICAL SCIENCES	0160	2021	BUILDING SYSTEMS	REPLACE WATERLESS URINALS THROUGHOUT BUILDING	$ 100,000
BIOMEDICAL PHYSICAL SCIENCES	0160	2022	BUILDING SYSTEMS	REPLACE CONTROL AIR COMPRESSOR	$ 39,000
BIOMEDICAL PHYSICAL SCIENCES	0160	2022	BUILDING SYSTEMS	REPLACE CONTROL AIR COMPRESSOR	$ 39,000
BIOMEDICAL PHYSICAL SCIENCES	0160	2025	BUILDING SYSTEMS	REPLACE AHU 5	$ 161,000
BIOMEDICAL PHYSICAL SCIENCES	0160	2025	BUILDING SYSTEMS	REPLACE PUBLIC RESTROOM FAUCETS, FLUSH VALVES AND TOILET SEATS	$ 62,000
BIOMEDICAL PHYSICAL SCIENCES	0160	2025	BUILDING SYSTEMS	REPLACE PUBLIC RESTROOM FIBERGALSS WATERLESS URINALS	$ 37,000
BIOMEDICAL PHYSICAL SCIENCES	0160	2025	BUILDING SYSTEMS	REPLACE WATER SOFTENER MINERAL IN WATER SOFTENERS	$ 37,000
					$ 680,000
BOX FARM-BARN	0477C	2019	BUILDING ENVELOPE	ROOFING - SH ROOF #1	$ 22,000
					$ 22,000
BOX FARM-HOUSE	0477A	2019	BUILDING ENVELOPE	ROOFING - SH ROOFS #1, 2, AND 3	$ 22,000
BOX FARM-HOUSE	0477A	2020	BUILDING SYSTEMS	HVAC EQUIPMENT - AHU	$ 42,000
					$ 64,000
BRESLIN	0069	2009	BUILDING SYSTEMS	REPLACE COOLING TOWER 01	$ 196,000
BRESLIN	0069	2015	BUILDING INTERIOR	REPLACE CARPET AND WALLBASE IN OFFICES AND CONFERENCE ROOMS OF BERKOWITZ ADDITION.	$ 62,000
BRESLIN	0069	2017	BUILDING SYSTEMS	REPLACE LEIBERT SPLIT AC UNIT THAT SERVES THE TV REPLAY ROOM #40J.	$ 20,000
BRESLIN	0069	2019	BUILDING ENVELOPE	ROOF REPAIR/REPLACEMENT ROOF #3,4,5,6	$ 86,000
BRESLIN	0069	2019	BUILDING SYSTEMS	SECURITY & EMERGENCY SYSTEMS/TIME CLOCKS - FIRE ALARM	$ 438,000
BRESLIN	0069	2020	BUILDING SYSTEMS	REPLACE AIR HANDLING UNITS 1 - 14, HV-1 AND HV-5, PLUS 15 SMALL EXHAUST FANS FOR BERKOWITZ ADDITION.	$ 3,691,000

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Building Name	Bldg	Work Plan Year	Type	Description (Title)	Total Estimate
BRESLIN	0069	2020	BUILDING SYSTEMS	REPLACE AIR PUMPS AMD ELECTRICAL CONTROLS ON SEWAGE EJECTION SYSTEM	$ 92,000
BRESLIN	0069	2021	BUILDING SYSTEMS	REPLACE BUNDLE IN HEAT EXCHANGER(S) FOR BERKOWITZ ADDITION	$ 25,000
BRESLIN	0069	2022	BUILDING SYSTEMS	REPLACE 2 HOT WATER HEAT PUMPS IN MECH ROOM A-140.	$ 31,000
BRESLIN	0069	2022	BUILDING SYSTEMS	REPLACE CONDENSATE RETURN UNIT IN BERKOWITZ	$ 49,000
BRESLIN	0069	2022	BUILDING SYSTEMS	REPLACE MAIN CHILLER FOR BERKOWITZ, TRANE MODEL RTAA, LOCATED IN OUTSIDE ENCLOSURE TO RM A-138	$ 197,000
BRESLIN	0069	2022	BUILDING SYSTEMS	REPLACE TWO CHILLED WATER PUMPS AND ASSOCIATED ELECTRICAL IN MECH ROOM A-140	$ 31,000
BRESLIN	0069	2022	BUILDING SYSTEMS	REPLACE TWO VERTICAL TURBINE SEWAGE PUMPS LOCATED IN BERKOWITZ MECH ROOM A-180	$ 27,000
					$ 4,945,000
BUSINESS COLLEGE	0080	2015	BUILDING ENVELOPE	REPAIR RAINWATER INFILTRATION ISSUE IN ROOMS 14, 14A AND 25	$ 83,000
BUSINESS COLLEGE	0080	2015	BUILDING SYSTEMS	REPLACE DOMESTIC STEAM WATER HEATER IN BASEMENT MR-B1	$ 61,000
BUSINESS COLLEGE	0080	2016	BUILDING INTERIOR	REPLACE LANDING FLOORING AND TREADS AND RISERS IN TWO (2) STAIRWELLS	$ 48,000
BUSINESS COLLEGE	0080	2017	BUILDING SYSTEMS	BUSINESS COLLEGE - REPLACE EXISTING FIRE ALARM PANEL	$ 1,900,000
BUSINESS COLLEGE	0080	2017	BUILDING SYSTEMS	ELEVATOR - 2	$ 412,000
BUSINESS COLLEGE	0080	2017	BUILDING SYSTEMS	HVAC S1 & S2 DISTRIBUTION SYSTEM	$ 1,779,000
BUSINESS COLLEGE	0080	2017	BUILDING SYSTEMS	REPLACE CHILLED WATER PUMPS	$ 73,000
BUSINESS COLLEGE	0080	2017	BUILDING SYSTEMS	REPLACE CONDENSATE RETURN UNIT	$ 43,000
BUSINESS COLLEGE	0080	2017	BUILDING SYSTEMS	REPLACE SECOND OF TWO DOMESTIC STEAM WATER HEATERS IN MR-N1	$ 61,000
BUSINESS COLLEGE	0080	2019	BUILDING SYSTEMS	TRACTION ELEVATOR - 1	$ 412,000
BUSINESS COLLEGE	0080	2020	BUILDING SYSTEMS	CHILLER	$ 187,000
BUSINESS COLLEGE	0080	2020	BUILDING SYSTEMS	REPLACE DOMESTIC WATER METER AND ISOLATION VALVES IN MR-N1	$ 31,000
BUSINESS COLLEGE	0080	2020	BUILDING SYSTEMS	REPLACE URINALS IN MENS PUBLIC RESTROOMS	$ 31,000
BUSINESS COLLEGE	0080	2021	BUILDING SYSTEMS	EPPLEY/BUSINESS COLLEGE COMPLEX DEFERRED RENEWAL (FUNDING PART 2 OF 2)	$ 2,700,000
BUSINESS COLLEGE	0080	2024	BUILDING SYSTEMS	ELEVATOR - 5	$ 416,000
BUSINESS COLLEGE	0080	2024	BUILDING SYSTEMS	REPLACE ELEVATOR 4	$ 296,000
BUSINESS COLLEGE	0080	2025	BUILDING SYSTEMS	REPLACE TOILET FLUSH VALVES, TOILET SEATS, AND LAV FAUCETS IN PUBLIC RESTROOMS	$ 49,000
					$ 8,582,000
CENTER INTEGRATIVE PLANT SYS-LAB	0181A	2017	BUILDING SYSTEMS	CENTER INTEGRATIVE PLANT - REPLACE FIRE ALARM SYSTEM	$ 506,000
CENTER INTEGRATIVE PLANT SYS-LAB	0181A	2017	BUILDING SYSTEMS	CIPS - BUILDING TEMPERATURE CONTROL UPGRADES	$ 168,000
CENTER INTEGRATIVE PLANT SYS-LAB	0181A	2017	BUILDING SYSTEMS	CIPS - UPGRADE BUILDING EXHAUST SYSTEMS	$ 2,893,000
CENTER INTEGRATIVE PLANT SYS-LAB	0181A	2017	BUILDING SYSTEMS	CIPS - UPGRADES TO BUILDING HEATING SYSTEMS	$ 433,000
CENTER INTEGRATIVE PLANT SYS-LAB	0181A	2017	BUILDING SYSTEMS	REPLACE CONDENSATE DUPLEX PUMPS IN WEST BASEMENT MECH ROOM	$ 52,000
CENTER INTEGRATIVE PLANT SYS-LAB	0181A	2017	BUILDING SYSTEMS	REPLACE STEAM PRV STATION LOCATED IN THE PENTHOUSE MECHANICAL ROOM	$ 45,000
CENTER INTEGRATIVE PLANT SYS-LAB	0181A	2019	BUILDING SYSTEMS	CIPS- UPGRADE PCB TRANSFORMERS AND ELECTRICAL SYSTEMS	$ 255,000
CENTER INTEGRATIVE PLANT SYS-LAB	0181A	2019	BUILDING SYSTEMS	PRELIM DESIGN, ESTIMATES, AND PHASING PLANS FOR CIPS HVAC 1 & 2 REPLACEMENT	$ 50,000

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Building Name	Bldg	Work Plan Year	Type	Description (Title)	Total Estimate
CENTER INTEGRATIVE PLANT SYS-LAB	0181A	2020	BUILDING INTERIOR	REPLACE CEILING IN NON-MECHANICAL SPACES IN CIPS	$ 302,000
CENTER INTEGRATIVE PLANT SYS-LAB	0181A	2020	BUILDING SYSTEMS	REPLACE HVAC #1 LOCATED IN PENTHOUSE	$ 1,718,000
CENTER INTEGRATIVE PLANT SYS-LAB	0181A	2020	BUILDING SYSTEMS	REPLACE HVAC #2 LOCATED IN PENTHOUSE	$ 1,718,000
CENTER INTEGRATIVE PLANT SYS-LAB	0181A	2021	BUILDING INTERIOR	REPLACE CORRIDOR FLOORING AND WALL BASE ON BASEMENT AND 2ND FLOORS. INCLUDE STAIRWELL LANDINGS.	$ 46,000
					$ 8,186,000
CENTRAL SCHOOL	0204	2012	BUILDING INTERIOR	INTERIOR PAINTING - REPAINT HALLWAYS AND HIGH USE ROOMS	$ 59,000
CENTRAL SCHOOL	0204	2016	BUILDING ENVELOPE	EXTERIOR MASONRY AND CAULKING REPAIRS	$ 44,000
CENTRAL SCHOOL	0204	2017	BUILDING SYSTEMS	CENTRAL SCHOOLS BOILER 1, 2 AND 3 REPLACEMENT	$ 211,000
CENTRAL SCHOOL	0204	2018	BUILDING SYSTEMS	REPLACE ELEVATOR 1	$ 296,000
CENTRAL SCHOOL	0204	2019	BUILDING SYSTEMS	REPLACE ALL TOILET FLUSH VALVES, LAVATORY FAUCETS AND TRIM, KITCHEN SINK FAUCETS	$ 27,000
CENTRAL SCHOOL	0204	2019	BUILDING ENVELOPE	REPLACE ROOFING #1, 2, 3, 4	$ 111,000
CENTRAL SCHOOL	0204	2020	BUILDING INTERIOR	CENTRAL SCHOOL REPLACE VCT FLOORING THROUGHOUT BUILDING	$ 290,000
					$ 1,038,000
CENTRAL SERVICES	0060	2014	BUILDING SYSTEMS	REPLACE DOMESTIC HOT WATER HEATER IN MR3 -	$ 68,000
CENTRAL SERVICES	0060	2014	BUILDING ENVELOPE	REPLACE OLD WINDOWS WITH ALUMINUM FRAMED, INSULATED GLASS.	$ 262,000
CENTRAL SERVICES	0060	2015	BUILDING SYSTEMS	REPLACE ELEVATOR 2	$ 296,000
CENTRAL SERVICES	0060	2016	BUILDING SYSTEMS	REPLACE ALL OLD LIGHTING PANELS	$ 198,000
CENTRAL SERVICES	0060	2016	BUILDING SYSTEMS	REPLACE AND UPGRADE ELECTRICAL DISTRIBUTION AND LIGHTING PANELS	$ 293,000
CENTRAL SERVICES	0060	2020	BUILDING SYSTEMS	REPLACE CAST IRON RADIATORS WITH CONVECTORS	$ 204,000
CENTRAL SERVICES	0060	2020	BUILDING SYSTEMS	REPLACE ROOF TOP AIR CONDITIONING UNIT FOR ROOMS 115 AND 116	$ 52,000
CENTRAL SERVICES	0060	2025	BUILDING SYSTEMS	REPLACE FIRE ALARM SYSTEM AND ADD SMOKE DETECTION	$ 323,000
					$ 1,696,000
CHEMICAL WASTE FACILITY 2	0475B	2022	BUILDING SYSTEMS	WASTE PIPING	$ 90,000
CHEMICAL WASTE FACILITY 2	0475B	2025	BUILDING SYSTEMS	WATER PIPING	$ 60,000
					$ 150,000
CHEMISTRY	0163	2014	BUILDING SYSTEMS	REPLACE ELEVATOR 3	$ 59,000
CHEMISTRY	0163	2017	BUILDING ENVELOPE	MASONRY AND CAULKING RESTORATION IN CHEM HALL	$ 553,000
CHEMISTRY	0163	2020	BUILDING SYSTEMS	CHEMISTRY - OVERLOADED PANELS	$ 30,000
CHEMISTRY	0163	2020	BUILDING SYSTEMS	INSTALL NEW LIGHTING PANELS (12)	$ 78,000
CHEMISTRY	0163	2020	BUILDING SYSTEMS	REMOVE DI-ELECTRIC UNIONS AND REPLACE WITH BRASS UNIONS OR WATER WAYS - 4TH AND 5TH FLOORS.	$ 27,000
CHEMISTRY	0163	2020	BUILDING SYSTEMS	REPLACE CHEMISTRY HVAC-1	$ 1,030,000
CHEMISTRY	0163	2020	BUILDING SYSTEMS	REPLACE CHEMISTRY HVAC-2	$ 1,030,000
CHEMISTRY	0163	2020	BUILDING INTERIOR	REPLACE LANDING FLOORING AND TREADS AND RISERS IN THREE (3) STAIRWELLS	$ 157,000
CHEMISTRY	0163	2020	BUILDING SYSTEMS	REPLACE TOILET FLUSH VAVLES, LAVATORY FAUCETS AND TRIM, AND TOILET SEATS.	$ 37,000
					$ 3,001,000

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Building Name	Bldg	Work Plan Year	Type	Description (Title)	Total Estimate
CLINICAL CENTER-ANIMAL	0202	2013	BUILDING SYSTEMS	REPLACE ANIMAL ROOM WET VACUUM SYSTEM	$ 43,000
CLINICAL CENTER-ANIMAL	0202	2024	BUILDING SYSTEMS	UPGRADE 3 DDC PANEL SERVING CAR AREA	$ 66,000
					$ 109,000
CLINICAL CENTER-CLINIC	0200	2010	BUILDING INTERIOR	REPLACE EXTERIOR OVERHANG AND CEILING AT NORTH ENTRANCE	$ 194,000
CLINICAL CENTER-CLINIC	0200	2013	BUILDING ENVELOPE	REPLACE EXISTING METAL SIDING ON ENTIRE COMPLEX	$ 4,655,000
CLINICAL CENTER-CLINIC	0200	2014	BUILDING INTERIOR	REPLACE CEILING TILE AND GRID IN ENTIRE BUILDING	$ 1,050,000
CLINICAL CENTER-CLINIC	0200	2018	BUILDING SYSTEMS	HVAC EQUIPMENT - AHU	$ 413,000
CLINICAL CENTER-CLINIC	0200	2018	BUILDING SYSTEMS	LIGHTING FIXTURES	$ 35,000
CLINICAL CENTER-CLINIC	0200	2019	BUILDING SYSTEMS	REPLACEMENT OF CHILLED WATER PUMPS	$ 103,000
CLINICAL CENTER-CLINIC	0200	2019	BUILDING SYSTEMS	UPGRADE PCB TRANSFORMERS AND ELECTRICAL DISTRIBUTION	$ 1,689,000
CLINICAL CENTER-CLINIC	0200	2020	BUILDING SYSTEMS	NEW BLDG STEAM PRV SYSTEM FOR CLINICAL A, B, AND C	$ 150,000
CLINICAL CENTER-CLINIC	0200	2020	BUILDING SYSTEMS	REPLACE STEAM SERVICE TO INSIDE OF BUILDING	$ 161,000
CLINICAL CENTER-CLINIC	0200	2020	BUILDING SYSTEMS	REPLACE URINAL FLUSH VALAVES, TOILET FLUSH VALVES, AND TOILET SEATS IN PUBLIC RESTROOMS	$ 31,000
CLINICAL CENTER-CLINIC	0200	2022	BUILDING ENVELOPE	ROOF REPLACEMENT/RESTORATION ON WINGS A, B, C	$ 1,802,000
CLINICAL CENTER-CLINIC	0200	2024	BUILDING SYSTEMS	REPLACE DRY COOLER 1	$ 31,000
CLINICAL CENTER-CLINIC	0200	2024	BUILDING SYSTEMS	REPLACE DRY COOLER 2	$ 31,000
					$ 10,345,000
CLINICAL CENTER-OFFICE/LAB	0201	2011	BUILDING SYSTEMS	REPLACE DUAL SYSTEM ELEVATORS B1 & B2	$ 946,000
CLINICAL CENTER-OFFICE/LAB	0201	2017	BUILDING INTERIOR	REPLACE CEILING TILE IN ENTIRE OFFICE WING	$ 66,000
CLINICAL CENTER-OFFICE/LAB	0201	2020	BUILDING SYSTEMS	CLINICAL CENTER - B1 ELEVATOR REPLACEMENT	$ 412,000
CLINICAL CENTER-OFFICE/LAB	0201	2020	BUILDING SYSTEMS	CLINICAL CENTER - B2 ELEVATOR REPLACEMENT	$ 412,000
CLINICAL CENTER-OFFICE/LAB	0201	2021	BUILDING INTERIOR	REPLACE FLOOR TILE AND WALL BASE IN CORRIDORS OF OFFICE WING	$ 92,000
					$ 1,928,000
COMMUNICATION ARTS	0084	2017	BUILDING SYSTEMS	PUMPS	$ 20,000
COMMUNICATION ARTS	0084	2017	BUILDING SYSTEMS	REPLACE 17 AIR HANDLING UNITS AND ASSOCIATED FANS, PLUS 255 VAV BOXES	$ 3,412,000
COMMUNICATION ARTS	0084	2018	BUILDING SYSTEMS	CHILLER REPLACEMENT	$ 4,053,000
COMMUNICATION ARTS	0084	2019	BUILDING ENVELOPE	DOORS - EXTERIOR - BD	$ 33,000
COMMUNICATION ARTS	0084	2020	BUILDING SYSTEMS	INSTALL NEW DISTRIBUTION PANELS (6)	$ 181,000
COMMUNICATION ARTS	0084	2020	BUILDING SYSTEMS	REPLACE DOMESTIC COLD WATER METER AND ASSOCIATED SHUT OFF VALVES.	$ 31,000
COMMUNICATION ARTS	0084	2020	BUILDING SYSTEMS	REPLACE ONE CONDENSER PUMP	$ 80,000
COMMUNICATION ARTS	0084	2021	BUILDING ENVELOPE	REPLACE COMMUNICATION ARTS ROOF #9 PHASE 2 OF 2	$ 450,000
					$ 8,260,000
COMMUNICATION ARTS - MITN STORAGE	0084A	2020	BUILDING SYSTEMS	HVAC EQUIPMENT - AHU	$ 28,000

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Building Name	Bldg	Work Plan Year	Type	Description (Title)	Total Estimate
COMMUNICATION ARTS - MITN STORAGE	0084A	2020	BUILDING SYSTEMS	VAV SYSTEM	$ 90,000
					$ 118,000
COMPUTER CENTER	0035	2015	BUILDING SYSTEMS	REPLACE 13 BRANCH CIRCUIT PANELS	$ 98,000
COMPUTER CENTER	0035	2015	BUILDING SYSTEMS	REPLACE ALL HOT AND COLD WATER SHUT OFF VALVES AND RE-INSULATE.	$ 92,000
COMPUTER CENTER	0035	2016	BUILDING ENVELOPE	WINDOWS - REPLACE BUILDING WINDOWS AND GLASS BLOCK.	$ 739,000
COMPUTER CENTER	0035	2017	BUILDING SYSTEMS	COMPUTER CENTER - REPLACE FIRE ALARM SYSTEM	$ 420,000
COMPUTER CENTER	0035	2018	BUILDING SYSTEMS	COOLING TOWERS - DC1	$ 108,000
COMPUTER CENTER	0035	2018	BUILDING SYSTEMS	COOLING TOWERS - DC2	$ 108,000
COMPUTER CENTER	0035	2018	BUILDING SYSTEMS	COOLING TOWERS - DC3	$ 108,000
COMPUTER CENTER	0035	2020	BUILDING SYSTEMS	REPLACE CONTROL AIR COMPRESSOR	$ 39,000
COMPUTER CENTER	0035	2020	BUILDING SYSTEMS	SUBSTATIONS/TRANSFORMERS - 13.2 KV	$ 699,000
COMPUTER CENTER	0035	2022	BUILDING SYSTEMS	REPLACE 15 TON WATER COOLED LIEBERT A/C SYSTEM	$ 102,000
COMPUTER CENTER	0035	2022	BUILDING SYSTEMS	REPLACE 15 TON WATER COOLED LIEBERT A/C SYSTEM	$ 102,000
COMPUTER CENTER	0035	2022	BUILDING SYSTEMS	REPLACE 15 TON WATER COOLED LIEBERY A/C SYSTEM	$ 102,000
COMPUTER CENTER	0035	2022	BUILDING SYSTEMS	REPLACE 30 TON DRY COOLER & 2 PUMPS THAT SERVE FOR HEAT REJECTION ON THE CONDENSER LOOP FOR RM 204	$ 38,000
COMPUTER CENTER	0035	2023	BUILDING SYSTEMS	REPLACE 15 TON WATER COOLED LIEBERT A/C SYSTEM	$ 102,000
COMPUTER CENTER	0035	2023	BUILDING SYSTEMS	REPLACE 15 TON WATER COOLED LIEBERT A/C SYSTEM	$ 102,000
COMPUTER CENTER	0035	2023	BUILDING SYSTEMS	REPLACE 30 TON DRY COOLER AND 2 PUMPS THAT SERVE FOR HEAT REJECTION ON THE CONDENSER LOOP FOR RM 204	$ 38,000
COMPUTER CENTER	0035	2024	BUILDING SYSTEMS	REPLACE 30 TON DRY COOLER AND 2 PUMPS THAT SERVE FOR HEAT REJECTION ON CONDENSER LOOP FOR RM 204	$ 38,000
					$ 3,035,000
CONRAD HALL	0328	2014	BUILDING SYSTEMS	REPLACE BOOSTER COIL VALVES	$ 148,000
CONRAD HALL	0328	2016	BUILDING SYSTEMS	REPLACE OLD LIGHTING PANELS	$ 36,000
CONRAD HALL	0328	2019	BUILDING SYSTEMS	CONRAD HALL- UPRADE PCB TRANSFORMERS AND ELECTRICAL EQUIPMENT	$ 114,000
CONRAD HALL	0328	2020	BUILDING SYSTEMS	CHILLER - CH1	$ 250,000
CONRAD HALL	0328	2020	BUILDING SYSTEMS	REPLACE DOMESTIC COLD WATER SHUTOFF VALVES AND WATER METER WHERE WATER COMES INTO THE BUILDING.	$ 31,000
					$ 579,000
COOK-SEEVERS HALL	0020	2025	BUILDING SYSTEMS	REPLACE FLUSH VALVES, TOILET SEATS, LAVATORY FAUCETS, & WATER COOLERS IN PUBLIC RESTROOMS.	$ 25,000
					$ 25,000
COWLES HOUSE	0009	2017	BUILDING SYSTEMS	COWLES HOUSE - REPLACE FIRE ALARM SYSTEM	$ 101,000
COWLES HOUSE	0009	2017	BUILDING SYSTEMS	REPLACE WALK-IN COOLER AND WALK-IN FREEZER REFRIGERATION EQUIPMENT AND DOORS.	$ 45,000
COWLES HOUSE	0009	2018	BUILDING SYSTEMS	REPLACE 2 REACH-IN COOLERS, ONE REACH-IN FREEZER & UNDERCOUNTER COOLER.	$ 23,000
COWLES HOUSE	0009	2020	BUILDING SYSTEMS	REPLACE 2 KITCHEN DISHWASHERS AND 1 GARBAGE DISPOSAL	$ 21,000
COWLES HOUSE	0009	2020	BUILDING SYSTEMS	REPLACE 3-SEASONS ROOM AIR CONDITIONING SYSTEM	$ 23,000

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Building Name	Bldg	Work Plan Year	Type	Description (Title)	Total Estimate
COWLES HOUSE	0009	2020	BUILDING SYSTEMS	REPLACE BATHROOM SINKS, FAUCETS AND TOILETS. REPLACE KITCHEN FAUCETS.	$ 35,000
COWLES HOUSE	0009	2020	BUILDING SYSTEMS	REPLACE KITCHEN HVAC EQUIPMENT, FIRE ALARM SYSTEM AND MAIN HVAC EQUIPMENT.	$ 308,000
COWLES HOUSE	0009	2020	BUILDING ENVELOPE	REPLACE OR REPAIR ROOFS 3,4,5,6,7 AND 9.	$ 177,000
					$ 733,000
CROP SCIENCE-FIELD LAB	0213	2016	BUILDING SYSTEMS	VAV SYSTEM	$ 291,000
CROP SCIENCE-FIELD LAB	0213	2018	BUILDING SYSTEMS	REPLACE MAIN LIGHTING AND POWER DISTRIBUTION PANELS	$ 60,000
CROP SCIENCE-FIELD LAB	0213	2018	BUILDING SYSTEMS	REPLACE RESTROOM PLUMBING FIXTURES	$ 31,000
CROP SCIENCE-FIELD LAB	0213	2019	BUILDING SYSTEMS	PUMPS	$ 98,000
CROP SCIENCE-FIELD LAB	0213	2020	BUILDING SYSTEMS	REPLACE ELEVATOR 1	$ 296,000
					$ 776,000
CROP SCIENCE-PESTICIDE/HERBICIDE	0442F	2017	BUILDING ENVELOPE	ROOF #1	$ 21,000
CROP SCIENCE-PESTICIDE/HERBICIDE	0442F	2025	BUILDING SYSTEMS	PLUMBING FIXTURES	$ 33,000
					$ 54,000
CROP SCIENCE-RESEARCH	0442G	2025	BUILDING SYSTEMS	PLUMBING FIXTURES	$ 28,000
					$ 28,000
CROP SCIENCE-STRG 1	0442E	2017	BUILDING ENVELOPE	REPLACE ROOF #1	$ 117,000
					$ 117,000
DAIRY RESEARCH-FOREMAN'S HSE	0469F	2017	BUILDING SYSTEMS	REPLACE BOILER	$ 23,000
					$ 23,000
DAIRY RESEARCH-HEIFER BARN 1	0469A	2012	BUILDING INTERIOR	REPAIR SETTLING FLOOR AND REPIPE HEATING LINES TO CONVECTORS IN MAIN ENTRANCE AREA.	$ 52,000
DAIRY RESEARCH-HEIFER BARN 1	0469A	2017	BUILDING SYSTEMS	REPLACE DISTRIBUTION PANELS, LIGHTING PANELS AND BRANCH CIRCUITS,	$ 296,000
DAIRY RESEARCH-HEIFER BARN 1	0469A	2018	BUILDING SYSTEMS	REPLACE DISTRIBUTION PANEL, LIGHTING PANELS AND BRANCH CIRCUITS, AND LIGHTING FIXTURES IN BARN 469A.	$ 70,000
					$ 418,000
DAIRY RESEARCH-MAIN BARN	0469H	2012	BUILDING SYSTEMS	DAIRY RESEARCH BARN BOILER 1 REPLACEMENT	$ 24,000
DAIRY RESEARCH-MAIN BARN	0469H	2012	BUILDING SYSTEMS	DAIRY RESEARCH BARN BOILER 2 REPLACEMENT	$ 23,000
DAIRY RESEARCH-MAIN BARN	0469H	2017	BUILDING SYSTEMS	DAIRY RES BARN (469H)(001)- REPLACE BOILER PAST LIFE EXPECTANCY WITH ENERGY EFFICIENT OPERATION UNIT	$ 32,000
DAIRY RESEARCH-MAIN BARN	0469H	2017	BUILDING SYSTEMS	DAIRY RES BARN (469H)(002)- REPLACE BOILER PAST LIFE EXPECTANCY WITH ENERGY EFFICIENT OPERATION UNIT	$ 32,000
					$ 111,000
DEMONSTRATION HALL	0057	2015	BUILDING SYSTEMS	REPLACE OBSOLETE HEATING AND VENTILATING UNITS, CONTROL VALVES, AND TRAPS	$ 341,000
DEMONSTRATION HALL	0057	2015	BUILDING SYSTEMS	UPGRADE ARENA AUDIENCE LIGHTING	$ 128,000
DEMONSTRATION HALL	0057	2016	BUILDING SYSTEMS	REPLACE OLD INCANDESCENT FIXTURES WITH NEW FLUORESCENT- FOR CLASS ROOMS, OUTSIDE AND STORAGE AREA	$ 53,000

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Building Name	Bldg	Work Plan Year	Type	Description (Title)	Total Estimate
DEMONSTRATION HALL	0057	2016	BUILDING SYSTEMS	REPLACE UNIT HEATERS IN OLD HOCKEY RINK	$ 77,000
DEMONSTRATION HALL	0057	2016	BUILDING ENVELOPE	WINDOWS - REPLACE ALL OLD BUILDING WINDOWS (-197)	$ 1,137,000
DEMONSTRATION HALL	0057	2017	BUILDING SYSTEMS	UPGRADE FIRE ALARM SYSTEM AND ADD SMOKE DETECTION	$ 439,000
DEMONSTRATION HALL	0057	2018	BUILDING SYSTEMS	REPLACE RESTROOM FIXTURES AND WATER COOLERS	$ 62,000
DEMONSTRATION HALL	0057	2018	BUILDING SYSTEMS	REPLACE WATER SOFTENER SYSTEM IN EAST MECH ROOM 3	$ 62,000
DEMONSTRATION HALL	0057	2024	BUILDING ENVELOPE	REPLACE DEMONSTRATION HALL ROOF - AREA 4	$ 310,000
DEMONSTRATION HALL	0057	2024	BUILDING ENVELOPE	REPLACE DEMONSTRATION HALL ROOF - AREA 6	$ 354,000
					$ 2,963,000
DOBIE TOWER TV/FM TRANS	0601	2018	BUILDING SYSTEMS	EMERGENCY GENERATOR-DEPT. OWNED	$ 82,000
DOBIE TOWER TV/FM TRANS	0601	2018	BUILDING SYSTEMS	REPLACE EMERGENCY GENERATOR-DEPT. OWNED	$ 52,000
					$ 134,000
ENDOCRINE RES-SWINE	0470D	2017	BUILDING SYSTEMS	PUMPS	$ 22,000
					$ 22,000
ENG RESEARCH COMPLEX	0203A	2016	BUILDING SYSTEMS	HVAC EQUIPMENT	$ 869,000
ENG RESEARCH COMPLEX	0203A	2016	BUILDING SYSTEMS	LIGHTING FIXTURES	$ 617,000
ENG RESEARCH COMPLEX	0203A	2018	BUILDING SYSTEMS	REPLACE DOMESTIC COLD WATER METER AND ISOLATION VALVES IN MR-B105	$ 31,000
ENG RESEARCH COMPLEX	0203A	2019	BUILDING SYSTEMS	PRELIM DESIGN, ESTIMATE, AND PHASING PLANS - ENG RESEARCH COMPLEX HVAC	$ 270,000
ENG RESEARCH COMPLEX	0203A	2020	BUILDING SYSTEMS	A AND C WING EXHAUST FANS REPLACEMENT	$ 1,018,000
ENG RESEARCH COMPLEX	0203A	2020	BUILDING SYSTEMS	REPLACE AIR HANDLERS SERVING A, B, & C WINGS	$ 1,739,000
					$ 4,544,000
ENGINEERING	0081	2010	BUILDING INTERIOR	REPLACE OLD METAL PAN CEILINGS AND LIGHTING IN STAIRWELLS OF OLD ENGINEERING WING	$ 26,000
ENGINEERING	0081	2013	BUILDING ENVELOPE	EXTERIOR DOORS - REPLACE ALL EXTERIOR DOORS, HARDWARE AND FRAMES -	$ 222,000
ENGINEERING	0081	2014	BUILDING SYSTEMS	COMPLETE OVERHAUL OF OLD FREIGHT ELEVATOR, CONVERT TO PASSENGER ELEVATOR	$ 517,000
ENGINEERING	0081	2014	BUILDING ENVELOPE	REPAIR CONCRETE AND BRICK SCREENWALLS	$ 86,000
ENGINEERING	0081	2016	BUILDING ENVELOPE	REPLACE FAILED GLASS UNITS	$ 124,000
ENGINEERING	0081	2016	BUILDING SYSTEMS	VAV SYSTEM	$ 1,002,000
ENGINEERING	0081	2017	BUILDING SYSTEMS	REPLACE 2 MECHANICAL CHILLERS	$ 387,000
ENGINEERING	0081	2017	BUILDING SYSTEMS	REPLACE MOTOR CONTROL CENTERS	$ 60,000
ENGINEERING	0081	2017	BUILDING SYSTEMS	REPLACE ORIGINAL STEAM WATER HEATER IN MECH RM MR-21	$ 74,000
ENGINEERING	0081	2017	BUILDING SYSTEMS	REPLACEMENT OF CONDENSATE RECEIVER LOCATED IN THE BASEMENT HALLWAY	$ 45,000
ENGINEERING	0081	2018	BUILDING SYSTEMS	HVAC EQUIPMENT - AHU	$ 4,587,000
ENGINEERING	0081	2018	BUILDING SYSTEMS	REPLACE DUPLEX 5HP CONTROL AIR COMPRESSORS ON 120 GALLON TANK AND AIR DRYER	$ 31,000
ENGINEERING	0081	2018	BUILDING SYSTEMS	REPLACE LAVATORY FAUCETS AND TRIM, TOILET FLUSH VALVES AND SEATS, AND URINALS IN ORIGINAL BUILDING	$ 43,000
ENGINEERING	0081	2019	BUILDING SYSTEMS	HVAC EQUIPMENT - AHU	$ 2,925,000
ENGINEERING	0081	2019	BUILDING SYSTEMS	LIGHTING FIXTURES	$ 1,015,000

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Building Name	Bldg	Work Plan Year	Type	Description (Title)	Total Estimate
ENGINEERING	0081	2019	BUILDING SYSTEMS	REPLACE DUPLEX CONTROL AIR COMPRESSORS, AIR DRYER AND AIR BOARD LOCATED IN PENTHOUSE RM #500	$ 31,000
ENGINEERING	0081	2020	BUILDING SYSTEMS	REPLACE CHILLED WATER COILS IN HVAC FANS	$ 245,000
ENGINEERING	0081	2020	BUILDING SYSTEMS	REPLACE LAVATORY FAUCETS AND TRIM, URINAL AND TOILET FLUSH VALVES AND TOILET SEATS	$ 31,000
ENGINEERING	0081	2020	BUILDING SYSTEMS	REPLACE STEAM WATER HEATER IN MR-B510	$ 62,000
ENGINEERING	0081	2020	BUILDING SYSTEMS	VAV SYSTEM	$ 1,396,000
					$ 12,909,000
ENTOMOLOGY FIELD RESEARCH-MAIN	0474	2016	BUILDING ENVELOPE	REPLACE EXTERIOR DOORS (2) OHD`S AND (3) HM DOORS	$ 26,000
					$ 26,000
ERICKSON HALL	0144	2017	BUILDING SYSTEMS	ERICKSON HALL- REPLACE TWO BUNDLES IN NORTH BASEMENT MECHANICAL REPLACE EXPANSION TANK IN PENTHOUSE	$ 125,000
ERICKSON HALL	0144	2017	BUILDING ENVELOPE	FUND STUDY OF EXTERIOR MASONRY AND CAULKING FOR RESTORATION	$ 54,000
ERICKSON HALL	0144	2017	BUILDING SYSTEMS	REPLACE (2) SMALLER CONDENSATE RETURN UNIT AND ONE LARGER CRU IN MECH ROOM 1, 7, & 13	$ 158,000
ERICKSON HALL	0144	2017	BUILDING SYSTEMS	REPLACE ALL OLD POWER PANELS	$ 356,000
ERICKSON HALL	0144	2017	BUILDING SYSTEMS	REPLACE FAILED GLASS UNITS	$ 32,000
ERICKSON HALL	0144	2017	BUILDING SYSTEMS	REPLACE STEAM COIL, VALVES, TRAPS ON HVAC #2 IN NORTH BASEMENT MECHANICAL ROOM	$ 34,000
ERICKSON HALL	0144	2018	BUILDING SYSTEMS	REPLACE URINAL AND TOILET FLUSH VALVES	$ 43,000
ERICKSON HALL	0144	2018	BUILDING SYSTEMS	REPLACE DOMESTIC WATER METER AND ISOLATION VALVES (SOUTH SIDE OF MR-13)	$ 37,000
ERICKSON HALL	0144	2019	BUILDING SYSTEMS	REPLACE SF-6	$ 731,000
ERICKSON HALL	0144	2019	BUILDING SYSTEMS	REPLACE SF-7	$ 803,000
ERICKSON HALL	0144	2019	BUILDING SYSTEMS	REPLACE SF-8	$ 855,000
ERICKSON HALL	0144	2019	BUILDING SYSTEMS	REPLACE SF-9	$ 731,000
ERICKSON HALL	0144	2019	BUILDING INTERIOR	REPLACE STAIR TREADS IN ERICKSON HALL	$ 60,000
ERICKSON HALL	0144	2020	BUILDING SYSTEMS	UPDATE FIRE ALARM SYSTEM	$ 960,000
ERICKSON HALL	0144	2025	BUILDING SYSTEMS	REPLACE 2 HWH PUMPS B & G 1510, VALVES AND ELECTRICAL CONTROLS	$ 33,000
					$ 5,012,000
EUSTACE-COLE HALL	0015	2018	BUILDING SYSTEMS	PUMPS	$ 133,000
EUSTACE-COLE HALL	0015	2018	BUILDING SYSTEMS	VAV SYSTEM	$ 280,000
EUSTACE-COLE HALL	0015	2019	BUILDING SYSTEMS	CHILLER - CH1	$ 200,000
					$ 613,000
FARRALL HALL	0091	2015	BUILDING INTERIOR	INTERIOR DOOR/ FRAME/ HARDWARE REPLACEMENTS IN BASEMENT LEVEL	$ 48,000
FARRALL HALL	0091	2015	BUILDING SYSTEMS	REPLACE LIGHTING AND POWER DISTRIBUTION PANELS	$ 57,000
FARRALL HALL	0091	2015	BUILDING SYSTEMS	REPLACE OBSOLETE FIXTURES AND BRANCH CIRCUIT WIRING	$ 624,000
FARRALL HALL	0091	2015	BUILDING ENVELOPE	REPLACE STEEL WINDOWS WITH NEW INSULATED WINDOWS	$ 646,000
FARRALL HALL	0091	2017	BUILDING SYSTEMS	FARRALL HALL - INSTALL NEW ELECTRICAL MAIN STEAM VALVE	$ 43,000
FARRALL HALL	0091	2019	BUILDING SYSTEMS	PUMPS	$ 33,000
					$ 1,451,000
FARRALL-PROTOTYPE ASSEMBLY	0091A	2019	BUILDING SYSTEMS	PUMPS	$ 50,000

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Building Name	Bldg	Work Plan Year	Type	Description (Title)	Total Estimate
FARRALL-PROTOTYPE ASSEMBLY	0091A	2019	BUILDING SYSTEMS	VAV SYSTEM	$ 90,000
					$ 140,000
FEE HALL	0327	2011	BUILDING INTERIOR	FLOOR COVERING - REPLACE OR REPAIR IN STAIRWELLS	$ 245,000
FEE HALL	0327	2015	BUILDING SYSTEMS	REMOVE SPRAY-ON FIREPROOFING IN MR-E15 AND MR-B2 AND REINSULATE	$ 196,000
FEE HALL	0327	2018	BUILDING SYSTEMS	REPLACE TOILET AND URINAL FLUSH VALVES, FAUCETS, TRAPS, DRAINS IN PUBLIC RESTROOMS	$ 55,000
FEE HALL	0327	2019	BUILDING ENVELOPE	FEE HALL STUDY - WINDOW REPLACEMENT AND MASONRY RESTORATION	$ 103,000
FEE HALL	0327	2019	BUILDING SYSTEMS	FEE HALL- UPGRADE PCB TRANSFORMERS AND ELECTRICAL EQUIPMENT	$ 244,000
FEE HALL	0327	2019	BUILDING INTERIOR	REPLACE CEILINGS AND LIGHTING	$ 309,000
FEE HALL	0327	2019	BUILDING SYSTEMS	REPLACE STEAM BOOSTER COILS	$ 515,000
FEE HALL	0327	2020	BUILDING SYSTEMS	FEE - 5 ELEVATOR REPLACEMENT	$ 412,000
FEE HALL	0327	2020	BUILDING SYSTEMS	FEE HALL STEAM COIL PROBLEM	$ 21,000
					$ 2,100,000
FIRE STATION	0131	2015	BUILDING ENVELOPE	DOORS - EXTERIOR	$ 20,000
FIRE STATION	0131	2017	BUILDING SYSTEMS	REPLACE THE CONDENSATES RETURN DUPLEX UNIT IN THE BASEMENT MECH ROOM	$ 44,000
FIRE STATION	0131	2019	BUILDING ENVELOPE	REPLACE ROOF #4	$ 23,000
FIRE STATION	0131	2020	BUILDING INTERIOR	DOORS - INTERIOR	$ 116,000
					$ 203,000
FOOD SAFETY TOXICOLOGY	0186	2015	BUILDING SYSTEMS	PROVIDE CONNECTION POINT FOR PORTABLE GENERATOR TO POWER CAR AREAS.	$ 32,000
FOOD SAFETY TOXICOLOGY	0186	2017	BUILDING SYSTEMS	VAV SYSTEM	$ 3,479,000
FOOD SAFETY TOXICOLOGY	0186	2020	BUILDING SYSTEMS	REPLACE DOMESTIC HOT WATER HEATER	$ 59,000
FOOD SAFETY TOXICOLOGY	0186	2020	BUILDING SYSTEMS	UPGRADE 1 DDC PANEL SERVING CAR AREA	$ 22,000
FOOD SAFETY TOXICOLOGY	0186	2021	BUILDING SYSTEMS	REPLACE WATER SOFTENING EQUIPMENT	$ 75,000
FOOD SAFETY TOXICOLOGY	0186	2022	BUILDING SYSTEMS	PUMPS	$ 381,000
FOOD SAFETY TOXICOLOGY	0186	2022	BUILDING SYSTEMS	REPLACE CONTROL AIR COMPRESSOR (DUPLEX 5HP), MR B21	$ 31,000
FOOD SAFETY TOXICOLOGY	0186	2022	BUILDING SYSTEMS	REPLACE PUBLIC RESTROOM FIXTURES	$ 31,000
FOOD SAFETY TOXICOLOGY	0186	2023	BUILDING SYSTEMS	REPLACE AIR HANDLING UNIT 3	$ 161,000
					$ 4,271,000
FOOD SCIENCE	0179	2015	BUILDING SYSTEMS	PROVIDE CONNECTION POINT FOR PORTABLE GENERATOR TO POWER CAR AREAS.	$ 32,000
FOOD SCIENCE	0179	2015	BUILDING SYSTEMS	REPLACE CONDENSOR LINES FOR PROCESS REFRIGERATION	$ 225,000
FOOD SCIENCE	0179	2017	BUILDING SYSTEMS	FOOD SCIENCE BUILDING - REPLACE AIR COOLED A/C CHILLER SERVING ANIMAL AREA IN BASEMENT	$ 245,000
FOOD SCIENCE	0179	2018	BUILDING SYSTEMS	REPLACE 4 DISTRIBUTION AND POWER PANELS IN CAR AREA	$ 32,000
FOOD SCIENCE	0179	2018	BUILDING SYSTEMS	REPLACE LAB FIXTURE PLUMBING TRIM AND	$ 596,000
FOOD SCIENCE	0179	2019	BUILDING SYSTEMS	FOOD SCIENCE- UPGRADE PCB TRANSFORMERS AND ELECTRICAL EQUIPMENT	$ 236,000
FOOD SCIENCE	0179	2019	BUILDING INTERIOR	REPLACE INTERIOR LAMINATE CLAD OFFICE DOORS & HARDWARE AS NECESSARY	$ 323,000
FOOD SCIENCE	0179	2019	BUILDING SYSTEMS	UPGRADE 1 DDC PANEL SERVING CAR AREA	$ 39,000

MSU Capital Renewal Maintenance by Building FY2021-2025 (Including Deferred)

Building Name	Bldg	Work Plan Year	Type	Description (Title)	Total Estimate
FOOD SCIENCE	0179	2020	BUILDING SYSTEMS	REPLACE CHILLED WATER PUMPS FOR THE ANIMAL AREA	$ 39,000
FOOD SCIENCE	0179	2020	BUILDING SYSTEMS	REPLACE DOMESTIC WATER METER AND ISOLATION VALVES	$ 31,000
FOOD SCIENCE	0179	2020	BUILDING SYSTEMS	REPLACE FLUSH VALVES, TOILET SEATS, LAV FAUCETS ANDS TRIM	$ 25,000
FOOD SCIENCE	0179	2020	BUILDING SYSTEMS	REPLACE HV-3	$ 803,000
FOOD SCIENCE	0179	2020	BUILDING ENVELOPE	ROOF REPAIR/REPLACEMENT ROOF #3, 7	$ 42,000
FOOD SCIENCE	0179	2024	BUILDING SYSTEMS	REPLACE COOLING TOWER 01	$ 206,000
FOOD SCIENCE	0179	2024	BUILDING SYSTEMS	REPLACE COOLING TOWER 02	$ 206,000
FOOD SCIENCE	0179	2025	BUILDING SYSTEMS	REPLACE BOOSTER COILS THAT SERVE ANIMAL ROOMS	$ 32,000
FOOD SCIENCE	0179	2025	BUILDING SYSTEMS	REPLACE HEAT EXCHANGER THAT SERVES ANIMAL ROOMS	$ 39,000
FOOD SCIENCE	0179	2025	BUILDING SYSTEMS	REPLACE HOT WATER HEATING PUMPS THAT SERVES ANIMAL ROOMS	$ 78,000
					$ 3,229,000
FRIB	0164	2010	BUILDING ENVELOPE	EXTERIOR PAINTING	$ 21,000
FRIB	0164	2014	BUILDING SYSTEMS	REPLACE ELEVATOR 1	$ 426,000
FRIB	0164	2015	BUILDING SYSTEMS	HVAC EQUIPMENT	$ 251,000
FRIB	0164	2019	BUILDING SYSTEMS	PUMPS	$ 28,000
FRIB	0164	2020	BUILDING SYSTEMS	HVAC EQUIPMENT	$ 2,663,000
FRIB	0164	2020	BUILDING ENVELOPE	REPLACE / COAT ROOFS #23, 24	$ 108,000
FRIB	0164	2020	BUILDING ENVELOPE	REPLACE ROOFS 2, 3, 4, 5, 6, 7, 12	$ 722,000
FRIB	0164	2022	BUILDING SYSTEMS	REPLACE COOLING TOWER RM 176 & COOLED CONDENSER RM 244	$ 59,000
					$ 4,278,000
GEOGRAPHY	0176	2017	BUILDING SYSTEMS	GEOGRAPHY - REPLACE DOMESTIC WATER	$ 65,000
GEOGRAPHY	0176	2017	BUILDING SYSTEMS	REPLACE OBSOLETE MOTOR STARTERS AND DISCONNECTS.	$ 41,000
GEOGRAPHY	0176	2020	BUILDING SYSTEMS	REPLACE MAIN DOMESTIC COLD WATER SHUT OFF VALVES AND WATER METER,	$ 28,000
					$ 134,000
GILTNER HALL	0028	2010	BUILDING SYSTEMS	REPLACE AHU 2 AND 3, AND ASSOCIATED EXHAUST FANS	$ 355,000
GILTNER HALL	0028	2012	BUILDING SYSTEMS	REPLACE HEATING COILS IN HV1 AND HV2	$ 341,000
GILTNER HALL	0028	2013	BUILDING SYSTEMS	REPLACE 10 DISTRIBUTION AND POWER PANELS IN CAR AREA.	$ 84,000
GILTNER HALL	0028	2015	BUILDING SYSTEMS	REPLACE 480 VOLT DISTRIBUTION SYSTEM, MOTOR STARTERS	$ 790,000
GILTNER HALL	0028	2016	BUILDING INTERIOR	CEILINGS - REPLACE VARIOUS LAB ROOM CEILINGS THROUGHOUT THE ENTIRE BUILDING	$ 148,000
GILTNER HALL	0028	2016	BUILDING SYSTEMS	CONNECT TO CENTRAL CONTROL	$ 511,000
GILTNER HALL	0028	2017	BUILDING SYSTEMS	ELEVATOR # 4 REPLACEMENT	$ 296,000
GILTNER HALL	0028	2017	BUILDING SYSTEMS	GILTNER HALL - BASEMENT AIR PLENUMS-REMOVE ALL PIPE INSULATION ON UTILITY PIPING & REINSULATE	$ 169,000
GILTNER HALL	0028	2017	BUILDING SYSTEMS	GILTNER HALL - ELEVATOR #3 REPLACEMENT	$ 473,000
GILTNER HALL	0028	2017	BUILDING SYSTEMS	REPLACE AHU-1 AND ASSOCIATED EXHAUST FAN	$ 161,000
GILTNER HALL	0028	2017	BUILDING SYSTEMS	REPLACE DOMESTIC STEAM WATER HEATER IN MR-22	$ 61,000
GILTNER HALL	0028	2017	BUILDING SYSTEMS	REPLACE DOMESTIC STEAM WATER HEATER IN MR-35	$ 61,000
GILTNER HALL	0028	2017	BUILDING SYSTEMS	SPLIT A/C 1 - REPLACE COND. UNIT AND EVAP. COIL	$ 66,000
GILTNER HALL	0028	2018	BUILDING SYSTEMS	REPLACE 2 CONTROL AIR COMPRESSORS WITH LARGER ONES	$ 53,000

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Building Name	Bldg	Work Plan Year	Type	Description (Title)	Total Estimate
GILTNER HALL	0028	2018	BUILDING SYSTEMS	REPLACE ALL RESTROOM URINALS WITH 1/8 GAL. FLUSH URINALS.	$ 49,000
GILTNER HALL	0028	2018	BUILDING ENVELOPE	WINDOWS - CI	$ 60,000
GILTNER HALL	0028	2020	BUILDING SYSTEMS	PROVIDE CONNECTION POINT FOR PORTABLE GENERATOR TO POWER CAR AREAS.	$ 97,000
GILTNER HALL	0028	2020	BUILDING SYSTEMS	REPLACE BOOSTER COILS FOR ANIMAL ROOMS	$ 97,000
GILTNER HALL	0028	2020	BUILDING SYSTEMS	REPLACE HEAT EXCHANGERS FOR ANIMAL ROOMS	$ 39,000
GILTNER HALL	0028	2020	BUILDING SYSTEMS	REPLACE HEAT PUMPS FOR ANIMAL ROOMS	$ 78,000
GILTNER HALL	0028	2020	BUILDING ENVELOPE	WINDOWS - CI	$ 34,000
GILTNER HALL	0028	2020	BUILDING ENVELOPE	WINDOWS - REPLACE/REFURBISH OLD WOOD WINDOWS	$ 294,000
GILTNER HALL	0028	2024	BUILDING SYSTEMS	UPGRADE 3 DDC PANELS SERVING CAR AREA	$ 85,000
					$ 4,402,000
HANCOCK TURFGRASS-FIELD LAB	0476	2018	BUILDING SYSTEMS	REPLACE ORIGINAL EXTERIOR SIDING	$ 42,000
					$ 42,000
HANNAH ADMINISTRATION	0067	2014	BUILDING SYSTEMS	REPLACE CEILING AND ADD NEW DUCT WORK - ROOMS 50 & 60	$ 315,000
HANNAH ADMINISTRATION	0067	2014	BUILDING ENVELOPE	REPLACE WINDOWS AND ENTRY DOORS	$ 2,651,000
HANNAH ADMINISTRATION	0067	2017	BUILDING ENVELOPE	EXTERIOR RESTORATION AND CAULKING	$ 166,000
HANNAH ADMINISTRATION	0067	2018	BUILDING SYSTEMS	COMPLETE REPLACEMENT OF SPECIAL ELEVATOR	$ 341,000
HANNAH ADMINISTRATION	0067	2019	BUILDING SYSTEMS	ADMINISTRATION-UPGRADE PCB TRANSFORMERS AND ELECTRICAL EQUIPMENT	$ 236,000
HANNAH ADMINISTRATION	0067	2019	BUILDING SYSTEMS	HANNAH ADMIN: REPLACE SF-7 - UNIT IS BEYOND LIFE EXPECTANCY	$ 285,000
HANNAH ADMINISTRATION	0067	2019	BUILDING SYSTEMS	PRELIM DESIGN, ESTIMATES, AND PHASING PLANS FOR HVAC 5 AND 6	$ 50,000
HANNAH ADMINISTRATION	0067	2019	BUILDING SYSTEMS	REPLACE (4) HOT WATER HEATING PUMPS AND VALVES	$ 88,000
HANNAH ADMINISTRATION	0067	2019	BUILDING SYSTEMS	REPLACE 20 TON CHILLER	$ 323,000
HANNAH ADMINISTRATION	0067	2019	BUILDING SYSTEMS	REPLACE CHILLER	$ 172,000
HANNAH ADMINISTRATION	0067	2020	BUILDING SYSTEMS	HANNAH ADMIN: REPLACE SF-1 - UNIT IS BEYOND LIFE EXPECTANCY	$ 285,000
HANNAH ADMINISTRATION	0067	2020	BUILDING SYSTEMS	HANNAH ADMIN: REPLACE SF-2 - UNIT IS BEYOND LIFE EXPECTANCY	$ 285,000
HANNAH ADMINISTRATION	0067	2020	BUILDING SYSTEMS	HANNAH ADMIN: REPLACE SF-3 - UNIT IS BEYOND LIFE EXPECTANCY	$ 285,000
HANNAH ADMINISTRATION	0067	2020	BUILDING SYSTEMS	HANNAH ADMIN: REPLACE SF-4 - UNIT IS BEYOND LIFE EXPECTANCY	$ 285,000
HANNAH ADMINISTRATION	0067	2020	BUILDING SYSTEMS	HANNAH ADMIN: REPLACE SF-5 - UNIT IS BEYOND LIFE EXPECTANCY	$ 285,000
HANNAH ADMINISTRATION	0067	2020	BUILDING SYSTEMS	HANNAH ADMIN: REPLACE SF-6 - UNIT IS BEYOND LIFE EXPECTANCY	$ 285,000
HANNAH ADMINISTRATION	0067	2020	BUILDING INTERIOR	REPLACE CEILINGS, LIGHTING, AND INSTALL HVAC DISTRIBUTION	$ 1,786,000
HANNAH ADMINISTRATION	0067	2022	BUILDING SYSTEMS	REPLACE 2 BASE MT. SUMP PUMPS (GORMAN RUPP) IN MR B1	$ 29,000
HANNAH ADMINISTRATION	0067	2025	BUILDING SYSTEMS	REPLACE CHILLER #1 AND COOLING TOWER - CT1	$ 2,214,000
HANNAH ADMINISTRATION	0067	2025	BUILDING SYSTEMS	REPLACE CHILLER #2 AND COOLING TOWER - CT 2	$ 2,214,000
					$ 12,580,000
HORSE RESEARCH-BARN	0456O	2020	BUILDING ENVELOPE	ROOFING - SH, ROOF #1	$ 43,000

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Building Name	Bldg	Work Plan Year	Type	Description (Title)	Total Estimate
					$ 43,000
HORSE RESEARCH-STRG/EXERCISE	0456M	2015	BUILDING ENVELOPE	ROOFS #1	$ 42,000
					$ 42,000
HORSE RESEARCH-TEACH RESEARCH BARN	0456L	2021	BUILDING ENVELOPE	REPLACE METAL ROOF AT HORSE RESEARCH TEACHING & RESEARCH BARN	$ 23,000
					$ 23,000
HORSE RESEARCH-WEST HORSE BARN	0456B	2017	BUILDING ENVELOPE	ROOFS #2 AND 3	$ 103,000
					$ 103,000
HORTICULTURE RES-HOUSE/OFFICE	0407A	2012	BUILDING SYSTEMS	HORTICULTURE RESEARCH BOILER 1 REPLACEMENT	$ 20,000
HORTICULTURE RES-HOUSE/OFFICE	0407A	2017	BUILDING SYSTEMS	REPLACE HOT WATER BOILER WITH HIGH EFF. EQUIPMENT..	$ 32,000
					$ 52,000
HORTICULTURE RES-WINERY	0407F	2017	BUILDING ENVELOPE	ROOFS #1 AND 2	$ 53,000
HORTICULTURE RES-WINERY	0407F	2019	BUILDING SYSTEMS	HVAC EQUIPMENT - AHU	$ 138,000
HORTICULTURE RES-WINERY	0407F	2019	BUILDING SYSTEMS	PUMPS	$ 138,000
					$ 329,000
HUMAN ECOLOGY	0005	2017	BUILDING SYSTEMS	HUMAN ECOLOGY - ELEVATOR 1 REPLACEMENT	$ 412,000
HUMAN ECOLOGY	0005	2018	BUILDING ENVELOPE	HUMAN ECOLOGY: MASONRY AND CAULKING RESTORATION	$ 307,000
HUMAN ECOLOGY	0005	2019	BUILDING ENVELOPE	ROOF REPLACEMENT - ASBESTOS SHINGLES, BUILT UP, COPPER	$ 797,000
HUMAN ECOLOGY	0005	2020	BUILDING SYSTEMS	HUMAN ECOLOGY - BUILDING STEAM VALVE	$ 23,000
HUMAN ECOLOGY	0005	2020	BUILDING INTERIOR	REPLACE CEILING AND LIGHTING IN BUILDINGS CORRIDORS	$ 85,000
HUMAN ECOLOGY	0005	2020	BUILDING INTERIOR	REPLACE SELECTED HALLWAY ROOM DOORS AND HARDWARE AS NECESSARY (APPROXIMATELY 40)	$ 78,000
					$ 1,702,000
IM SPORTS-CIRCLE	0051	2010	BUILDING INTERIOR	REPLACE 1ST FLOOR GYMNASIUM ENTRY DOORS AND HARDWARE	$ 21,000
IM SPORTS-CIRCLE	0051	2014	BUILDING SYSTEMS	REPLACE OUTSIDE AIR DAMPERS	$ 80,000
IM SPORTS-CIRCLE	0051	2016	BUILDING INTERIOR	DEMO 30'X50' 12"X12" GLUED ON CEILING TILE & REPLACE CEILING W/ 2'X2' DROP CEILING	$ 47,000
IM SPORTS-CIRCLE	0051	2016	BUILDING SYSTEMS	REPLACE BATTERY OPERATED EM LIGHTS	$ 230,000
IM SPORTS-CIRCLE	0051	2016	BUILDING SYSTEMS	REPLACE ELEVATOR 1	$ 328,000
IM SPORTS-CIRCLE	0051	2017	BUILDING INTERIOR	REPLACE STAIR TREADS, RISERS, STRINGERS AND LANDING FLOORING	$ 33,000
IM SPORTS-CIRCLE	0051	2017	BUILDING INTERIOR	REPLACE CEILINGS AND LIGHTING IN CORRIDORS	$ 87,000
IM SPORTS-CIRCLE	0051	2017	BUILDING SYSTEMS	REPLACE FIRE ALARM SYSTEM	$ 436,000
IM SPORTS-CIRCLE	0051	2018	BUILDING SYSTEMS	REPLACE GASKETS/SEALS ON LIGHTS, UPGRADE TO HID FIXTURES	$ 98,000
IM SPORTS-CIRCLE	0051	2018	BUILDING SYSTEMS	REPLACE WATER SOFTENER MINERAL IN BUILDING WATER SOFTENERS	$ 62,000
IM SPORTS-CIRCLE	0051	2019	BUILDING SYSTEMS	CHANGE IM CIRCLE POOL FILTRATION TO CLOSED LOOP	$ 102,000
IM SPORTS-CIRCLE	0051	2020	BUILDING SYSTEMS	REPLACE COLUMN AND WALL SHOWERS IN THE MEN'S & WOMEN'S LOCKER ROOMS	$ 95,000

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Building Name	Bldg	Work Plan Year	Type	Description (Title)	Total Estimate
IM SPORTS-CIRCLE	0051	2020	BUILDING SYSTEMS	REPLACE TOILETS, LAVATORIES & URINALS IN RESTROOMS	$ 71,000
IM SPORTS-CIRCLE	0051	2022	BUILDING INTERIOR	IM SPORTS-CIRCLE - REPLACE FLOOR IN 2ND FLOOR GYM	$ 443,000
					$ 2,133,000
IM SPORTS-EAST	0175	2011	BUILDING INTERIOR	REPLACE FLOORING ON RUNNING TRACK. APPROXIMATELY 7000 SQFT	$ 71,000
IM SPORTS-EAST	0175	2016	BUILDING ENVELOPE	ROOF REPLACEMENT / RESTORATION	$ 1,061,000
IM SPORTS-EAST	0175	2018	BUILDING SYSTEMS	HVAC EQUIPMENT - AHU	$ 1,581,000
IM SPORTS-EAST	0175	2018	BUILDING SYSTEMS	REPLACE CHILLED WATER PUMPS	$ 67,000
IM SPORTS-EAST	0175	2018	BUILDING SYSTEMS	REPLACE ELEVATOR 1	$ 296,000
IM SPORTS-EAST	0175	2018	BUILDING SYSTEMS	REPLACE HW HEAT PUMPS	$ 67,000
IM SPORTS-EAST	0175	2025	BUILDING SYSTEMS	REPLACE CONTROL AIR COMPRESSOR	$ 35,000
IM SPORTS-EAST	0175	2025	BUILDING SYSTEMS	SECURITY & EMERGENCY SYSTEMS/ TIME CLOCK - FIRE ALARM	$ 110,000
					$ 3,288,000
IM SPORTS-WEST	0151	2012	BUILDING INTERIOR	REPLACE CEILING AND LIGHTING IN 2ND FLOOR GYMNASIUM	$ 98,000
IM SPORTS-WEST	0151	2014	BUILDING SYSTEMS	REPLACE DETERIORATED DUCTWORK ABOVE CEILINGS AT ROOMS 138 & 140.	$ 54,000
IM SPORTS-WEST	0151	2015	BUILDING SYSTEMS	REPLACE AIR CONDITIONING SYSTEM FOR ROOM 231 BY CONNECTING TO NEW CHILLER SYSTEM	$ 111,000
IM SPORTS-WEST	0151	2015	BUILDING ENVELOPE	REPLACE ROOF #13	$ 61,000
IM SPORTS-WEST	0151	2016	BUILDING SYSTEMS	REMOVE ASBESTOS ACOUSICAL PLASTER	$ 319,000
IM SPORTS-WEST	0151	2016	BUILDING SYSTEMS	REPLACE CABINET HEATERS NORTH ENTRANCE	$ 26,000
IM SPORTS-WEST	0151	2017	BUILDING ENVELOPE	IM SPORTS-WEST - REPLACE EXTERIOR DOORS	$ 222,000
IM SPORTS-WEST	0151	2018	BUILDING SYSTEMS	REPLACE 20 ORIGINAL HOT AND COLD WATER SHUT OFF VALVES	$ 47,000
IM SPORTS-WEST	0151	2019	BUILDING SYSTEMS	REPLACE HV-11	$ 206,000
IM SPORTS-WEST	0151	2019	BUILDING SYSTEMS	REPLACE HV-13 AND HV-19	$ 361,000
IM SPORTS-WEST	0151	2019	BUILDING SYSTEMS	REPLACE HV-15 AND HV-23	$ 464,000
IM SPORTS-WEST	0151	2019	BUILDING SYSTEMS	REPLACE HV-18 AND HV-26	$ 464,000
IM SPORTS-WEST	0151	2019	BUILDING SYSTEMS	REPLACE HV-20	$ 206,000
IM SPORTS-WEST	0151	2019	BUILDING SYSTEMS	REPLACE HV-21 AND HV-24	$ 515,000
IM SPORTS-WEST	0151	2019	BUILDING SYSTEMS	REPLACE HV-3	$ 721,000
IM SPORTS-WEST	0151	2019	BUILDING SYSTEMS	REPLACE HV-4 AND HV-16	$ 361,000
IM SPORTS-WEST	0151	2019	BUILDING SYSTEMS	REPLACE HV-6 AND HV-17	$ 361,000
IM SPORTS-WEST	0151	2019	BUILDING SYSTEMS	REPLACE HV-9	$ 206,000
IM SPORTS-WEST	0151	2019	BUILDING INTERIOR	REPLACE STAIR TREADS IN IM WEST	$ 151,000
IM SPORTS-WEST	0151	2020	BUILDING INTERIOR	REPLACE GYM FLOOR - ROOM 10	$ 148,000
IM SPORTS-WEST	0151	2020	BUILDING SYSTEMS	REPLACE 40 TOILETS, 40 LAVATORIES, AND 25 URINALS IN RESTROOMS	$ 89,000
IM SPORTS-WEST	0151	2020	BUILDING SYSTEMS	REPLACE COLUMN SHOWERS AND WALL SHOWERS VALVES IN LOCKER ROOMS	$ 118,000
IM SPORTS-WEST	0151	2020	BUILDING SYSTEMS	REPLACE EXHAUST FANS IN ARENA, TENNIS COURTS, AND UPPER WEST GYM.	$ 69,000
IM SPORTS-WEST	0151	2020	BUILDING INTERIOR	REPLACE GYM FLOORS - ROOMS 230 AND 233	$ 295,000
IM SPORTS-WEST	0151	2021	BUILDING SYSTEMS	IM WEST OUTDOOR POOL RESTORATION	$ 600,000
					$ 6,273,000
IPF	0167	2016	BUILDING SYSTEMS	REPLACE ELEVATOR AND CONVERT TO PASSENGER	$ 205,000
IPF	0167	2018	BUILDING SYSTEMS	REPLACE CONTROL AIR COMPRESSOR AND AIR DRYER	$ 49,000
IPF	0167	2019	BUILDING ENVELOPE	IPF LOADING DOCK	$ 31,000
					$ 285,000

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Building Name	Bldg	Work Plan Year	Type	Description (Title)	Total Estimate
IPF - STORAGE NO. 1	0209	2018	BUILDING ENVELOPE	ROOFING - FM ROOF #1	$ 86,000
					$ 86,000
IPF - STORAGE NO. 2	0210	2019	BUILDING ENVELOPE	ROOFING - FM ROOF #1	$ 108,000
					$ 108,000
JENISON FIELDHOUSE	0056	2013	BUILDING INTERIOR	REPLACE WOOD FLOOR IN NORTH UPPER GYM	$ 295,000
JENISON FIELDHOUSE	0056	2014	BUILDING INTERIOR	REPLACE OLD STEEL TOILET PARTITIONS	$ 31,000
JENISON FIELDHOUSE	0056	2015	BUILDING SYSTEMS	REPLACE ALL DETERIORATED UNDERGROUND SANITARY AND STORM WASTE PIPING	$ 977,000
JENISON FIELDHOUSE	0056	2015	BUILDING SYSTEMS	REPLACE CONTROL AIR COMPRESSOR (DUPLEX 200GAL 7.5HP)	$ 33,000
JENISON FIELDHOUSE	0056	2016	BUILDING ENVELOPE	REPAIR MASONRY AT ENTRANCES	$ 129,000
JENISON FIELDHOUSE	0056	2017	BUILDING SYSTEMS	REPLACE HEATING AND VENTILATING UNITS	$ 591,000
JENISON FIELDHOUSE	0056	2017	BUILDING SYSTEMS	REPLACE STEAM PRV SYSTEM IN MAIN MECHANICAL ROOM	$ 148,000
JENISON FIELDHOUSE	0056	2018	BUILDING SYSTEMS	REPLACE ALL ORIGINAL EXPOSED SANITARY WASTE PIPING	$ 246,000
JENISON FIELDHOUSE	0056	2018	BUILDING SYSTEMS	REPLACE ORIGINAL STORM WASTE PIPING	$ 246,000
JENISON FIELDHOUSE	0056	2018	BUILDING SYSTEMS	REPLACE URINALS, TOILETS, LAVATORIES, AND WATER COOLERS IN PUBLIC RESTROOMS	$ 117,000
JENISON FIELDHOUSE	0056	2019	BUILDING SYSTEMS	REMOVE AND REPLACE ORIGINAL EXPOSED DOMESTIC HOT AND COLD WATER PIPING IN BASEMENT.	$ 185,000
JENISON FIELDHOUSE	0056	2019	BUILDING SYSTEMS	REPLACE ELECTRICAL BRANCH CIRCUIT PANELS, PANEL FEEDERS, AND BRANCH CIRCUITS	$ 1,845,000
JENISON FIELDHOUSE	0056	2019	BUILDING SYSTEMS	REPLACE WATER SOFTENER MINERAL IN TWO WATER SOFTENER TANKS LOCATED IN THE BASEMENT MECH ROOM.	$ 37,000
JENISON FIELDHOUSE	0056	2020	BUILDING SYSTEMS	REPLACE TWO 4" GORMON RUPP BASE MTD SUMP PUMPS	$ 44,000
JENISON FIELDHOUSE	0056	2021	BUILDING SYSTEMS	VAV SYSTEM	$ 362,000
JENISON FIELDHOUSE	0056	2022	BUILDING SYSTEMS	REPLACE 2 CHILLERS LOCATED ON ROOF.	$ 418,000
JENISON FIELDHOUSE	0056	2022	BUILDING SYSTEMS	REPLACE FILTRINE CHILLER, PUMPS, AND CONTROLS FOR THE TRAINING ROOM COLD TUB	$ 25,000
JENISON FIELDHOUSE	0056	2024	BUILDING SYSTEMS	REPLACE 2 PEERLESS POOL PUMPS IN BASEMENT MECH ROOM	$ 62,000
JENISON FIELDHOUSE	0056	2024	BUILDING SYSTEMS	REPLACE HOT WATER HEAT PUMPS CP-1 AND CP-2	$ 30,000
					$ 5,821,000
KEDZIE HALL	0029	2011	BUILDING ENVELOPE	ROOF REPAIR/REPLACEMENT ROOF #12	$ 21,000
KEDZIE HALL	0029	2016	BUILDING INTERIOR	REPLACE STAIRTREADS/ RISERS AND LANDING MATERIAL IN STAIRWELL	$ 65,000
KEDZIE HALL	0029	2017	BUILDING INTERIOR	REPLACE MARBLE TOILET PARTITIONS WITH NEW STAINLESS STEEL	$ 46,000
KEDZIE HALL	0029	2017	BUILDING ENVELOPE	REPLACE ROOF SPLIT AC 6	$ 39,000
KEDZIE HALL	0029	2017	BUILDING SYSTEMS	SOUTH KEDZIE REPLACE STEAM PRV	$ 81,000
KEDZIE HALL	0029	2018	BUILDING SYSTEMS	REPLACE DOMESTIC WATER METER	$ 37,000
KEDZIE HALL	0029	2018	BUILDING SYSTEMS	REPLACE PUBLIC RESTROOM FIXTURES	$ 31,000
KEDZIE HALL	0029	2019	BUILDING INTERIOR	CEILING REPLACEMENTS IN CORRIDORS OF 1ST, 2ND AND 3RD FLOORS OF NORTH WING	$ 103,000
KEDZIE HALL	0029	2019	BUILDING SYSTEMS	KEDZIE HALL - UPGRADE PCB TRANSFORMERS AND ELECTRICAL EQUIPMENT	$ 118,000
KEDZIE HALL	0029	2019	BUILDING SYSTEMS	REPLACE CONSOLE INDUCTION TERMINAL UNITS AT SOUTH KEDZIE	$ 1,193,000
KEDZIE HALL	0029	2020	BUILDING SYSTEMS	REPLACE 4 HWH PUMPS #3,4,5,6 (BASE MTD., B&G 1510'S)	$ 66,000
KEDZIE HALL	0029	2023	BUILDING SYSTEMS	REPLACE 1 BASE MTD. PUMP THAT SENSES CHILLED WATER TO MARSHALL HALL W/ 2 NEW PUMPS	$ 66,000

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Building Name	Bldg	Work Plan Year	Type	Description (Title)	Total Estimate
KEDZIE HALL	0029	2023	BUILDING SYSTEMS	REPLACE SECONDARY CHILLED WATER PUMP & INSTALL 2ND PUMP FOR REDUNDANCY	$ 88,000
					$ 1,954,000
KRESGE ART	0150	2015	BUILDING ENVELOPE	REPLACE CURTAIN WALL/WINDOWS	$ 5,747,000
KRESGE ART	0150	2015	BUILDING SYSTEMS	REPLACE HOT WATER HEATING SYSTEM	$ 2,299,000
KRESGE ART	0150	2016	BUILDING ENVELOPE	REPLACE BALCONY DOORS AND HARDWARE ON SOUTH SIDE OF BLDG	$ 127,000
KRESGE ART	0150	2017	BUILDING SYSTEMS	CHILLER	$ 341,000
KRESGE ART	0150	2017	BUILDING SYSTEMS	COOLING TOWERS	$ 290,000
KRESGE ART	0150	2018	BUILDING SYSTEMS	ABATE PLASTER/SPRAY-ON FIREPROOFING	$ 900,000
KRESGE ART	0150	2018	BUILDING ENVELOPE	DOORS - EXTERIOR - ED	$ 50,000
KRESGE ART	0150	2022	BUILDING SYSTEMS	INSTALL DUPLEX CONTROL AIR COMPRESSOR	$ 29,000
					$ 9,783,000
KRESGE ART-SCULPTURE STUDIO	0150A	2013	BUILDING ENVELOPE	REPLACE EXTERIOR ALUMINUM DOORS AND HARDWARE IN (2) LOCATIONS	$ 26,000
					$ 26,000
LANDSCAPE SERVICES	0158	2020	BUILDING SYSTEMS	HVAC EQUIPMENT - AHU	$ 37,000
					$ 37,000
LANDSCAPE SRVCS NURSERY-HEADHOUSE	0406A	2015	BUILDING ENVELOPE	REPLACE ROOF #1, 2, AND 3	$ 34,000
					$ 34,000
LARGE ANIMAL RES-HAY BARN	0447B	2022	BUILDING ENVELOPE	ROOFING - MT #1	$ 46,000
					$ 46,000
LIBRARY	0049	2015	BUILDING ENVELOPE	REPLACE EXTERIOR ALUMINUM ENTRANCE DOORS AND HARDWARE	$ 142,000
LIBRARY	0049	2017	BUILDING SYSTEMS	REPLACE DOMESTIC STEAM WATER HEATER IN BASEMENT MR WB-12	$ 61,000
LIBRARY	0049	2017	BUILDING SYSTEMS	REPLACE HOT WATER HEATER (STEAM) 1	$ 80,000
LIBRARY	0049	2018	BUILDING SYSTEMS	REPLACE DOMESTIC WATER METER AND ISOLATION VALVES ON MAIN COLD WATER PIPING IN BASEMENT MR WB-12	$ 31,000
LIBRARY	0049	2019	BUILDING SYSTEMS	LIBRARY - UPGRADE PCB TRANSFORMERS AND ELECTRICAL EQUIPMENT	$ 244,000
LIBRARY	0049	2019	BUILDING SYSTEMS	LIBRARY HVAC PRELIM DESIGN, ESTIMATES, AND PHASING	$ 100,000
LIBRARY	0049	2019	BUILDING SYSTEMS	PUMPS	$ 50,000
LIBRARY	0049	2019	BUILDING SYSTEMS	REPLACE SF-2	$ 1,406,000
LIBRARY	0049	2019	BUILDING SYSTEMS	REPLACE SF-4A	$ 876,000
LIBRARY	0049	2019	BUILDING SYSTEMS	REPLACE SF-5	$ 876,000
LIBRARY	0049	2019	BUILDING SYSTEMS	REPLACE SF-6	$ 876,000
LIBRARY	0049	2020	BUILDING SYSTEMS	VAV SYSTEM	$ 108,000
					$ 4,850,000
LIFE SCIENCE	0183	2015	BUILDING SYSTEMS	PROVIDE CONNECTION POINT FOR PORTABLE GENERATOR TO POWER CAR AREAS.	$ 52,000
LIFE SCIENCE	0183	2016	BUILDING ENVELOPE	GENERAL MASONRY & CAULKING REPAIRS	$ 394,000
LIFE SCIENCE	0183	2017	BUILDING SYSTEMS	REPLACE FIRE ALARM SYSTEM	$ 797,000
LIFE SCIENCE	0183	2017	BUILDING SYSTEMS	REPLACE HEAT PUMPS #5, #6, AND #7 IN THE NORTH A-WING PENTHOUSE, ADD 4TH PUMP	$ 129,000
LIFE SCIENCE	0183	2017	BUILDING SYSTEMS	REPLACE TWO ORIGINAL STEAM WATER HEATERS	$ 185,000
LIFE SCIENCE	0183	2018	BUILDING SYSTEMS	LIFE SCIENCE - ABATE SPRAY-ON FIREPROOFING ABOVE CEILINGS IN ENTIRE BUILDING	$ 10,558,000

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Building Name	Bldg	Work Plan Year	Type	Description (Title)	Total Estimate
LIFE SCIENCE	0183	2018	BUILDING SYSTEMS	REPLACE 6 DISTRIBUTION AND POWER PANELS IN CAR AREA.	$ 45,000
LIFE SCIENCE	0183	2018	BUILDING SYSTEMS	REPLACE ALL PUBLIC RESTROOM LAVATORY FAUCETS AND TRIM,	$ 37,000
LIFE SCIENCE	0183	2019	BUILDING SYSTEMS	LIFE SCIENCE- UPGRADE PCB TRANSFORMERS AND ELECTRICAL EQUIPMENT	$ 244,000
LIFE SCIENCE	0183	2019	BUILDING SYSTEMS	REPLACE HVAC-1	$ 403,000
LIFE SCIENCE	0183	2019	BUILDING SYSTEMS	REPLACE HVAC-2	$ 403,000
LIFE SCIENCE	0183	2019	BUILDING SYSTEMS	REPLACE HVAC-4	$ 265,000
LIFE SCIENCE	0183	2019	BUILDING SYSTEMS	REPLACE HVAC-5	$ 250,000
LIFE SCIENCE	0183	2020	BUILDING SYSTEMS	LIFE SCIENCE PLENUM ABATEMENT, LIGHTING, CEILING, & INSULATION	$ 13,000,000
LIFE SCIENCE	0183	2020	BUILDING SYSTEMS	REPLACE BOOSTER COILS AND VALVES FOR ANIMAL ROOMS	$ 32,000
LIFE SCIENCE	0183	2020	BUILDING SYSTEMS	REPLACE HUMIDIFICATION FOR ANIMAL ROOMS	$ 32,000
LIFE SCIENCE	0183	2021	BUILDING SYSTEMS	REPLACE ELEVATOR 1	$ 59,000
LIFE SCIENCE	0183	2024	BUILDING SYSTEMS	REPLACE ELEVATOR 2	$ 473,000
					$ 27,358,000
LINTON HALL	0014	2011	BUILDING SYSTEMS	REPLACE ELEVATOR 2	$ 59,000
LINTON HALL	0014	2018	BUILDING INTERIOR	INTERIOR DOORS - REPLACE SELECTED INTERIOR DOORS AND HARDWARE	$ 51,000
LINTON HALL	0014	2018	BUILDING SYSTEMS	REPLACE LINTON LIGHTING FIXTURES	$ 22,000
LINTON HALL	0014	2020	BUILDING SYSTEMS	REPLACE ALL WATER PIPING IN BUILDING.	$ 984,000
LINTON HALL	0014	2021	BUILDING ENVELOPE	LINTON HALL BUILDING ENVELOPE RENEWAL	$ 2,500,000
LINTON HALL	0014	2025	BUILDING SYSTEMS	ELEVATOR - 1	$ 416,000
					$ 4,032,000
MANLY MILES	0154	2014	BUILDING ENVELOPE	REPLACE ALL WINDOWS	$ 1,437,000
MANLY MILES	0154	2017	BUILDING SYSTEMS	REMOVE ALL ASBESTOS CONTAMINATED CEILING PLASTER AND SPRAY ON FIRE RETARDANT ABOVE IN BLDG	$ 646,000
MANLY MILES	0154	2018	BUILDING SYSTEMS	HVAC EQUIPMENT - AHU	$ 416,000
MANLY MILES	0154	2018	BUILDING SYSTEMS	PUMPS	$ 163,000
MANLY MILES	0154	2018	BUILDING INTERIOR	STAIRWELL TREADS AND LIGHTING FLOORING REPLACEMENT	$ 32,000
MANLY MILES	0154	2019	BUILDING INTERIOR	INSTALL NEW SUSPENDED CEILINGS AND LIGHTING IN BLDG	$ 517,000
MANLY MILES	0154	2019	BUILDING INTERIOR	MANLY MILES FEASIBILITY STUDY	$ 31,000
MANLY MILES	0154	2019	BUILDING ENVELOPE	REPLACE ALUMINUM ENTRANCE DOORS, FRAMES, GLAZING AND HARDWARE	$ 32,000
MANLY MILES	0154	2020	BUILDING SYSTEMS	HVAC EQUIPMENT - AHU	$ 33,000
MANLY MILES	0154	2020	BUILDING SYSTEMS	REPLACE EXISTING CHILLER	$ 264,000
MANLY MILES	0154	2020	BUILDING SYSTEMS	REPLACE FAN COIL UNITS	$ 2,927,000
					$ 6,498,000
MORRILL HALL OF AGRICULTURE	0022	2016	BUILDING ENVELOPE	REPLACE ROOFS #4 AND 5	$ 345,000
MORRILL HALL OF AGRICULTURE	0022	2019	BUILDING SYSTEMS	CHILLER - CH1	$ 291,000
MORRILL HALL OF AGRICULTURE	0022	2019	BUILDING SYSTEMS	PUMPS	$ 110,000
MORRILL HALL OF AGRICULTURE	0022	2019	BUILDING SYSTEMS	VAV SYSTEM	$ 652,000
MORRILL HALL OF AGRICULTURE	0022	2020	BUILDING ENVELOPE	MORRILL HALL EXTERIOR PAINTING	$ 500,000
MORRILL HALL OF AGRICULTURE	0022	2020	BUILDING SYSTEMS	REPLACE TOILET FLUSH VALVES, URINAL FLUSH VALVES, LAVATORY FAUCETS AND TRIM, AND TOILET SEATS	$ 25,000

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Building Name	Bldg	Work Plan Year	Type	Description (Title)	Total Estimate
MORRILL HALL OF AGRICULTURE	0022	2021	BUILDING SYSTEMS	VAV SYSTEM REPAIRS	$ 167,000
					$ 2,090,000
MSU SURPLUS AND RECYCLING	0223	2019	BUILDING SYSTEMS	REPLACE DOMESTIC HOT WATER HEATER	$ 51,000
MSU SURPLUS AND RECYCLING	0223	2024	BUILDING SYSTEMS	REPLACE STORM DOMESTIC WATER RECLAIM PUMP 1	$ 24,000
MSU SURPLUS AND RECYCLING	0223	2024	BUILDING SYSTEMS	REPLACE STORM WATER RECLAIM 2	$ 25,000
MSU SURPLUS AND RECYCLING	0223	2024	BUILDING SYSTEMS	REPLACE STORM WATER RECLAIM PUMP 1	$ 24,000
MSU SURPLUS AND RECYCLING	0223	2024	BUILDING SYSTEMS	REPLACE STORM WATER RECLAIM PUMP 2	$ 24,000
MSU SURPLUS AND RECYCLING	0223	2024	BUILDING SYSTEMS	REPLACE STORM WATER RECLAIM SYSTEM	$ 25,000
MSU SURPLUS AND RECYCLING	0223	2024	BUILDING SYSTEMS	REPLACE WATER SOFTENER 1	$ 51,000
MSU SURPLUS AND RECYCLING	0223	2024	BUILDING SYSTEMS	REPLACE WATER SOFTENER 1	$ 49,000
MSU SURPLUS AND RECYCLING	0223	2024	BUILDING SYSTEMS	REPLACE WATER SOFTENER 1	$ 51,000
					$ 324,000
MUNN ICE ARENA	0059	2010	BUILDING INTERIOR	REPLACE HOLLOW METAL INTERIOR DOORS AND FRAMES IN VARIOUS AREAS	$ 42,000
MUNN ICE ARENA	0059	2011	BUILDING ENVELOPE	PAINT METAL ROOF 2	$ 572,000
MUNN ICE ARENA	0059	2012	BUILDING ENVELOPE	REPAIR MASONRY AT ALL ENTRANCES	$ 31,000
MUNN ICE ARENA	0059	2013	BUILDING INTERIOR	REPLACE SELECTED HOLLOW METAL DOORS AND HARDWARE.	$ 55,000
MUNN ICE ARENA	0059	2014	BUILDING SYSTEMS	REPLACE FREIGHT ELEVATOR HYDRAULICS, CONTROLLER AND WORN CAR PARTS.	$ 308,000
MUNN ICE ARENA	0059	2014	BUILDING INTERIOR	REPLACE RUBBER FLOOR TILES IN AREAS WHERE FLOOR IS WALKED ON WITH SKATES	$ 31,000
MUNN ICE ARENA	0059	2017	BUILDING SYSTEMS	MUNN ICE ARENA - UPGRADE ALL 480 VOLT DISTRIBUTION BREAKERS	$ 158,000
MUNN ICE ARENA	0059	2017	BUILDING SYSTEMS	REPLACE SNOW MELT SERVICE	$ 55,000
MUNN ICE ARENA	0059	2017	BUILDING SYSTEMS	REPLACE TWO DOMESTIC WATER HEATERS IN THE MAIN MECHANICAL ROOM	$ 123,000
MUNN ICE ARENA	0059	2018	BUILDING SYSTEMS	REPLACE COLD WATER METER, TWO ISOLATION VALVES AND ONE BYPASS VALVE IN MAIN BSMNT MECH RM	$ 31,000
MUNN ICE ARENA	0059	2018	BUILDING SYSTEMS	REPLACE CONDENSATE RETURN UNIT IN MAIN BASEMENT MECHANICAL ROOM	$ 62,000
MUNN ICE ARENA	0059	2018	BUILDING INTERIOR	REPLACE PAINTED TOILET PARTITIONS	$ 27,000
MUNN ICE ARENA	0059	2018	BUILDING SYSTEMS	REPLACE PLUMBING FIXTURES IN 1ST FLR AND BASEMENT	$ 37,000
MUNN ICE ARENA	0059	2018	BUILDING SYSTEMS	REPLACE STEAM PRV SERVICE INCLUDING SAFTEY VALVE/VENT	$ 123,000
MUNN ICE ARENA	0059	2019	BUILDING SYSTEMS	REPLACE 2 GORMAN RUPP PUMPS (AND ASSOCIATED ELECTRICAL), THAT PUMP OUT THE ZAMBONI MELTING PIT.	$ 37,000
MUNN ICE ARENA	0059	2019	BUILDING SYSTEMS	REPLACE 2 STORM SUMP PUMPS AND ELECTRICAL DISCONNECTS LOCATED IN ROOM 23.	$ 34,000
MUNN ICE ARENA	0059	2019	BUILDING SYSTEMS	REPLACE CONDENSATE RETURN UNIT IN MECH ROOM 127.	$ 31,000
MUNN ICE ARENA	0059	2020	BUILDING INTERIOR	REPLACE CEILING TILES AND GRID AS NEEDED IN ALL AREAS OF ORIGINAL BUILDING.	$ 37,000
MUNN ICE ARENA	0059	2020	BUILDING SYSTEMS	REPLACE LEAKING FIBERGLASS CONDENSATE THAT IS DIRECT BARRIED UNDER CONCOURSE	$ 150,000
MUNN ICE ARENA	0059	2024	BUILDING ENVELOPE	REPLACE ALUMINUM ENTRANCE FRAMES, DOORS AND HARDWARE	$ 258,000
					$ 2,202,000

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Building Name	Bldg	Work Plan Year	Type	Description (Title)	Total Estimate
MUSEUM	0013	2014	BUILDING SYSTEMS	REPLACE ELEVATOR 1	$ 296,000
MUSEUM	0013	2014	BUILDING ENVELOPE	WINDOWS - REPLACE ALL EXTERIOR WINDOWS, OLD STEEL (341)	$ 919,000
MUSEUM	0013	2015	BUILDING SYSTEMS	REPLACE EF-1, EF-1A, EF-1B, EF-1D, EF-2, EF-2A, SF-1, SF-1A	$ 775,000
MUSEUM	0013	2015	BUILDING SYSTEMS	REPLACE VENTILATION FOR MAIN GALLERY ROOM 105 AND HERITAGE GALLERY ROOM 106	$ 1,129,000
MUSEUM	0013	2017	BUILDING INTERIOR	DOORS - INTERIOR	$ 87,000
MUSEUM	0013	2017	BUILDING SYSTEMS	REPLACE FIRE ALARM SYSTEM IN MUSEUM	$ 244,000
MUSEUM	0013	2018	BUILDING SYSTEMS	REPLACE CLASSMATE UNIT WITH NEW SELF CONTAINED COMPUTER ROOM AIR CONDITIONING UNIT	$ 59,000
MUSEUM	0013	2019	BUILDING SYSTEMS	REPLACE CAST IRON RADIATORS AND CONTROL VALVES	$ 341,000
MUSEUM	0013	2022	BUILDING SYSTEMS	REPLACE FUME HOOD FAN FH-1 LOCATED IN THE ATTIC	$ 32,000
					$ 3,882,000
MUSIC	0011	2014	BUILDING INTERIOR	INTERIOR DOORS - REPLACE SOME OLD DOORS AT BASEMENT AND 1ST FLOOR, INCLUDING HARDWARE	$ 32,000
MUSIC	0011	2015	BUILDING INTERIOR	FLOOR COVERING - REPLACE FLOORING AT BASEMENT LEVEL	$ 111,000
MUSIC	0011	2015	BUILDING INTERIOR	REPLACE VINYL FLOORING AND WALL BASE ON 1ST AND 2ND FLOOR CORRIDORS INCLUDING ROOM 120	$ 103,000
MUSIC	0011	2015	BUILDING INTERIOR	REPLACE VINYL FLOORING AND WALL BASE ON 1ST AND 2ND FLOOR CORRIDORS INCLUDING ROOM 120	$ 103,000
MUSIC	0011	2015	BUILDING INTERIOR	REPLACE VINYL FLOORING AND WALL BASE ON 1ST AND 2ND FLOOR CORRIDORS INCLUDING ROOM 120	$ 103,000
MUSIC	0011	2015	BUILDING INTERIOR	REPLACE VINYL FLOORING AND WALL BASE ON 1ST AND 2ND FLOOR CORRIDORS INCLUDING ROOM 120	$ 103,000
MUSIC	0011	2016	BUILDING INTERIOR	DOORS - INTERIOR	$ 313,000
MUSIC	0011	2017	BUILDING SYSTEMS	MUSIC BUILDING - REMOVE AND REPLACE ALL AIR DUCTS IN THE ORIGINAL PART OF THE BUILDING.	$ 554,000
MUSIC	0011	2017	BUILDING SYSTEMS	REPLACE RF-1, EF-2, EF-3, EF-6, RF-8, RF-11, RF-12, RF-9, SF-1, SF-10, SF-15, SF-16, SF-3, AND SF-5	$ 1,421,000
MUSIC	0011	2018	BUILDING SYSTEMS	REPLACE HALLWAY LIGHTING AND WIRING ON THE 1ST AND 2ND FLOORS (MR5)	$ 32,000
MUSIC	0011	2019	BUILDING SYSTEMS	MUSIC REPLACE HV-1	$ 1,648,000
MUSIC	0011	2019	BUILDING SYSTEMS	MUSIC REPLACE HV-10	$ 1,339,000
MUSIC	0011	2019	BUILDING SYSTEMS	MUSIC REPLACE HV-15	$ 1,442,000
MUSIC	0011	2019	BUILDING SYSTEMS	MUSIC REPLACE HV-3	$ 1,339,000
MUSIC	0011	2019	BUILDING SYSTEMS	REPLACE ELEVATOR 1	$ 296,000
					$ 8,939,000
MUSIC PRACTICE	0021	2010	BUILDING SYSTEMS	INSTALL BALANCING VALVES ON CHILLED WATER (5 VALVES)	$ 20,000
MUSIC PRACTICE	0021	2012	BUILDING INTERIOR	FLOOR COVERING - REPLACE FRONT STAIRWELL AND LANDINGS	$ 111,000
MUSIC PRACTICE	0021	2015	BUILDING ENVELOPE	EXTERIOR MASONRY AND CAULKING REPAIRS	$ 111,000
MUSIC PRACTICE	0021	2017	BUILDING SYSTEMS	REPLACE 2 HOT WATER HEATING SYSTEMS	$ 129,000
MUSIC PRACTICE	0021	2018	BUILDING INTERIOR	CEILINGS - CEILING TILE REPLACEMENT	$ 34,000
MUSIC PRACTICE	0021	2018	BUILDING INTERIOR	REPLACE CEILING AND LIGHTING IN PUBLIC CORRIDORS AND STAIRWELLS	$ 84,000
MUSIC PRACTICE	0021	2018	BUILDING INTERIOR	REPLACE CORRIDOR FLOORING AND WALL BASE	$ 99,000
MUSIC PRACTICE	0021	2018	BUILDING INTERIOR	REPLACE CORRIDOR FLOORING AND WALL BASE	$ 99,000

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Building Name	Bldg	Work Plan Year	Type	Description (Title)	Total Estimate
MUSIC PRACTICE	0021	2018	BUILDING INTERIOR	REPLACE CORRIDOR FLOORING AND WALL BASE	$ 99,000
MUSIC PRACTICE	0021	2018	BUILDING INTERIOR	REPLACE CORRIDOR FLOORING AND WALL BASE	$ 99,000
MUSIC PRACTICE	0021	2018	BUILDING INTERIOR	REPLACE STAIR TREADS/ RISERS AND LANDING MATERIAL IN BACK STAIRWELL	$ 97,000
MUSIC PRACTICE	0021	2018	BUILDING INTERIOR	REPLACE STAIRWELL FIRE DOORS AND	$ 39,000
					$ 1,021,000
NATURAL RESOURCES	0180	2017	BUILDING SYSTEMS	NATURAL RESOURCES - REPLACE 2 DOMESTIC HOT WATER HEATERS	$ 123,000
NATURAL RESOURCES	0180	2017	BUILDING ENVELOPE	REPLACE EXTERIOR DOORS/ JAMBS/ AND HARDWARE (6-OHD) (16 ENTRY)	$ 181,000
NATURAL RESOURCES	0180	2017	BUILDING SYSTEMS	REPLACE HEAT EXCHANGER 1	$ 75,000
NATURAL RESOURCES	0180	2018	BUILDING SYSTEMS	REPLACE DOMESTIC WATER METER	$ 37,000
NATURAL RESOURCES	0180	2018	BUILDING SYSTEMS	REPLACE PUBLIC RESTROOM PLUMBING FIXTURES	$ 31,000
NATURAL RESOURCES	0180	2020	BUILDING INTERIOR	REPLACE DAMAGED/OUTDATED CEILING TILE AND LIGHTING	$ 222,000
					$ 669,000
NATURAL SCIENCE	0024	2010	BUILDING INTERIOR	FLOOR COVERING - REPLACE DETERIORATED FLOOR TILE	$ 323,000
NATURAL SCIENCE	0024	2010	BUILDING INTERIOR	INTERIOR DOORS - REPAIR DOORS AND HARDWARE, BASEMENT THROUGH 4TH FLOOR	$ 111,000
NATURAL SCIENCE	0024	2014	BUILDING SYSTEMS	REPLACE WATER HEATER IN EAST BASEMENT MR	$ 74,000
NATURAL SCIENCE	0024	2017	BUILDING SYSTEMS	NATURAL SCIENCE - REPLACE ELEVATOR 2	$ 296,000
NATURAL SCIENCE	0024	2017	BUILDING SYSTEMS	REPLACE AIR-COOLED CHILLERS	$ 927,000
NATURAL SCIENCE	0024	2019	BUILDING SYSTEMS	REPLACE AIR HANDLING UNIT SF - 1	$ 211,000
NATURAL SCIENCE	0024	2019	BUILDING SYSTEMS	REPLACE AIR HANDLING UNIT SF - 2	$ 195,000
NATURAL SCIENCE	0024	2019	BUILDING SYSTEMS	REPLACE AIR HANDLING UNIT SF - 3	$ 209,000
NATURAL SCIENCE	0024	2019	BUILDING SYSTEMS	REPLACE AIR HANDLING UNIT SF - 4	$ 234,000
NATURAL SCIENCE	0024	2020	BUILDING SYSTEMS	REPLACE 4 BASEMT SUMP PUMPS IN AIR PLENUMS E & W	$ 55,000
					$ 2,635,000
NISBET	0128	2014	BUILDING SYSTEMS	HVAC EQUIPMENT	$ 24,000
NISBET	0128	2016	BUILDING ENVELOPE	EXTERIOR MASONRY REPAIRS AND CAULKING	$ 100,000
NISBET	0128	2019	BUILDING SYSTEMS	CHILLER - CH1	$ 275,000
NISBET	0128	2019	BUILDING SYSTEMS	CHILLER - CH2	$ 275,000
					$ 674,000
OLD BOTANY	0017	2015	BUILDING SYSTEMS	REPLACE LIGHTING AND BRANCH CIRCUITS	$ 198,000
OLD BOTANY	0017	2018	BUILDING SYSTEMS	REPLACE HOT AND COLD WATER PIPING THROUGHOUT BUILDING	$ 62,000
OLD BOTANY	0017	2018	BUILDING SYSTEMS	REPLACE OLD BOTANY 1-PIPE HOT WATER HEATING SYS WITH 2-PIPE SYS	$ 301,000
					$ 561,000
OLD HORTICULTURE	0025	2016	BUILDING SYSTEMS	REMOVE ELECTRICAL DISTRIBUTION SYSTEM FROM AIR PLENUM	$ 270,000
OLD HORTICULTURE	0025	2018	BUILDING SYSTEMS	CHILLER	$ 187,000
OLD HORTICULTURE	0025	2021	BUILDING SYSTEMS	REPLACE ELEVATOR 1	$ 328,000
					$ 785,000
OLDS HALL	0047	2015	BUILDING SYSTEMS	BASEMENT CRAWL SPACE-REMOVE ALL ASBESTOS PIPE INSULATIONS & REINSULATE WITH NON-ASBESTOS INSULATIONS	$ 26,000
OLDS HALL	0047	2016	BUILDING ENVELOPE	REPLACE FIRE ESCAPE EXTERIOR DOORS, FRAMES AND HARDWARE (9)	$ 64,000
OLDS HALL	0047	2017	BUILDING SYSTEMS	INSTALL NEW HEATING/VENTILATING UNIT TO SERVE ENTIRE BUILDING,	$ 8,087,000
OLDS HALL	0047	2017	BUILDING SYSTEMS	VAV SYSTEM	$ 166,000

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Building Name	Bldg	Work Plan Year	Type	Description (Title)	Total Estimate
OLDS HALL	0047	2019	BUILDING ENVELOPE	REPLACE ROOF #1, 2 AND 3	$ 245,000
OLDS HALL	0047	2019	BUILDING SYSTEMS	REPLACE ROOF TOP AIR CONDITIONING UNIT #1	$ 65,000
OLDS HALL	0047	2020	BUILDING SYSTEMS	REPLACE ALL DOMESTIC HOT AND COLD WATER PIPING INSIDE THE BUILDING,	$ 1,230,000
					$ 9,883,000
OYER SPEECH AND HEARING	0089	2017	BUILDING SYSTEMS	REPLACE ORIGINAL STEAM REDUCING STATION	$ 47,000
OYER SPEECH AND HEARING	0089	2019	BUILDING SYSTEMS	OYER- UPGRADE PCB TRANSFORMERS AND ELECTRICAL EQUIPMENT	$ 361,000
					$ 408,000
PACKAGING	0177	2017	BUILDING INTERIOR	REPLACE APPROXIMATELY (23) INTERIOR BIRCH VENEER DOORS AND HARDWARE	$ 36,000
PACKAGING	0177	2018	BUILDING SYSTEMS	RESIZE AND REPLACE CONTROL AIR COMPRESSORS IN THE BASEMENT MECHANICAL ROOM	$ 31,000
PACKAGING	0177	2019	BUILDING SYSTEMS	PACKAGING- UPGRADE PCB TRANSFORMERS AND ELECTRICAL EQUIPMENT	$ 118,000
PACKAGING	0177	2019	BUILDING INTERIOR	REPLACE CORRIDOR FLOOR TILE IN ORIGINAL BUILDING	$ 47,000
PACKAGING	0177	2020	BUILDING SYSTEMS	HVAC #1 & 3	$ 1,058,000
					$ 1,290,000
PATHOLOGICAL INCINERATOR	0524	2017	BUILDING SYSTEMS	REPLACE 2 EXHAUST FANS	$ 21,000
					$ 21,000
PAVILION AG LIVESTOCK	0212	2012	BUILDING ENVELOPE	REPLACE VARIOUS HOLLOW METAL AND OVERHEAD DOORS WHERE DAMAGED	$ 30,000
PAVILION AG LIVESTOCK	0212	2013	BUILDING INTERIOR	INTERIOR PAINTING WALL AREAS WHERE NEEDED	$ 74,000
PAVILION AG LIVESTOCK	0212	2016	BUILDING ENVELOPE	EXTERIOR MASONRY REPAIRS AND CAULKING	$ 55,000
PAVILION AG LIVESTOCK	0212	2016	BUILDING SYSTEMS	VAV SYSTEM	$ 326,000
PAVILION AG LIVESTOCK	0212	2018	BUILDING SYSTEMS	REPLACE PUBLIC RESTROOM PLUMBING FIXTURES	$ 37,000
PAVILION AG LIVESTOCK	0212	2020	BUILDING SYSTEMS	CHILLER	$ 239,000
					$ 761,000
PLANT AND SOIL SCIENCE	0086	2012	BUILDING SYSTEMS	REPLACE HVAC SYSTEM 1 (MPS)	$ 422,000
PLANT AND SOIL SCIENCE	0086	2014	BUILDING SYSTEMS	REPLACE HYDRAULIC ELEVATOR	$ 511,000
PLANT AND SOIL SCIENCE	0086	2015	BUILDING ENVELOPE	REMOVE DOUBLE STRENGTH GLASS IN ROOF AND REPLACE WITH POLYCARBONATE.	$ 94,000
PLANT AND SOIL SCIENCE	0086	2016	BUILDING SYSTEMS	HVAC EQUIPMENT	$ 6,899,000
PLANT AND SOIL SCIENCE	0086	2017	BUILDING SYSTEMS	REPLACE 5 SUPPLY FANS, 4 PLENUM EXHAUST FANS.....;	$ 3,281,000
PLANT AND SOIL SCIENCE	0086	2018	BUILDING SYSTEMS	LIGHTING FIXTURES	$ 2,196,000
PLANT AND SOIL SCIENCE	0086	2019	BUILDING SYSTEMS	REPLACE PLUMBING FIXTURES	$ 49,000
					$ 13,452,000
PLANT BIOLOGY	0178	2010	BUILDING SYSTEMS	REPLACE ALL AUTO VALVES ON BOOSTER COILS; INSTALL SHUT OFF VALVES ON ALL AUTO VALVES (BOTANY WING)	$ 46,000

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Building Name	Bldg	Work Plan Year	Type	Description (Title)	Total Estimate
PLANT BIOLOGY	0178	2012	BUILDING SYSTEMS	ADD A REDUNDANT HOT WATER HEAT PUMP SO THAT WORK CAN BE PERFORMED ON THE EXISTING PUMP.	$ 22,000
PLANT BIOLOGY	0178	2015	BUILDING SYSTEMS	HVAC EQUIPMENT	$ 1,383,000
PLANT BIOLOGY	0178	2015	BUILDING SYSTEMS	LIGHTING FIXTURES	$ 324,000
PLANT BIOLOGY	0178	2017	BUILDING ENVELOPE	PLANT BIOLOGY - EXTERIOR DOORS - REPLACE ALL MAIN ENTRANCES.	$ 79,000
PLANT BIOLOGY	0178	2017	BUILDING SYSTEMS	REPLACE DETERIORATED PENTHOUSE DUCT INSULATION	$ 107,000
PLANT BIOLOGY	0178	2020	BUILDING SYSTEMS	MOVE AND RE-PIPE HWHT BOOSTER COILS THAT ARE LOCATED IN THE HERBARIUM.	$ 71,000
PLANT BIOLOGY	0178	2020	BUILDING INTERIOR	PLANT BIOLOGY REPLACE FLOORING BASEMENT CORRIDOR	$ 70,000
PLANT BIOLOGY	0178	2020	BUILDING INTERIOR	REPLACE SUSPENDED CEILINGS AND LIGHTING THROUGHOUT CORRIDORS	$ 600,000
					$ 2,702,000

PLANT SCIENCE GREENHOUSE-EAST	0098C	2011	BUILDING SYSTEMS	REPLACE ELEVATOR 1	$ 177,000
PLANT SCIENCE GREENHOUSE-EAST	0098C	2011	BUILDING SYSTEMS	REPLACE ELEVATOR 2	$ 177,000
					$ 354,000

PLANT SCIENCE GREENHOUSE-SUPPORT	0094	2010	BUILDING ENVELOPE	REPLACE EAVES TROUGHS AND REPAIR ROOF #1	$ 20,000
					$ 20,000

PLANT SCIENCE GREENHOUSE-WEST	0093	2018	BUILDING INTERIOR	DOORS - INTERIOR	$ 27,000
PLANT SCIENCE GREENHOUSE-WEST	0093	2018	BUILDING INTERIOR	DOORS - INTERIOR	$ 27,000
PLANT SCIENCE GREENHOUSE-WEST	0093	2018	BUILDING INTERIOR	DOORS - INTERIOR	$ 27,000
PLANT SCIENCE GREENHOUSE-WEST	0093	2018	BUILDING INTERIOR	DOORS - INTERIOR - IND	$ 27,000
PLANT SCIENCE GREENHOUSE-WEST	0093	2019	BUILDING ENVELOPE	WINDOWS - FRN	$ 54,000
PLANT SCIENCE GREENHOUSE-WEST	0093	2019	BUILDING ENVELOPE	WINDOWS - GRN	$ 54,000
PLANT SCIENCE GREENHOUSE-WEST	0093	2019	BUILDING ENVELOPE	WINDOWS - GRN	$ 54,000
PLANT SCIENCE GREENHOUSE-WEST	0093	2019	BUILDING ENVELOPE	WINDOWS - GRN	$ 54,000
PLANT SCIENCE GREENHOUSE-WEST	0093	2019	BUILDING ENVELOPE	WINDOWS - GRN	$ 54,000
PLANT SCIENCE GREENHOUSE-WEST	0093	2019	BUILDING ENVELOPE	WINDOWS - GRN	$ 54,000
PLANT SCIENCE GREENHOUSE-WEST	0093	2019	BUILDING ENVELOPE	WINDOWS - GRN	$ 54,000
PLANT SCIENCE GREENHOUSE-WEST	0093	2019	BUILDING ENVELOPE	WINDOWS - GRN	$ 54,000
PLANT SCIENCE GREENHOUSE-WEST	0093	2019	BUILDING ENVELOPE	WINDOWS - GRN	$ 54,000
PLANT SCIENCE GREENHOUSE-WEST	0093	2019	BUILDING ENVELOPE	WINDOWS - GRN	$ 54,000
PLANT SCIENCE GREENHOUSE-WEST	0093	2019	BUILDING ENVELOPE	WINDOWS - GRN	$ 54,000
PLANT SCIENCE GREENHOUSE-WEST	0093	2019	BUILDING ENVELOPE	WINDOWS - GRN	$ 54,000
PLANT SCIENCE GREENHOUSE-WEST	0093	2019	BUILDING ENVELOPE	WINDOWS - GRN	$ 54,000
PLANT SCIENCE GREENHOUSE-WEST	0093	2019	BUILDING ENVELOPE	WINDOWS - GRN	$ 54,000

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Building Name	Bldg	Work Plan Year	Type	Description (Title)	Total Estimate
PLANT SCIENCE GREENHOUSE-WEST	0093	2020	BUILDING SYSTEMS	REPLACE 160 SIDEWALL EXHAUST FANS	$ 646,000
					$ 1,510,000
POULTRY-LAB	0473B	2015	BUILDING INTERIOR	FLOORS	$ 22,000
					$ 22,000
POULTRY-SERVICE	0473A	2012	BUILDING SYSTEMS	POULTRY SERVICE BOILER 1 REPLACEMENT	$ 24,000
POULTRY-SERVICE	0473A	2017	BUILDING SYSTEMS	REPLACE 6 GAS-FIRED UN-VENTED HEATING	$ 45,000
POULTRY-SERVICE	0473A	2017	BUILDING SYSTEMS	REPLACE BOILER PAST LIFE EXPECTANCY WITH ENERGY EFFICIENT OPERATION UNIT	$ 32,000
					$ 101,000
PSYCHOLOGY	0027	2016	BUILDING SYSTEMS	CHILLER	$ 187,000
PSYCHOLOGY	0027	2018	BUILDING SYSTEMS	REPLACE DOMESTIC WATER METER AND SHUT OFF VALVES	$ 29,000
PSYCHOLOGY	0027	2018	BUILDING SYSTEMS	REPLACE ORIGINAL TOILETS, FLUSH VALVES, URINALS, & URINAL FLUSH VALVES	$ 52,000
PSYCHOLOGY	0027	2019	BUILDING SYSTEMS	PSYCHOLOGY - UPGRADE PCB TRANSFORMERS AND ELECTRICAL EQUIPMENT	$ 122,000
PSYCHOLOGY	0027	2022	BUILDING SYSTEMS	REPLACE ELEVATOR 1	$ 473,000
PSYCHOLOGY	0027	2024	BUILDING SYSTEMS	REPLACE CHILLED WATER PUMP 3	$ 37,000
PSYCHOLOGY	0027	2024	BUILDING SYSTEMS	REPLACE CHILLED WATER PUMP 4	$ 37,000
PSYCHOLOGY	0027	2024	BUILDING SYSTEMS	REPLACE DOMESTIC HOT WATER HEATER 1	$ 77,000
PSYCHOLOGY	0027	2024	BUILDING SYSTEMS	REPLACE DOMESTIC HOT WATER HEATER 2	$ 77,000
PSYCHOLOGY	0027	2024	BUILDING SYSTEMS	REPLACE EXHAUST FAN 1	$ 27,000
PSYCHOLOGY	0027	2024	BUILDING SYSTEMS	REPLACE HOT WATER PUMP 1	$ 24,000
PSYCHOLOGY	0027	2024	BUILDING SYSTEMS	REPLACE HOT WATER PUMP 2	$ 24,000
PSYCHOLOGY	0027	2024	BUILDING SYSTEMS	REPLACE HVAC SYSTEM 1	$ 302,000
PSYCHOLOGY	0027	2024	BUILDING SYSTEMS	REPLACE HVAC SYSTEM 2	$ 302,000
PSYCHOLOGY	0027	2024	BUILDING SYSTEMS	REPLACE HVAC SYSTEM 3	$ 172,000
PSYCHOLOGY	0027	2024	BUILDING SYSTEMS	REPLACE HVAC SYSTEM 4	$ 162,000
PSYCHOLOGY	0027	2024	BUILDING SYSTEMS	REPLACE STEAM FIRED HOT WATER HEATER 1	$ 86,000
					$ 2,190,000
PUBLIC SAFETY	0087	2014	BUILDING INTERIOR	PAINT MAIN LOBBY AND HALLWAYS	$ 51,000
PUBLIC SAFETY	0087	2015	BUILDING ENVELOPE	EXTERIOR ENTRANCE DOORS/ FRAMES/ HARDWARE	$ 88,000
PUBLIC SAFETY	0087	2017	BUILDING ENVELOPE	EXTERIOR MASONRY RESTORATION	$ 74,000
PUBLIC SAFETY	0087	2017	BUILDING ENVELOPE	ROOF REPAIR/REPLACEMENT ROOF #1,2,3,5,7,8	$ 592,000
PUBLIC SAFETY	0087	2017	BUILDING SYSTEMS	VAV SYSTEM	$ 279,000
					$ 1,084,000
PUREBRED BEEF-HAY SHED	0450E	2015	BUILDING ENVELOPE	PAINT ROOF	$ 47,000
					$ 47,000
PUREBRED BEEF-LOOSE HOUSING	0450C	2010	BUILDING ENVELOPE	RE-COAT NE ROOF	$ 23,000
					$ 23,000
PUREBRED BEEF-MAIN	0450A	2013	BUILDING ENVELOPE	REPLACE EXISTING VINYL SIDING WITH NEW STEEL VERTICAL BARN SIDING AND TRIM	$ 103,000
PUREBRED BEEF-MAIN	0450A	2014	BUILDING ENVELOPE	REPAIR CRACKED BLOCK WALLS	$ 53,000
PUREBRED BEEF-MAIN	0450A	2018	BUILDING SYSTEMS	REPLACE BRANCH CIRCUIT WIRING IN ALL BILDINGS, REPLACE LIGHT FIXTURES.	$ 158,000
					$ 314,000

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Building Name	Bldg	Work Plan Year	Type	Description (Title)	Total Estimate
RADIO FACILITY-RADIO TRANSM WKAR	0600A	2020	BUILDING ENVELOPE	ROOFS #1, 2 AND 3. REPLACEMENT.	$ 76,000
					$ 76,000
RADIOLOGY	0214	2018	BUILDING SYSTEMS	PUMPS	$ 256,000
RADIOLOGY	0214	2018	BUILDING SYSTEMS	VAV SYSTEM	$ 524,000
RADIOLOGY	0214	2023	BUILDING SYSTEMS	REPLACE ELEVATOR 1	$ 473,000
					$ 1,253,000
REGIONAL CHILLED WATER PLANT	0189	2014	BUILDING ENVELOPE	GENERAL MASONRY & CAULKING RESTORATION OF ENTIRE BUILDING	$ 166,000
REGIONAL CHILLED WATER PLANT	0189	2015	BUILDING ENVELOPE	EXTERIOR DOOR REPLACEMENT (2) ENTRY DOORS & (2) OVERHEAD DOORS	$ 26,000
REGIONAL CHILLED WATER PLANT	0189	2015	BUILDING SYSTEMS	LIGHTING FIXTURES	$ 23,000
REGIONAL CHILLED WATER PLANT	0189	2015	BUILDING ENVELOPE	ROOF REPAIR/REPLACEMENT ROOF #2	$ 103,000
REGIONAL CHILLED WATER PLANT	0189	2018	BUILDING SYSTEMS	REPLACE CHILLER #10 AND COOLING TOWER	$ 2,242,000
REGIONAL CHILLED WATER PLANT	0189	2018	BUILDING SYSTEMS	REPLACE STEAM POWERED CONDENSATE PUMPS SERVING NORTH CHILLERS	$ 206,000
REGIONAL CHILLED WATER PLANT	0189	2019	BUILDING SYSTEMS	REPLACE CHILLER #9 AND COOLING TOWER	$ 2,214,000
REGIONAL CHILLED WATER PLANT	0189	2020	BUILDING SYSTEMS	PROVIDE CONNECTION FOR PORTABLE GENERATOR TO RUN ABSORBER AND CIRCULATING PUMPS FOR CAR BUILDINGS.	$ 187,000
REGIONAL CHILLED WATER PLANT	0189	2023	BUILDING SYSTEMS	REPLACE 1250 TON CHILLER #8 AND COOLING TOWER	$ 2,214,000
					$ 7,381,000
RIVER WATER RESEARCH	0052	2013	BUILDING ENVELOPE	DOORS - EXTERIOR	$ 21,000
					$ 21,000
RIVER WATER RESEARCH - LAB	0052A	2014	BUILDING ENVELOPE	REMOVE AND REPLACE ROOFS 1 AND 2	$ 71,000
					$ 71,000
SHAW LANE POWER PLANT	0061	2016	BUILDING ENVELOPE	ABATE AND REPLACE ROOF	$ 970,000
					$ 970,000
SHEEP BARN	0449	2017	BUILDING ENVELOPE	ROOF #1 AND 2	$ 85,000
					$ 85,000
SPARTAN CHILD DEVELOPMENT	0217	2019	BUILDING SYSTEMS	PRELIM DESIGN FOR HVAC SYSTEM REPLACEMENT	$ 200,000
					$ 200,000
STUDENT SERVICES	0142	2013	BUILDING INTERIOR	CORRIDOR CEILING AND LIGHTING REPLACEMENTS ON 1ST, 2ND & 3RD FLOORS	$ 155,000
STUDENT SERVICES	0142	2015	BUILDING SYSTEMS	REPLACE 10 OBSOLETE MOTOR STARTERS, BRANCH CIRCUIT FEEDERS.	$ 41,000
STUDENT SERVICES	0142	2016	BUILDING ENVELOPE	EXTERIOR MASONRY RESTORATION AND EXTERIOR WATERPROOFING	$ 416,000
STUDENT SERVICES	0142	2017	BUILDING ENVELOPE	DOORS - EXTERIOR	$ 200,000
STUDENT SERVICES	0142	2017	BUILDING SYSTEMS	REPLACE 4 HOT WATER HEAT PUMPS AND VALVES	$ 74,000
STUDENT SERVICES	0142	2017	BUILDING SYSTEMS	REPLACE HOT WATER DOMESTIC CONVERTOR	$ 68,000
STUDENT SERVICES	0142	2017	BUILDING INTERIOR	REPLACE INTERIOR DOORS AND HARDWARE TO OFFICES AND CLOSETS	$ 646,000
STUDENT SERVICES	0142	2019	BUILDING SYSTEMS	REPLACE CHILLED WATER PUMP N-3	$ 38,000
STUDENT SERVICES	0142	2019	BUILDING SYSTEMS	REPLACE CHILLED WATER PUMP N-4	$ 38,000

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Building Name	Bldg	Work Plan Year	Type	Description (Title)	Total Estimate
STUDENT SERVICES	0142	2020	BUILDING SYSTEMS	REPLACE ALL PUBLIC RESTROOM LAVATORY FAUCETS AND TRIM, AND TOILET FLUSH VALVES AND TOILET SEATS.	$ 37,000
STUDENT SERVICES	0142	2020	BUILDING SYSTEMS	REPLACE EXISTING SHUT OFF VALVES AND WATER METER....	$ 31,000
STUDENT SERVICES	0142	2020	BUILDING SYSTEMS	REPLACE SUMP PUMP 03	$ 23,000
STUDENT SERVICES	0142	2020	BUILDING SYSTEMS	REPLACE SUMP PUMP 04	$ 23,000
STUDENT SERVICES	0142	2020	BUILDING SYSTEMS	UPDATE FIRE SYSTEM AND ADD SMOKE DETECTORS	$ 568,000
STUDENT SERVICES	0142	2022	BUILDING SYSTEMS	REPLACE ELEVATOR 1	$ 473,000
STUDENT SERVICES	0142	2022	BUILDING SYSTEMS	REPLACE ELEVATOR 2	$ 473,000
STUDENT SERVICES	0142	2024	BUILDING SYSTEMS	REPLACE CHILLER 2A	$ 281,000
STUDENT SERVICES	0142	2025	BUILDING SYSTEMS	REPLACE SUMP PUMP 01	$ 23,000
STUDENT SERVICES	0142	2025	BUILDING SYSTEMS	REPLACE SUMP PUMP 02	$ 23,000
					$ 3,631,000
SWINE RESEARCH-AG POLLUTION CNTRL	0440F	2015	BUILDING SYSTEMS	WASTE PIPING	$ 48,000
SWINE RESEARCH-AG POLLUTION CNTRL	0440F	2015	BUILDING SYSTEMS	WATER PIPNG	$ 33,000
					$ 81,000
SWINE RESEARCH-BARN/ELEVATOR STRG	0440A	2012	BUILDING SYSTEMS	RELACE DETERIORATED WATER PIPING.	$ 20,000
SWINE RESEARCH-BARN/ELEVATOR STRG	0440A	2017	BUILDING ENVELOPE	REMOVE OLD ROOF SHINGLES AND REPLACE (AREAS 1,4,5) REPLACE AREA 3 WITH NEW COATING SYSTEM	$ 103,000
SWINE RESEARCH-BARN/ELEVATOR STRG	0440A	2018	BUILDING SYSTEMS	REPLACE LIGHT FIXTURES AND BRANCH CIRCUITS, CONDUITS, AND RECEPTACLES. (POLE BARN)	$ 34,000
SWINE RESEARCH-BARN/ELEVATOR STRG	0440A	2019	BUILDING ENVELOPE	ROOFING - MT ROOFS #1, 2, 3, 4 AND 5	$ 108,000
SWINE RESEARCH-BARN/ELEVATOR STRG	0440A	2020	BUILDING SYSTEMS	REPLACE LIGHT FIXTURES AND BRANCH CIRCUITS, CONDUITS, AND RECEPTACLES.	$ 99,000
SWINE RESEARCH-BARN/ELEVATOR STRG	0440A	2020	BUILDING SYSTEMS	REPLACE LIGHT FIXTURES AND BRANCH CIRCUITS, CONDUITS, AND RECEPTACLES. (BARN A)	$ 198,000
SWINE RESEARCH-BARN/ELEVATOR STRG	0440A	2020	BUILDING SYSTEMS	REPLACE LIGHT FIXTURES AND BRANCH CIRCUITS, CONDUITS, AND RECEPTACLES. (BARN F)	$ 119,000
SWINE RESEARCH-BARN/ELEVATOR STRG	0440A	2020	BUILDING SYSTEMS	REPLACE LIGHT FIXTURES AND BRANCH CIRCUITS. (BARN G)	$ 36,000
					$ 717,000
SWINE RESEARCH-GARAGE	0440B	2015	BUILDING ENVELOPE	DOORS - EXTERIOR	$ 40,000
					$ 40,000
SWINE RESEARCH-HSE 1	0440L	2014	BUILDING SYSTEMS	HVAC EQUIPMENT	$ 30,000
					$ 30,000
SWINE RESEARCH-PORTER	0440J	2018	BUILDING ENVELOPE	ROOFING - MT ROOF #1	$ 43,000
					$ 43,000
SWINE TEACH AND RESEARCH	0479	2025	BUILDING SYSTEMS	PUMPS	$ 38,000
					$ 38,000
TB SIMON POWER PLANT	0065	2015	BUILDING ENVELOPE	REPLACE MAIN ENTRANCE EXTERIOR DOOR AND VESTIBULE DOOR AND HARDWARE	$ 26,000
TB SIMON POWER PLANT	0065	2015	BUILDING ENVELOPE	REPLACE ORIGINAL HOLLOW METAL EXTERIOR DOORS AND HARDWARE	$ 58,000
TB SIMON POWER PLANT	0065	2015	BUILDING ENVELOPE	REPLACE ORIGINAL OVERHEAD DOORS ON BLDG EXTERIOR	$ 129,000

MSU Capital Renewal Maintenance by Building FY2021-2025 (Including Deferred)

Building Name	Bldg	Work Plan Year	Type	Description (Title)	Total Estimate
TB SIMON POWER PLANT	0065	2018	BUILDING SYSTEMS	ELEVATOR - 2	$ 665,000
TB SIMON POWER PLANT	0065	2019	BUILDING ENVELOPE	REPLACE ROOFS 9, 12, 13, 14, 17	$ 155,000
TB SIMON POWER PLANT	0065	2019	BUILDING ENVELOPE	ROOF REPAIR/REPLACEMENT ROOF #17,16	$ 73,000
TB SIMON POWER PLANT	0065	2019	BUILDING ENVELOPE	ROOF REPAIR/REPLACEMENT ROOF #2	$ 75,000
					$ 1,181,000
THAYER HOUSE	0445A	2017	BUILDING SYSTEMS	REPLACE BOILER PAST LIFE EXPECTANCY WITH ENERGY EFFICIENT OPERATION UNIT	$ 32,000
THAYER HOUSE	0445A	2018	BUILDING ENVELOPE	DOORS - EXTERIOR	$ 31,000
					$ 63,000
TREE RESEARCH-HEADHOUSE	0472D	2014	BUILDING ENVELOPE	ROOF REPAIR/REPLACEMENT - GREENHOUSE (NORTH) ROOF #1, GREENHOUSE (SOUTH)	$ 202,000
					$ 202,000
TREE RESEARCH-RESIDENCE	0472H	2016	BUILDING SYSTEMS	HVAC EQUIPMENT	$ 42,000
					$ 42,000
TREE RESEARCH-SHOP/OFFICE	0472A	2017	BUILDING SYSTEMS	REPLACE HOT WATER HEATING BOILER AND PERIPHERAL EQUIPMENT IN SHOP	$ 32,000
					$ 32,000
UFSC-4-H	0453G	2016	BUILDING ENVELOPE	ROOF #1	$ 155,000
					$ 155,000
UFSC-COMMUNITY STRG	0453D	2015	BUILDING ENVELOPE	ROOF #1	$ 106,000
					$ 106,000
UFSC-MAINTENANCE	0453H	2014	BUILDING ENVELOPE	ROOF #1	$ 84,000
UFSC-MAINTENANCE	0453H	2019	BUILDING SYSTEMS	HVAC EQUIPMENT - AHU	$ 83,000
					$ 167,000
UFSC-MATERIALS & PESITCIDE STRG	0453J	2015	BUILDING ENVELOPE	ROOF #1	$ 64,000
					$ 64,000
UFSC-NORTH MORTON	0453I	2015	BUILDING ENVELOPE	ROOF #1	$ 85,000
					$ 85,000
UNIV RESEARCH CONTAINMENT	0211	2010	BUILDING INTERIOR	PAINT INTERIOR WALLS, DOORS AND FRAMES, AND RECOAT FLOORS IN CAR AREA	$ 26,000
UNIV RESEARCH CONTAINMENT	0211	2017	BUILDING SYSTEMS	REPLACE SHEET METAL PANS IN HVAC 3 AND HVAC 5	$ 42,000
UNIV RESEARCH CONTAINMENT	0211	2018	BUILDING SYSTEMS	REPLACE AHU 1, 2, 3, 4, 5, 6, EXHAUST FANS 1, 2, 7, AND 8.	$ 1,421,000
UNIV RESEARCH CONTAINMENT	0211	2020	BUILDING SYSTEMS	REPLACE ENERGY RECLAIM PUMPS (2)	$ 97,000
UNIV RESEARCH CONTAINMENT	0211	2020	BUILDING SYSTEMS	REPLACE HEAT EXCHANGERS	$ 32,000
UNIV RESEARCH CONTAINMENT	0211	2020	BUILDING SYSTEMS	REPLACE HOT WATER HEATING PUMPS	$ 78,000
UNIV RESEARCH CONTAINMENT	0211	2020	BUILDING SYSTEMS	REPLACE SUMP PUMPS	$ 57,000
UNIV RESEARCH CONTAINMENT	0211	2020	BUILDING ENVELOPE	ROOFING - FM ROOFS #1, 2, 3, AND 4	$ 281,000
UNIV RESEARCH CONTAINMENT	0211	2020	BUILDING SYSTEMS	VAV SYSTEM	$ 468,000

MSU Capital Renewal Maintenance by Building FY2021-2025 (Including Deferred)

Building Name	Bldg	Work Plan Year	Type	Description (Title)	Total Estimate
UNIV RESEARCH CONTAINMENT	0211	2020	BUILDING SYSTEMS	VAV SYSTEM	$ 813,000
UNIV RESEARCH CONTAINMENT	0211	2021	BUILDING SYSTEMS	REPLACE CHILLED WATER PUMPS	$ 343,000
UNIV RESEARCH CONTAINMENT	0211	2022	BUILDING SYSTEMS	REPLACE EAST LOW PRESSURE BOILER	$ 323,000
UNIV RESEARCH CONTAINMENT	0211	2022	BUILDING SYSTEMS	REPLACE HIGH PRESSURE BOILER	$ 258,000
UNIV RESEARCH CONTAINMENT	0211	2022	BUILDING SYSTEMS	REPLACE WEST LOW PRESSURE BOILER	$ 323,000
UNIV RESEARCH CONTAINMENT	0211	2022	BUILDING SYSTEMS	UPGRADE 5 DDC PANELS SERVING CAR AREA/ ENTIRE FACILITY	$ 168,000
UNIV RESEARCH CONTAINMENT	0211	2025	BUILDING SYSTEMS	REPLACE WATER SOFTNER THAT SERVES BOILER	$ 26,000
					$ 4,756,000
URBAN PLANNING LANDSCAPE ARCH-IMC	0082	2010	BUILDING INTERIOR	REST ROOM PARTITIONS - REPLACE TOILET PARTITIONS.	$ 20,000
URBAN PLANNING LANDSCAPE ARCH-IMC	0082	2017	BUILDING SYSTEMS	URBAN PLANNING LANDSCAPE - REPLACE FIRE ALARM SYSTEM	$ 247,000
URBAN PLANNING LANDSCAPE ARCH-IMC	0082	2018	BUILDING SYSTEMS	REPLACE HOT WATER HEAT PUMPS 1 AND 2, INCLUDING CHECK, BALANCING AND ISOLATION VALVES	$ 39,000
URBAN PLANNING LANDSCAPE ARCH-IMC	0082	2019	BUILDING SYSTEMS	VAV SYSTEM	$ 47,000
					$ 353,000
VET RESEARCH-GERM FREE BARN	0446F	2015	BUILDING ENVELOPE	REPLACE ROOF #1	$ 138,000
VET RESEARCH-GERM FREE BARN	0446F	2020	BUILDING ENVELOPE	DOORS - EXTERIOR - ED	$ 70,000
VET RESEARCH-GERM FREE BARN	0446F	2020	BUILDING INTERIOR	DOORS - INTERIOR - IND	$ 27,000
					$ 235,000
VET RESEARCH-LARGE ANIMAL	0446A	2018	BUILDING ENVELOPE	DOORS - EXTERIOR - ED	$ 40,000
VET RESEARCH-LARGE ANIMAL	0446A	2018	BUILDING INTERIOR	DOORS - INTERIOR	$ 23,000
VET RESEARCH-LARGE ANIMAL	0446A	2020	BUILDING SYSTEMS	BARN "A" - REWIRE BUILDING	$ 31,000
VET RESEARCH-LARGE ANIMAL	0446A	2020	BUILDING SYSTEMS	BARN "B" - REWIRE	$ 41,000
					$ 135,000
VET RESEARCH-MANAGER'S HOUSE	0446C	2011	BUILDING ENVELOPE	COMPLETE EXTERIOR RENOVATION INCLUDING WINDOWS, DOORS, SIDING, AND ROOFING.	$ 43,000
VET RESEARCH-MANAGER'S HOUSE	0446C	2013	BUILDING ENVELOPE	REPLACE ALL WINDOWS AND MAIN ENTRY DOORS	$ 23,000
					$ 66,000
VET RESEARCH-ROUND ROOF	0446B	2018	BUILDING ENVELOPE	RECOAT ROUND ROOF BARN 446B.	$ 47,000
VET RESEARCH-ROUND ROOF	0446B	2019	BUILDING ENVELOPE	REPLACE EXTERIOR DOORS	$ 26,000
					$ 73,000
VET RESEARCH-SMALL ANIMAL	0446J	2015	BUILDING SYSTEMS	PROVIDE CONNECTION POINT FOR PORTABLE GENERATOR TO POWER CAR AREAS.	$ 32,000
VET RESEARCH-SMALL ANIMAL	0446J	2020	BUILDING SYSTEMS	REPLACE GAS FIRE DOMESTIC WATER HEATER	$ 32,000
VET RESEARCH-SMALL ANIMAL	0446J	2020	BUILDING SYSTEMS	REPLACE LOW PRESSURE STEAM BOILER AND BOILER FEED SYSTEM	$ 258,000

MSU Capital Renewal Maintenance by Building FY2021-2025 (Including Deferred)

Building Name	Bldg	Work Plan Year	Type	Description (Title)	Total Estimate
VET RESEARCH-SMALL ANIMAL	0446J	2025	BUILDING SYSTEMS	REPLACE HWHT BOILER	$ 26,000
					$ 348,000
VETERINARY DIAGNOSTIC LABORATORY	0215	2020	BUILDING SYSTEMS	REPLACE STEAM DOMESTIC WATER HEATER LOCATED IN PENTHOUSE	$ 61,000
VETERINARY DIAGNOSTIC LABORATORY	0215	2020	BUILDING SYSTEMS	REPLACE WATER SOFTENER MINERAL IN 2 DOMESTIC WATER SOFTENER TANKS IN MR-032	$ 43,000
VETERINARY DIAGNOSTIC LABORATORY	0215	2021	BUILDING SYSTEMS	UPGRADE CONTROLS IN VDL TRAILER-1	$ 25,000
VETERINARY DIAGNOSTIC LABORATORY	0215	2022	BUILDING SYSTEMS	REPLACE FILTER MEDIA IN THE IRON FILTER TANKS FOR DOMESTIC COLD WATER IN MR-032	$ 43,000
VETERINARY DIAGNOSTIC LABORATORY	0215	2025	BUILDING SYSTEMS	REPLACE DEAERATOR AND FEED PUMPS FOR BOILER SYSTEM	$ 969,000
VETERINARY DIAGNOSTIC LABORATORY	0215	2025	BUILDING SYSTEMS	REPLACE EAST HIGH PRESSURE BOILER	$ 969,000
VETERINARY DIAGNOSTIC LABORATORY	0215	2025	BUILDING SYSTEMS	REPLACE WEST HIGH PRESSURE BOILER	$ 969,000
					$ 3,079,000
VETERINARY MEDICAL CENTER	0170	2014	BUILDING ENVELOPE	EXTERIOR MASONRY RESTORATION AND EXTERIOR WATERPROOFING	$ 429,000
VETERINARY MEDICAL CENTER	0170	2016	BUILDING SYSTEMS	COMPLETE ELEVATOR REPLACEMENT	$ 270,000
VETERINARY MEDICAL CENTER	0170	2017	BUILDING ENVELOPE	FUND STUDY OF EXTERIOR MASONRY AND CAULKING FOR RESTORATION	$ 54,000
VETERINARY MEDICAL CENTER	0170	2018	BUILDING INTERIOR	REPLACE ORIGINAL 9X9 FLOOR TILE IN HALLWAYS AND PUBLIC AREAS OF `A` BUILDING.	$ 388,000
VETERINARY MEDICAL CENTER	0170	2018	BUILDING SYSTEMS	REPLACE STEAM PRV STATION, RECONFIGURE PIPING MR-A50	$ 52,000
VETERINARY MEDICAL CENTER	0170	2019	BUILDING SYSTEMS	REPLACE CONTROL AIR COMPRESSORS (3 SETS)	$ 92,000
VETERINARY MEDICAL CENTER	0170	2019	BUILDING SYSTEMS	VETERINARY MEDICAL CENTER- UPGRADE PCB TRANSFORMERS AND ELECTRICAL EQUIPMENT	$ 236,000
VETERINARY MEDICAL CENTER	0170	2020	BUILDING SYSTEMS	REPLACE ELEVATOR D2	$ 328,000
VETERINARY MEDICAL CENTER	0170	2020	BUILDING SYSTEMS	REPLACE ELEVATOR G3	$ 328,000
VETERINARY MEDICAL CENTER	0170	2020	BUILDING SYSTEMS	REPLACE ELEVATOR G4	$ 328,000
VETERINARY MEDICAL CENTER	0170	2021	BUILDING ENVELOPE	REPAIR/REPLACE ROOF FLASHING	$ 37,000
VETERINARY MEDICAL CENTER	0170	2021	BUILDING SYSTEMS	VAV SYSTEM	$ 833,000
VETERINARY MEDICAL CENTER	0170	2025	BUILDING SYSTEMS	PLUMBING FIXTURES	$ 464,000
					$ 3,839,000
VETERINARY MEDICAL CENTER-EQUINE	0170A	2018	BUILDING SYSTEMS	2 TRANE UNITS - 20/30 TONS - DX ON WEST END	$ 169,000
VETERINARY MEDICAL CENTER-EQUINE	0170A	2019	BUILDING SYSTEMS	HVAC EQUIPMENT - AHU	$ 641,000
VETERINARY MEDICAL CENTER-EQUINE	0170A	2019	BUILDING SYSTEMS	LIGHTING FIXTURES	$ 66,000
VETERINARY MEDICAL CENTER-EQUINE	0170A	2019	BUILDING SYSTEMS	REPLACE GROUND MOUNTED AIR COOLED DX CHILLER	$ 162,000

MSU Capital Renewal Maintenance by Building FY2021-2025 (Including Deferred)

Building Name	Bldg	Work Plan Year	Type	Description (Title)	Total Estimate
VETERINARY MEDICAL CENTER-EQUINE	0170A	2020	BUILDING SYSTEMS	PUMPS	$ 136,000
					$ 1,174,000
WELL HOUSE 15	0550	2016	BUILDING ENVELOPE	DOORS - EXTERIOR	$ 20,000
					$ 20,000
WELLS HALL	0078	2011	BUILDING INTERIOR	REST ROOM PARTITIONS - REPLACE REST ROOM PARTITIONS IN B 110, 111.	$ 20,000
WELLS HALL	0078	2014	BUILDING ENVELOPE	REPLACE 6 EXTERIOR DOORS AND HARDWARE AT A & D WINGS	$ 39,000
WELLS HALL	0078	2015	BUILDING SYSTEMS	REMOVE ALL ASBESTOS	$ 1,576,000
WELLS HALL	0078	2020	BUILDING SYSTEMS	PLUMBING FIXTURES	$ 103,000
WELLS HALL	0078	2024	BUILDING SYSTEMS	REPLACE 590 TON CHILLER #1 (IN MR B-1) AND ASSOCIATED COOLING TOWER	$ 2,091,000
WELLS HALL	0078	2024	BUILDING SYSTEMS	REPLACE 590 TON CHILLER #2 (IN MR B-1) AND ASSOCIATED COOLING TOWER	$ 2,091,000
					$ 5,920,000
WHARTON	0085	2012	BUILDING INTERIOR	REPLACE CEILING TILE IN OFFICES, PUBLIC AREAS, BATHS AND HALLWAYS, AS NECESSARY.	$ 135,000
WHARTON	0085	2012	BUILDING SYSTEMS	REPLACE ELEVATOR 1	$ 296,000
WHARTON	0085	2012	BUILDING SYSTEMS	REPLACE ELEVATOR 2	$ 296,000
WHARTON	0085	2012	BUILDING SYSTEMS	REPLACE ELEVATOR 3	$ 426,000
WHARTON	0085	2014	BUILDING INTERIOR	INTERIOR PAINTING - THROUGHOUT THE ENTIRE BUILDING.	$ 177,000
WHARTON	0085	2017	BUILDING ENVELOPE	EXTERIOR MASONRY RESTORATION AND EXTERIOR WATERPROOFING	$ 199,000
WHARTON	0085	2017	BUILDING ENVELOPE	REPLACE EXTERIOR DOORS, FRAMES, HARDWARE (DOOR ID #988)	$ 123,000
WHARTON	0085	2020	BUILDING SYSTEMS	REPLACE 3 DISTRIBUTION PANELS	$ 121,000
WHARTON	0085	2020	BUILDING SYSTEMS	REPLACE FUSIBLE SWITCH TO BREAKERS OR NEW SWITCHES	$ 79,000
WHARTON	0085	2020	BUILDING SYSTEMS	REPLACE URINAL FLUSH VALVES, TOILET FLUSH VALVES AND TOILET SEATS	$ 31,000
WHARTON	0085	2021	BUILDING SYSTEMS	REPLACE FIRE SUPPRESSION PIPING (3 AREAS)	$ 590,000
WHARTON	0085	2024	BUILDING SYSTEMS	REPLACE CONTROL AIR COMPRESSOR (SAYLOR BEALL 707 5HP, 200 GALLON TANK	$ 33,000
					$ 2,506,000
WILLS HOUSE	0008	2013	BUILDING ENVELOPE	REPLACE (3) ENTRANCES, DOORS, FRAMES, AND HARDWARE	$ 26,000
WILLS HOUSE	0008	2014	BUILDING ENVELOPE	REPLACE ALL WINDOWS AND EXTERIOR DOORS	$ 402,000
WILLS HOUSE	0008	2016	BUILDING ENVELOPE	EXTERIOR MASONRY AND CAULKING RESTORATION	$ 28,000
WILLS HOUSE	0008	2017	BUILDING SYSTEMS	LIGHTING FIXTURES	$ 50,000
WILLS HOUSE	0008	2020	BUILDING SYSTEMS	REPLACE CAST IRON RADIATORS WITH CONVECTORS AND SELF CONTAINED VALVES.	$ 41,000
WILLS HOUSE	0008	2020	BUILDING ENVELOPE	ROOFING - FC 1 AND 2	$ 43,000
					$ 590,000

All Buildings: $ 320,379,000

Fall 2019

Appendix F: Utilities

Fiscal Year 2021
Budget Information

5-Year Capital Request Planning and Capital Outlay Request

Submitted By:

MICHIGAN STATE UNIVERSITY

MSU Capital Renewal Utilities FY21-25 (Including Deferred)

Building Name	Bldg	Work Plan Year	Def Ext	Description (Title)	Total Estimate
SEWER DISTRIBUTION	9572	2015	UTILITIES	STORM WATER DISTRIBUTION - SEWER SEPARATION FOR LOT 87	$ 442,000
					$ 442,000
SEWER DISTRIBUTION	9572	2016	UTILITIES	SEWER DIST SYSTEM - STORM/SANITARY CROSS CONNECTION STUDY	$ 166,000
COMMUNICATION DISTRIBUTION	9576	2016	UTILITIES	COMMUNICATION DUCTLINE - NEW DUCTLINE - HOLMES AND AKERS HALL AREA	$ 1,278,000
COMMUNICATION DISTRIBUTION	9576	2016	UTILITIES	COMMUNICATION DUCTLINE - NEW DUCTLINE FROM SHAW LANE TO MCDONEL HALL	$ 311,000
					$ 1,755,000
WATER DISTRIBUTION	9571	2017	UTILITIES	WATER DISTRIBUTION - REPLACE DETERIORATED CAST IRON DISTRIBUTION MAINS	$ 1,892,000
STREET LIGHT DISTRIBUTION	9574	2017	UTILITIES	REPLACE UNDERGROUND STREET LIGHT CABLE - PHASE 5 OF 12 PHASES	$ 203,000
					$ 2,095,000
REGIONAL CHILLED WATER PLANT	0189	2018	UTILITIES	RCWP STEAM METERING	$ 206,000
STEAM DISTRIBUTION	9570	2018	UTILITIES	REMOTE MONITORING SYSTEM - HIGH PRESSURE STEAM TRAPS	$ 206,000
STEAM DISTRIBUTION	9570	2018	UTILITIES	STEAM DISTRIBUTION - MISC. MAJOR REPAIRS	$ 1,659,000
ELECTRICAL DISTRIBUTION	9573	2018	UTILITIES	ELECTRICAL DISTRIBUTION - CABLE/MISC REPLACEMENT AND REPAIRS	$ 2,523,000
					$ 4,594,000
STEAM DISTRIBUTION	9570	2019	UTILITIES	STEAM DISTRIBUTION - MISC. MAJOR REPAIRS	$ 885,000
STEAM DISTRIBUTION	9570	2019	UTILITIES	STEAM DISTRIBUTION INSTALL SECOND 18" CR LINE FROM PWR PLT TO VLT 206	$ 2,168,000
WATER DISTRIBUTION	9571	2019	UTILITIES	LEADED HYDRANT REPLACEMENT PHASE 1 OF 3	$ 103,000
WATER DISTRIBUTION	9571	2019	UTILITIES	LEADED HYDRANT REPLACEMENT PHASE 2 OF 3	$ 103,000
WATER DISTRIBUTION	9571	2019	UTILITIES	LEADED HYDRANT REPLACEMENT PHASE 3 OF 3	$ 103,000
WATER DISTRIBUTION	9571	2019	UTILITIES	WATER DISTRIBUTION - REPLACE DETERIORATING CAST IRON DISTRIBUTION MAINS	$ 1,892,000
ELECTRICAL DISTRIBUTION	9573	2019	UTILITIES	ELECTRICAL DISTRIBUTION - INSTALL ELE DUCTBANK FROM FARM LANE TO INTERDISPL BLDG ALONG SERVICE RD	$ 2,060,000
ELECTRICAL DISTRIBUTION	9573	2019	UTILITIES	REPLACE CONTACTORS, CONTROL SYSTEMS, WIRE AND LIGHT FIXTURES IN STEAM TUNNELS AND VAULTS	$ 164,000
ELECTRICAL DISTRIBUTION	9573	2019	UTILITIES	REPLACE UNDERGROUND STREET LIGHT CABLE - PHASE 7 OF 12 PHASES	$ 246,000
					$ 7,724,000
WATER DISTRIBUTION	9571	2020	UTILITIES	WATER DISTRIBUTION - REPLACE DETERIORATING CAST IRON DISTRIBUTION MAINS	$ 2,523,000
SEWER DISTRIBUTION	9572	2020	UTILITIES	SERVICE ROAD STORM SEWER INTERCEPTOR	$ 927,000
ELECTRICAL DISTRIBUTION	9573	2020	UTILITIES	ELECTRICAL DISTRIBUTION - CABLE/MISC REPLACEMENT AND REPAIRS	$ 2,523,000
STREET LIGHT DISTRIBUTION	9574	2020	UTILITIES	REPLACE UNDERGROUND STREET LIGHT CABLE	$ 246,000
STREET LIGHT DISTRIBUTION	9574	2020	UTILITIES	STREET LIGHT DISTRIBUTION - CABLE REPLACEMENT - PHASE 4 OF 10	$ 370,000
COMMUNICATION DISTRIBUTION	9576	2020	UTILITIES	COMMUNICATION DUCTLINE - NEW DUCTLINE ALONG WB SHAW LANE FROM FARM LANE TO RED CEDAR	$ 651,000
					$ 7,240,000
TB SIMON POWER PLANT	0065	2021	UTILITIES	POWER & WATER - CHIMNEY REPAIRS	$ 500,000
TB SIMON POWER PLANT	0065	2021	TURBINE-BOILER-BAGHS	POWER & WATER - DISTRIBUTION SYSTEM METER REPAIRS	$ 100,000

MSU Capital Renewal Utilities FY21-25 (Including Deferred)

Building Name	Bldg	Work Plan Year	Def Ext	Description (Title)	Total Estimate
TB SIMON POWER PLANT	0065	2021	TURBINE-BOILER-BAGHS	POWER & WATER - FIX U3 ATTEMPERATOR BACK-UP SUPPLY VALVE	$ 50,000
TB SIMON POWER PLANT	0065	2021	TURBINE-BOILER-BAGHS	POWER & WATER - IMPROVE STEAM TURBINE HOT STANDBY LAYUP	$ 100,000
TB SIMON POWER PLANT	0065	2021	UTILITIES	POWER & WATER - MISCELLANEOUS SAFETY PLATFORMS (ANNUAL)	$ 75,000
TB SIMON POWER PLANT	0065	2021	TURBINE-BOILER-BAGHS	POWER & WATER - REPLACE CT ROTOR	$ 3,090,000
TB SIMON POWER PLANT	0065	2021	TURBINE-BOILER-BAGHS	POWER & WATER - REPLACE SOOT BLOWING AIR COMPRESSOR	$ 250,000
TB SIMON POWER PLANT	0065	2021	TURBINE-BOILER-BAGHS	POWER & WATER - TRANSFORMER MONITORING EQUIPMENT (17 UNITS)	$ 300,000
TB SIMON POWER PLANT	0065	2021	TURBINE-BOILER-BAGHS	POWER & WATER - TURBINE OVERHAUL	$ 600,000
TB SIMON POWER PLANT	0065	2021	WELLS	POWER & WATER - WELL SYSTEM REPAIRS	$ 250,000
ROADS	2070	2021	UTILITIES	ROADS/UTILITIES - SERVICE RD AND SERVICE/BOGUE INTERSECTION RECONSTRUCTION (FUNDING PHASE 2 OF 2)	$ 3,000,000
STEAM DISTRIBUTION	9570	2021	UTILITIES	STEAM DISTRIBUTION - MISC MAJOR REPAIRS	$ 2,523,000
WATER DISTRIBUTION	9571	2021	UTILITIES	WATER DISTRIBUTION - REPLACE DETERIORATING CAST IRON DISTRIBUTION MAIN AND UPSIZE FOR FLOW CAPACITY	$ 851,000
WATER DISTRIBUTION	9571	2021	UTILITIES	WATER DISTRIBUTION - REPLACE DETERIORATING CAST IRON DISTRIBUTION MAINS	$ 3,153,000
SEWER DISTRIBUTION	9572	2021	UTILITIES	CLEAN AND VIDEO TAPE CAMPUS SANITARY AND STORM SEWERS	$ 166,000
ELECTRICAL DISTRIBUTION	9573	2021	UTILITIES	ELECTRICAL DISTRIBUTION - CABLE/MISC REPLACEMENT AND REPAIRS	$ 2,523,000
ELECTRICAL DISTRIBUTION	9573	2021	UTILITIES	REMOVE AND REPLACE LID TO ELECTRICAL VAULT TV19	$ 118,000
ELECTRICAL DISTRIBUTION	9573	2021	UTILITIES	REPAIR CONCRETE SPALLING IN ELE-169 MANHOLE	$ 25,000
STREET LIGHT DISTRIBUTION	9574	2021	UTILITIES	STREET LIGHT DISTRIBUTION - CABLE REPLACEMENT - PHASE 5 OF 10	$ 370,000
COMMUNICATION DISTRIBUTION	9576	2021	UTILITIES	COMMUNICATION DUCTLINE - NEW DUCTLINE ALONG BOGUE (SOUTH OF SERVICE RD) TO LIFE SCI	$ 790,000
COMMUNICATION DISTRIBUTION	9576	2021	UTILITIES	COMMUNICATION DUCTLINE - NEW DUCTLINE FROM LIFE SCI AND CLINICAL CENTER	$ 835,000
COMMUNICATION DISTRIBUTION	9576	2021	UTILITIES	COMMUNICATION DUCTLINE - NEW DUCTLINE FROM UNION TO HUMAN ECOLOGY	$ 131,000
COMMUNICATION DISTRIBUTION	9576	2021	UTILITIES	COMMUNICATION DUCTLINE - NEW DUCTLINE INTO FOOD STORES	$ 131,000
COMMUNICATION DISTRIBUTION	9576	2021	UTILITIES	COMMUNICATION DUCTLINE - NEW DUCTLINE INTO OWEN HALL	$ 233,000
COMMUNICATION DISTRIBUTION	9576	2021	UTILITIES	COMMUNICATION DUCTLINE - NEW DUCTLINE INTO PACKAGING BUILDING	$ 62,000
COMMUNICATION DISTRIBUTION	9576	2021	UTILITIES	COMMUNICATION DUCTLINE - NEW DUCTLINE INTO UNIVERSITY SERVICES	$ 248,000
COMMUNICATION DISTRIBUTION	9576	2021	UTILITIES	COMMUNICATION DUCTLINE - NEW DUCTLINE INTO WELLS HALL	$ 52,000
COMMUNICATION DISTRIBUTION	9576	2021	UTILITIES	COMMUNICATION DUCTLINE - NEW DUCTLINE TO HUBBARD, FEE AND CONRAD HALL AREA	$ 1,864,000
COMMUNICATION DISTRIBUTION	9576	2021	UTILITIES	COMMUNICATION DUCTLINE - NEW DUCTLINE TO RAMP NO. 2 AND BESSEY HALL (COORDINATE WITH PARKING RAMP NO	$ 233,000
					$ 22,623,000

COMPUTER CENTER	0035	2022	UTILITIES	COMPUTER CENTER - STUDY - ADD PERM. DATA CENTER GENERATOR	$ 26,000
TB SIMON POWER PLANT	0065	2022	TURBINE-BOILER-BAGHS	POWER & WATER - AUTOMATE U4 BAGHOUSE INLET POPPETS	$ 150,000

MSU Capital Renewal Utilities FY21-25 (Including Deferred)

Building Name	Bldg	Work Plan Year	Def Ext	Description (Title)	Total Estimate
TB SIMON POWER PLANT	0065	2022	TURBINE-BOILER-BAGHS	POWER & WATER - COMMISSION U6 HRSG FEEDWATER PREHEATER SECTION	$ 150,000
TB SIMON POWER PLANT	0065	2022	TURBINE-BOILER-BAGHS	POWER & WATER - DISTRIBUTION SYSTEM METER REPAIRS	$ 150,000
TB SIMON POWER PLANT	0065	2022	WELLS	POWER & WATER - INSTALL NEW WELL/WELL HOUSE	$ 650,000
TB SIMON POWER PLANT	0065	2022	UTILITIES	POWER & WATER - MISCELLANEOUS SAFETY PLATFORMS (ANNUAL)	$ 75,000
TB SIMON POWER PLANT	0065	2022	TURBINE-BOILER-BAGHS	POWER & WATER - PLANT MODS TO RETIRE U1&2	$ 350,000
TB SIMON POWER PLANT	0065	2022	TURBINE-BOILER-BAGHS	POWER & WATER - PLANT STABILIZATION AND LOAD SHEDDING	$ 750,000
TB SIMON POWER PLANT	0065	2022	TURBINE-BOILER-BAGHS	POWER & WATER - REPLACE MAIN STEAM CROSS CONNECT VALVES PHASE 1 OF 2	$ 350,000
TB SIMON POWER PLANT	0065	2022	UTILITIES	POWER & WATER - REPLACE/EXPAND SECURITY CAMERA SYSTEM	$ 400,000
TB SIMON POWER PLANT	0065	2022	TURBINE-BOILER-BAGHS	POWER & WATER - RETIRE/REPLACE U1/2/3 COOLING TOWER	$ 350,000
TB SIMON POWER PLANT	0065	2022	TURBINE-BOILER-BAGHS	POWER & WATER - TURBINE OVERHAUL	$ 600,000
TB SIMON POWER PLANT	0065	2022	TURBINE-BOILER-BAGHS	POWER & WATER - U4 BOILER IMPROVEMENTS	$ 50,000
TB SIMON POWER PLANT	0065	2022	WELLS	POWER & WATER - WELL SYSTEM REPAIRS	$ 250,000
STEAM DISTRIBUTION	9570	2022	UTILITIES	ADDITIONAL STEAM MAIN AND UPGRADE TO EXISTING MAINS AT RIVER CROSSING PEDESTRIAN BRIDGE-WELLS HALL	$ 1,991,000
STEAM DISTRIBUTION	9570	2022	UTILITIES	INCREASE STEAM LINE SIZE FROM A 12" TO A 20" ALONG BOGUE ST. FROM WILSON RD. TO RED CEDAR RIVER BRID	$ 4,140,000
STEAM DISTRIBUTION	9570	2022	UTILITIES	INSTALL A SECOND 24" STEAM AND 12" CR ALONG SERVICE ROAD FROM STM0206 (PWR PLNT) TO BOGUE AND SERVIC	$ 11,064,000
STEAM DISTRIBUTION	9570	2022	UTILITIES	INSTALL SECOND 20" STEAM AND 10" CR LINE FROM WELLS HALL BRIDGE TO NCS	$ 4,313,000
STEAM DISTRIBUTION	9570	2022	UTILITIES	STEAM - REPLACE STEAM AND CONDENSATE RETURN FROM VAULT 1 TO VAULT 4, INCREASE CAPACITY	$ 2,710,000
STEAM DISTRIBUTION	9570	2022	UTILITIES	STEAM DISTRIBUTION - INSTALL SECOND 20" HPSTM / 10"PCR FROM V267 TO V193	$ 7,299,000
STEAM DISTRIBUTION	9570	2022	UTILITIES	STEAM DISTRIBUTION - INSTALL SECONDARY STEAM SERVICE TO NORTH CAMPUS, BOGUE STREET RIVER CROSSING.	$ 9,285,000
STEAM DISTRIBUTION	9570	2022	UTILITIES	STEAM DISTRIBUTION - MISC MAJOR REPAIRS AND RESTORATION	$ 2,523,000
WATER DISTRIBUTION	9571	2022	UTILITIES	WATER DISTRIBUTION - REPLACE DETERIORATING CAST IRON DISTRIBUTION MAINS	$ 3,153,000
ELECTRICAL DISTRIBUTION	9573	2022	UTILITIES	ELECTRICAL DISTRIBUTION - CABLE/MISC REPLACEMENT AND REPAIRS	$ 2,523,000
STREET LIGHT DISTRIBUTION	9574	2022	UTILITIES	STREET LIGHT DISTRIBUTION - CABLE REPLACEMENT - PHASE 6 OF 10	$ 370,000
					$ 53,672,000

TB SIMON POWER PLANT	0065	2023	TURBINE-BOILER-BAGHS	DISTRIBUTION SYSTEM METER REPAIRS	$ 150,000
TB SIMON POWER PLANT	0065	2023	UTILITIES	POWER & WATER - CONVERT TO MOTOR OPERATED VALVES FOR FEEDWATER PUMPS	$ 200,000
TB SIMON POWER PLANT	0065	2023	TURBINE-BOILER-BAGHS	POWER & WATER - INSTALL VACUUM PUMPS FOR U3/U4 TURBINE	$ 100,000
TB SIMON POWER PLANT	0065	2023	UTILITIES	POWER & WATER - MISCELLANEOUS SAFETY PLATFORMS (ANNUAL)	$ 75,000
TB SIMON POWER PLANT	0065	2023	UTILITIES	POWER & WATER - REMOVE MILLS ON NO. 3	$ 150,000

MSU Capital Renewal Utilities FY21-25 (Including Deferred)

Building Name	Bldg	Work Plan Year	Def Ext	Description (Title)	Total Estimate
TB SIMON POWER PLANT	0065	2023	TURBINE-BOILER-BAGHS	POWER & WATER - REPLACE MAIN STEAM CROSS CONNECT VALVES PHASE 2 OF 2	$ 350,000
TB SIMON POWER PLANT	0065	2023	TURBINE-BOILER-BAGHS	POWER & WATER - REPLACE U3 STG STEAM PATH	$ 2,000,000
TB SIMON POWER PLANT	0065	2023	TURBINE-BOILER-BAGHS	POWER & WATER - TURBINE OVERHAUL	$ 600,000
TB SIMON POWER PLANT	0065	2023	TURBINE-BOILER-BAGHS	POWER & WATER - U4 BAGHOUSE REFURBISHMENT	$ 250,000
TB SIMON POWER PLANT	0065	2023	TURBINE-BOILER-BAGHS	REPLACE FOUR PLANT REACTORS WITH 2000 AMP UNITS	$ 1,100,000
STEAM DISTRIBUTION	9570	2023	UTILITIES	STEAM DISTRIBUTION - MISC. MAJOR REPAIRS	$ 2,523,000
WATER DISTRIBUTION	9571	2023	UTILITIES	DOMESTIC WATER - REPLACE DETERIORATING CAST IRON (CI) DISTRIBUTION MAINS AND MISC REPAIRS	$ 3,153,000
ELECTRICAL DISTRIBUTION	9573	2023	UTILITIES	ELECTRICAL DISTRIBUTION - CABLE/MISC REPLACEMENT AND REPAIRS	$ 2,523,000
STREET LIGHT DISTRIBUTION	9574	2023	UTILITIES	REPLACE UNDERGROUND STREET LIGHT CABLE	$ 166,000
STREET LIGHT DISTRIBUTION	9574	2023	UTILITIES	STREET LIGHT DISTRIBUTION - CABLE REPLACEMENT - PHASE 7 OF 10	$ 370,000
					$ 13,710,000
TB SIMON POWER PLANT	0065	2024	TURBINE-BOILER-BAGHS	DISTRIBUTION SYSTEM METER REPAIRS	$ 150,000
TB SIMON POWER PLANT	0065	2024	UTILITIES	POWER & WATER - 7TH FLOOR STAIRWELL EMERGENCY EGRESS LIGHTING	$ 100,000
TB SIMON POWER PLANT	0065	2024	TURBINE-BOILER-BAGHS	POWER & WATER - ADD ATTEMPERATION CAPABILITY PER UNIT	$ 500,000
TB SIMON POWER PLANT	0065	2024	TURBINE-BOILER-BAGHS	POWER & WATER - AUTOMATE VALVES	$ 350,000
TB SIMON POWER PLANT	0065	2024	UTILITIES	POWER & WATER - MISCELLANEOUS SAFETY PLATFORMS (ANNUAL)	$ 75,000
TB SIMON POWER PLANT	0065	2024	TURBINE-BOILER-BAGHS	POWER & WATER - REPLACE CAUSTIC DAY TANK	$ 50,000
TB SIMON POWER PLANT	0065	2024	TURBINE-BOILER-BAGHS	POWER & WATER - TURBINE OVERHAUL	$ 600,000
STEAM DISTRIBUTION	9570	2024	UTILITIES	STEAM DISTRIBUTION - MISC. MAJOR REPAIRS	$ 2,523,000
WATER DISTRIBUTION	9571	2024	UTILITIES	DOMESTIC WATER - MISC. REPAIRS AND REPLACE DETERIORATING CAST IRON (CI) DISTRIBUTION MAINS	$ 3,153,000
STREET LIGHT DISTRIBUTION	9574	2024	UTILITIES	STREET LIGHT DISTRIBUTION - CABLE REPLACEMENT - PHASE 8 OF 10	$ 370,000
					$ 7,871,000
TB SIMON POWER PLANT	0065	2025	TURBINE-BOILER-BAGHS	DISTRIBUTION SYSTEM METER REPAIRS	$ 150,000
TB SIMON POWER PLANT	0065	2025	TURBINE-BOILER-BAGHS	POWER & WATER - AUTOMATE BLOWDOWN OF U6	$ 350,000
TB SIMON POWER PLANT	0065	2025	TURBINE-BOILER-BAGHS	POWER & WATER - AUTOMATE U6 ATTEMPERATOR BACK-UP SUPPLY VALVE	$ 150,000
TB SIMON POWER PLANT	0065	2025	TURBINE-BOILER-BAGHS	POWER & WATER - BLOWDOWN ON FIRST FLOOR/FOR U4 BOILER	$ 250,000
TB SIMON POWER PLANT	0065	2025	TURBINE-BOILER-BAGHS	POWER & WATER - BUILT PLATFORM FOR U5 TURBINE EXTRACTIONS TEAM COMMON ISO VALVE	$ 50,000
TB SIMON POWER PLANT	0065	2025	UTILITIES	POWER & WATER - D/A WATER SHUTOFF TO PREVENT WATER HAMMER	$ 500,000
TB SIMON POWER PLANT	0065	2025	WELLS	POWER & WATER - INSTALL NEW WELL/WELL HOUSE	$ 650,000
TB SIMON POWER PLANT	0065	2025	TURBINE-BOILER-BAGHS	POWER & WATER - INSTALL PLATFORM AND LIGHTING UNDERNEATH ATTEMPERATOR	$ 100,000
TB SIMON POWER PLANT	0065	2025	UTILITIES	POWER & WATER - MISCELLANEOUS SAFETY PLATFORMS (ANNUAL)	$ 75,000

MSU Capital Renewal Utilities FY21-25 (Including Deferred)

Building Name	Bldg	Work Plan Year	Def Ext	Description (Title)	Total Estimate
TB SIMON POWER PLANT	0065	2025	TURBINE-BOILER-BAGHS	POWER & WATER - POWERHOUSE FOUNDATION SUBSIDENCE	$ 250,000
TB SIMON POWER PLANT	0065	2025	TURBINE-BOILER-BAGHS	POWER & WATER - RELOCATE CONTROLLERS FOR ASH PIT SUMP AND U5 BLOWDOWN RECEIVER PUMPS	$ 100,000
TB SIMON POWER PLANT	0065	2025	UTILITIES	POWER & WATER - STRAINER FOR EAST TOWER	$ 50,000
TB SIMON POWER PLANT	0065	2025	TURBINE-BOILER-BAGHS	POWER & WATER - TURBINE OVERHAUL	$ 600,000
STEAM DISTRIBUTION	9570	2025	UTILITIES	STEAM DISTRIBUTION - MISC. MAJOR REPAIRS	$ 1,659,000
STEAM DISTRIBUTION	9570	2025	UTILITIES	STEAM DISTRIBUTION - MISC. MAJOR REPAIRS	$ 2,522,000
WATER DISTRIBUTION	9571	2025	UTILITIES	DOMESTIC WATER - REPLACE DETERIORATING CAST IRON (CI) DISTRIBUTION MAINS	$ 3,153,000
WATER DISTRIBUTION	9571	2025	UTILITIES	WATER DISTRIBUTION - REPLACE DETERIORATED CAST IRON DISTRIBUTION MAINS	$ 1,892,000
WATER DISTRIBUTION	9571	2025	UTILITIES	WATER DISTRIBUTION - REPLACE DETERIORATING CAST IRON DISTRIBUTION MAINS	$ 2,523,000
ELECTRICAL DISTRIBUTION	9573	2025	UTILITIES	ELECTRICAL DISTRIBUTION - CABLE/MISC REPLACEMENT AND REPAIRS	$ 2,523,000
ELECTRICAL DISTRIBUTION	9573	2025	UTILITIES	ELECTRICAL DISTRIBUTION - CABLE/MISC REPLACEMENT AND REPAIRS	$ 2,523,000
STREET LIGHT DISTRIBUTION	9574	2025	UTILITIES	STREET LIGHT DISTRIBUTION - CABLE REPLACEMENT - PHASE 8 OF 10	$ 370,000
					$ 20,440,000

All Utilities: $ 142,166,000

Fall 2019

Appendix G: SFY2021 Capital Outlay Request

Fiscal Year 2021 Budget Information

5-Year Capital Request Planning and Capital Outlay Request

Submitted By:

MICHIGAN STATE UNIVERSITY

STATE FISCAL YEAR 2021
CAPITAL OUTLAY PROJECT REQUEST

Institution Name:	Michigan State University		
Project Title:	Greenhouses - Renovation of Existing and Addition - Research Expansion and Learning		
Project Focus:	☒ Academic	☒ Research	☐ Administrative/Support
Type of Project:	☒ Renovation	☒ Addition	☐ New Construction

Program Focus of Occupants:	Research and teaching of plant sciences within the College of Agriculture and Natural Resources and College of Natural Science.
Approximate Square Footage:	175,000 GSF (combination of renovation/ addition)
Total Estimated Cost:	$20.9 million
Estimated Start/Completion Dates:	Start: Summer 2020(upon authorization) Completion: December 2022

Is the Five-Year Plan posted on the institution's public internet site?	☒ Yes ☐ No
Is the requested project the top priority in the Five-Year Capital Outlay Plan?	☒ Yes ☐ No
Is the requested project focused on a single, stand-alone facility?	☒ Yes ☐ No

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Project Purpose

Michigan State University is internationally recognized for its excellence in research and training in the plant sciences. Our future success is dependent on maintaining and expanding the overall quality and functionality of our experimental plant rearing facilities.

To remain nationally competitive and internationally relevant in the Plant Sciences, MSU must dramatically improve and expand its greenhouse facilities. One of the major challenges of the 21st century is to double food production and maintain global food security in the face of a growing population. Meeting that challenge will require the development of crops that are regionally adapted to future environmental conditions, including numerous abiotic and biotic stressors, and are more resilient to greater variation in their environment. This pressing societal need intersects with some of the most important questions in modern plant science and emphasizes the need for a better understanding of the interaction of genes and the environment. Accomplishing these goals requires reliable, modern, and energy-efficient greenhouse facilities and services.

Excellent research in the plant sciences requires the best infrastructure possible. In recent years, MSU has made major investments with the construction of the Molecular Plant Sciences Building and expansion of its growth chamber facilities. While these investments have greatly enhanced our position, parallel investments in our greenhouse facilities remain. Current greenhouse space infrastructure and capacity is not sufficient to facilitate the ongoing switch from model plant systems (suitable for small growth chambers) to agronomic crops that require greenhouses. New state-of-the-art greenhouse space will also reduce the pressure on our growth chamber resources. The campus growth chamber users committee recently estimated that additional greenhouse space would immediately

release 25-30 percent of the chamber space back to its highest and best use. This lack of critical research (greenhouse) infrastructure reduces our ability to recruit top plant scientists to MSU and hinders research capacity and extramural funding potential of current faculty.

The state-of-the-art for research greenhouses has advanced greatly since MSU last added new research greenhouses in 2002. Even with this addition, approximately two-thirds of the greenhouse facilities were built between 1955 and 1978 and require reinvestment. Furthermore, greenhouse space with necessary capabilities to facilitate research on resilience in agronomic crops and precisely control multiple environmental variables is not currently available on campus. The current infrastructure and capacity of the greenhouses limit the university's ability to meet the needs of the Michigan Agricultural Community, conduct critical research, and provide high quality plant science teaching facilities.

Renovation and expansion of the Plant Science Greenhouse Complex is critical to MSU maintaining its status as a world leader in plant science research. The status quo is not conducive with short and long-term plans for increased excellence in this important signature research program at MSU. With state-of-the-art plant science research facilities, MSU has an opportunity to build upon high interest and unique opportunities to have a major impact on feeding the world in the 21st century and beyond.

Scope of the Project

Many of the greenhouse facilities at Michigan State University are nearing the end of their useful life and are not configured for modern plant science research. The majority of greenhouses do not contain the environmental controls necessary for climate change research, or for year around use. Furthermore, most of the greenhouses do not have the instrumentation and internet connectivity necessary to control and monitor complex experiments.

This project would consist of selected renovations coupled with construction of additional greenhouses to provide sufficient capacity and high quality, functional and efficient greenhouse space. The greenhouses would have state-of-the-art environmental controls, consume less energy, and have the ability to automatically modulate internal temperature and supplemental lighting in response to external climate conditions of ambient sunlight and temperature. The new and renovated greenhouse facilities will have the ability to conduct controlled, replicated experiments, regardless of the season, and under a variety of growth, environmental and stress conditions. This greenhouse space would be located at the existing greenhouse range adjacent to other plant science research facilities. Preliminary planning anticipates that the scope of the project will be comprised of renovations and additions of approximately 175,000 gross square feet.

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

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

   Agriculture is the second largest contributor to the Michigan economy with over $104 billion in revenue attributed annually to food and agriculture. Total employment in the

food and agriculture sector in Michigan is 805,000 or about 17% of the state's employment. Michigan is also home to over 47,000 farms. The diversity of agricultural commodities (over 300) produced in Michigan ranks second in the nation behind California. Plant sciences research at Michigan State University contributes greatly to the success of these industries and is highly valued by a wide range of stakeholders. These strong, industry relevant research programs are a key component supporting growth and sustainability of the agricultural economy in the state.

Ongoing research efforts in the plant sciences at MSU are also supported in part by MSU AgBioResearch and through long standing state supported research programs such as Project GREEEN. Project GREEEN provides a vehicle for applied research tied to the most pressing problems confronting the plant based agricultural industries in the state. There are currently forty-four commodity/industry groups in the state of Michigan that are active partners in Project GREEEN and many of the projects supported by this program require greenhouse space. Total economic output of more than $2.5 billion over the past two decades has been attributed to this program, further supporting a highly tangible impact of plant science research in the state of Michigan. However, current infrastructure for plant science research, more specifically greenhouse capacity and quality, limits the ability of MSU to continue to concurrently meet the immediate needs of the Michigan agricultural community and conduct fundamental research in areas such as plant resilience, pest management, and innovative management systems to address challenges of the future.

Michigan State University is also an institutional partner in the U.S. Department of Energy (DOE) sponsored Great Lakes Bioenergy Research Center (GLBRC). Several MSU faculty members are involved with the GLBRC conducting research focused on converting plants to biofuels and bioproducts that are economically viable and environmentally sustainable. Since its inception in 2007, the GLBRC has received over $280 million in DOE funding.

The completion of this project will support high-priority academic functions and initiatives important to citizens of Michigan, who will continue to benefit from the teaching, research, and outreach. Investment will permit the University to continue to attract and retain quality faculty and students, increase participation at both the undergraduate and graduate levels, prepare students for careers in fields of agri-based science, and attract/increase federal, corporate and commodity group research dollars. In addition, research capacity would increase in areas critical to improving Michigan's economy, such as innovative research in agronomic crop resilience to maximize productivity of crops in response to a growing world population.

2. How does the project enhance the core academic, development of critical skill degrees, and/or research mission of the institution?

As a leader in plant science, MSU must maintain the highest level of research quality. Current MSU greenhouse space is functionally limiting and does not reflect its commitment to state-of-the-art research or the quality of the plant science programs, its faculty and students. Thus, it does not enable the vast majority of faculty members' research programs to propose and conduct precise quantitative and qualitative plant research at the level of precision and scale needed to meet current

and future societal needs as defined in requests for proposals from the National Science Foundation, United States Department of Agriculture, Department of Energy, and other funding agencies.

Renovations of the existing greenhouses, coupled with the addition of new state-of-the-art greenhouses with modern environmental control capacity, are necessary to provide increased research capacity and quality in this strategic area of the MSU research mission, support the shift of fundamental plant sciences from small scale model plant systems to agronomic crops, and address aging infrastructure. The current greenhouse infrastructure limits the university's ability to meet the needs of the Michigan agricultural community, the region, our global reach; conduct critical research, and provide student learning in modern facilities that reflect real world experiences. To continue our success and compete in the broad areas of the bio economy, it is necessary to address the condition and capacity of these facilities.

3. Is the requested project focused on a single, stand-alone facility? If no, please explain.

The requested project is focused on renovating existing greenhouse facilities encompassing approximately 150,000 gross square feet and additions up to 25,000 gross square feet all of which will be situated within or adjacent to the existing greenhouse range.

4. How does the project support investment in or adaptive re-purposing of existing facilities and infrastructure?

The project is a combination of renovations and additions at the existing greenhouse range. The greenhouse range is located in the Plant Science Neighborhood and includes the majority of plant science teaching and research facilities. The selected renovations will return existing greenhouses to higher functional use, leverage the site location of the existing greenhouse range, connect additions for improved functional use, and to the extent possible, will utilize existing utility infrastructure resources already in place on campus. This includes campus steam distribution, water, sewer, power, and data.

5. Does the project address or mitigate any current health/safety deficiencies relative to existing facilities? If yes, please explain

Most of the research greenhouses were constructed over forty years ago. While there have been selected upgrades to these facilities over time, they come with inherent infrastructure commensurate with the age of the facilities. The selected renovations and additions will address obsolescence of infrastructure, bring spaces into compliance with current codes and address programmatic requirements.

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

Michigan State University engages in a multi-faceted and comprehensive process for measuring utilization of its existing facilities. The University began a space metrics initiative in 2009 for quantitatively measuring the productivity and utilization of

research and academic office space. The metrics include research expenditures per net square feet of research space, as well as office space; and net square feet of space per full-time equivalent employee (FTE). Since the inception of the space metrics initiative, the university has realized a greater than 30 percent improvement in productivity and utilization of research space in terms of research expenditures per square foot. In addition to tracking utilization performance through internal metrics, the university periodically conducts benchmarking of its space metrics and overall space inventory with peer institutions of the Big Ten, using data from the National Science Foundation Science and Engineering Survey, and space survey data from the Higher Education Facilities Management Alliance. The university also uses the State of Michigan Academic Space Guidelines for planning new space and evaluating utilization.

A significant portion of the plant science research being conducted in growth chambers at MSU is better suited for modern greenhouses, especially in terms of environmental control, space and cost. The campus growth chamber user committee recently estimated that additional greenhouse space would immediately release 25-30 percent of the chamber space. New and improved greenhouse facilities will offer a solution to overcrowding at MSU's centralized growth chamber facilities and better align infrastructure with research and teaching needs in both the greenhouses and growth chambers.

Changes in management of greenhouse space were initiated beginning in January of 2019 to promote better management and utilization of existing greenhouse space. 1) A faculty greenhouse users committee was formed with representation from the six departments significantly engaged in plant science research, with administrative oversight provided from College of Agriculture and Natural Resources, College of Natural Sciences and MSU AgBioResearch. 2) Greenhouse space assignments are now handled centrally by the greenhouse manager and user's committee rather than at departmental level to promote more efficient use of existing space. 3) Greenhouse usage fees are being implemented effective January 2020 to further incentivize efficient use of existing space and provide additional revenue beyond annual base personnel and operating budget provided from above administrative units to address significant ongoing maintenance issues and small-scale improvements linked to aging greenhouse infrastructure.

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

Michigan State University's design guidelines and construction standards require that all new buildings and major renovation projects are designed to qualify for at least LEED Silver Certified as defined by the most current version of the United States Green Building Council LEED design requirements. The university also evaluates functional requirements and seeks opportunities for efficiency and productivity improvements in its space design and allocation. In addition, the university utilizes the least life cycle cost analysis to inform the design, equipment, and material selection, thereby minimizing the cost of operations and maintenance.

The University's Energy Transition Plan includes long range energy models for the reduction of greenhouse gas emissions and reduced energy consumption of existing

and new facilities, including a goal of 15 percent of energy consumption from renewable sources by the end of 2015. In 2016, MSU fully transitioned its power plant from coal to natural gas and continues to identify methods to supplement its capacity with renewable energy sources like the recently installed solar array panels on five parking lots, and an anaerobic digester. Progress on the energy transition plan includes reduced greenhouse gas emission by over 25 percent and increased renewables by 11.3 percent from baseline fiscal year 2010.

In addition, MSU joined the Department of Energy's (DOE) Better Buildings Challenge which is an initiative to reduce energy consumption in commercial buildings across the nation. The university pledged to reduce energy consumption by 20 percent in 20 million square feet of facilities by the year 2020. As part of this commitment, MSU along with the other Better Building partners, publish their goals and yearly progress updates on the DOE's Better Buildings website. To date, the university has reduced energy use intensity by close to 20 percent (weather adjusted) on average across the fleet of buildings on the East Lansing campus. Also, a ten-year plan to retro-commission 115 major campus buildings was completed at the end of FY2018. The scope of work included mechanical system retro-commissioning and whole building energy audits, resulting thus far in a greater than 20 percent reduction in utilities (steam and electricity) across the fleet of buildings included in the analysis.

The scope of the Greenhouses Renovation and Expansion project includes several components that will significantly improve the energy efficiency of the current greenhouse range by replacing antiquated materials and infrastructure with new glazing systems, LED lighting, and modern environmental control systems.

8. **Are match resources currently available for the project? If yes, what is the source of the match resources? If no, identify the intended source and the estimated timeline for securing said resources?**

   Michigan State University commits resources in the amount of $5.9 million (approximately 28.0%) of the $20.9 million estimated project cost. The university match will be from MSU capital and/or bonding paid for from general fund revenue.

9. **If authorized for construction, the state typically provides a maximum of 75% of the total cost for university projects and 50% of the total cost for community college projects. Does the institution intend to commit additional resources that would reduce the state share from the amounts indicated? If so, by what amount?**

   The total cost of the Greenhouses is estimated at $20.9 million. Michigan State University commits $5.9 million or 28.0% of its resources to assist with bringing this project to fruition, and respectfully requests State Capital Outlay funding in the amount of $15.0 million or approximately 72.0%.

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

Building operating costs for utilities, custodial, and maintenance for additional capacity of greenhouse space is estimated at approximately $135,000 annually, or $675,000 over a 5-year period, based on current dollars and the anticipated increase in square footage. However, operating costs associated with additional greenhouses will be significantly offset by gains in energy efficiency provided by the comprehensive renovations to the existing greenhouses. Any additional operating costs would be funded by budgeted general fund revenues.

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

This project will not have any direct impact on tuition costs.

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

If this project is not funded, the University's internationally recognized programs in research and education in plant sciences will be disadvantaged. The condition, capacity, and design of the existing facilities no longer supports the programs located within them and will not allow for new research or industry relevant teaching. This will negatively affect the quality of the University's teaching, research, and outreach efforts as well as its ability to attract and retain quality faculty and students, including several new faculty MSU anticipates hiring in the area of plant resilience. It will also affect the University's ability to compete for contracts and grants that ultimately would have a positive impact, both economically and intellectually, on the campus and throughout the state of Michigan as well as our capacity to address a grand challenge facing the world in the 21st century --- to safely and securely feed the world.

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

The University, through its annual planning process, evaluates space and facility needs on a recurring basis. This process, coupled with the campus land use master plan, has resulted in a careful review and placement of the projects on this current capital outlay submission. As stewards of State of Michigan resources, the University has identified renovations and additions for selected high-priority academic and support needs consistent with the mission of the University and service to the state of Michigan.

Increased research capacity in the plant sciences and training in modern methods cannot be met without modernization and expansion of the greenhouse facilities. Selected renovations coupled with building additional capacity within and adjacent to the existing greenhouse range is more economically and programmatically viable, and therefore is preferable to the alternative of full demolition and new construction of the research greenhouse complex.

Fall 2019

Appendix H: Facility for Rare Isotope Beams

Fiscal Year 2021
Budget Information

5-Year Capital Request Planning and Capital Outlay Request

Submitted By:

MICHIGAN STATE UNIVERSITY

Facility for Rare Isotope Beams

Background

The Facility for Rare Isotope Beams (FRIB) is a critical project for American science and the State of Michigan. FRIB not only will keep MSU on the cutting edge of nuclear science, but also will ensure the training of the nuclear scientists of tomorrow while bolstering the economies of mid-Michigan and the entire State. FRIB will cost $730 million to design and build. In FY14, the State made a commitment to bond and service the community cost share of $94.5 million. Construction began in 2014 and will be completed by 2022, with current forecasts anticipating early completion in 2021. FRIB is projected to create hundreds of jobs in Michigan, while bringing in more than $1 billion of economic activity to Michigan in the next 10 years. MSU looks forward to continuing its partnership with the State of Michigan to assure the successful completion of this project.

MSU continues to work with the U.S. Department of Energy Office of Science (DOE-SC) in developing FRIB and continues to manage against the annual plan prepared by MSU and approved by DOE-SC. On August 1, 2013, the DOE-SC approved Critical Decisions (CD) 2-3a, baselining the scope, cost and schedule, and authorizing the start of civil construction. The project received CD-3b approval (start of technical construction) in August 2014 with project progress well in advance of DOE-SC targets, and with civil construction nearing completion.

The centerpiece of the new user facility will be a superconducting linear accelerator that will increase dramatically the reach of rare-isotope research in the United States. The accelerator will produce isotopes that normally exist only in the most extreme environments in the universe and will expand the usefulness of isotopes in a broad range of applications from modeling stars to understanding the workings of nanoscale electronic devices, opening the door for critical applications in fields such as medicine, homeland security and industry.