UNIVERSITY of WISCONSIN
UWMILWAUKEE

REQUEST FOR PRE-DESIGN, DESIGN & CONSTRUCTION SERVICES

UW-Milwaukee

Southwest Quadrant Master Plan Update
&
New Engineering Building

DFD Project No. 19J3I

January 2020

BASIC SERVICES

This request provides architectural/engineering/planning (AEP) resources to complete the project phases indicated below for **Project No. 19J3I – SWQ Master Plan Update & New Engineering Building Pre-Design and Design at the University of Wisconsin-Milwaukee** (*see attached for further detail*).

Pre-Design Phase	Preliminary Design Phase	Final Design Phase	Bidding Phase	Construction Phase
☒	☒	☒	☒	☒

Consultants should submit their qualifications in the form of a letter of interest and demonstrate specific expertise and experience in the design and coordination of Engineering buildings, data visualization labs, interdisciplinary instructional facilities, steam and chilled water extensions, space planning and demolition of existing buildings as part of a design team.

The consultant(s) will participate in a highly collaborative and interactive campus planning process by meeting with appropriate campus staff, including Campus Planning, College of Engineering and other support services to develop Pre-Design documentation. Working in collaboration with the campus project team, the consultant will be responsible for program development, verification, and documentation; developing and documenting design alternatives with corresponding budget cost estimates and project schedules for each design alternative; and determining and documenting any project work dependencies for selected design alternatives.

The design consultant(s) will provide pre-design services as indicated in the current Division of Facilities Development and Management (DFDM) [*Guideline for Developing Program Statements and Feasibility Studies for Projects Requiring Enumeration,* and/or the *Policy and Procedure Manual for Architects/Engineers and Consultants*], and the DFDM *Contract for Professional Services*. These services may be contracted through multiple contracts or contracts with multiple parts and project-specific review/approval/authorization milestones as determined by the needs of the project. Authorization for subsequent services will be issued in writing upon satisfactory performance and completion of contracted services and deliverables.

This professional services for this project will be contracted in two phases. The first phase will provide an updated space utilization and master plan for the SW Quadrant of the UW-Milwaukee campus. It will also complete a Pre-Design Document for the resulting School of Engineering project. Upon completion, the A/E team will be put on-hold until the project is Enumerated in either the 2021/23 or 2023/15 biennium.

PRE-DESIGN SERVICES

In addition to the requirements for pre-design in the DFDM *Guideline for Developing Program Statements and Feasibility Studies for Projects Requiring Enumeration,* the following addition and clarifications should be noted:

- Update the existing SW Quad Master Plan to reflect most current needs, including the removal of the existing chemistry building.
- Assess quantity, condition and utilization of existing Engineering space. Develop classroom and lab quantities based on current and future student population trends and interdisciplinary lab utilization scenarios.
- Develop space tabulation for all Engineering space needs, including vetting and approvals.
- Perform Project Planning. Evaluate and prepare for DFDM and campus consideration options and scenarios for determining project priorities and project delivery, this includes scheduling, phasing, estimated cost, inflation, and loss of revenue implications.
- Prepare a Project Plan with a Program Statement per the DFDM *Guideline for Developing Program Statements and Feasibility Studies for Projects Requiring Enumeration* incorporating the Facilities Condition Assessment (completed during the feasibility study), code assessment, and project delivery scenarios, phases, and alternatives.

COST ESTIMATING

Provide conceptual construction cost estimates for all design alternatives. All estimates for a selected design alternative must provide construction cost detail with a dated reference for ease of future cost escalation. All project cost estimates not directly associated with the construction costs (basic and additional design services, project management fees, design contingency, project contingency, movable and special equipment, escalation factors) must be indicated separately from the construction cost estimates.

Life cycle cost estimates must include annual energy consumption; operational maintenance and repair cost estimates; life expectancy; and capital maintenance, repair, and replacement cost estimates of all facilities and utilities included in the master plan. Energy consumption estimates will be provided in the unit of measure most appropriate to the associated utility service to allow cost impact calculations at a future date based on current rates and agreements.

DELIVERABLES

Produce a Program Statement document with narrative descriptions of each project component and implementation phase, executive summary, detailed construction cost estimates, detailed life cycle costing estimates, full schematic building level floor plans for each level impacted by the project, two-dimensional elevations and color renderings of selected components, and three-dimensional color renderings of selected project areas. The narrative descriptions must include functions, occupant capacity/limits, building/structure and site infrastructure requirements, proposed materials, and applicable building code impacts. The executive summary will include all planning findings, project goals and principles, key recommendations, and an implementation plan.

All graphics must be grayscale compatible without losing meaning, distinguishing characteristics, or legibility.

All final documentation must be provided electronically via download link, USB flash drive, or optical disc (CD or DVD) in Adobe Acrobat PDF format. All narrative text and cost estimate documentation shall also be provided in an unlocked, editable file format for future use and presentation outside of the final Program Statement document. Text shall be provided in rich text format (*.RTF) or Microsoft Word XML document format (*.DOCX) and cost estimates provided in Microsoft Excel XML workbook format (*.XLSX). The content of the editable file formats must match the content of the final Program Statement document, but the organization, layout, and formatting needs only to be representative of the final content. All graphics, images, maps, plans, and renderings must be provided in electronic format separate from the master plan document in high-resolution 300 pixels per inch (ppi) raster format (*.PNG), suitable for poster size (minimum 24-inches by 36-inches) publication. All graphics, images, maps, plans, renderings, models, and documentation will become the property of the university.

Preliminary, Final Design and Construction Phase Services: In addition to the requirements for preliminary design through construction in the DFD *Policy and Procedure Manual for Architects/Engineers and Consultants*, the following additions and clarifications should be noted:

- The design consultant(s) will work with DFD and the appropriate campus staff to review the Program Statement, Preliminary Design, and Final Design documents. The design consultant(s) will attend a design review meeting at each of the Preliminary Design and Final Design review stages. The reviewers will provide written comments to the DFD Project Manager based on the documents, and discuss the comments with the design consultant(s). The design consultant(s) are required to provide written responses to the DFD Project Manager.

Note that per the DFD *Policy and Procedure Manual for Architects/Engineers and Consultants*, the following services will not be included in the scope of services:

- Hazardous material abatement design will be provided by a consultant under separate contract with DFD based on the demolition plans. Abatement documents will be incorporated into the bid set.
- Preparation of a Wisconsin Environmental Protection Act (WEPA)Type III Environmental Impact Statement will be contracted separately by the campus.

The following documents are available to for reference, verification, and update as it relates to the project intent, description, and scope of work.

Southwest Quadrant Academic/Research Building Pre-Design
Predesign Report
DFDM #12L2Y 10.2.15

CHM, CUN, EMS Facility Repair/Renovation Pre-Design
Southwest Quadrant Redevelopment Plan
Predesign Report
DFDM #12L2Y 6.12.15

Southwest Quadrant Redevelopment Plan
Appendix 8.4.1 Facility Condition Assessment - CHM
FCA Report
DFDM #12L2Y 6.24.15

Southwest Quadrant Redevelopment Plan
SWQ-1 Chilled Water/Steam Infrastructure Predesign
FCA Report
DFDM #12L2Y 9.9.15

Southwest Quadrant Redevelopment Plan
Executive Summary
Redevelopment/Master Plan Report
DFDM #12L2Y 10.22.15

Southwest Quadrant Redevelopment Plan
Redevelopment/Master Plan Report
DFDM #12L2Y 10.22.15

ID	Y/N?	Description	Comments and Clarification Notes
1.00	☒	**Project and Program Considerations**	
1.01	☒	Programming & Program Verification	
1.02	☒	Design Concept	
1.03	☒	Site/Survey	
1.04	☒	Site/Existing Conditions	
1.05	☒	Facilities Site Plan	
1.06	☒	Existing Land Use	
1.07	☒	*Topography/Drainage*	
1.08	☒	*Vegetation/Landscaping*	*1.09 Utilize existing soil borings from previous Projects int eh vicinity.*
1.09	☒	*Subsurface Conditions*	
1.10	☒	*Construction Staging/Occupancy of Site During Construction*	*1.11 An EIA is require for new building. A separate consultant will be hired.*
1.11	☐	*WEPA – Environmental Impact Determination and Identification*	
1.12	☒	Utilities/Infrastructure	
1.13	☒	Existing: capacity and condition of existing lines and equipment	***1.12*** *Previous Master Plans have identified central utility needs for the SWQ master plan. UW-Milwaukee Chemistry Project DFDM #18H3D will complete the utility loop for the SW-Quadrant with considerations for future buildings. The West Electrical Substation will not be addressed as part of that project. This pre-design will just need to provide validation.*
1.14	☒	Proposed central and site utility systems	
1.15	☒	Maintaining utility services and infrastructure during construction	
1.16	☒	Transportation/Circulation	
1.17	☒	Vehicular/Bicycle/Pedestrian	
1.18	☐	Parking	
1.19	☒	Service/Loading/Unloading	
1.20	☒	Access to Site	
1.21	☐	Existing Building Conditions	
1.22	☐	Conditions of Existing Building Spaces as necessary for design	
1.23	☐	Condition of Existing Infrastructure and Equipment	
1.24	☒	Demolition Planning/Phasing	
1.25	☒	Building Systems	
1.26	☒	Structural Systems	
1.27	☒	Mechanical Systems/HVAC	
1.28	☒	*Environmental Control*	
1.29	☒	Electrical/Lighting	
1.30	☒	*Lighting Design*	
1.31	☒	*Fire Alarm*	
1.32	☒	*Telecommunications Systems*	
1.33	☒	*Access Control*	
1.34	☒	Plumbing	
1.35	☒	Fire Protection Systems	
1.36	☒	Signage (Code Required; Building and Room/Space Identification)	
1.37	☒	Other Systems	
2.00	☒	**Design Considerations**	***2.04*** *Includes the Sustainable Facilities Standards Checklist items applicable to the project.*
2.01	☒	Cost Estimating	***5.01*** *Please see <https://www.wisconsin.edu/capital-planning/reference/deliverables/> for more detailed AutoCAD and geospatial data definition requirements.*
2.02	☒	Constructability	
2.03	☒	Accessibility	
2.04	☒	Sustainable Facilities and Energy Conservation	
2.05	☒	Equipment Layout	
2.06	☒	Campus Technical Review	
3.00	☒	**Bid Documents (see contract for details)**	
4.00	☒	**Construction Administration (see contract for details)**	
4.01	☒	Commissioning (Level 1 Independent 3rd Party)	
5.00	☒	**Post-Construction Deliverables (see contract for details)**	
5.01	☒	As-Built Record Drawings	
5.02	☒	Commissioning Details	
5.03	☒	Operations and Maintenance Manuals	
5.04	☒	Warranty/Guarantee Details	

SUPPLEMENTAL SERVICES

ID	Y/N?	Description	Comments and Clarification Notes
A.00	☐	**Planning Considerations**	
A.01	☒	Master Planning	
A.02	☒	Blocking and Stacking Diagramming	***A.04*** *Includes developing recommendations based on room scheduling and utilization data, program delivery, enrollment projections, and appropriate benchmarks.*
A.03	☒	Scope Definition	
A.04	☒	Space Needs Analysis	
A.05	☒	Site Evaluation	
A.06	☐	Market Study	
A.07	☒	Space Utilization Analysis	
B.00	☐	**Project and Program Considerations**	
B.01	☒	Occupants/User Activities	
B.02	☒	Space Tabulation	
B.03	☒	Room Data Sheets	
B.04	☐	Site/Survey	
B.05	☐	Easements	
B.06	☐	Zoning Approval Efforts	
B.07	☐	Floodplain Restrictions	
B.08	☐	Landholdings/Ownership/Boundaries	
B.09	☐	Utilities/Infrastructure	
B.10	☐	Energy Modeling	
B.11	☐	Existing Facilities Survey	***B.12*** *See SWQ Master Plan Documents*
B.12	☐	Facility Condition Assessment	
B.13	☐	Document Existing Conditions	
B.14	☐	Concealed Conditions	
B.15	☐	Building Code Analysis	
B.16	☐	Phasing Options and Analysis	
B.17	☐	Adjacency Analysis and Matrix	
B.18	☐	Facility Specialties	
B.19	☐	Acoustics	
B.20	☐	Elevator Constructor/Vertical Transportation	
B.21	☐	Food Service Operations/Kiosks	
B.22	☐	Security/Video Surveillance	
B.23	☐	Specialty Lighting	
B.24	☒	Space Planning	*B.24 Upgrade space planning assumptions from the previous campus master plan and SWQ space plan. Includes classroom and lab demand/utilization analysis.*
B.25	☐	Furnishings, Fixtures, & Equipment	
B.26	☐	Select Only (campus to procure and install)	
B.27	☐	Select & Specify (campus to procure and install)	
B.28	☐	Select, Specify, & Supervise Installation	
B.29	☐	Fixed Equipment	
B.30	☐	Movable Equipment	
B.31	☐	Art Selection Assistance	
B.32	☒	Universal Design	
B.33	☐	Historic Preservation	
B.34	☐	Historic Structure Report (HSR)	
B.35	☐	Historic Preservation Plan (HPP)	
B.36	☐	Wisconsin Historical Society Approval for Building Concept	
B.37	☐	Presentations	
B.38	☐	Formal Presentation(s)	
B.39	☐	Presentation Materials	
B.40	☐	Facilitate on Campus Design Document Review	
C.00	☐	**Construction Administration**	
C.01	☐	Additional Construction Administration Services	
D.00	☐	**Miscellaneous**	
D.01	☐	Wayfinding	
D.02	☐	Building Performance and Certification Standards Compliance	
D.03	☐	Renderings, Models, and Mock-Ups	
D.04	☐	Building Information Modeling	

D.05	☐	Measured Drawings Beyond Project Area
D.06	☐	Commissioning (i.e. Level 2, Exterior Envelope)
D.07	☐	Post Occupancy Evaluation
E.00	☐	**Other (Please Specify)**

SUPPLEMENTAL SERVICES — Board of Regents Evaluation Criteria Responses

ID	Y/N?	Description	Comments and Clarification Notes
F.00	☐	**Pre-Requisite Considerations**	***F.02*** *Determine and document if any site utility work is required to facilitate the proposed project scope that is not included in the current New Chemistry Building project DFDM #(18H3D) Also determine a strategy (including timing and coordination) for resolving the utility infrastructure issues identified.*
F.01	☐	Surge Space(s) Identification and Suitability Determination	
F.02	☒	Utility Infrastructure Impact(s) Identification and Strategy Recommendation	
G.00	☒	**Capital Plan Considerations**	***G.01*** *Determine and document what capital project work is required to enable or facilitate any portion of the proposed project solution/phase/alternate. The scope of work identified in this section may not be included in the proposed project solution/phase/alternate scope or budget estimate.*
G.01	☒	Project Sequence Dependency Identification	
H.00	☐	**Physical Development Impacts**	
H.01	☐	Code Compliance Resolution	
H.02	☐	Health & Safety Condition Resolution	
H.03	☐	Environmental Protection Condition Resolution	
H.04	☐	Facility and/or Program Standards Condition Resolution	
H.05	☒	Space Profile (Demolition/Renovation/New Construction)	***H.05*** *Complete the table shown at left as per each proposed project solution/phase/alternate and provide the additional assessments for each type of project space as outlined below the table.*

Demolition	0	ASF	0	GSF	$	0
Renovation	0	ASF	0	GSF	$	0
New Construction	0	ASF	0	GSF	$	0
Project Total	**0**	**ASF**	**0**	**GSF**	**$**	**0**

Capital Project Request
2021-23 Biennium

Agency	Institution	Facility ID	Facility Name
University of Wisconsin	Milwaukee	285-0B-999	New Building

Project ID	Project Title	Priority
19J3I	Engineering Building/Physics Relocation	1

Project Type

|<=== CATEGORICAL/CAPITAL PROJECT PROGRAM ENUMERATION (REMODELING/RENOVATION ONLY) ===>| *UNIQUE PROJECT ENUMERATION* *NOT A STATE DFDM/SBC PROJECT*

☐ All Agency ☐ Instructional ☐ Minor ☒ Major ☐ UW Managed

Double-click on a checkbox to open the Check Box Form Field Options dialog box to change the state of the checkbox.

Project Intent

UWM requests that the Board of Regents recommend this project to provide $118,593,000 General Fund Supported Borrowing to construct a new academic facility for the College of Engineering and Applied Sciences at UW-Milwaukee in the 2021-23 Capital Budget. In addition to constructing the new academic facility for the College of Engineering and Applied Sciences, the project will demolish the existing Physics building and renovate space to relocate Physics instructional labs, the L&S machine shop, and University Relations offices and studios.

Project Description and Scope

This project razes the existing Physics Building and constructs a new Engineering Building, completes sitework and updates the electrical substation. In addition, the project relocates the Physics Instructional Labs into the KIRC. The planetarium will remain in its current location. The new facility will include a flexible and interdisciplinary collaborative laboratory cluster that supports core courses, interdisciplinary spaces, first-year engineering and specialty instruction in areas such as advanced manufacturing. The facility will serve as the new home for the three-year-old Biomedical Engineering program, the just-launched environmental engineering program, and creates new instructional labs for computer science, mechanical, electrical, and industrial and manufacturing engineering programs. Relocating these spaces from the Engineering and Mathematical Sciences (EMS) building will provide some relief to the civil, manufacturing, and materials engineering programs, as well as computer science, which will remain located in that building until EMS can be renovated to specifically accommodate those programs.

The new instructional and research environments will infuse the student experience with thematic interdisciplinary education and application of modern tools and technology expected in the industry. Electrical engineering and mechanical engineering programs will share new mechatronics and controls laboratory spaces. Embedded systems laboratories will provide shared instructional space for computer sciences, electrical engineering, and mechanical engineering programs. New space for data analysis, visualization (including virtual and mixed reality), machine learning, and artificial intelligence will be constructed to provide the fundamental tools required for all engineering disciplines. Environments for advanced manufacturing instruction will be provided to respond to industry-wide demands and expectations. The following summary is the construction cost portion for the proposed scope of work.

The facility design will include a structural system capable of flexible floor configurations/layouts and will facilitate future maintenance, repair, and renovation activities. It is anticipated that the floor-to-floor height will be minimum 16 feet with a 24-foot high penthouse level. The exterior envelope and mechanical, electrical, and plumbing systems will be designed for energy efficiency and have the capacity for intensive instructional and research activities. Instructional laboratories will be designed for safety and high utilization. Central campus steam and pumped condensate return, chilled water supply and return, compressed air, natural gas, electrical power duct bank, and fiber optic backbone distribution will be extended from south of the EMS building to the proposed site of this project. These utility services will be sized to accommodate all planned future development in the southwest quadrant of campus. A new 10-megawatt distribution section will be installed in the West Campus Electrical Substation to support this proposed facility.

The project will have three distinct parts. The first phase will build out space for Physics in the KIRC at a cost of approximately $4.8 million. University Relations will relocate from the fourth floor of physics into other space on campus. Once those users are relocated, the Phase two demolition of the Physics Building will occur. Phase three, the construction of the new engineering Building will take place.

Demolition:	(67,628)	ASF	(108,329)	GSF	$	4,767,000
Renovation:	8,759	ASF	17,500	GSF	$	5,250,000
New Construction:	46,500	ASF	93,000	GSF	$	80,855,000
Project Total:	**122,887**	**ASF**	**218,829**	**GSF**	**$**	**90,872,000**

Cost values (far right column) should reflect construction costs only.

Background

The Physics Building (67,628 ASF/108,329 GSF) was constructed in 1964 and occupies the site designated for the proposed new Engineering Building. Intense renovation work is required to almost completely replace the building mechanical, electrical, and plumbing systems and the building envelope and below grade foundation walls are not repairable. A comprehensive condition analysis has been completed. This facility was assessed for reuse by the 2010 campus master plan and the 2014 Southwest Quadrant Redevelopment Plan. Through those efforts it was determined that the cost to renovate was more than seventy-five percent of the cost to construct replacement space. Physics Department research relocated to the new Kenwood Interdisciplinary Research Center in 2015.

The central heating and chilling plant has adequate steam and chilled water generating capacity to serve the proposed new facility. The proposed Chemistry Building replacement and central utilities distribution will be extended to this site from the same service corridor constructed under that project. The central utility lines that already pass through the Engineering and Mathematical Sciences building to serve the Physics Building will be utilized to form a local service loop. Electrical power capacity will be increased during this project.

Analysis of Need and Project Justification

The Engineering and Mathematical Sciences building (149,278 ASF/251,520 GSF) was constructed in 1968. The College of Engineering and Applied Science (CEAS) enrollments, as measured by the UWM Office of Assessment and Institutional Research, have more than doubled since the building was opened, including 25% increase in undergraduate enrollment and 29% increase in graduate enrollment over the last ten years. Total CEAS Enrollment is expected to increase another 7% over the next 3 years with 11% growth for undergraduates and a 9% decline in graduate enrollment.

The approximately 140 local business partnerships developed with CEAS (including Rockwell Automation, Johnson Controls, GE Healthcare, Harley-Davidson, Kohler Company, Quad Graphics, Milwaukee Tool, Modine Manufacturing, and WEC Energy Group) provide students with excellent co-operative and internship opportunities and assist the university in maintaining a vibrant and evolving program to meet regional needs. The recently announced international engineering co-operative program established with Foxconn is just one example of how CEAS is expanding to meet the needs of the local industry. Almost ninety percent of CEAS graduates secure a job before commencement, and over 70% remain in Wisconsin. Rockwell Automation alone employs over 200 CEAS alumni. CEAS is unique within the UW System in providing access to an engineering education to a wide range of students and affording them the opportunity to work in research labs with top faculty at an R1 institution coupled with the opportunity to work closely with industry on projects and in internships given our proximity and close partnerships with many companies. No other program provides all of these facets. Our programs are also tightly coupled with industry needs. Given our proximity to companies and that most of our students are hired by Wisconsin companies, we can ensure that our programs are fully meeting their needs more so than programs serving a broader, dispersed constituency. Our programs also take advantage of other unique features of southeast Wisconsin, including the major emphasis on water, with both the School of Freshwater Science at UWM and the Water Council located in Milwaukee, a major emphasis on electric power and controls, with the Midwest Energy Research Consortium located in Milwaukee along with many leading companies in this industry. These activities are unique to Milwaukee and provide many possibilities for engagement with our students.

According to the Bureau of Labor Statistics 2018 Occupational Outlook Handbook, graduates from engineering programs (Bachelor of Science) earn average salaries upon graduation ranging from $86,640 for civil engineers to $114,600 for computer hardware engineers. Employment projections for engineering disciplines from the same handbook show job opportunities are projected to grow between 0 and 8 percent during the next ten years.

The existing instructional and research laboratory suites were configured in a manner that was common during that era. Small, specialized and cellular spaces are prevalent as opposed to larger, flexible, and collaborative configurations

common today. The research laboratories were designed for larger-scale mechanical and electrical projects and do not address the modern needs for fume hoods, such as for biomaterials or nanotechnology, that work well for smaller-scale connected systems Both research and instructional labs in the existing building do not facilitate teaming, equipment sharing, or other collaborative activities found in modern university and industry labs. The building mechanical, electrical, and plumbing infrastructure is failing and cannot be replaced while the facility is fully occupied. Aside from necessary repairs, the mechanical systems are largely original. Energy conservation projects conducted a generation ago selectively either removed, or capped off, exhaust systems and consequently severely limited the capacity that is needed to serve the academic and research programs in operation today. The plumbing systems are corroded and non-functional in some areas and the fire suppression system only serves select areas of the facility. Electrical power capacity is inadequate, unreliable, and has caused several equipment failures. Although the fire alarm system is still functional, it has been discontinued by the manufacturer and finding replacements parts from this point forward will become increasingly difficult, if not impossible.

Existing laboratories are small highly specialized spaces designed for focused experimental activities. Several lab classes have resorted to lab demonstrations for the students rather than having the students do the experiments themselves because the labs are too small for the class size. Students are deprived of valuable hands-on experience and the learning that comes from having that experience.

Engineering programs have outgrown and evolved beyond the original EMS facility design. Instruction is necessarily implemented in a disjointed fashion due to the obsolete, dedicated, and specialized spaces available. Students currently migrate en masse between the third floor and basement to prepare metal samples, utilize specialized equipment for tensile strength tests, polishing, and instrumentation for analysis all during the same class session. To meet current curriculum standards, several spaces never designed for use as instructional laboratories have been pressed into service despite their shortcomings since no other, nor appropriate space is available. Experiments are often conducted in spaces not designed for these activities, routinely creating potentially hazardous conditions in the instructional environments. Existing laboratories are small highly specialized spaces designed for focused experimental activities. These isolated labs are dispersed throughout the building as labs were added over time in whatever space happened to be available. In contrast, engineering education is much more interdisciplinary with substantial overlap between fields. Modern engineering laboratories are larger, open spaces that accommodate multiple types of experiments from a variety of different courses. For example, a mechatronics/robotics lab might support mechanical engineering courses focused on automation and hardware control, electrical engineering courses on sensors and software control, computer science courses on networking, security, and robot planning and coordination, and industrial engineering courses on operational planning and material flow analysis and control. Furthermore, the current building lacks any laboratory capability for emerging topics such as virtual and augmented reality, nanotechnology, bio-tissue engineering, or water- and air-quality sensing and testing. Finally, the current building has small, repurposed area containing a maker space for student use. However, modern engineering education buildings have large, open space with numerous equipment types available for student use in maker-activities, class projects, or student organization competitions.

Alternatives

UW Managed Projects ≃ Major Projects

Remodel existing space. Enrollment projections and facility analysis done in the SWQ Redevelopment Plan the existing EMS Building does not provide adequate space for the College of Engineering and Applied Sciences. Updated enrollment projections based on trends through 2018 confirm the need for the planned building. Additional new or remodeled space is needed for Engineering. UWM does not have 90,000 GSF of unassigned space to remodel.

Project Budget				Funding Sources		
Construction:		$	89,897,000	GFSB:	$	118,093,000
Hazardous Materials:		$	975,000	PRSB:	$	0
Total Construction:		**$**	**90,872,000**	Cash:	$	0
Design Fees (Basic):	8.32%	$	7,561,000	Gifts:	$	0
Design Fees (Other):	1.65%	$	1,458,000	Grants:	$	0
Total Design Fees:		**$**	**9,019,000**	BTF:	$	500,000
Contingency:	12.00%	$	10,905,000	Other (BTF Demolition):	$	0

Capital Project Request
2021-23 Biennium

Management Fees:	4.00%	$	4,071,000	Other (Please Describe):	$	0
Furnishings/Fixtures/Eqpt:	0.00%	$	3,726,000	Other (Please Describe):	$	0
Total Budget Estimate:		**$**	**118,593,000**	**Total Funding Sources:**	**$**	**118,593,000**

Project Schedule

A/E Selection:	Mar 2020
Design Report:	Oct 2021
Approval:	Dec 2021
Bid Opening:	Dec 2022
Start Construction:	Feb 2023
Substantial Completion:	Jun 2026
Project Close Out:	Dec 2026

Project Contact (Institution)

Contact Name:	Geoff Hurtado
Contact Email:	<ghurtado@uwm.edu>
Contact Phone:	414 651-0728

Previous Action

None

Impact on Operating Budget

	FTE		Cost
Custodial Staff:	0.00	$	0
Maintenance Staff:	0.000	$	0
Supplies & Expenses:		$	0
Utility Bills:		$	0
TOTAL:	**00**	**$**	**0000**

Description

It is estimated that additional $776,000 will be required annually to support the completion of the engineering Building and relocated labs for staffing, supplies and expenses, and energy bills. This will be entirely offset by avoided costs due to demolition of the Physics Building which is slightly larger. Adequate and appropriate operational budget sources have been identified and internally allocated/committed to support this proposed project.