REQUEST FOR ARCHITECTURAL & ENGINEERING SERVICES

Science and Technology Innovation Center

November 2019

Project No. 19I1M

CONSULTANT REQUIREMENTS

This request provides architectural/engineering/planning (AEP) resources to complete the project phases indicated below for **State Project No. [19I1M] – Science and Technology Innovation Center at the University of Wisconsin-River Falls** (*see attached for further detail*).

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

Consultants should submit their qualifications per DFDM instructions to demonstrate specific expertise and experience in the design and coordination of constructing an undergraduate science instruction and research building as part of a design team. Work includes project area surveys, acquiring field data, and verifying as-built conditions to assure accurate development of design and bidding documents.

The consultant(s) will participate in a highly interactive campus planning process by meeting with appropriate campus staff, including representatives from the biology, chemistry & biotechnology, physics, and psychology & neuroscience departments to develop Preliminary Design and Final Design documentation. Working in collaboration with the campus project team, the consultant will be responsible for program verification and documentation; developing and documenting design alternatives with corresponding construction cost estimates and project schedules for each design alternative; and determining and documenting any project work dependencies for selected design alternatives.

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

- The design consultant(s) will also prepare documents necessary for Board of Regents and State Building Commission construction authority.

Cost Estimating: Provide conceptual construction cost estimates for all design alternatives and provide full budget estimates for selected design alternative. 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.

Produce a life cycle cost estimate document detailing energy consumption; operational maintenance and repair cost impacts; capital maintenance, repair, and replacement cost impacts; and life expectancy for all selected design alternatives.

All graphics must be grayscale compatible without losing meaning, distinguished 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 and Final Design Services: In addition to the requirements for preliminary design through construction in the DFDM *Policy and Procedure Manual for Architects/Engineers and Consultants*, the following additions and clarifications should be noted:

- The design consultant(s) will work with DFDM and the appropriate campus staff to review the Program Statement, Preliminary Design, and when enumerated, Final Design documents. The design consultant(s) will attend a design review meeting at each of the review stages. The reviewers will provide written comments to the DFDM 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 DFDM Project Manager.

Note that per the DFDM *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 DFDM based on the demolition plans. Abatement documents will be incorporated into the bid set.
- Preparation of a Wisconsin Environmental Protection Act (WEPA)Type I Environmental Impact Statement will be contracted separately by the campus.

The following documents will be made available to the successful design consultant team for reference, verification, and update as it relates to the project intent, description, and scope of work.

Science Facilities Feasibility Study
Feasibility Study
J-16-009 November, 2017
https://www.uwrf.edu/SciTech/upload/2017-11-27-UWRF-Science-Facilities-Feasibility-Study_FINAL-2.pdf

Science and Technology Innovation Center Space Program
Pre-Design J-16-009 June 15, 2018
https://www.uwrf.edu/SciTech/upload/2018-06-15-UWRF-SciTechProgram_FINAL.pdf

Note: This template is based upon DFDM's *Policy and Procedure Manual for Architects/Engineers and Consultants,* December 2013 edition, Section Three - Pre-Design Phase (*3.c.2.b Table of Contents, 3.C.2.e Physical Planning Issues, 3.C.2.h Room Data Sheets, 3.C.2.i Special Planning Issues, 3.C.2.j Budget*).

ID	Y/N?	Description	Comments and Clarification Notes
1.00	☒	**Project and Program Considerations**	*For Feasibility Studies, Project and Program Considerations items that are selected to recognize that the documentation and professional guidance required to develop the required support documentation is above and beyond the traditional 10% concept report, but not necessarily completing the full 35% preliminary design efforts.*
1.01	☒	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	***1.05** Please see <https://www.wisconsin.edu/capital-planning/reference/deliverables/> for more detailed AutoCAD and geospatial data definition requirements.*
1.07	☒	*Topography/Drainage*	
1.08	☒	*Vegetation/Landscaping*	
1.09	☒	*Subsurface Conditions*	***1.06** Includes erosion control requirements.*
1.10	☒	*Construction Staging/Occupancy of Site During Construction*	
1.11	☒	*WEPA – Environmental Impact Determination and Identification*	
1.12	☒	Utilities/Infrastructure	***1.13** Verify that the new design does not exceed the known capacity of campus utilities.*
1.13	☒	Existing: capacity and condition of existing lines and equipment	
1.14	☒	Proposed central and site utility systems	***1.14** Includes chilled water, domestic water, electrical power, natural gas, sanitary sewer, storm water sewer, steam and condensate return, and telecommunications.*
1.15	☒	Maintaining utility services and infrastructure during construction	
1.16	☒	Transportation/Circulation	
1.17	☒	Vehicular/Bicycle/Pedestrian	***1.18** Investigate opportunities to maximize onsite parking.*
1.18	☒	Parking	***1.20** Includes during construction period.*
1.19	☒	Service/Loading/Unloading	***1.23** confirm conditions of utility hook-up locations after demolition of existing building.*
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 (Building and Room/Space Identification)	
1.37	☒	Other Systems (A/V Systems in teaching spaces)	
2.00	☒	**Design Considerations**	***2.04** Includes the Sustainable Facilities Standards Checklist items applicable to the project.*
2.01	☒	Cost Estimating	***3.00-5.04** Please note: these services will become part of the scope after project enumeration.*
2.02	☒	Constructability	
2.03	☒	Accessibility	
2.04	☒	Sustainable Facilities and Energy Conservation	***5.01** Please see <https://www.wisconsin.edu/capital-planning/reference/deliverables/> for more detailed AutoCAD and geospatial data definition requirements.*
2.05	☒	Equipment Layout	
2.06	☒	Campus Technical Review	
3.00	☒	**Bid Documents (see contract for details)**	***5.02** Includes performance test data, list of normal and alarm set points, and contact information for responsible parties.*
4.00	☒	**Construction Administration (see contract for details)**	***5.03** Includes all newly installed components, include list of all input/output control points and custom software with programming requirements needed to maintain and/or field-modify newly installed systems.*
4.01	☒	Commissioning (Level 1)	
5.00	☒	**Post-Construction Deliverables (see contract for details)**	***5.04** Includes contact information for responsible parties and date of warranty expiration.*
5.01	☒	As-Built Record Drawings	
5.02	☒	Commissioning Details	
5.03	☒	Operations and Maintenance Manuals	
5.04	☒	Warranty/Guarantee Details	

ID	Y/N?	Description	Comments and Clarification Notes
A.00	☐	**Planning Considerations**	
A.01	☐	Master Planning	
A.02	☐	Blocking and Stacking Diagramming	
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.04*** *Includes Geotechnical Survey and Report. Please see <https://www.wisconsin.edu/capital-planning/reference/deliverables/> for more detailed AutoCAD and geospatial data definition requirements. All buildings, site improvements, and site utilities within the designated project area, including those not impacted by project construction. Reference known elevation datum and include attributes for input or transfer to campus GIS mapping.* ***B.05 – B.06*** *Architect to verify design conforms to municipal height and setback ordinances – but the university does not anticipate any work associated with modifying or changing existing easements or zoning.*
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	☐	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.20*** *Architect to verify new elevators meet local ordinances and building needs, specialty consulting is not anticipated.*
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	☐	Other (Please Specify)	
B.25	☐	Furniture and Equipment	
B.26	☐	Design Standards to Follow	
B.27	☒	Furniture Design Services	
B.28	☒	Fixed Equipment	
B.29	☒	Movable Equipment	
B.30	☐	Art Selection Assistance	
B.31	☐	Universal Design	
B.32	☐	Historic Preservation	
B.33	☐	Historic Structure Report (HSR)	
B.34	☐	Historic Preservation Plan (HPP)	
B.35	☐	Wisconsin Historical Society Approval for Building Concept	
B.36	☐	Presentations	
B.37	☒	Formal Presentation(s)	
B.38	☒	Presentation Materials	
B.39	☐	Facilitate on Campus Design Document Review	
C.00	☐	**Construction Administration**	
C.01	☐	Additional Construction Administration Services	
D.00	☐	**Miscellaneous**	
D.01	☐	Wayfinding	
D.02	☐	LEED™	

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)**

ID	Y/N?	Description	Comments and Clarification Notes
F.00	☐	**General 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 proposed project solution/phase/alternate scope and budget estimate. Specifically, as it applies to cooling.*
F.01	☐	Surge Space(s) Identification	
F.02	☒	Utility Infrastructure Impact(s) Identification	
G.00	☐	**Priority Considerations**	
G.01	☐	Project Sequence Dependency Identification	
H.00	☐	**Physical Development Considerations**	
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)	

Demolition	61,637	ASF	83,218	GSF	$	2,395,000
Renovation	0	ASF	0	GSF	$	0
New Construction	72,230	ASF	131,300	GSF	$	79,161,000
Project Total	**133,867**	**ASF**	**214,518**	**GSF**	**$**	**110,932,000**

Determine and document the following for each solution/phase/alternative…

1. *Estimated capital renovation costs and current replacement value for the proposed space to be demolished.*
2. *Estimated capital renovation costs and current replacement value for the proposed space to be renovated.*
3. *If any portion of the proposed new construction space is required to resolve building codes and standards, and/or health and safety conditions, and/or environmental protection conditions, and/or facility or program standards which cannot be economically be resolved in existing space.*
4. *If any portion of the proposed new construction space is required to resolve demonstrated capacity issues or space shortages related to enrollment growth and 5-year enrollment trends (specific program and/or overall campus).*
5. *If any portion of the proposed new construction is required to resolve poor adaptive reuse potential for existing space that could have been included in the proposed project solution scope and budget estimate.*

I.00	☐	**Program Considerations**	***I.02*** *Determine and document a total energy cost estimate comparison for the proposed project per solution/phase/alternate vs. existing space energy costs. Please breakdown the energy cost estimate by electrical, heating, and cooling.*
I.01	☐	Functionality Improvement(s) Identification	
I.02	☒	Energy Cost Impact Profile	
I.03	☐	Space Shortage(s) Condition Resolution	
I.04	☐	Space Utilization Profile	

Major Project Request
2019 - 21 Biennium

Agency	Institution	Facility ID	Facility Name
University of Wisconsin	River Falls	285-0J-9999	New Building

Project Title

Science & Technology Innovation Center

This document is a copy of the request made to the State Building Commission for enumeration in 2019.

Project Description and Scope

This project constructs a new home for Biology, Chemistry, Physics, and Psychology departments, which will be relocated from Centennial Science Hall, and support the following programs: biology, biomedical and health sciences, biomedical engineering, biotechnology, chemistry, environmental engineering, international food business, neuroscience, physics, psychology, and urban agriculture. The new facility will also provide support for agricultural programs (agricultural education, agricultural science, animal science, crop and soil science, and dairy science) and enhance and grow partnerships with businesses and industries through collaborative programming, internships, and innovative product development. The former student center, Hagestad Hall (58,906 ASF/80,374 GSF), which will be vacant after the Rodli Hall renovation is complete, will be razed to clear the proposed site designated for the replacement science facility. The following summary is the construction cost portion for the proposed scope of work.

Demolition:	58,906	ASF	80,374	GSF	$	1,831,000
Renovation:	0	ASF	0	GSF	$	0
New Construction:	72,230	ASF	131,300	GSF	$	79,725,000
Project Total:	131,136	ASF	211,674	GSF	$	81,556,000

The new facility will feature twelve flexible undergraduate instructional laboratory suites, active learning studios, undergraduate and faculty research spaces, and shared interdisciplinary space. The new laboratory suites will include associated and required preparation rooms and storage for chemicals, equipment, and instructional materials. A new Business Collaboration Innovation suite will provide three research laboratories, prototyping and maker space, collaboration area, and three internship/incubation offices. This suite will feature computer-aided design, three-dimensional printing, material and chemical analysis, collaborative product development from ideation through engineering and prototyping. This facility will allow increased public-private partnerships for faculty positions, similar to the first UW-River Falls chemistry and biotechnology visiting assistant professor position co-funded by a campus alumni-owned partnership with Interfacial Consultants, LLC. This position teaches chemistry and biotechnology courses on campus and simultaneously contributes to research and product incubation activities for the co-funding partner.

The new instructional spaces will be expanded in comparison to the obsolete original spaces to accommodate the current space planning standards for square feet per student station, flexible furnishings, active learning studios, instructional technology, and increased computing and instrumentation requirements. The new instructional laboratories will be designed and modeled for flexibility to adequately serve multiple courses, disciplines, and programs to maximize utilization and minimize the required and dedicated, specialized space. The associated laboratory preparation and support spaces will also be increased to minimize the instructional schedule impacts. The new facility will include a fire suppression system, structural fire compartmentalization, code compliant hazardous chemical storage, air supply and exhaust systems with adequate capacity and controls to supply the required air exchanges, and 16-foot floor-to-floor clearance to accommodate the modern building infrastructure and facilitate future maintenance and renovation activities. The exterior envelope, building entrances, and mechanical system equipment and controls will be designed for optimal energy efficiency and sustainability.

Background

Addressing the shortcomings of the campus science facilities was identified as a top priority in the current campus master plan completed in 2011. A comprehensive science facility feasibility study was completed in 2017 and a programming study was completed in 2018. These studies outlined a two-phased plan to replace the current science instructional and research laboratories in a new facility, the reallocation and renovation of existing space in Centennial Science Hall to general access classrooms, and the renovation of Agricultural Science laboratories. The planning process conducted

during this effort included analysis for campus wide classroom demand and instructional space utilization; peer benchmarking; and the forecasting of enrollment, research funding, and faculty/staff levels.

Hagestad Hall, which was constructed in 1959 with building additions in 1962 and 1990, is the former student center facility that was replaced in 2006 by the University Center. It is a substandard facility in poor functional and physical condition, with outdated and unreliable building infrastructure and poor building envelope performance, energy efficiency, and room aspect ratios for instructional purposes. This facility is structurally, spatially, and systemically incapable of providing adequate space, even on a temporary basis, for the STEM instructional space needs. The studies concluded it was most cost efficient to raze Hagestad Hall, replace Centennial Science Hall space, use that building as surge space while Agricultural Science is renovated, and then reallocate and renovate Centennial Science Hall into general access classrooms. This proposed scope of work is based on the conclusions of the studies and begins that recommended sequence of capital projects.

Analysis of Need and Project Justification

Centennial Science Hall (37,705 ASF/67,363 GSF) was constructed in 1977, with an observatory addition constructed in 1980, and the majority of the building infrastructure systems are original to the facility. The building mechanical, electrical, and plumbing systems are obsolete and have far exceeded their expected useful lives. This facility does not have a fire suppression system, nor proper fire compartmentalization. The instructional spaces do not have the current fire alarm and smoke detection system code requirements for speaker/strobe devices or heat detectors. The fumehood exhaust dampers and sash doors are failing, the fumehood ductwork is corroded and leaking contaminated air, and the air handling unit coils and baseboard convector valves leak due to corrosion. The variable air volume system does not have reheat coils, so the system is not capable of tempering the air supplied, which makes it difficult to provide the required air exchanges without over cooling the rooms. The steam traps are wearing out, as evidenced by the frequent leaking and hammering effects, and the resulting noise introduces another challenge to teaching in the laboratories. The acid waste system compression joints have pulled apart, causing leaks. The backflow preventer located in the penthouse must be removed from the line to be serviced, which interrupts building operations.

The instructional spaces are inadequate in size, quality, and configuration; they do not support active learning spatially; and the ability to integrate instructional technology has been poor, which hampers active learning implementation. The building's structural system 50 lbs. per square foot live load capacity is inadequate to support modern science laboratories compared to the current building code requirement of 100 lbs. per square foot for this type of space. It has been determined that it is financially infeasible to augment the building's structural system to accommodate the new code requirements, so the existing building cannot be comprehensively renovated to serve its original purpose. There is inadequate instructional laboratory support space, student display and undergraduate research space is limited and estimated to be significantly below peer standards. The laboratory casework is splintered, delaminated, corroded, and the countertops are suspected to contain asbestos. The natural gas system serving the laboratories does not have emergency shut off valves and reliability has been poor due to worn and broken fixtures and components. The emergency showers are not easily reset once they have been activated. The electrical floor boxes are susceptible to flooding, which results in excessive corrosion, and there are no ground faulted circuit interrupter lines, nor proper ground available.

Agricultural Science (95,346 ASF/143,464 GSF) was constructed in 1966 with an annex addition constructed in 1980 and a food science addition constructed in 1982. This facility currently houses the Biology Department, but lacks the dedicated and specialized spaces required for human anatomy laboratories, molecular biology, and microbiology. These disciplines require a separation of mechanical systems to avoid cross-contamination and have higher expectations and standards for cleanliness in comparison to the typical ecology or soils laboratory spaces. Due to the specialized building infrastructure requirements for these programs and the high cost associated with providing appropriate space and associated services, it was determined the most feasible option was to relocate these spaces from Agricultural Science into this proposed replacement facility. Animal Science is the largest campus major and the undergraduate Dairy Science program is the second largest in the nation. All students in those programs will directly benefit from this proposed new facility where courses in general and organic chemistry, biochemistry, cell and molecular biology, microbiology, physics, and zoology will be taught.

Alternatives

The option to comprehensively remodel Centennial Science Hall was investigated and determined to be cost ineffective, as the budget estimate to renovate would have resulted in a compromised facility that was more than 75% of the cost to construct a new facility with no compromises. The planning and pre-design efforts already completed have concluded

Major Project Request
2019 - 21 Biennium

Centennial Science Hall cannot effectively be renovated for modern science laboratories due to inadequate structural capacity for floor loading, an inability to meet current firestopping/fireproofing requirements, and low floor-to-floor heights.

Project Budget

Construction:		$	81,556,000
Hazardous Materials:		$	0
Total Construction:		$	81,556,000
Design Fees (Basic):	8.32%	$	6,786,000
Design Fees (Other):	2.09%	$	1,706,000
Total Design Fees:		$	8,492,000
Contingency:	10.00%	$	8,156,000
Management Fees:	4.00%	$	3,589,000
Equipment/Other:	6.00%	$	4,893,000
Total Budget Estimate:		$	106,686,000

Project Schedule

A/E Selection:	Jan 2020
Design Report:	Jan 2021
Approval:	Mar 2021
Bid Date:	Jul 2023
Start Project:	Sep 2023
Substantial Completion:	Jun 2025
Project Close Out:	Dec 2025

Previous Action
None.

Segregated Fee Impact(s)
Not Applicable.

Impact on Operating Budget

	FTE		Cost
Custodial Staff:	2.00	$	81,432
Maintenance Staff:	1.00	$	53,244
Supplies & Expenses:		$	0
Utility Bills:		$	85,000
TOTAL:	3.00	$	219,676

Description
It is estimated that an additional $219,676 will be required annually to support the completion of this project for staffing, supplies and expenses, and energy bills. Adequate and appropriate operational budget sources have been identified and internally allocated/committed to support this proposed project.