THE UNIVERSITY of WISCONSIN MADISON

REQUEST FOR
ARCHITECTURAL & ENGINEERING SERVICES:
SPACE NEEDS ASSESSMENT
AND
FEASIBILITY STUDY

Chemistry Instructional Addition and Renovation

December 2010

Project No. 10K1F

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Project Background and Purpose

The outdated and deteriorated state of UW-Madison's chemistry's instructional facilities, including both lecture rooms and laboratories, has become a serious limitation to effective instruction in nearly all undergraduate chemistry courses, especially the largest courses in general and organic chemistry. The need for new labs is driven both by safety considerations that cannot be met by remodeling of the current labs, and by substantially increased enrollments that have forced subpar modifications of the content of the core curriculum solely to accommodate the increased enrollment. Demand for chemistry classes has continuously increased over the last 20 years and shows no sign of abating. The existing facilities do not support contemporary instructional methods and are unable to accommodate the growing number of students required to use them. The laboratories fail to conform to modern safety and hygiene standards.

Fifty-five percent of entering freshmen take a chemistry course during their under-graduate career. Forty percent of entering freshmen take a chemistry course during their *first semester* on campus. Because virtually all students majoring in science, engineering, and allied health fields require chemistry courses as *prerequisites* to courses in the major, the Department's ability to accommodate large general chemistry (freshman) and organic chemistry (sophomore) enrollments is a crucial factor in influencing the time-to-degree for a substantial fraction of *all* undergraduate majors on campus.

Funds from the Madison Initiative for Undergraduates are targeted to address improvements in undergraduate education, particularly "bottleneck" courses. Chemistry 343 (lecture) and 344 (lab) are routinely hailed as examples of large courses whose limited throughput is an impediment to timely graduation of undergraduates across campus. While increased funding for additional faculty and staff will alleviate some of the pressure, it is the physical infrastructure of the building that currently limits throughput in the laboratory courses.

The campus has grappled with this problem for a number of years, has investigated a series of unattractive options to address facility needs off-site and has implemented various undesirable changes to pedagogy. The recent acquisition of a parcel of land immediately to the west of the existing Daniels Building has finally provided a site for the addition required to improve the quality and quantity of chemistry instructional space.

Project Description

This project will determine the appropriate space required to solve the Chemistry program's current and projected space needs. It will focus on need for instructional facilities and address opportunities for both new and renovated space. Based on departmental calculations, approximately 60,000 new assignable square feet (ASF) is needed along with renovation of a similar amount of space. The project may 1) demolish a portion of the existing Daniels Chemistry Building, 2) demolish the structure adjoining the east side of the Wesley Foundation; 3) construct a major building addition, and 4) renovate and back-fill space in the existing chemistry complex. The project will provide additional space for instructional laboratories, classrooms/discussion rooms and lecture rooms for the Department of Chemistry. In addition, life safety, accessibility, and infrastructure maintenance problems for existing areas being remodeled will be fully addressed. Final determination of the optimal way to achieve the Department's programmatic goals and long-term space needs will be part of this planning process. A secondary focus of this planning effort will include a long-range plan for the maximum capacity of the defined site and long-term space needs for additional non-specific Chemistry growth beyond the needed instructional improvements.

Scope of Services

UW-Madison is seeking consulting services to prepare a space needs assessment and feasibility study for an addition and renovation for its chemistry instructional facilities. The consulting team will conduct planning for this project, in order to develop a space needs assessment, and a project feasibility study which will include a complete program statement, project budget, and schedule for submittal as part of the campus' 2013-15 capital budget request. Upon successful enumeration, another consultant selection process will be undertaken to design and implement this project. The consultants selected for this study would be eligible to pursue selection for the design contract. The planning information may also be used to coordinate other projects that could be affected by this project, or to request and implement other projects that may be necessary to support this project.

The consulting team should have experience in the integrated design of higher education instructional facilities for 4-year institutions. Well qualified teams will also have experience in the last ten years in:

1) Space use planning and needs assessment;
2) Programming and feasibility analysis of instructional science facilities:
3) Design of chemistry instructional labs and support spaces;
4) Design of technology-equipped large lecture rooms and other classrooms;
5) Large building additions with heavy renovation in existing occupied facilities;
6) Use of Building Information Modeling (BIM) in planning for architectural and structural disciplines; and,
7) High performance/sustainable design.

The consultant team should be prepared to work with a diverse constituency of stakeholders that include university faculty, staff, teaching assistants, administration, UW System staff, and DSF staff.

Provide the following services:

- Conduct an assessment of instructional space (quantitative and qualitative) in the immediate vicinity of the Chemistry Building using campus-provided data maintained in formats per the Postsecondary Education Facilities and Inventory Classification Manual (FICM) 2006. Use the campus' strategic plan, academic plan, and master plan as well as the Chemistry Department's input related to current and intended courses and pedagogical approach and student headcount/FTE (both at this point in time and as projected to 2025) to identify and characterize the type and extent of space quality and quantity needs. Evaluate these space assessments within the context of nation-wide benchmarks for 4-year higher educational chemistry instructional space. Make recommendations related to satisfying the unmet demand using an optimal combination of new and renovated spaces.

- Working with users, develop a summary program statement that encompasses identified needs, adjacency diagrams, and descriptions of user functions and requirements.

- Evaluate, and describe the existing building areas, utilities infrastructure, equipment, and code compliance, and produce a *Facility Condition Report* (FCR) for the existing Chemistry Building, The FCR will be used to evaluate the suitability to their current use, as well as potential adaptive re-use and/or renovation. The FCR should include, but not be limited to:

- All MEP systems including HVAC, plumbing, electrical, fire alarm, fire protection, elevator, emergency generator and telecommunications;
- Assessment of the feasibility to upgrade MEP systems to meet current codes and DSF design standards;
- Upgrades required of architectural finishes;
- Building envelope including walls, roofs, doors and windows; and
- ADA requirements.

- Perform a site analysis that addresses opportunities and constraints. Test alternative conceptual layouts of the building and site elements.

- Provide national benchmark data on recent university chemistry instructional facilities. Show a wide variety of layouts for classrooms, discussion rooms and labs. Include photographs and floor plans of benchmark facilities.

- Develop design criteria and evaluate alternatives based on those design criteria.

- Working with stakeholders, the FCRs, and quantified space needs, determine a highest and best use for the current facility. Identify options that match the building functional analysis with alternative uses, and identify opportunities for efficient space reorganization. Iinvestigation of options should include combinations of partial demolition, replacement, remodeling and construction of additional space. Options should also include component floor plans and massing diagrams for the addition. Determine the extent of alterations required and select the components that can most logically be constructed. Options should reflect the need to coordinate and minimize disruption to the operations of the balance of the facility not being renovated. Temporary relocations should be called out if needed.

- Develop a diagrammatic site plan and building massing. Address orientation, physical and functional connectivity with existing facilities; vehicular, bike and pedestrian access and circulation (including primary and secondary entries, service, delivery, emergency); open space interaction; and, integration with the broader campus.

- Identify zoning and permitting actions that will be necessary to implement this project.

- Provide preliminary calculations for this project's utility loads. Working with information provided by the institution and/or local utilities, perform an analysis of utilities necessary to serve this project. The analysis should include the condition, material, size, availability and proximity of line and system capacity of existing utilities, both within the existing building and from the street grid; the affect on central heating, cooling, and electrical equipment; as well as anticipated extensions to and upgrades of existing utilities. Provide a recommendation of utility routing to serve this project.

- Perform a functional analysis of building program components, develop alternative functional blocking/stacking/massing diagrams based on the program and site analysis, and recommend an option that best meets the needs of this project. The functional diagrams should include floor plans of major functional components.

- Meet with campus Design Review Board to discuss preliminary findings and site concepts relative to the campus fabric.

- Recommend a preferred option with a concise summary of rationale for the recommendation.

- Investigate phasing alternatives and recommend strategy that best meets the needs of this project, including maintaining instruction, operations and services to the building and site, and maintaining life-safety and code compliant occupancy.

- Using DSF sustainability requirements and LEED guidelines, conduct a sustainability charrette and work with stakeholders to identify sustainability practices that may be feasible for further investigation during project implementation and could result in a LEED™ silver project as intended.

- Conduct preliminary energy modeling to demonstrate feasibility of the concepts developed to achieve a high performance facility and be compliant with current energy conservation requirements in place at DSF and on campus.

- Develop a project schedule, including major milestones, based on the design and program information, concept, and information provided by the stakeholders.

- Develop a project budget estimate that includes construction costs and related project costs as determined by the university and Division of State Facilities (DSF). Provide benchmark data and/or other data that supports the recommended budget estimate. Budgets should be computed in current dollars and escalated to the appropriate construction year using Engineering News Report (ENR) indexing and the DSF Budget Worksheet.

- Develop a project budget estimate that includes demolition, renovation and construction costs and related project costs. Provide benchmark data and/or other data that support the recommended budget estimate. Work with UW and DSF to include non-construction costs.

- The A/E team will be expected to prepare presentation materials for use in meetings with the Chemistry Department, the College of Letters and Science Facilities Committee, the Campus Planning Committee, campus administration and possible donors.

The following services will not be included in the scope of services:

- Hazardous materials survey and testing will be contracted separately
- Site surveys or geotechnical soils testing will be a reimbursable expense at implementation
- EIA or EIS will be contracted separately at implementation.

The following Pre-Design deliverables will be required for this project:

- Six (6) bound color copies 8-1/2" x 11" of the Pre-Design report. Diagrams and drawings may either be 8-1/2" x 11", or 11" x 17", folded to fit within the bound report.
- Seven (7) CD's of the electronic version of the Pre-Design Report in PDF format, AutoCAD floor plans and site plans developed for the presentations in the Pre-Design report. The electronic version should be capable of being printed either in color, or in black and white, with full graphic clarity in either format. The final electronic document shall not be locked so that images and materials in the report can be electronically reproduced into follow-up design work on this and other projects or published to the university's web site.
- Exterior images of the preferred massing option done with 3-D drawing tools. Illustration quality images are not anticipated at this time. Provide the full electronic 3-D model for use by the future design consultant.

Special Requirements

The following special requirements are applicable to this project:

- Since the instructional and research operations of the existing building must remain operational during the project and the academic year, Pre-Design should include the creation of a plan that will provide very minimal interruption to service during construction. Options to be investigated should include: implementing the project in phases or leaving much of the existing building in service until completion of new construction. The University Space Management Office will assist in planning options for the general instructional space.
- The presence and location of hazardous materials is inventoried in the state's Wisconsin Asbestos and Lead Management System (WALMS) database. In general, asbestos-containing materials include floor tile and mastic, carpet mastic, pipe insulation fittings, and spray fireproofing.

Project Schedule

- Consultant Selection for Study — December 2010
- Begin Study — January 2010
- Draft document submittal — July 2011
- Final document complete — November 2011

Preliminary Project Budget

The current estimated project budget is $60,000,000. The purpose of this study is to provide a project program, budget and schedule that could be included in the campus' 2013-15 capital budget request.

Contacts

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Preliminary Space Tabulation

Preliminary Chemistry Instructional Needs Summary	
Function	**ASF Required**
General Chemistry Instructional Labs & Support	25,000
Organic Chemistry Instructional Labs & Support	25,000
Analytical Chemistry Instructional Labs & Support	12,000
Physical Chemistry Instructional Labs & Support	8,000
Lecture Rooms and Lecture Demonstration	20,000
Classrooms	7,500
Library	7,500
Undergraduate Program Support	15,000
Total New and Renovated Space	120,000

Available Documentation

- Draft site plan for the recently acquired space to the west of the existing building
- Existing site plans in AutoCad including utilities and surface features and contours
- Simplified floor plans in AutoCad of the 2001 Chemistry Addition and Renovation project will be made available to the selected AE.
- 2005 Campus Master Plan
- 2005 Campus Utility Master Plan