



REQUEST FOR ARCHITECTURAL & ENGINEERING DESIGN SERVICES

Babcock Hall Dairy Plant Renovation
and
Center for Dairy Research Addition

2013-2015

DFD Project # 13A2U

April 2013

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Background and Purpose

Babcock Hall is located at 1605 Linden Drive, at the center of campus. The University of Wisconsin's commitment to agriculture and food science has played a critical role in the development of Wisconsin as America's Dairyland.

Construction of Babcock Hall was completed in 1951 and the new building replaced Hiram Smith Hall, the original home of the dairy program. At the time of construction, the 80,833 ASF/136,071 GSF building contained instructional space and an entire working dairy plant. Today, Babcock Hall houses the Food Science Department, the Dairy Plant, Dairy Store, and the Center for Dairy Research (CDR). The Food Science Department is home to more than 150 undergraduate and 40 graduate students, of which about 30 work on dairy related research projects. The CDR, currently located within the Dairy Plant, was established 25 years ago, and is the largest dairy foods research center in the U.S with over 35 staff. The CDR researches the functional, flavor and physical properties of cheese and milk products as well as developing new uses and processes for the dairy industry. In 2010 alone, the CDR provided research, technical support and outreach to almost 200 Wisconsin dairy companies, dairy buyers/end users, suppliers, regulatory agencies and national/international dairy organizations. Together the Food Science Department and the CDR offer more than 22 short courses and 17 custom industry trainings per year. Since 1989, more than 10,000 participants have taken either a short course or custom training program.

The Babcock Hall Dairy Plant serves as the dairy manufacturing center for the UW community. As a small commercial operating facility, the Dairy Plant manufactures and markets fresh dairy products ranging from milk to ice cream and cheese for campus food service, provides facilities for UW Food Science teaching and research and serves the food processing industry with pilot plant research capabilities and processing expertise. The Dairy Plant uniquely educates UW Food Science students, enables state-of-the-art food science research and provides an industry partnership that makes certain UW Food Science will continue to be a world leader. The Dairy Plant processes 3 millions pounds of milk packages ~800,000 bottles of milk, 75,000 gallons of ice cream, 40,000 pounds of cheese, and conducts 25-30 industry projects annually. The revenues generated from the sales of these products cover the cost of operation.

The Department of Food Science and CDR agreed to jointly fund a planning study to look at options for renovating the Dairy Plant and providing increased space for the CDR. Different options were explored for updating the existing infrastructure and adding the additional space needs to meet the instructional, research and outreach mission of both programs. See "Pertinent Website" for a link to this study.

The goal of the completed project is to provide a state of the art production, teaching and research facility for both the Department of Food Sciences' dairy plant and the CDR. The project will address numerous mechanical, electrical, plumbing and functional issues within the dairy plant as well as provide additional research and instructional space to serve the expanding programs within the CDR.

This project is anticipated to be enumerated as part of the UW 2013-15 Capital Budget Request at \$15,959,000 General Fund Supported Borrowing, and \$15,961,000 Gifts/Grants for a total project request of \$31,920,000.

Project Scope and Description

The recommendations made in the May, 2012 study completed by BWZ (Concept Design Option B) (DFD#11E4F) for this project are as follows:

- 1) Construct a three-story addition with central lobby space to Babcock Hall to house the CDR. (Approximately 27,300 GSF). If fundraising exceeds its targeted goal, the campus wishes to have the flexibility to explore adding a modest amount of program space to the addition.
- 2) Demolish 5,000 GSF of space that includes the existing milk intake area, the existing drying tower, a mechanical space at the northwest corner of Babcock Hall, and a stair tower. Science House (3,200 GSF) at 1645 Linden Drive will also be demolished as part of this project (The State Historical Society has determined that this building is not historic or eligible for listing).
- 3) Construct a new milk intake facility with three storage silos (1,450 GSF), infill approximately 1,275 GSF of an existing two-story space to create additional office space for CDR, and a new mechanical penthouse for the Dairy Plant (2,500 GSF).
- 4) Renovate 29,700 GSF of space on the basement, first and second levels of the west end of Babcock Hall. This includes a complete renovation of the existing dairy plant (including mechanical, plumbing, electrical, process piping and controls, creation of a specialty cheese handling area for CDR, and the replacement and addition of new state of the art processing and packaging equipment for the Dairy Plant.
- 5) The project will remove approximately 26 parking spaces to the west and south of the existing building. Parking along Farm Drive will remain.

The CDR addition will include two floors of flexible research space, designed to allow for easy change-out of equipment as research needs change, including easy access (e.g., such as garage door) for palletted or skid-mounted equipment on each floor, and flexible hookup of equipment to utilities or process control/recording infrastructure/systems. The third floor level will contain a dedicated auditorium with seating for 99 people, and two food application labs for training. Movable walls between the two application labs will allow several different configurations of the floor. A central lobby between the existing building and the addition will contain restrooms, electrical and telecom rooms, an elevator, and will provide accessible entry from both the north and south. The CDR offices will remain on the second floor of the existing building.

Landscape Architecture

The project will include landscape and site work around the new facility including new entry sidewalks, retaining walls, landscape plantings and parking modifications south of the building.

Regulatory Compliance and Inspections

All new and renovated research or processing spaces, as well as moveable equipment, within the CDR or Dairy Plant areas of the project, must be designed and built as food-inspected

areas/equipment, meeting all modern food processing regulatory and safety requirements and standards. The Wisconsin Dept. of Agriculture, Trade and Consumer Protection has requirements for dairy plant construction in ATCP 80. Also, the WDATCP Food Safety Division would be the primary agency governing construction, and proper design and installation of equipment. They use the Pasteurized Milk Ordinance as well as 3A standards as their model for plant and equipment construction and design issues that aren't specifically spelled out in ATCP 80. Because the dairy plant produces food and some of it gets shipped over state lines (for example, cheese boxes), FDA has the authority to inspect the facility.

Process Operations and Requirements

The Dairy Plant operation involves: milk reception, intake, raw milk storage, milk pasteurization, cream separation, and fat standardization. Products that are manufactured include various types of fluid milks, ice cream, butter, and cheese.

The CDR research areas include: cultured products (e.g., yogurt, cream cheese); milk protein fractionation, concentration and drying of whey products; all types of cheeses; specialty cheese manufacture and ripening rooms; aseptic beverages; and food application areas (research kitchens).

Additional Project Scope

In addition to the project scope described in the May 2012 study, the project scope will include the purchase and installation of new compressor/condenser packages, ice building (sweet water) tank and water filtration equipment within Mechanical Room B146 as follows:

1. Disassembly and removal of the existing Vilter chiller serving Dairy Plant systems. Salvaging the approximately 14 year old chiller and/or major components for resale or reuse elsewhere.
2. Replace the Vilter Chiller with four (4) new compressor/condenser refrigeration packages to serve the associated two (2) freezers, a new ice building (sweet water) tank and ice cream making equipment.
3. Install a new ice building (sweet water) tank in room B146 and relocate existing tank pumps and tank controls from room B170.
4. Install a new water filtration system on the city water supply in room B146.

Scope of Services

The AE team will be required to meet requirements contained in the *DFD Policy and Procedure Manual for Architects/Engineers and Consultants* with the following additions:

- Working with the user group and other stakeholders, develop a complete program statement based on Concept Design Study – Option B, including a Space Tabulation and Room Data Sheets.
- Conduct all necessary detailed and final surveys to verify existing conditions and building systems to enable selections of final option in each case.
- Provide a high performance building following the guidelines outlined by the U.S. Green Building Council in order to achieve Leadership in Energy and Environmental Design (LEED®) Silver certification or higher for the CDR addition. The A/E firm will submit

to the U.S. Green Building Council, with assistance from UW Facilities Planning & Maintenance (FP&M) on owner related credits. The DFD Sustainability Requirements should also be followed closely throughout the project.

- Provide complete landscape and site work design for all areas of the site that are directly affected by this project.
- Prepare documents for, participate in, and assist campus staff in public review including a Joint West Campus Area Committee meeting (1 meeting), City of Madison Plan Commission (1 meeting), City of Madison Development Assistance Team (1 meeting), and Campus Design Review Board (3 meetings). It is desired that these meetings occur during conceptual design development, prior to the submission of the Preliminary Review and Design Report. The A/E team will also prepare documents necessary for Board of Regents approval.
- Work with the DFD and the appropriate campus staff (UW-Madison FP&M Physical Plant, Campus Planning, Capital Planning, the College of Agriculture and Life Sciences (CALS), Safety department, and UW Police) to review the Preliminary Review and Final Review documents. The A/E team will facilitate a review meeting at the Preliminary Review and Final Review stages. The groups will provide written comments based on the documents, discuss the comments with the A/E and their sub consultants, and written responses are required to be provided by the A/E. The A/E will provide the campus with eight (8) complete review sets (in addition to the review sets required for DFD) for the Preliminary Review and Final Reviews.
- Provide 3D detailed design renderings for review by CALS and FP&M as the project progresses. These drawings should show information appropriate to the phase of the work (early drawings will show the architecture of the spaces, later drawings will show all colors and materials). These drawings will show all exterior elevations and all major interior spaces.
- Provide process flow diagrams, and process piping and instrumentation diagrams (P&ID) for each of the processing/research areas within the Dairy Plant and CDR, which will be used for the installation of all process equipment, as well as the integration of modern food process controls. These diagrams will be included in the Preliminary and Final review documents and the bid documents.
- Provide coordination, inspection, and oversight of the provision, installation, testing, and startup of all process equipment, instrumentation, and controls in conjunction with a third party commissioning agent.
- Provide interior design services including design and specifications of systems furniture in office areas in addition to design and specification of all other movable furniture. A/E will provide construction administration services for coordinating the receiving and installation of all furnishings.
- Provide building signage to include all life safety, room number, informational and way finding. A/E will work with the college to identify locations and come up with appropriate designs for the donor signage/wall plaques.
- Coordinate final inspections and approvals with the Wisconsin Department of Agriculture, Trade and Consumer Protection to meet regulations for food inspected areas/equipment. A/E will provide 3 sets of documents to DATCP for review at Preliminary and Final Review and must incorporate their comments into the project. Any deficiencies must be corrected before substantial completion.

- At the end of construction, provide the campus with any renderings or models generated by the AE.

In accordance with the *DFD Policy and Procedure Manual for Architects/Engineers and Consultants* the following services will be procured separately by DFD:

- Third party Level-two commissioning
- Preparation of asbestos abatement design for Babcock Hall and Science House to be incorporated into the bid documents as a separate base bid.
- Environmental Impact Assessment. The A/E team will provide documents and information necessary for the EIA consultant to prepare the report.

Project Budget

Construction Cost:		\$20,452,000
Abatement (Babcock & Science House):		325,000
Demolition (Science House):		200,000
A/E Design Fees:	8.00%	1,729,000
Other Fees		210,000
DFD Management Fees:	4.00%	898,000
Contingency:	7.00%	1,468,000
Movable/Special Equipment:		6,638,000
		\$31,920,000

Project Schedule

Program Approval	June 2013
A/E Selection	July 2013
Design Report Approval	June 2014
Early Bid Package Construction Complete	March 2015
Science House Abatement and Demo Complete	June 2015
Bid Date	July 2015
Start Construction	September 2015
Substantial Completion	March 2018
Occupancy	May 2018

A phasing plan will need to be developed in order to minimize disruption to the programs, although it is anticipated that the plant will be shut down for construction. In addition, as described under Project Scope and Description above, a new process chilled water system will need to be completed as a separate phase or bid package in advance of the main project.

Preliminary Space Tabulation

Ref. No.	Babcock Hall - Remodel	Total ASF
Basement		
B.1	Food Science Lab	2,230
B.2	Staff Lockers - Women	340
B.3	Staff Lockers - Men	350
B.4	Storage	1,710
	Basement Sub-Total ASF	4,630
First Floor		
1.1	Dairy Plant	5,100
1.2	Coolers	2,910
1.3	Freezers	310
1.4	Hardening Room	230
1.5	Brine Room	120
1.6	Warm Room	80
1.7	Cut/Wrap	110
1.8	Q/C Lab	270
1.9	Office	150
1.10	Clean in Place	480
1.11	Raw Process	690
1.12	Dry Storage	500
1.13	Supplies	310
	First Floor Sub-Total ASF	11,260

Ref. No.	Babcock Hall - Remodel	Total ASF
Second Floor		
2.1	CDR Offices & Conference (includes 1,275 s.f. infill)	3,310
2.2	Meeting Room	400
2.3	Cheese Prep	280
2.4	Cheese Ripening	360
2.5	Overlook Viewing Platform	400
	Second Floor Sub-Total ASF	4,750
	REMODELING-GRAND TOTAL ASF	20,640
	Efficiency Factor .69	
	GRAND TOTAL GSF	29,700

Ref. No.	Center for Dairy Research - Addition	Total ASF
Basement		
B.5	Atrium/CDR Lobby	2,650
B.6	Non-Cheese Lab	5,000
	Basement Sub-Total ASF	7,650
First Floor		
1.14	Atrium/CDR lobby	1,700
1.15	Cheese Lab	4,100
	First Floor Sub-Total ASF	5,800
Second Floor		
2.6	Atrium/CDR Lobby	1,700
2.7	Auditorium	2,000
2.8	Food Applications Lab A	1,450
2.9	Food Applications Lab B	1,250
	Second Floor Sub-Total	6,400
	ADDITION - GRAND TOTAL ASF	19,850
	Efficiency Factor .72	
	SUB-TOTAL GSF	27,350
1.1	Milk Intake Addition to Babcock	1,450
3.1	Mechanical Penthouse Addition to Babcock	2,500
	ADDITIONS - GRAND TOTAL GSF	31,300

General Requirements

Refer to the 2012 Babcock Dairy Plant Renovation & Center for Dairy Research Addition Study under “Pertinent Websites” for full project scope and requirements.

Site Requirements

Work will be done at the center of campus near the intersection of two high-traffic streets. A portion of the existing building will remain functioning during the duration of the project, so a clear construction staging plan for all contractors and subcontractors will be required in order to understand the limits and restrictions of the site. Disruption to the existing occupants must be minimized during construction.

Utility Analysis

The A/E is responsible for surveying existing capacity of all site utilities. The existing 6” university campus water service is believed to be adequate, however the possibility exists to tap into the city 20” water main with the addition of a water meter. This line runs parallel to the 6” university line. The existing electrical service is aged, although adequate for this project. The UW Electric shop recommends replacing the existing service, if funding allows. Recently completed utility projects adjacent to Babcock Dairy Plant include: DFD Project 08A2E Wisconsin Energy Institute Steam & Condensate, DFD Project 09B2F Steam Condensate Repairs, and DFD Project 10I3F Pits 56/10 – 58/10 Steam Box Conduit. Record documents of these projects will be made available to the selected AE team.

Environmental Impact/WEPA

In compliance with the Wisconsin Environmental Policy Act (WEPA), this project will require a Type II Environmental Impact Assessment (EIA), which will be completed by a separate third-party consultant hired by DFD. This EIA must be completed prior to the design report approval.

Health and Safety

A survey of asbestos and lead containing materials has been conducted. The report is available under the WALMS database system (Wisconsin Asbestos and Lead Management System). Asbestos containing material will be abated during demolition phase of construction. Known materials include: pipe insulation, laboratory countertops, terrazzo flooring, and carpet, ceramic tile, and resilient tile flooring with mastic.

Sustainability Requirements

It is the goal of this project to provide a high performance building by closely following DFD Sustainability requirements and guidelines outlined by the United States Green Building Council’s (USGBC) Leadership in Energy and Environmental Design (LEED) program. LEED silver is the stated goal.

Historic Concerns

While neither Babcock Hall nor the Science House are eligible for listing on the State Register or National Register of Historic Places, the project is immediately east of the existing historic Stock Pavilion. The Stock Pavilion is listed on both the State and National Registers. The project calls for a significant increase in finished square footage from what is presently at the site. It will be necessary to maintain the green space as well as Farm Drive and its associated parking between

the project area and the Stock Pavilion to the greatest degree possible. The relationship of the Stock Pavilion to its surroundings should remain substantially similar to its current / historic setting. Any encroachment into the setting of the Stock Pavilion would be an effect that the WHS would review for adverse effect.

Project Delivery

Because of the need to meet food-grade requirements associated with this project, a constricted site, and complex phasing of the new construction and renovation, the university will request single-prime bidding as a delivery method. Accordingly, a waiver of §16.855 Wis. Stat. under §13.48(19) Wis. Stat. will be sought to allow for single-prime bidding.

Pertinent Websites

The following links contain information that informs the design of this project.

UW-Madison Campus Master Plan:

<http://www.uc.wisc.edu/masterplan:>

2012 Babcock Dairy Plant Renovation & Center for Dairy Research Addition Study:

<https://www2.fpm.wisc.edu/capbudg/CampusDevelopment/BabcockHallFinalReport5-15-12.pdf>

UW Madison Technical Guidelines:

<https://fpm->

[www3.fpm.wisc.edu/cpd/ConstructionDesignGuidelines/TechnicalGuidelines/tabid/80/Default.aspx](https://fpm-)

CAMPUS LOCATION MAP



SITE MAP

