

All Agency Project Request

2011 - 2013 Biennium

<u>Agency</u>	<u>Institution</u>	<u>Building No.</u>	<u>Building Name</u>
University of Wisconsin	La Crosse	285-0E-9931	Utility - Site Electrical (underground)

<u>Project No.</u>	13A2S	<u>Project Title</u>	Campus 5kV Switchgear Repl
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Project Intent

This project provides pre-design and design services to replace the campus main 5kV switchgear to improve the electrical distribution system reliability, redundancy, and capacity to serve future campus loads; to install a new 5kV distribution circuit to serve two new buildings; and to install new 15kV service equipment needed to serve a new west campus chiller plant.

Project Description

Project work includes replacing the campus 5kV switchgear located in a vault room adjacent to the heating plant. A new main-tie-main 5kV circuit breaker line-up will be installed including 13 branch circuit breakers, metering cubicles, control power cubical, and DC power supply. The power factor capacitors will also be replaced. An emergency circuit will be extended from the Heating Plant emergency distribution system to feed the switchgear. Work in the Excel Energy Fairgrounds Substation located across East Avenue from the switchgear vault will include reconfiguring the utility's two 3750/5000 kVA, 5kV transformers (currently connected in a parallel configuration) to allow each transformer to serve one main circuit breaker. Work in the state owned 15/5 kV portion of the Fairgrounds Substation will include installation of an additional 15kV switch and power factor correction equipment. Approximately 170 LF of four 5-inch conduit ductbank will be installed between Pit P15 and the electrical switchgear vault.

The consultant will also study the total life cycle cost for the state to replace the two utility owned transformers with two new 5000/6250 kVA state owned transformers, replace utility owned overhead 15kV busing and switching serving transformers with state owned switchgear, and complete related substation site work. Site work will include the construction of a concrete wall with brick veneer around the perimeter of the substation yard.

The project will also construct ~500 LF of new four 5-inch power conduit and four 4-inch signal conduit ductbank from pits P19/S19 to pits P21/S21, and ~900 LF of new four 4-inch signal conduit ductbank from pit S19 to S30. A new 5kV looped power cable will be installed from the new switchgear to pit P19. Solid state electrical metering will be installed on each individual building electrical service transformer and connected to the campus automation system.

Project Justification

The campus electrical switchgear was installed in 1967 at the time the campus Heating Plant was constructed. During the past 6 years, UW-System has replaced the 1960s vintage switchgear constructed with the heating plants at seven campuses because the equipment has reached the end of its useful life and repair parts are difficult to obtain. This is the last switchgear of that vintage and it should also be replaced. The switchgear configuration is a single buss served by one utility secondary feed with campus looped feeders serving campus buildings. While the looped feeder network provides redundancy in the case of power cable failure or branch circuit breaker failure, it does not protect against a switchgear main buss failure. The installation of main-tie-main configuration switchgear served by two utility secondary feeds with loop campus feeders served from two different busses provides needed reliability and redundancy.

In the next three years, a new 161,000 GSF student union and a new 179,000 GSF science building will be constructed. These buildings will consume significant amounts of energy due to the food service component in the union and the wet lab component in the science building. The campus feeder distribution is not adequate to add this additional load without compromising the loop feeder network capacity to supply load from an alternate feeder should one feeder segment fail. These critical facilities must have a reliable power source and the campus signal ductbank system does not have spare capacity to install new signal cable from the new buildings to the two campus fiber optic backbone hubs and the campus telephone switch. Additional conduit is needed for new fiber optic cable and multi-pair telephone cable to support these facilities.

A recent Chilled Water Plant Study (DFD 12H2C) was undertaken to assess the campus chilled water production and distribution system capacity, taking into consideration the new facilities to be constructed through completion of the Campus

All Agency Project Request

2011 - 2013 Biennium

Master Plan. The study concluded that two new 1,200-ton chillers should be installed in a new chiller plant and constructed on the western portion of campus. This facility must be served from the state owned 15kV switchgear located in the Fairgrounds Substation. A new 15kV switch is needed to provide a disconnecting and overcurrent means for a new 15kV power cable that will route across campus to the new plant. The cable will be installed under the West Campus Chilled Water Plant project. A power factor correction is also needed at this switchgear to eliminate an annual \$8,300 utility power factor charge.

Enhanced building electronic metering is needed to collect and compile building specific energy use data to better manage energy use. Collecting energy data through the campus automation system provides the appropriate energy management tools and information.

A/E Consultant Requirements

A/E Selection Required?

Consultants should have specific expertise and experience in the design and coordination of medium voltage distribution systems serving multiple buildings in an institutional environment. Work includes site surveys, acquiring field data, and verifying as-built conditions to assure accurate development of design and bidding documents, and production of necessary design and bidding documents. Consultants should indicate specific projects from past experience (including size, cost, and completion date) in their letter of interest and when known, include proposed consulting partners and specialty consultants.

The consultant will verify project scope and budget estimates, and recommend modifications as required to complete the specified project intent. The consultant will prepare a pre-design document to establish an appropriate project scope, budget, and schedule prior to the university seeking authority to construct from the Board of Regents and State Building Commission.

Commissioning

- Level 1
 Level 2

Project Budget

Construction Cost:		\$3,513,300			
Haz Mats:		\$0			
Construction Total:		\$3,513,300			
Contingency:	15%	\$527,000			
A/E Design Fees:	8%	\$281,100			
DFD Mgmt Fees:	4%	\$161,600			
Equipment/Other:		\$0			
		\$4,483,000			

Funding Source

GFSB - Utilities Repair & Renovation [Z080]	\$0
PRSB - Utilities Repair & Renovation [T570]	\$0
Agency/Institution Cash [AGF0]	\$45,000
Gifts	\$0
Grants	\$0
Building Trust Funds [BTF]	\$67,400
Other Funding Source	\$0
	\$112,400

Project Schedule

SBC Approval: 11/2013
A/E Selection: 03/2013
Bid Opening: 03/2014
Construction Start: 05/2014
Substantial Completion: 08/2015
Project Close Out: 12/2015

Project Contact

Contact Name: Scott J. Schumacher
Email: <sschumacher@uwlax.edu>
Telephone No.: (608) 785-8916 x

Project Scope Consideration Checklist

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|---|-------------------------------------|--------------------------|
| | <u>Y</u> | <u>N</u> |
| 1. Will the building or area impacted by the project be occupied during construction? If yes, explain how the occupants will be accommodated during construction. | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

All Agency Project Request

2011 - 2013 Biennium

All project work will be coordinated through campus physical plant staff to minimize disruptions to daily operations and activities. The campus will need to coordinate short switching outages to accommodate the cutover from the existing switchgear to new switchgear.

2. Is the project an extension of another authorized project? If so, provide the project #...
3. Are hazardous materials involved? If yes, what materials are involved and how will they be handled?
Hazardous materials abatement is not anticipated on this project. Comprehensive building survey inventory data is not available on Wisconsin's Asbestos & Lead Management System (WALMS) <<http://walms.doa.state.wi.us/>>.
4. Will the project impact the utility systems in the building and cause disruptions? If yes, to what extent?
All project work will be coordinated through campus physical plant staff to minimize disruptions to daily operations and activities. The campus will need to coordinate short switching outages to accommodate the cutover from the existing switchgear to new switchgear.
5. Will the project impact the heating plant, primary electrical system, or utility capacities supplying the building? If yes, to what extent?
Project upgrades the campus 5kV electrical service.
6. Are other projects or work occurring within this project's work area? If yes, provide the project # and/or description of the other work in the project scope.
7. Have you identified the WEPA designation of the project...Type I, Type II, or Type III?
Type III.
8. Is the facility listed on a historic register (federal or state), or is the facility listed by the Wisconsin Historical Society as a building of potential historic significance? If yes, describe here.
9. Are there any other issues affecting the cost or status of this project?
10. Will the construction work be limited to a particular season or window of opportunity? If yes, explain the limitations and provide proposed solution.
11. Will the project improve, decrease, or increase the function and costs of facilities operational and maintenance budget and the work load? If yes, to what extent?
Completion of this project will decrease operational maintenance costs. Installation of electronic electrical metering in each building with reporting to the campus automation system will avoid manual meter readings each month.

All Agency Project Request

2011 - 2013 Biennium

12. Are there known code or health and safety concerns? If yes, identify and indicate if the correction or compliance measure was included in the budget estimate, or indicate plans for correcting the issue(s).

Depending on the final project scope, energized equipment with exposed live parts within the Fairgrounds Substation may be eliminated or substantially reduced.

13. Are there potential energy or water usages reduction grants, rebates, or incentives for which the project may qualify (i.e. Focus on Energy <<http://www.focusonenergy.com>> or the local utility provider)? If yes, describe here.

14. If this is an energy project, indicate and describe the simple payback on state funding sources in years and the expected energy reduction here.