All Agency Project Request

2013 - 2015 Biennium

Agency	Institution	Building No.	Building Name
University of Wisconsin	La Crosse	285-0E-0002	WING TECHNOLOGY CENTER

Project No. 14C1I **Project Title** Wing Tech Data Ctr HVAC Sys Repl

Project Intent

This project provides investigation and research, pre-design, and design services of the campus data center mechanical and electrical systems, and makes recommendations to address the operational concerns. Mechanical and electrical systems will be evaluated to identify deficiencies, develop design solution alternatives, and recommend appropriate and comprehensive corrective measures.

Project Description

It is anticipated that the data center mechanical and electrical systems will be modified or replaced. It is anticipated that the data center's electrical and mechanical system will be modified or replaced as part of the project. Air supply distribution pathways, distribution outlet locations, airflow pathways through server cabinets, and potential supply/return air short circuiting will be evaluated during the pre-design phase of the project. Work may include reconfiguring or replacing the existing cooling system, and associated controls, and alarms connected to the campus Andover building automation system. The cooling system will be evaluated for conformance with current standards and codes, functional performance, reliability, and its capacity to accommodate projected server equipment growth over the next 10 years. The cooling system must be able to cool the data center in all seasons, without relying on the campus chilled water loop. Existing equipment operation and new system configuration options shall be evaluated for energy conservation. Required cooling system redundancy shall be confirmed and capacity added as needed to meet capacity requirements.

Work may also include reconfiguration/modification of the existing data center equipment rack system. The rack location, data cabling routing, and general layout of rack equipment may be modified to improve the energy efficiency and operational reliability of the data center.

Architectural work may be required as a result of evaluation including subdivision of the existing data room to create a general utility space where equipment that is less temperature sensitive, such as transformers, could be housed. The intent is to re-use the existing Ansul fire suppression system, though coverage, capacity, and control will need to be studied to ensure functional integration with new cooling system design and applicable space or equipment configuration changes. All work will be completed while maintaining the data center operation.

Project Justification

The cooling system in the data center is approximately 14 years old. While this does not exceed the expected useful life of this type of system, the existing equipment has had extensive maintenance issues and the system does not perform adequately to keep the data center at acceptable temperatures. The room is currently cooled by two Data Aire units that blow cold air below the raised computer floor. The system was designed to distribute the air below the floor and up through floor openings near the server racks, transformers and back-up power systems. Data centers are dynamic facilities and servers are constantly being added, subtracted, or relocated based on the computing needs of the campus. The number and location of floor openings has changed over the years bringing into question the distribution effectiveness. The space below the raised floor has become increasingly crowded with cables, effectively blocking airflow. Maintenance access to the floor plenum area is challenging leading to the accumulation of dust. The dust becomes entrained in the air distribution, eventually settling within the room and inside the networking equipment. During a recent event that led to a loss of cooling within the data room, campus IT staff lifted a floor tile and placed an additional fan below the floor to promote air movement. The resulting dust cloud activated the oxygen depleting fire suppression system in the room, forcing evacuation of the room and shut down of the entire campus network.

During recent summers, due to unusually warm and humid weather, the campus Physical Plant had to install two large portable air conditioning units inside the data center to supplement the underperforming Data Aire systems. Prior to the use of the supplemental coolers, the temperatures climbed to as high as 85 degrees in the room even with both Data

Aire units functional. When temperatures climb that high in the room, localized temperatures at the networking equipment can be in excess of 100 degrees. As this threatens to permanently damage the equipment, the campus network has been shut down in the past to avoid long-term failures. Though prudent, the unplanned shutdowns of the campus network cause significant disruption to the daily activities of the university. The Data Aire units and associated condensers have been plagued with maintenance issues causing loss of cooling for significant periods of time. All the glycol pumps have been replaced on one system, the condenser fan motors fail at a rate of one per year, one of four compressors have been replaced, the condenser coils are permanently fouled after several cleanings, and the humidifier canister and valve have been replaced on both units. As a result of the component failures, the campus Physical Plant has spent considerable amounts of time and resources to keep the systems running and it is believed that the units no longer deliver nameplate capacity. It is anticipated that disproportionate maintenance attention will continue until the system is replaced in its entirety.

A/E Consultant Requirements

☑ A/E Selection Required?

Consultants design team should have specific expertise and experience in the design and technical coordination of data center mechanical and electrical systems, have a current understanding of data center industry trends, be familiar with best practices for data communication facilities, and have knowledge of ASHRAE Technical Committee 9.9 latest findings. Work includes site surveys, acquiring field data, computation of existing mechanical and electrical loads, verifying existing 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.

Commissioning

☑ Level 1

☐ Level 2

Project Budget

$473,900

Funding Source(s)	Total
GFSB - Facilities Maintenance & Renovation [Z060]	$0
PRSB - []	$0
Agency/Institution Cash [AGF0]	
Gifts	$0
Grants	$0
Building Trust Funds [BTF]	$0
Other Funding Source	$0

Project Schedule

SBC Approval:	12/2014
A/E Selection:	05/2014
Bid Opening:	03/2015
Construction Start:	05/2015
Substantial Completion:	09/2015
Project Close Out:	12/2015

Project Contact

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Project Scope Consideration Checklist

	Y	N
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.	☑	☐

All project work will be coordinated through campus physical plant staff to minimize disruptions to daily operations and activities.

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.

5. Will the project impact the heating plant, primary electrical system, or utility capacities supplying the building? If yes, to what extent? ☐ ☑

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. ☑ ☐

    Preferred project work schedule should be limited to late spring, summer, and/or early fall months if possible.

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.

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). ☐ ☑

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. ☐ ☑