

# All Agency Project Request

2009 - 2011 Biennium

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<u>Agency</u>	<u>Institution</u>	<u>Building No.</u>	<u>Building Name</u>
University of Wisconsin	Milwaukee	285-0B-9920	Utility - Site Mechanical

<u>Project No.</u>	<u>Project Title</u>
11A3M	NW Quadrant Central Utility Ext

## Project Intent

This project provides pre-design services to extend central campus utilities (underground steam and condensate box conduit, chilled water piping, primary electric and signal communication ductbank, and fiber optic wiring) to connection points within the Northwest Quadrant (former Columbia Saint Mary's Hospital complex) buildings. All central utilities except the primary electric service will be energized as part of this project. Pre-design services will also include verification of the utility distribution infrastructure within the northwest quadrant complex, and providing recommendations and estimates for utility distribution renovations to accommodate the additional load.

## Project Description

**STEAM AND CONDENSATE:** Construct ~525 LF of concrete box conduit containing 8-inch high pressure steam (HPS) and 4-inch condensate pump discharge (CPD) from the navigable utility tunnel near the intersection of E. Hartford Ave. and N. Maryland Ave. to the Northwest Quadrant Energy Center. Construct three (3) new steam vaults and expand the navigable utility tunnel at the campus connection point for both steam and condensate, and chilled water piping and valve connections. The Northwest Quadrant connection location will be within the East Wing utility tunnel. Review all condensate pumps within the Northwest Quadrant to determine if new condensate pumps are required. The consultant will survey the steam and condensate connection through the Energy Center to the College of Nursing and provide future connection options. The long-term goal is to provide steam and condensate to the College of Nursing site without passing through the Energy Center.

**CHILLED WATER:** Construct ~700 LF of 20-inch chilled water supply and chilled water return piping from the navigable utility tunnel near the intersection of E. Hartford Ave. and N. Maryland Ave. to the Northwest Quadrant East Wing Mechanical Room H53E. Review the distribution piping system served by the two (2) 600-ton chillers to determine if the distribution pumps are required based on the differential pressure of the campus chilled water system. Review the chilled water piping cross connections between the East Wing chilled water system and the chilled water systems in the Clinical Building and Medical Arts and provide distribution options for serving these systems from the campus chilled water system.

**PRIMARY ELECTRIC AND SIGNAL COMMUNICATION:** Construct ~750 LF of electrical ductbank containing six (6) 5-inch primary electric conduits and nine (9) 4-inch signal communication conduits from campus primary/signal pits P8/S8 near the intersection of E. Hartford Ave. and N. Maryland Ave. to the Northwest Quadrant. Construct approximately five (5) new primary/signal pits (each). The signal conduits will enter the Northwest Quadrant complex approximately at the center of the West Wing, and then proceed through the building corridor system to the Main Distribution Room B80. Two hundred (200) strands of single mode and one hundred (100) strands of multi-mode fiber optic cable will be extended from the Data Center in the EMS Building to the Main Distribution Room. The power conduits will terminate in or near Electrical Room H52E located in the East Wing. The consultant shall survey Electrical Room H52E, Mechanical Room H53E, and surrounding space to determine where new 5kV switchgear could be located. The long-term goal is to remove the two Wisconsin Electric 26.4/4.16 kV utility service transformers west of the Energy Center and the associated 5 kV service switchgear in the Energy Center and provide electrical service to the Northwest Quad from the East and West Campus Substations.

All work either completed as part of this project or planned for a future project will allow the Energy Center to be razed for potential site development. All hazardous materials abatement will be included as necessary. Temporary isolation valves or blanks will be installed to allow construction activities to occur without extended utility shutdowns to other buildings served by the distribution system. The project requires removing and replacing roadways, sidewalks, driveways, and parking lots. Landscape repair will include lawn replacement, repair of irrigation, and provision of replacement nursery stock trees and shrubs.

## Project Justification

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Connecting the Northwest Quadrant to the central campus utility systems provides significant annual savings in operating costs and lowered purchased utility costs. This project eliminates steam generation at the Energy Center and chilled water production from the chillers and cooling towers distributed throughout the Northwest Quadrant.

This project eliminates the need to staff the Energy Center and maintain the generation and production equipment in these facilities. It is estimated that four (4) full time staff would be required to manage the Energy Center operations and cost \$245,000 annually. The steam generation equipment in the campus Heating Plant is estimated to operate with a 9% better efficiency than the Northwest Quadrant Energy Center due to equipment types, controls, and system design. Connecting to central steam will save an estimated \$119,000 annually in natural gas purchases. The chilled water production equipment in the campus Heating Plant utilizes cooler Lake Michigan water for heat rejection, without cooling towers that require significantly more chemicals, and use larger more efficiently designed chillers which results in an estimated 22% lower cost for generating chilled water. Connecting to central chilled water will save an estimated \$34,000 in purchased utility costs and \$40K in avoided chemical costs, or \$74,000 annually. The total annual saving is estimated to be \$438,000.

### A/E Consultant Requirements

A/E Selection Required?

### Commissioning

Consultants should have specific expertise and experience in the design and coordination of in the design and coordination of underground utility installations as part of a design team. 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.

Level 1

Level 2

Connecting the northwest quadrant will increase the campus boiler load, and therefore may require permit or equipment modifications since the boiler firing rates are limited by permit. An environmental consultant will be required to review the campus boiler operating permit and recommend and estimate appropriate permit and/or equipment modifications.

A portion of the construction could potentially be funded from energy conservation appropriations. It is anticipated the consultant will be required to provide support documentation for portions of the project work to justify energy conservation expenditures.

### Project Budget

Construction Cost:		\$3,027,000	
Haz Mats:		\$20,000	
Construction Total:		\$3,047,000	
Contingency:	15%	\$457,000	
A/E Design Fees:	8%	\$243,800	
DFD Mgmt Fees:	4%	\$140,200	
Equipment/Other:		\$0	
		<b>\$3,888,000</b>	

### Funding Source

GFSB -   
 PRSB -   
 Agency/Institution Cash   
 Gifts  
 Grants  
 Building Trust Funds [BTF]  
 Other Funding Source

### Total

\$0  
 \$0  
 \$0  
 \$0  
 \$0  
 \$122,000  
 \$0  
**\$122,000**

### Project Schedule

### Project Contact

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SBC Approval: 09/2011  
A/E Selection: 03/2011  
Bid Opening: 02/2012  
Construction Start: 04/2012  
Substantial Completion: 09/2012  
Project Close Out: 12/2012

Contact Name: Andrew C. Nelson  
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Telephone No.: (414) 229-4013 x

## **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?    

Required hazardous materials abatement of asbestos containing material has been included in the estimated project schedule and project budget. Comprehensive environmental 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?    

Short utility shutdowns will be coordinated with the users to allow for tie-ins.
5. Will the project impact on the utility capacities supplying the building? If yes, to what extent?
6. Will the project impact the heating plant or the primary electrical system supplying the campus or institution? If yes, to what extent?
7. Have you identified the WEPA designation of the project...Type I, Type II, or Type III?    
Type II.
8. Is the project affected by historic status?
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.    

Work will need to be completed during late spring/summer/early fall.