All Agency Project Request

2011 - 2013 Biennium

Agency	Institution	Building No.	Building Name
University of Wisconsin	Superior	285-0M-9924	Utility - Site Steam & Condensate

Project No. 13D1S **Project Title** Steam Dist Sys Repr/Repl (Flood Restoration, Ph. III)

Project Intent

This project repairs or replaces ~2,316 LF of underground conduit containing high-pressure steam and pumped condensate piping. This project completes repairs of damage caused by a flood in June of 2012, implements steam/condensate distribution system flood mitigation strategies, and replaces distribution components at or nearing the end of their service lives.

Project Description

Existing concrete box conduit systems project work includes excavation and exposure of the conduit box, removal and preservation of conduit lids, and removal and disposal of high-pressure steam and condensate piping insulation. Upon full exposure, a complete inspection will be performed on conduit systems including testing of concrete structures, high-pressure steam and condensate piping, and piping supports as deemed necessary to determine remaining life. Based on the inspection and testing results, the concrete conduit box, steam and condensate piping, and piping supports are to be fully replaced, partially replaced, or reused as dictated by their condition and as directed by the Division of Facilities Development. Following the inspection, testing, and the repair or replacement work, the steam and condensate piping will be reinsulated, concrete lids will be repoured or reinstalled as appropriate, and conduit boxes will be waterproofed. The project areas will be backfilled and the site restored to pre-project conditions, including landscaping, pavements, and turf.

Existing direct-buried steel or cast-iron conduit sections project work includes excavation, removal and disposal of conduit systems complete with piping, supports, and insulation systems. After demolition work is complete, a new concrete box conduit system will be constructed, including new steam and condensate piping, new piping supports, and new piping insulation. The steam and condensate piping associated to the direct-buried systems between Steam Pit 5 & Steam Pit 10 and Steam Pit 10 & Steam Pit 11, will be upsized from 6-inch HPS/3-inch PCR to 8-inch HPS/4-inch PCR to increase steam flow capacity to the central campus. All new piping will be hydro-tested for leakage before box lids are poured. After the new box conduit system is waterproofed, the excavation will be backfilled, and the site restored to pre-project conditions, including landscaping, pavements, and turf.

The following steam distribution system sections are included in the project scope…

90 LF: 21st Street Crossing @ Grand Ave (10-inch steam, 5-inch condensate) – Concrete Box Conduit
258 LF: Steam Pit 4 to Steam Pit 4A (6-inch steam, 3-inch condensate) – Concrete Box Conduit
311 LF: Steam Pit 4A to Marcovich Wellness Center (4-inch steam, 2.5-inch condensate) – Concrete Box Conduit
287 LF: Steam Pit 5 to Steam Pit 10 (6-inch steam, 3-inch condensate) – Direct Buried Steel Conduit.
312 LF: Steam Pit 10 to Steam Pit 11 (6-inch steam, 3-inch condensate) – Direct Buried Steel Conduit.
177 LF: Steam Pit 11 to Steam Pit 12 (6-inch steam, 3-inch condensate) – Concrete Box Conduit
30 LF: Steam Pit 11 to Curran-McNeill Ostrander Halls (3-inch steam, 2-inch condensate) – Concrete Box Conduit
225 LF: Steam Pit 8A to Wessman Arena (4-inch steam, 2-inch condensate) – Concrete Box Conduit
128 LF: Steam Pit 15 to Steam Pit 16 (4-inch steam, 2-inch condensate) – Concrete Box Conduit
248 LF: Steam Pit 16 to Old Main (4-inch steam, 2-inch condensate) – Concrete Box Conduit
160 LF: Steam Pit 15 to Barstow Hall (6-inch steam, 3-inch condensate) - Concrete Box Conduit
90 LF: Old Main to Erlanson Hall (3-inch steam, 1-1/2 inch condensate) – Direct Buried Cast Iron Conduits
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2,316 LF Total

In addition to conduit system repairs/replacement work, the project scope will include the following steam pit repairs and enhancements…

Steam Pit 2: New sump (re-use existing pump)
Steam Pit 3: New sump (re-use existing pump)

Steam Pit 4: New sump and pump (emer. powered), new exterior water-proofing, lights and electrical receptacles
Steam Pit 4A: New exterior water-proofing, lights and electrical service receptacles
Steam Pit 5: Enlarge existing sump (re-use existing pump), new exterior water-proofing, lights and receptacles.
Steam Pit 7: New sump (re-use existing pump)
Steam Pit 8: New sump (re-use existing pump)
Steam Pit 10: New exterior water-proofing, lights and electrical service receptacles
Steam Pit 11: New exterior water-proofing, lights, electrical service receptacles and concrete crack leak sealing
Steam Pit 12: New steam pit, including water-proofing, lights, electrical receptacles, sump systems (fed by emergency power circuit) and new steam/condensate isolation valves, expansion joints and anchor steel.

The GIS campus utility map which locates steam, condensate, electrical power, and telecommunications in combination with the City of Superior domestic water, sanitary and storm sewer systems, will be updated to reflect project-effected changes. A final version will be provided to UW-Superior Physical Plant.

Lastly, the project scope will include installation of bulkheads, where existing box conduit systems penetrate building walls, to prevent an uninhibited path of water entry into finished spaces should a flood event occur. The bulkheads will be installed in the buildings impacted by the project scope: Barstow Hall, Erlanson Hall, Old Main, Curran-McNeill Ostrander Hall, Marcovich Wellness Center, and Wessman Arena.

Project Justification

Torrential rains on 06/19/12 and 06/20/12 flooded a significant portion of the campus, completely submersing most of the steam and condensate distribution system. The piping insulation was saturated or dislodged by water currents as the conduit systems quickly filled with water during the event. Some debris and silt was carried by floodwaters into the box conduit systems and remained after the waters receded. Most of the affected sections, dating to the 1960s and 1970s, contain aged insulation systems that are not well suited for heavy water exposure. As the piping insulation thermal resistance properties have been permanently compromised by the unique flood event, piping insulation replacement is the only option for returning the system to its former energy efficiency level. If left in its current state, boiler capacity will be taxed due to excessive heat transmission losses in the steam and condensate distribution system. Replacement piping insulation material will be selected to better resist water absorption and be well suited to withstand flowing water forces, if a flood event should reoccur.

Concurrent with the piping insulation replacement work, the condition of the concrete box conduit, steam/condensate piping, and piping supports will be inspected, tested, and repaired per the project description to ensure that the systems have significant useful life remaining after the restoration project is completed. Deterioration due to age may dictate the design solutions (repair or replacement). Since the box conduit and piping systems will be fully exposed during re-insulation work, it is both time and cost efficient to complete any additional repairs concurrently with the re-insulation work.

The steam pits were also constructed in the 1960s and 1970s and repairs are required due to age, moisture, and salt exposure. The salt-laden moisture originates from winter applications of de-icing agents on adjacent sidewalks and roadways. Due to repeated exposure, certain sections of the concrete reinforcement steel have rusted and caused concrete spalling.

Where direct-buried steel or cast iron conduit was used to house steam and condensate piping, the systems are nearing the end of their expected life cycles with flood water exposure accelerating insulation and conduit degradation. There is not a cost effective or practical means to remove the conduit, preserve existing piping, replace piping insulation and install a new steel conduit. Therefore, the direct-buried conduit systems will be replaced with concrete box conduit systems.

The Federal Emergency Management Agency (FEMA) and Wisconsin Emergency Management (WEM) will be reviewing claim applications for this work. Preliminary discussions with both organizations have indicated that a substantial portion of the costs associated to flood restoration work may be covered and reimbursed after construction is completed.

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A/E Consultant Requirements

☑ A/E Selection Required?

Consultants should have specific expertise and experience in the design and coordination of site mechanical utilities for institutional environments, including underground steam and condensate pipes in a box conduit system, 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 proposed consulting partners and specialty consultants.

Commissioning

☑ Level 1

☐ Level 2

Project Budget

Construction Cost:		$3,077,000
Haz Mats:		$50,000
Construction Total:		$3,127,000
Contingency:	15%	$469,000
A/E Design Fees:	8%	$250,200
DFD Mgmt Fees:	4%	$143,800
Equipment/Other:		$0
		$3,990,000

Funding Source

Funding Source	Total
GFSB - Utilities Repair & Renovation [Z080]	$2,793,000
PRSB - Utilities Repair & Renovation [T570]	$1,197,000
Agency/Institution Cash []	$0
Gifts	$0
Grants	$0
Building Trust Funds [BTF]	$0
Other Funding Source	$0
	$3,990,000

Project Schedule

SBC Approval:	06/2013
A/E Selection:	07/2013
Bid Opening:	02/2014
Construction Start:	05/2014
Substantial Completion:	08/2015
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?	☑	☐
Required hazardous materials abatement (mechanical piping insulation and fittings) has been included in the estimated project schedule and project budget. 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. ☑ ☐

    Project work is seasonal. 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? ☐ ☑

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. ☐ ☑