University of Wisconsin La Crosse  
285-0E-9934 Utility- Site Data Communications  
Project No. 14C1E  
Project Title UWLAX Fiber Optic Backbone Upgrade  

Project Intent  
This project provides investigation and research, pre-design, and design services to upgrade the campus fiber optic backbone cable system to meet both current and future requirements for the university's data, voice, video, building HVAC control and building fire alarm reporting systems. The fiber optic cable system will be evaluated to identify deficiencies, develop design solution alternatives, and recommend appropriate corrective measures.

Project Description  
The project will be implemented in two phases. In the first phase, the consultant will survey the existing campus signal utility infrastructure, document conditions and capacity, and develop options to upgrade the utility. Survey work includes examination of approximately 54 signal pits and approximately 32 building entrance facilities. Signal cable quantities and types shall be identified and percent conduit fill verified. Abandoned, unused and underutilized cabling, and cable that could be abandoned by conversion of a service to another cable type will be identified. Survey work will also include examination of the fiber optic network hub facilities in Wing Communication Center and Murphy Library, the video head-end facilities in Wing Communication Center and the telephone PBX facilities in Graff Main Hall. The consultant will review and comment on the suitability of these locations for their identified purpose, including usable space, power, mechanical cooling and security. In coordination with the university, the consultant will develop conceptual plans for the long-term configuration of the fiber optic backbone cable system. It is anticipated that new single mode (SM) fiber will be needed in many areas. Consultant will identify shortcomings in the existing utility infrastructure that would inhibit the construction of the new cable system. The analysis shall identify key areas of congestion, the potential for abandoned and/or unused cable to be removed and options for additions and/or re-work of the existing utility. Once options are selected by the campus, the consultant will develop Preliminary Design documents (including a Design Report) for the agency to seek SBC approval.

In the second phase of the project – when approved by the SBC – the consultant will develop the selected option and prepare bid documents to allow construction of an upgrade project. It is anticipated that new concrete encased signal ductbanks may be needed to accommodate the new fiber if removal of obsolete cable does not provide adequate spare conduit capacity. Various building signal entrance facilities and telecommunications equipment rooms may need to be renovated to provide a proper environment for equipment. New SM fiber interface modules may be added to building EMS and fire alarm panels to allow for removal of underutilized cables. Electronic equipment required to facilitate the conversion of services to the fiber optic cable system may be purchased.

Project Justification  
The campus long range IT plan includes increasing the speed of the data network to serve increasing academic, administrative and student use. Needed data and communication services cannot be provided to campus buildings because of deficiencies in the buried infrastructure. There is no spare capacity in the buried conduit system which causes significant issues in providing basic service to new facilities on campus and providing enhanced service to existing buildings.

The plan includes the ability to accommodate higher network speeds, conversion of the campus copper cable based telephone system to Voice-over-IP, conversion of the campus coaxial cable based video system to video over IP, conversion of the copper cable based fire alarm reporting system the campus multi-mode fiber based EMS system network links to SM fiber.

The campus telephone system consists of a PBX switch in Graff Main Hall with a multi-pair copper trunk cable
distribution network serving each building. The switch and network was installed in the late 1980s, is at capacity and is nearing the end of its useful life. The new cable system will offer the university additional flexibility in identifying the most cost-effective option for replacement of this equipment, including approaches that could reduce or eliminate the operating cost billed on a per line basis by the phone company.

The campus video system consists of video distribution head-end equipment in Wing Communications Center with a coaxial cable distribution network serving each building. The bulk of the coaxial cable was installed in the early 1980s. This coaxial cable has deteriorated over time and the signal levels available at the buildings are very weak. This system needs to be replaced to restore adequate signal levels at the buildings, improve reliability and accommodate new buildings and services.

**A/E Consultant Requirements**
Consultant should have specific expertise and experience in the design and coordination of underground utility infrastructure and communications cabling systems serving multiple buildings in a campus setting. Work includes site surveys, acquiring field data, and verifying as-built conditions to assure accurate development of design and bidding documents, and – in the second phase of the work if approved – 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 develop and verify project scope, schedule, and budget estimates, and recommend modifications as required to complete the specified project intent. Following pre-design, the consultant will prepare Preliminary Design documents, including a Design Report, to establish an appropriate project scope, budget, and schedule for the university to seek authority to construct from the Board of Regents and State Building Commission.

**Project Budget**

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<tr>
<th>Description</th>
<th>Amount</th>
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</thead>
<tbody>
<tr>
<td>Construction Cost</td>
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<td>Haz. Mats:</td>
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<td>Contingency:</td>
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<td>DFD Mgmt Fees:</td>
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<td><strong>Total</strong></td>
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**Project Schedule:**

- SBC Approval: 12/2014
- A/E Selection: 05/2014
- Bid Opening: 04/2015
- Construction Start: 05/2015
- Substantial Completion: 08/2015
- Project Close Out: 12/2015