Montana Department of Transportation
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Memorandum

To: Ryan Dahlke, P.E.
Consultant Design Engineer

From: Bryan Miller, P.E. BLM
Consultant Plans Engineer

Date: June 28, 2019

Subject: STPB 8113(8)
Higgins Ave. BR Rehab - Missoula
UPN 8807000
Work Type 231 - Major Bridge Rehabilitation without added capacity

Public Interest Finding – Ultra High Performance Concrete (UHPC)

Project Background

This project is located on Higgins Avenue in downtown Missoula, MT. The project is a major bridge rehabilitation that includes replacing the existing deck and repairing structural components to extend services life. The project also includes roadway approach work to match the new bridge typical section. The 3rd Street intersection which is located at the southern bridge end, will be reconfigured to improve traffic movements and increase safety for pedestrians.

The City of Missoula has identified the Higgins Avenue Bridge as a priority location for improving multimodal transportation. The existing sidewalks on the bridge are narrow, with substandard railing. As part of the project, improved accommodations for bicycles and pedestrians will be provided. The City is contributing local funding for the improved bicycle and pedestrian accommodations and other amenities that match the downtown streetscape.

Justification

The bridge construction will be completed in phases where half of the bridge deck will be replaced while maintaining traffic on the opposite side. The final phase will include a concrete closer pour that connects the two previously built phases.

The project is located in downtown Missoula, and the bridge spans over Caras Park, the City trail system, parking lots, and Carousel Drive. Speed of construction is important to limit impacts to the travelling public, downtown businesses, and events that occur in the park.

The use of Ultra High Performance Concrete (UHPC) for the bridge deck closure pour provides the following benefits:

- Compared to standard deck concrete, UHPC allows for a narrow closer pour width due to the high strength and reduced lap splice lengths for deck reinforcing steel. This allows for wider temporary lanes during construction and improves work zone safety.
- UHPC cures faster than conventional concrete, reducing construction time and impacts to the travelling public, downtown businesses, and public events that occur in the park.
- UHPC provides very low permeability which improves resistance to chloride ion and chemical attack compared to conventional deck concrete.

- Use of UHPC supports the FHWA "Every Day Counts Initiative".

The Domestic Materials provision §106.09 of the Standard Specifications will apply.

Conclusion

Although multiple DOT agencies are pursuing a nonproprietary mix design for UHPC, at this time, there is one supplier for UHPC that uses DUCTAL concrete materials manufactured by Lafarge North America. Providing UHPC manufactured by Lafarge North America is in the best interest of the public for the reasons discussed herein.

The use of this proprietary item is unique to this project.

Approved _____ Date 7-3-2019

Ryan Dahlke, Consultant Design Engineer

copies:

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