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 – Fiber Reinforced Polymer (FRP) Deck Panels

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 service 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 is being widened to the west to provide additional space on the new deck for a shared use path on both sides of the roadway. Over dry land, the existing substructure will be widened to support new beam lines below the wider bridge deck. Over the river, a cantilever structure will be attached to the existing steel girders to support the new shared use path. The use of a cantilever system avoids the need for in stream work and the associated cost and environmental implications. The cantilever structure is only feasible through the use of lightweight decking panels composed of Fiber Reinforced Polymer (FRP).

The design of the structural steel cantilever, deck drainage system, and pedestrian railing are dependent on the FRP panel details. There are a few FRP manufacturers that supply deck panels. However, the system provided by Composite Advantage, 750 Rosedale Drive, Dayton, OH 45402, best fits the design of this project. The benefits of this product include:

- The panels can be fabricated with variable thickness to accommodate slope and drainage.
- The panels can be supplied with an integral curb and drainage scupper. Capturing and conveying stormwater into a treatment system is a project goal.
- The panels can by designed and fabricated to support a pedestrian rail

- The panels are supplied with an integral wearing surface that is similar to that applied to the adjacent concrete surface. The wearing surface is resistance to damage from snow plow blades.
- The panels can be supplied in the longest lengths which reduce the number of joints that are susceptible to leaking and subsequent maintenance.
- This same product has been used on another recent bridge project in Missoula where the City is responsible for maintenance.

Conclusion

The City of Missoula has contributed local funding to the project and is responsible for maintaining some project elements. The cantilever structure, supporting the shared use path, and the FRP decking is a project feature that utilizes local funds. The cantilever structure is not possible without the use of the lightweight FRP decking and the panels supplied by Composite Advantage best fit the needs of this particular project.

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

Approved Ryan Dahlke Date 7-3-2019
Ryan Dahlke, Consultant Design Engineer

copies:

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