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Subject:

USACE PROJECT NUMBER: NAO-2017-01937

PROJECT NAME: CSXT – Howardsville Bridge at Milepost CAB 91.2

PROJECT DESCRIPTION: Stabilize stream bank and encase the western abutment of existing railroad bridge for structural integrity. No work will occur to the surface or face of the bridge structure other than routine deck and track replacement. Bridge stabilization requires placement of rip rap stone along both abutments and the pier to prevent scour as well as the aforementioned encasement of the western abutment. The proposed rip rap stone will be added up to the ordinary high water mark (OHMW) of the river surface.

PROJECT LOCATION: Railroad bridge over the Rockfish River at Milepost CAB 91.2, Howardsville, Virginia (Lat: 37.73276, long: -78.64794)

Bridge Stabilization Alternatives Record to File

To improve safety and stability of the Howardsville railroad bridge over the Rockfish River at Milepost CAB 91.2, CSX Transportation, Inc. (CSXT) proposes to improve the structural integrity of the bridge structure by the concrete encasement of the western abutment. In response to the pre-construction notification (PCN) under the Nationwide Permit (NWP) No. 14, the US Army Corps of Engineers (USACE) consulted with the Virginia Department of Historic Resources (DHR) on the proposed action to the CSXT Howardsville bridge. Based on conversations with the DHR, the railroad bridge is considered a contributing element of the Southern Albemarle Rural Historic District. As such, the DHR is concerned that the proposed corrective action would be considered an adverse impact to the historically significant bridge. Amec Foster Wheeler and the design engineering GEC (HDR Engineering, Inc.) have assessed various alternatives to safely stabilize, yet preserve the historic elements of the western bridge abutment. After careful review of the various alternatives, the CSXT team believes that the selected alternative best meets the need to protect the bridge integrity as well as minimizing the adverse impact to the historical element of the bridge. Unfortunately, no means to safely or feasibly repair the bridge without the abutment encasement was available (without total bridge replacement). However, with the selected option, the entire eastern abutment will not be affected and will be left exposed and maintains historic integrity.

The alternatives assessed to provide the needed structural integrity to the abutment are as follows:

1. Encasement of the existing western abutment of the bridge with 6” of concrete. After a thorough engineering analysis of the various alternatives, it was determined that this is the preferred option to stabilize and maintain the structural integrity and safety of the bridge. The encasement procedure is relatively easy to complete, and because this repair procedure is routinely performed on other structures in need of repair, the CSXT

team is very familiar with the repairs and thus, will provide less potential to damage other components of the bridge. Of note, sometime in the past, the existing western abutment was partially encased with concrete. With the selected option, the proposed corrective action just vertically extends that encasement. Although this alternative does cover the stone blocks of the western abutment stone blocks, as previously stated, no work is proposed for the eastern abutment with the exception of rip rap stone below the water line, and as such, the stone blocks will remain visible to preserve the DHR's opinion of the historical element of the bridge.

2. Wrapping the western abutment with a carbon fiber wrap. This alternative provides superior strength; however, the corrective action is extremely expensive and is also labor intensive – thus, extending the time required for “in water” work which could adversely impact permitting timelines. The extended time to install the fiber wrap would also impact the railroad work schedules in an adverse way. Finally, this alternative encases the western abutment stone blocks, as well.
3. Replacement of the entire existing western abutment. This alternative demolishes the entire western abutment and replaces it with a new abutment. Temporary shoring would be required to keep the track/bridge in service; however, some discontinuance of service (i.e. - shutdown) for the railroad would be required to complete the installation of a new western abutment. This alternative would remove the existing stones and replace them with a new concrete abutment. Although visually appealing, stone masonry construction is considered an antiquated technology and no longer used in construction of the railroad infrastructure, as safety issues will eventually become problematic.
4. Remove and replace damaged stones. This proposed alternative is an engineering problem. It is difficult to inspect the stone, and precisely determine how the western abutment as a whole would react when individual stones are removed and replaced. Removal and replacement of visible damaged stones cannot provide assurance of future safety and integrity of the interior of the western abutment. Preliminary engineering review of to remove the damaged stones determined that the option is not viable due to the possibility of a catastrophic collapse of the entire abutment or possible bridge structure.
5. Preservation in place for some of the stones. This is a similar approach to removing and replacing individual stone blocks (see discussion for alternative #4). By removing some blocks and leaving other blocks in place of the western abutment, it was feared that this would reduce the material integrity of the abutment as a whole unit through continued weathering and ultimately reduce the strength of the entire structure⁶. Attaching wire netting over the western abutment. Although the mesh would catch the stone or pieces of stone that break off, this alternative does not provide any structural improvement to the western abutment and as such, does not meet the purpose and need of the proposed corrective action to provide additional strength to the structure. Therefore, this alternative was not considered.

These five alternatives were assessed by HDR to provide the needed stabilization and improve the integrity of the western abutment of the Howardsville bridge at Milepost CAB 91.2. After careful review, Alternative #1 is considered the best available means to meet the project's ultimate purpose as well as providing minimal impact to the DHR's opinion of the bridge structure's historical significance. As previously discussed, the lower segment of this abutment has been encased for stability in this manner at some time in the past. Although encasement of the western abutment may be considered adversely impacted by the DHR, the stonework and

stone blocks of the eastern abutment of the bridge will remain visible and thus, will not be impacted from this proposed bridge repair work.

This Report to File was requested during consultations with DHR on December 7, 2017, in order to confirm that alternative options to the repair of the bridge were taken into account during the design phase of the project. During the conference, DHR also requested mitigation efforts in the form of State Level Historic Recordation by a qualified architectural historian. To ensure a timely review process and efficient completion of safety repairs, the State Level historic documentation has been initiated concurrently with this submission. Ultimately, a Memorandum of Agreement (MOA) between DHR, USACE, and CSXT will be prepared to define the level of mitigation conducted to meet the agreed upon historic recordation of the bridge prior to repairs.

Thank you for your time and consideration. Please feel free to contact me at 502.267.0700 or at matt.prybylski@amecfw.com to discuss any questions you may have regarding this Record to File.

Respectfully submitted,
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