Response Summary:

At the request of SWL district, the authors of this study reexamined the suggested Courses of Action to address the bulkhead center-post anchor bolt problem throughout the Little Rock District (SWL) navigation lock inventory. The authors performed a detailed investigation of the problem, including an exploration of solutions that have already been proposed. The authors first investigated the proposal to add weight to the bulkhead system to resist overturning of the center-post, as this seemed to be a straight-forward solution with minimal discussion in the available documentation. Calculations were performed to determine the necessary weight needed to successfully realize this course of action. The calculations led to a concurrence with the design charrette that adding weight to the system to resist overturning would be infeasible, primarily due to the extreme magnitude of weight that would be required.

An option that the authors did not find discussion on was the fabrication of new bulkheads to a) utilize the existing bulkhead recess without the need for further modification and b) be lighter to accommodate limited crane capacities. The investigation found evidence that, if new 110' bulkheads are considered, the existing recesses on the lock chamber walls may have sufficient strength without the need for further retrofit. Moreover, if new bulkheads are designed to be compatible with the existing recesses, then the authors suggest exploring options to design lighter bulkheads that are also compatible with the crane weight limitations. Ultimately, the authors herein recommend SWL consider fabrication of new bulkheads that are lighter and designed around the unique constraints found on the SWL projects. This design option will eliminate the need to modify the existing bulkhead recesses, assuage concerns about crane capacity, and likely be considerably cheaper as it is assumed that one set of stop logs can be utilized at all sites.

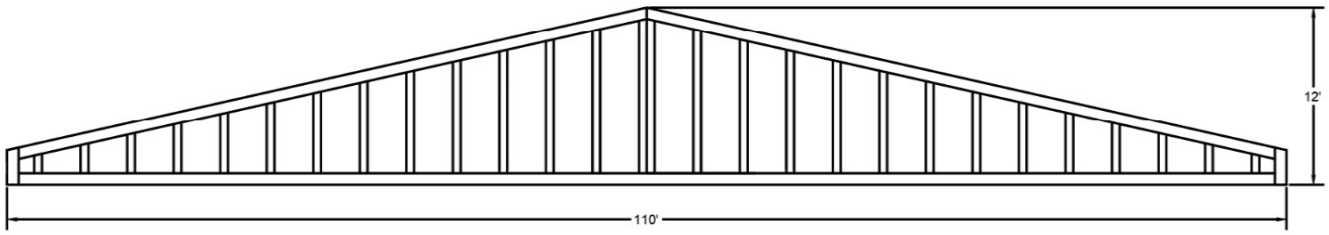

Figure 1. Plan view of conceptual composite bulkhead

Period of Performance:

11FEB2019 through 26JUL2019

Benefits of the Response to the USACE Dredging/Navigation Program:

The team's response has the potential to significantly reduce the current projected rehabilitation cost of 100 million dollars and additionally reduce the projected 20 year completion time.

Deliverable:

An ERDC Letter Report was generated as well as several follow-up meetings to finalize a path forward to ultimately decide on the feasibility of the team's findings.

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