



## ERDC Dredging Operations Technical Support Program (DOTS)

U.S. ARMY CORPS OF ENGINEERS

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### Response Summary:

USACE Nashville District (LRN) requested an ERDC site visit to Wheeler Lock located in Rogersville, AL. The site visit included an evaluation of frequently impacted locations along the concrete lock walls that could potentially benefit from the use of ultra-high-performance concrete (UHPC) as a repair material. These impacted areas included steel-armored corners within the lock and the bullnose of the upstream guidewall. Wilson Lock, located nearby, was also surveyed as part of this effort. Dr. Stephanie Wood and Mr. Tom Hood were in attendance from ERDC.

### Period of Performance:

The site visit took place on 11 July 2023.

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

This response benefits the Navigation Program by fostering collaboration and knowledge share between USACE Districts and ERDC. UHPC is a validated, high-strength candidate material that has been used extensively in military engineering applications and precast transportation bridges by the Federal Highway Administration (FHWA). In civil works applications, UHPC is expected to improve navigation lock durability against both external loads from navigation contact and internal concrete deterioration mechanisms. Laboratory testing indicates that the use of UHPC will eliminate the need to use steel armor that often detaches from the lock wall concrete. The goal of this work is to reduce the frequency of concrete repair activities and the costs associated with those repairs. This visit also provided the ERDC with in-person observation of these and other concrete-related challenges that face USACE Districts so that those issues are factored into future research.

### Deliverable:

The deliverable for this work was an on-site meeting with LRN personnel, including engineers and lock operators. Follow-up discussions will include the feasibility of, and costs associated with, cast-in-place repairs using UHPC.

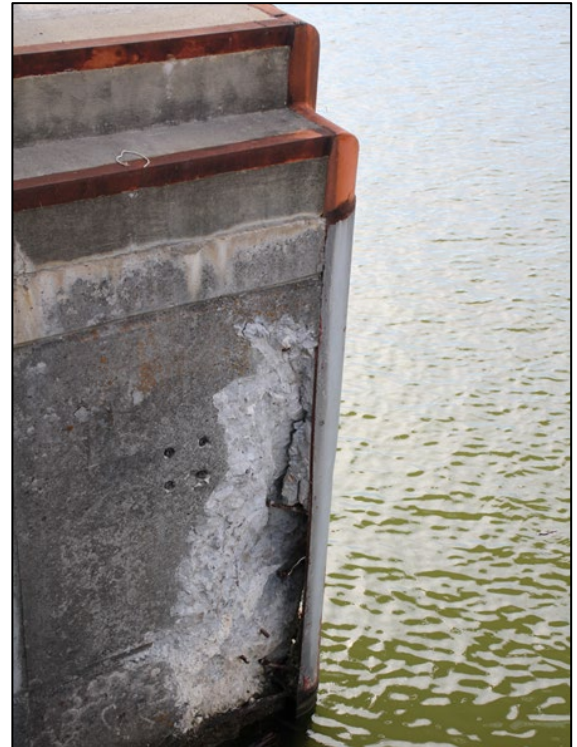


Figure 1. Crushed concrete on corner of miter gate recess at Wheeler Lock.



Figure 2. Crushed concrete on the bullnose of the upstream guidewall at Wheeler Lock.



Providing environmental and engineering technical support to the U.S. Army Corps of Engineers Operations and Maintenance navigation and dredging missions

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