

Upper Mississippi Locks 22 and 25 Concept Study

Upper Mississippi River

Owner: USACE, Rock Island District

Description: INCA Engineers, Inc., A Tetra Tech Company (INCA) completed this concept study in 2005 for the Rock Island District, which followed work previously performed in 2000 to design 118-foot long post-tensioned concrete box beams for new lower guide walls on the Upper Mississippi River. Both design efforts required close coordination with Rock Island and St. Louis Districts.

The Upper Mississippi Lock Concept Study was completed under the framework of the Navigation Ecosystem Sustainability Program (NESP). It represented an initial study within the site-specific development of the Design Documentation Reports for a new 1,200-foot lock at Locks 22 and 25. The new lock will be located downstream of the existing auxiliary lock miter gate bay, referred to in previous Upper Mississippi River - Illinois Waterway (UMR-IWW) reports as Location 3. This study independently developed recommended lock concepts at Lock 22 and Lock 25 on the Upper Mississippi River. Lock 22 was selected as representative of a typical rock-founded lock; Lock 25 was a prototype for a sand-founded site on the Upper Mississippi.

INCA prepared design criteria, developed lock concepts, evaluated the new lock alternatives, prepared preliminary construction schedules (including considerations of required closures of the existing lock), and completed quantity take-off and planning level cost estimates.

INCA prepared concept plan drawings for the following elements:

- ▶ Lock layouts, including fill/empty system and construction sequence
- ▶ Lock wall plans and sections
- ▶ Miter gate sills
- ▶ Lower bulkhead sill (in-the-wet construction)
- ▶ Fabrication, installation, and connection details
- ▶ Floor system and pile-founded struts at the sand-founded prototype lock

INCA met the aggressive schedule required for this project, completing all work in six months. At the end of the study, INCA participated in a lock concept selection meeting with Rock Island, St. Louis, and St. Paul Districts. INCA recommended a lift-in precast concrete alternative for the new lock wall designs, and this general concept was selected as the basis for future design phases. In performance evaluations for this task order, INCA received an overall rating of Excellent and our design services were rated at Outstanding in all categories.

"This project required flexible and good coordination between A-E and Government, which was achieved. The design ideas were well thought out and developed. The design reports were detailed and well written."

Mark Hoague
Asst. Chief, Engineering Division
USACE, Rock Island District

