

Lock 52 Upper Guide Wall Resurfacing

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Background

- Lock 52's 1200' TEMPORARY chamber was conducted in 1969 to help with traffic for 15-25 years until Olmsted was finished.
- It is now 46 years later.
- The upper guide wall consists of a concrete wall resting upon a sheet pile cell foundation.
- 4-6" of lost concrete has been noted on the wall causing wear to the supporting cells



Location



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Pre work - Condition

Shaved off
ladder recess

Worn sheet pile
Cell and loss of
Fill material



Exposed rebar
Indicating 4-6"
material loss



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Pre work - Condition



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Thought Process

- Wear to existing wall was not causing a navigational issue, however wear to the supporting cells was causing some fill loss.
- Cell stability was not yet in question, however, continued wear could cause interlock failure.
- Resurfacing with UHMW panels was thought to be an effective approach for a temporary repair.
- Installation time was a primary concern as it would likely require a lock closure.



Design Process

- Design was performed by LRL's navigation design team
- Wall was analyzed for a typical tow impact of 39,000 tons per ETL 1110-2-563. Frictional force per sheet ended up being 70 kips.
- Thermal expansion was a considerable design force and ended up influencing anchor design more than the impact friction.



Design Process

- Panels were made of a 4" sheet of UHMW bolted to a 2" sheet of UHMW to make the desired 6" thickness. A 6" sheet was much higher cost.
- Hilti HVU anchoring system was selected for high strength and faster cure times.



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Design Process

- Work access was an important consideration. Custom platforms were constructed and mounted to our barges.



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Installation

- 71 Total 8' Long UHMW Panels were installed, with 2 Steel Ramp plates at the beginning and end.
- Panels were mechanically anchored initially then drilled for adhesive anchors
- Installation took 9 days of the entire LRS crew working two shifts.
- Originally scheduled for 2-10day closures, with a partial crew, however, water conditions prevented the other job.



Costs

- LRS Crew and Labor – approx \$400k
- UHMW Sheets - \$233k
- Hilti Glue and All Thread - \$83k
- Total Cost \$716k



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Installation



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Questions?



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