

# Chickamauga Lock Gate Anchorage Replacement

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2010 Lock Maintenance Workshop  
St Louis, MO  
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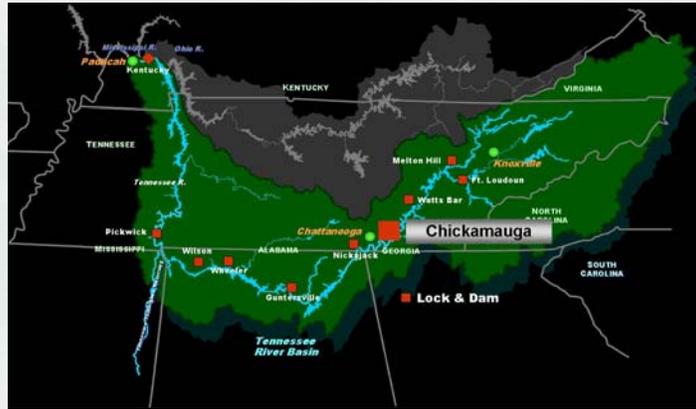
## Chickamauga Lock

- Location: 7 miles upstream of Chattanooga, TN on the Tennessee River
- Construction: Opened to traffic in 1940 by TVA
- Chamber: 60 ft. x 360 ft. with a 53 ft. lift



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# Chickamauga Lock



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# Background



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## Background - Monolith 47



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## Background - Monolith 47

- Major cracking due to Alkali-Aggregate Reaction (AAR)
- Horizontal post-tensioned anchors were installed in 1988
- Vertical post-tensioned anchors were installed in 1997



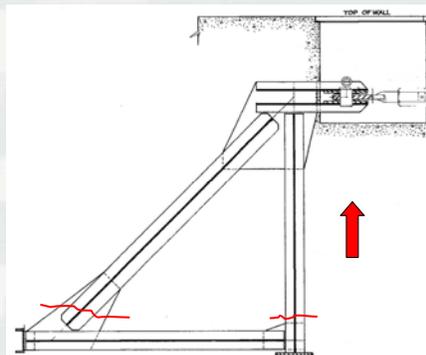
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## Background - Design



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## Background - Design

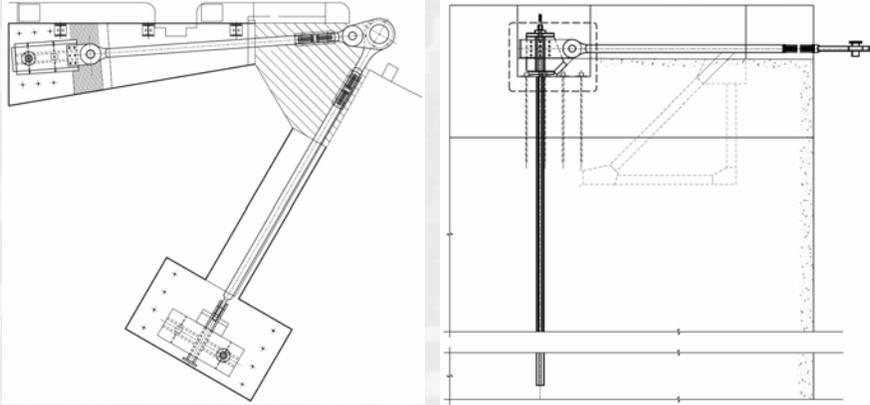


- Finite element analysis determined the anchorage may have seen enough stress due to AAR to crack the embedded frame.



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## Background - Design



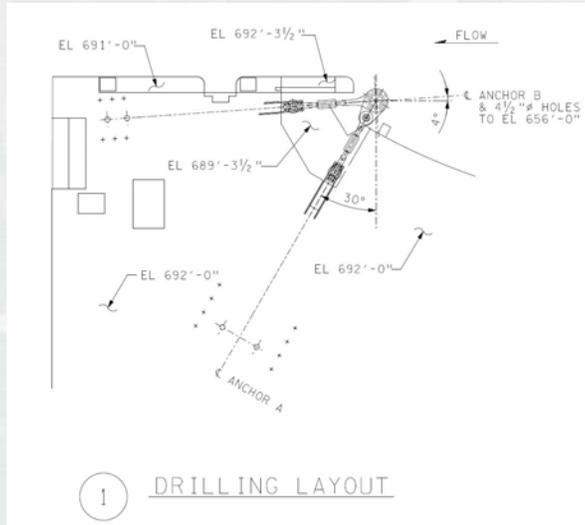
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## Horizontal Post-Tensioned Anchors



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# Drill Hole Locations



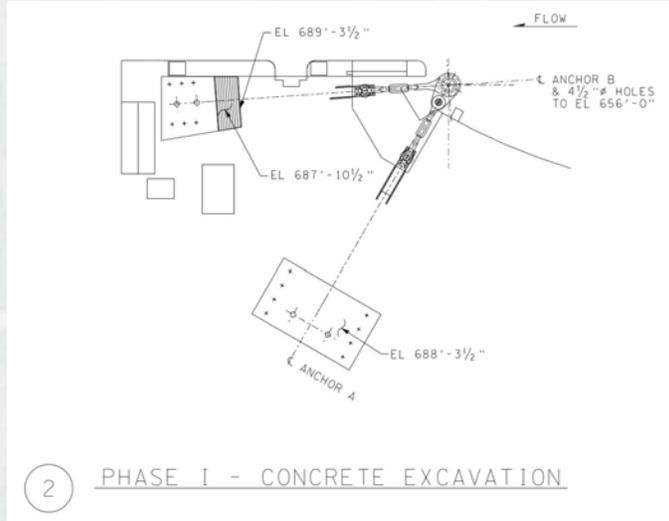
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# Drill Hole Locations



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# Concrete Excavation – Phase 1



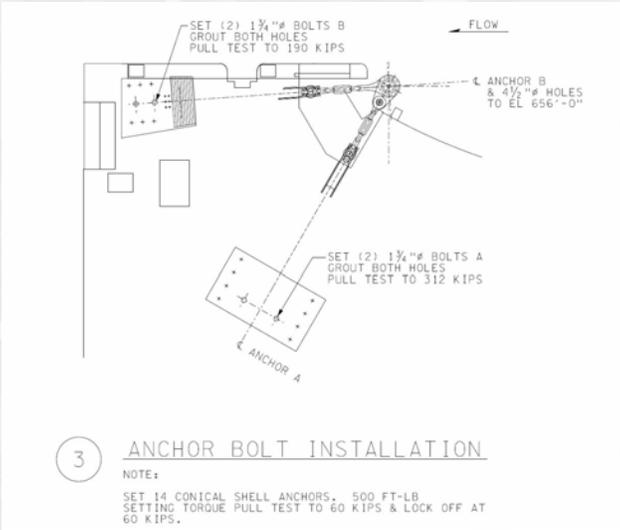
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# Concrete Excavation – Phase 1



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# Anchor Bolt Installation



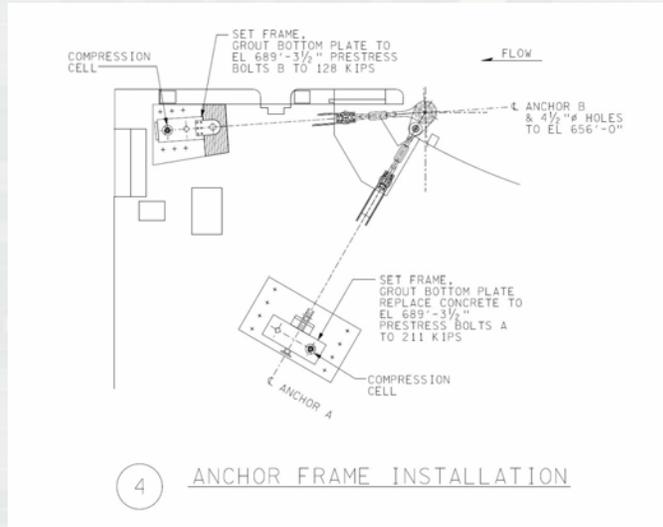
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# Anchor Bolt Installation



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# Anchor Frame Installation



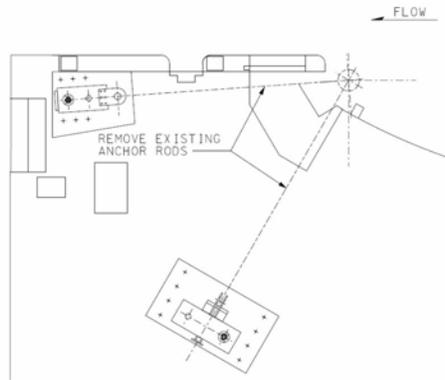
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# Anchor Frame Installation



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# Anchor Rod Removal

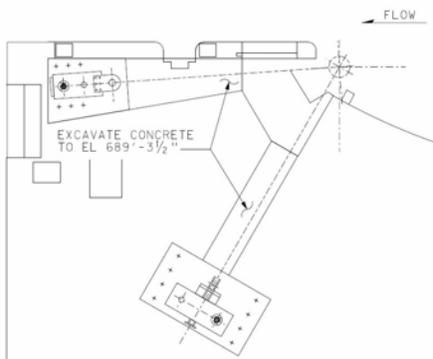


5 ANCHOR ROD REMOVAL



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# Concrete Excavation – Phase 2



6 PHASE II - CONCRETE EXCAVATION



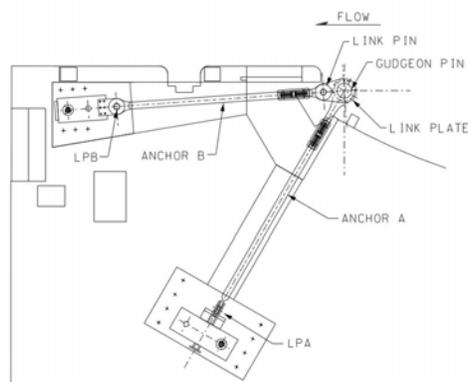
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## Concrete Excavation – Phase 2



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## Anchor Rod Installation



7

ANCHOR ROD INSTALLATION



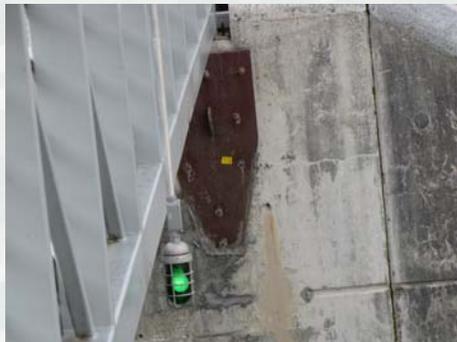
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## Anchor Rod Installation



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## Pedestrian Bridge Reinforcement



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# Instrumentation

- Load Cells
- Proximity Probes
- Load Pins



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# Grating Frame



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## Grating



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## Results

- Total project time: 23 Feb – 29 May
- Scheduled outage time: 14 days
- Actual outage time: 8 days



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# Conclusion

- **Finite Element Analysis:**  
Hatch Acres (Dan Curtis)
- **Engineering/Design:**  
Inca Engineers  
Gapos Engineering (Tom Bucy)
- **Drilling:**  
Swift Creek Inc.(MATOC) / Arcadis / Tri-state drilling
- **Metal Fabrication:**  
Hardie-Tynes Co.



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# Conclusion



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# Questions



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