Innovative Geotechnical Aspects of the New Champ Clark Bridge

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The Champ Clark project is located in Louisiana, Missouri
The original Champ Clark bridge was quite an ambitious project in the 1920s.
HNTB partnered with MODOT on the original Champ Clark bridge

Harrington, Howard, and Ash (HNTB predecessor)

Their Job Was to See that the Bridge Was Built Right

Harrington was first to envision the bridge as a reality
A robust team made the original Champ Clark bridge a reality.
The existing Champ Clark Bridge was not designed for modern vehicles.
<table>
<thead>
<tr>
<th>Planning</th>
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<tbody>
<tr>
<td><strong>Environmental Assessment:</strong></td>
<td>Performed jointly by MODOT and IDOT</td>
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<tr>
<td><strong>Funding Sources:</strong></td>
<td>2015 TIGER Grants + 2016-2021 STIP</td>
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<th>Design and Construction</th>
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<tbody>
<tr>
<td><strong>Design-Build Engineer:</strong></td>
<td>HNTB</td>
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<tr>
<td><strong>Design-Build Contractor:</strong></td>
<td>Massman Construction</td>
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<tr>
<td><strong>PDA Testing Subcontractor:</strong></td>
<td>Foundation Testing Consultants (FTC)</td>
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An extensive geotechnical investigation was performed at the Champ Clark site.
The new Champ Clark Bridge is a very interesting project geotechnically.

- Spread Footing on Rock
- 48” O.D. Pipe Piles to Rock
- 11.5’ Dia. Drilled Shafts with 11.0’ Dia. Rock Sockets
- H-Piles to Rock
Drilled Shafts
Driven Pile

Delmag D30-32
75.4 kip-ft rated energy
6.6 kip ram weight

\[ R_{ndr} = 2865 \text{ kips} \]
\[ R_{ndr, \text{ min}} = 2070 \text{ kips} \]

Delmag D62-22
164.6 kip-ft rated energy
13.7 kip ram weight
100% PDA testing

\[ R_{PDA, \text{ min}} = 2099 \text{ kips} \]
What does it cost to build a bridge?

Original Champ Clark Bridge
$1.0 M in 1926 = $14.3 M in 2018

New Champ Clark Bridge
HNTB Winning Bid of $60 M in 2017

More Traffic  Higher Loads
Taller Bridge  Wider Deck
MODOT on Current Status of Bridge
Thank You!
Geotechnical challenges were encountered at the East Approach Embankment

**ESTIMATE REMAINING SETTLEMENT FROM SETTLEMENT PLATE DATA USING THE ASAOKA METHOD (1978)**

**Evaluation of Data for Settlement Gauge G5**

\[ y = 0.8789x + 2.0929 \]

\[ R^2 = 0.979 \]