

# Innovative Geotechnical Aspects of the New Champ Clark Bridge

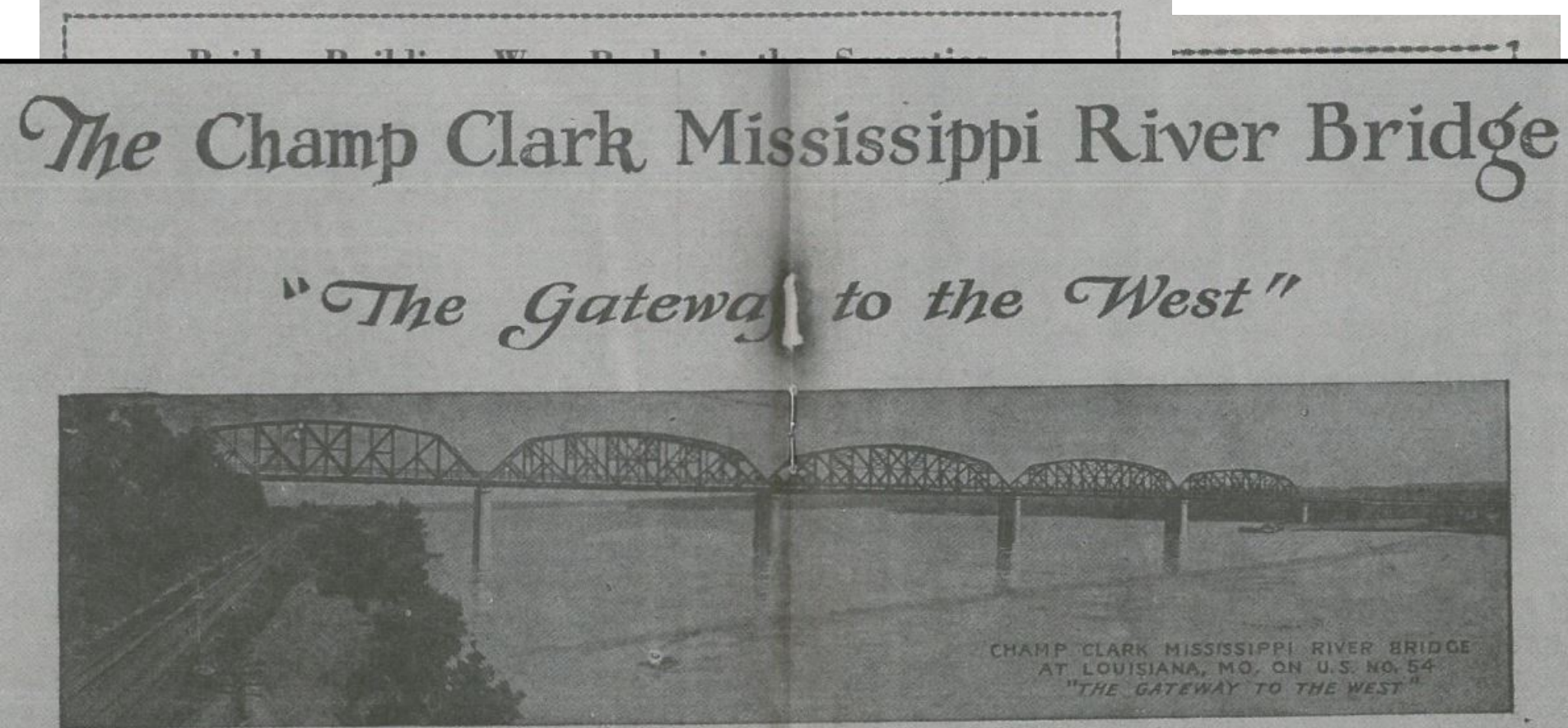


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# The Champ Clark project is located in Louisiana, Missouri



The original Champ Clark bridge was quite an ambitious project in the 1920s



Picture of the Chicago and Alton Railroad Bridge at Louisiana which was taken a short time after the bridge was completed in December, 1873.

ie Two Pikes Ferry, at the Landing at the Foot of Tennessee Street.



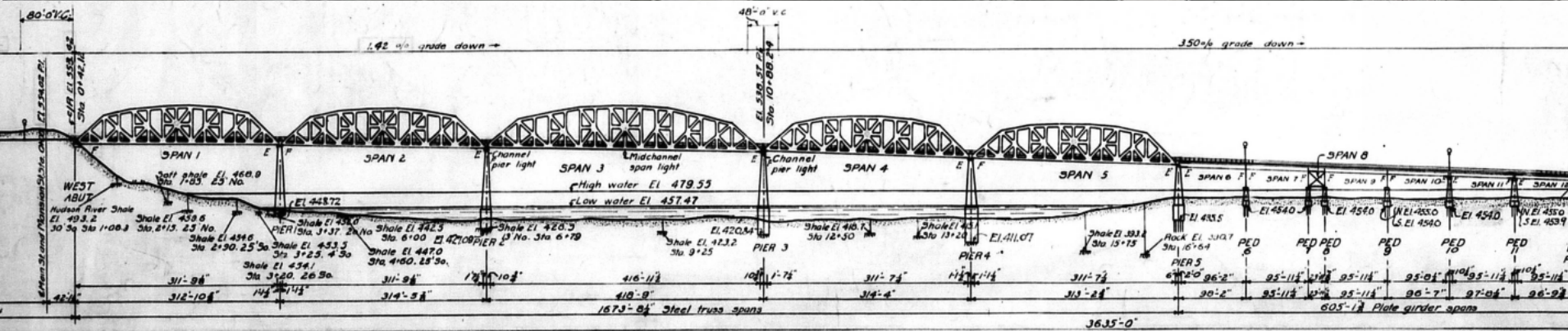
# HNTB partnered with MODOT on the original Champ Clark bridge

Harrington, Howard, and Ash (HNA)

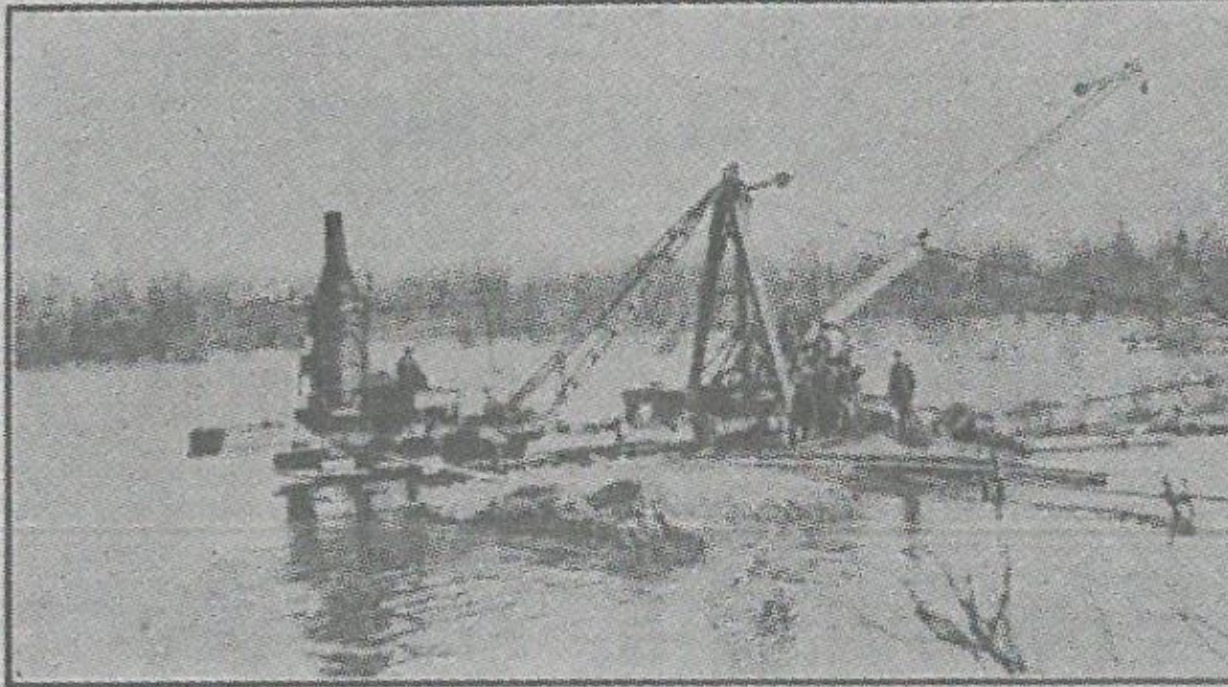


Harrington was first to envision the bridge as a reality

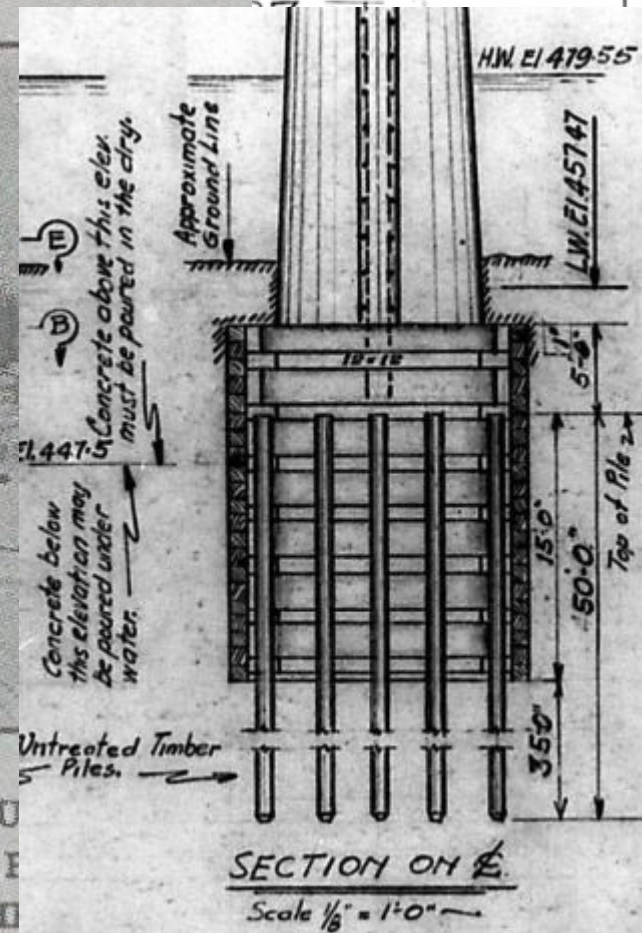
Their Job Was to See that  
the Bridge Was Built Right



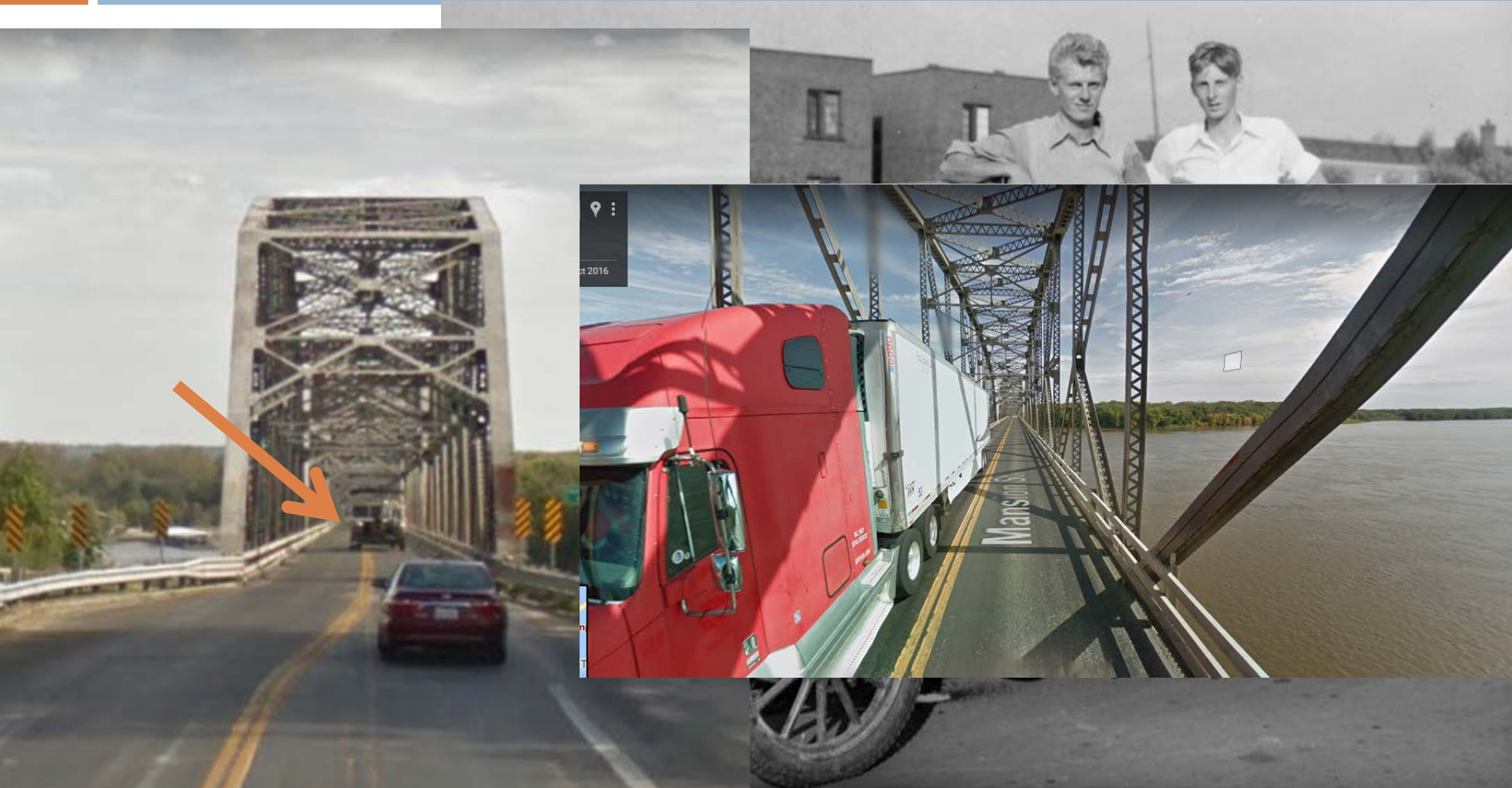
# A robust team made the original Champ Clark bridge a reality



MISSOURI VALLEY COMPANY WORKING UNDER DIFFICULTY DURING HIGH WATER IN SPRING OF 1927. DRIVING PILES FOR TRAMWAY NEAR THE LOCATION OF PIER 5 ON THE MISSOURI SIDE OF THE RIVER.



# The existing Champ Clark Bridge was not designed for modern vehicles



# A robust team is making the new Champ Clark bridge a reality

## Planning

Environmental Assessment: Performed jointly by MODOT and IDOT

Funding Sources: 2015 TIGER Grants + 2016-2021 STIP

## Design and Construction

Design-Build Engineer: HNTB

Design-Build Contractor: Massman Construction

PDA Testing Subcontractor: Foundation Testing Consultants (FTC)

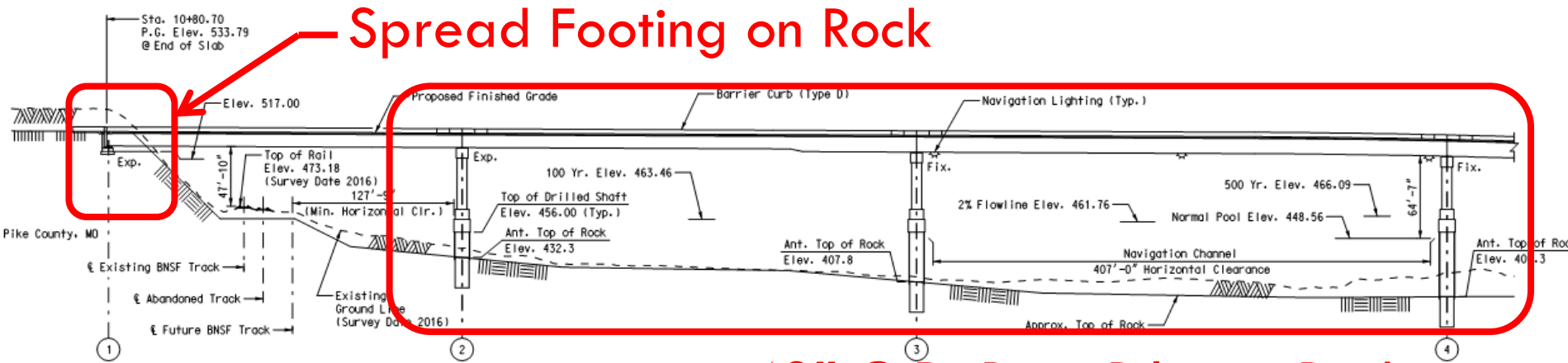


# An extensive geotechnical investigation was performed at the Champ Clark site



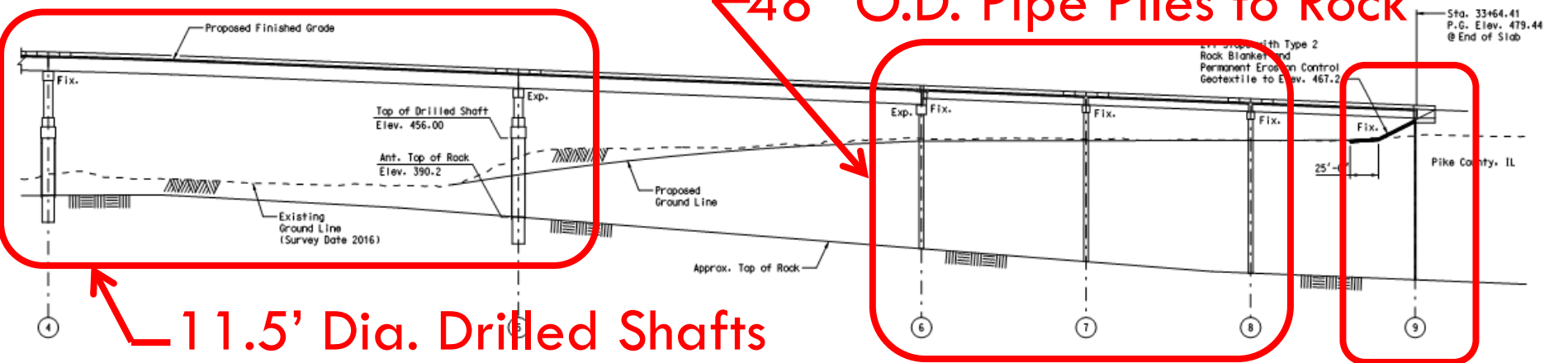


# The new Champ Clark Bridge is a very interesting project geotechnically



**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 rate  
6.6 kip ram we



Delmag D62-22

164.6 kip-ft rated energy

13.7 kip ram weight

100% PDA testing

$R_{ndr} = 2865$  kips

$R_{ndr, min} = 2070$  kips

$R_{PDA, min} = 2099$  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

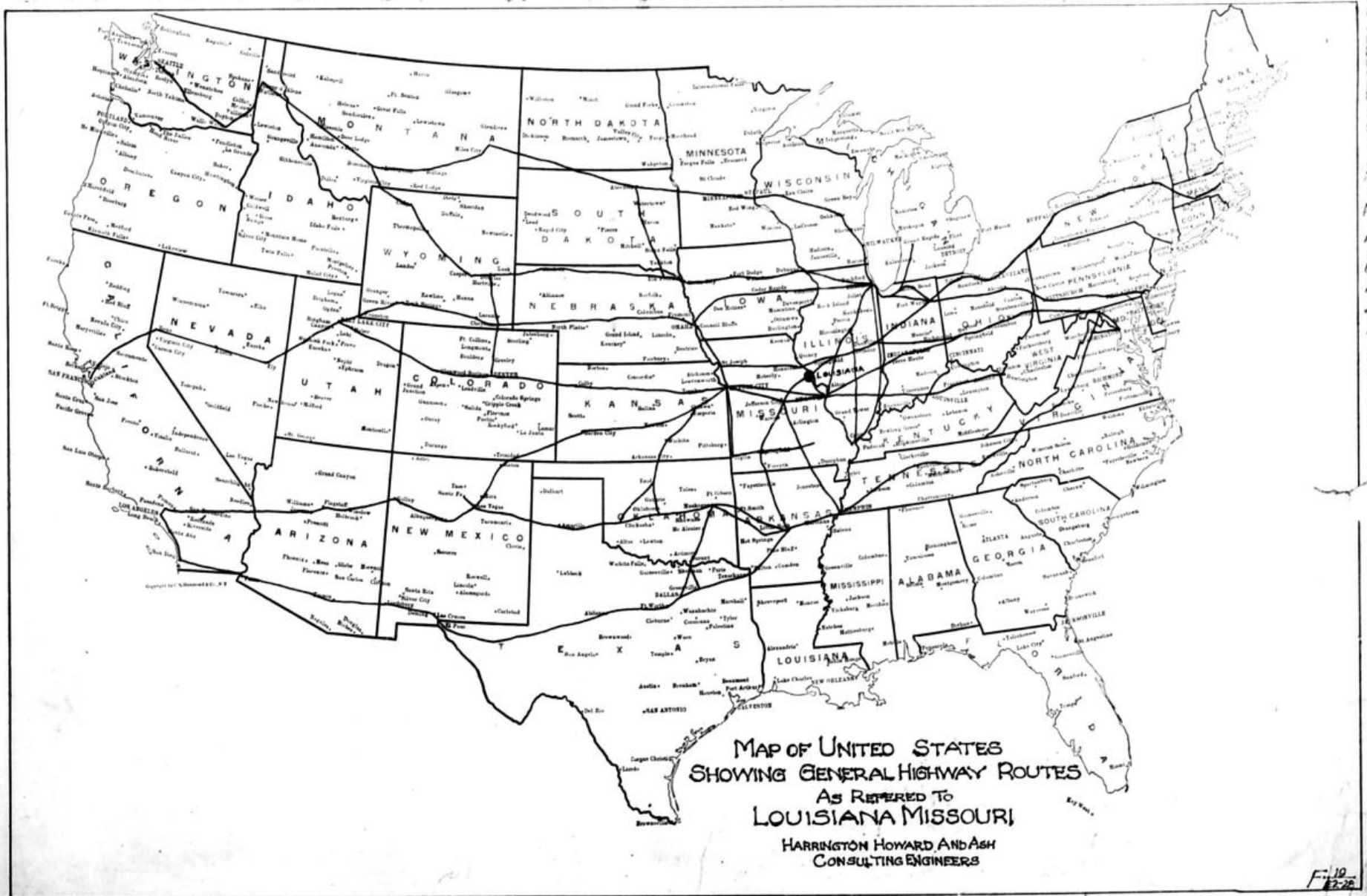
More Traffic  
Taller Bridge

Higher Loads  
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)

