

A Beginner's Guide to:

I-794 BRIDGES

Fall 2014 Edition

Look inside
for the history
of the Hoan Bridge,
construction in the
classroom, and
much more!

Wisconsin Department of Transportation

SO HOW DOES THIS ALL APPLY TO THE BRIDGES ALONG I-794?



The I-794 Lake Freeway / Hoan Bridge Project is underway to extend the life of the Hoan Bridge and ensure it maintains its structural integrity. Work is also underway to replace the eastbound and westbound I-794 bridge structures from Broadway to the Milwaukee River.



The arches of the Hoan Bridge create a truly remarkable backdrop for Milwaukee's skyline, but these arches are not simply for decoration. These curved structures span the bridge in order to support the massive weight of the structure. Bridge repairs and continued maintenance will safeguard against common bridge destroyers that have occurred over the years, such as excess tension and compression, torsion, shear stress, resonance, and weather.



The eastbound and westbound bridges along I-794 were originally constructed as concrete box girder bridges. For this type of bridge, the deck, or travel surface, is part of the structural element referred to as a girder.

These bridges are being replaced with a structure that includes steel girders with a cast-in-place deck on top. The new design will better accommodate standard maintenance practices with the intent of producing a longer lasting bridge.

Construction Dictionary:

A basic understanding of bridge speak

Abutment:

Part of a structure which supports the end of a span or accepts the thrust of an arch; often supports and retains the approach embankment.

Column/Pier:

An upright support for a structure or superstructure.

Deck:

The top surface of a bridge which carries the traffic.

Footing:

The enlarged lower portion of the substructure or foundation which rests directly on the soil, bedrock, or piles; usually below grade and not visible.

Girder:

A horizontal structure member supporting vertical loads by resisting bending. A girder is a large beam made of multiple metal plates. The plates are usually riveted or welded together.

Parapet:

A low wall along the outside edge of a bridge deck used to protect vehicles and pedestrians.



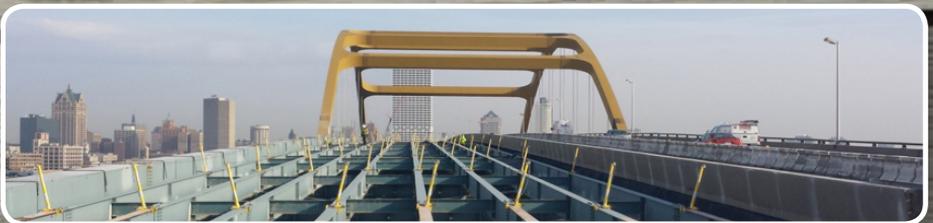
DECKING FORMS

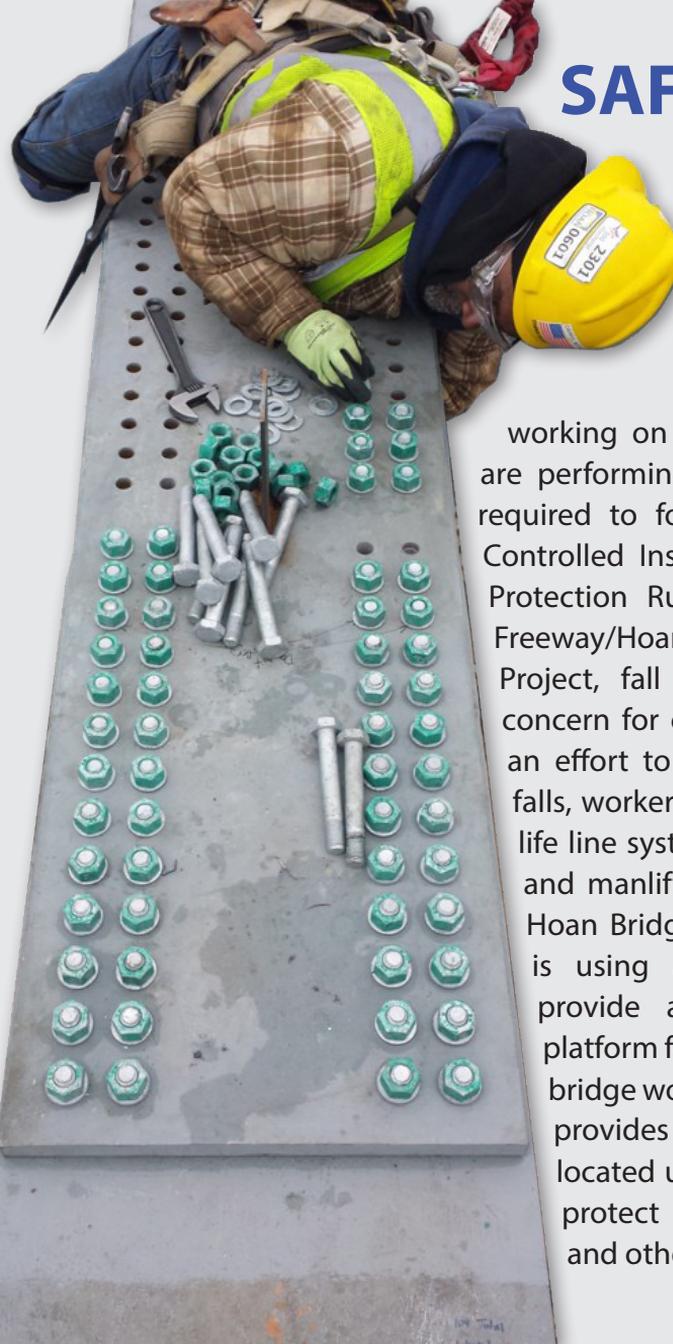


FOOTING & COLUMN



GIRDER





SAFETY FIRST

The potential hazards associated with bridge construction are well recognized. Serious injuries, or even death, can occur from falls or other incidents while

working on a bridge. Workers who are performing duties at heights are required to follow the OCIP (Owner Controlled Insurance Program) 6' Fall Protection Rule. On the I-794 Lake Freeway/Hoan Bridge Rehabilitation Project, fall protection is a major concern for construction workers. In an effort to minimize exposures to falls, workers are utilizing horizontal life line systems, guard rail systems, and manlifts. I-794 Lake Freeway/Hoan Bridge Rehabilitation Project is using a Safespan system to provide a safe, elevated work platform for workers doing various bridge work. The Safespan system provides shielding for areas located under the bridge to help protect from demolition debris and other hazards.

A LOOK BACK: HOAN BRIDGE

The Daniel Hoan Memorial Bridge is a tied arch bridge that connects I-794 in downtown Milwaukee, Wisconsin, to the Lake Freeway across the Milwaukee River inlet.

Construction started:
1970

Opened:
1977

Total length:
10,032 feet

Architect firm:
HNTB

The Hoan Bridge is referred to as a tied-arch bridge. A tied-arch bridge is an arch bridge in which the outward-directed horizontal forces of the arch, or top chord, are borne as tension by the bottom chord (either tie-rods or the deck itself), rather than by the ground or the bridge foundations. These types of bridges can be prefabricated off site, and subsequently floated, hauled or lifted into place.



CONSTRUCTION IN THE CLASSROOM

I-794 LAKE FREEWAY/HOAN BRIDGE PROJECT BY THE NUMBERS

3 million sq. feet of painting

equal to 55 football fields

...

The Lake Interchange carries

around 74,900 vehicles per day

while

The Hoan Bridge carries

around 40,000 vehicles per day

...

35 years old

*age of the Hoan Bridge at
reconstruction*

...

11 million pounds of rebar

equal to 2,000 miles

*(this is enough to extend from
Milwaukee to Los Angeles)*

3.5 miles

length of the I-794 Lake Freeway

...

42,000 cubic yards of concrete

equal to 8.5 million gallons of milk

...

3 million tons of cargo

*annual amount processed by
the Port of Milwaukee, which is
serviced by the Lake Interchange*

...

40 to 50 years

*extended life of bridge after
improvements are made*

