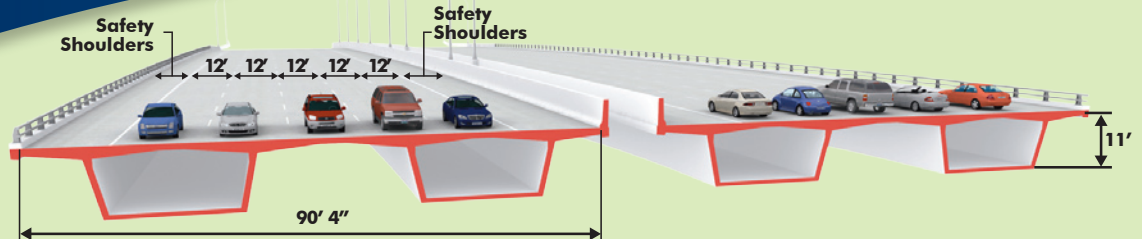
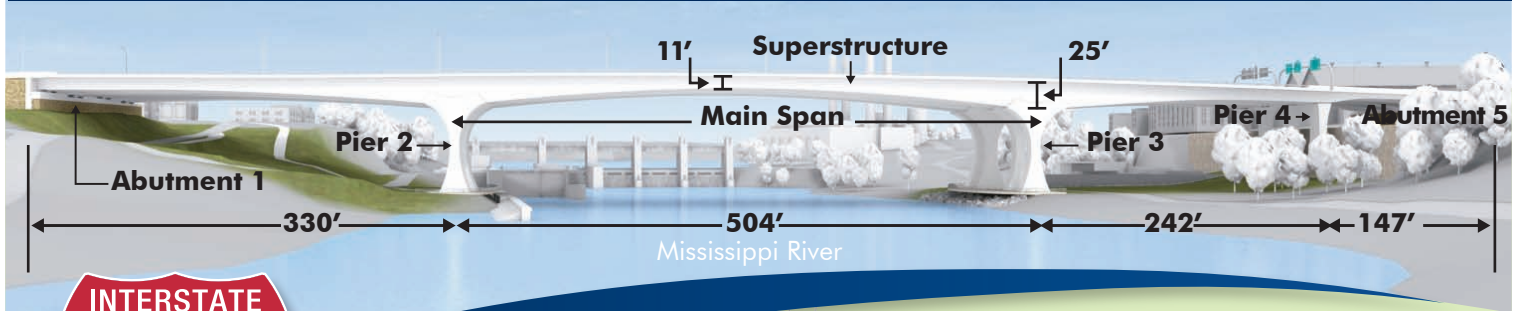


I-35W ST. ANTHONY FALLS BRIDGE



9 KEY STEPS OF MAINSPAN CONSTRUCTION

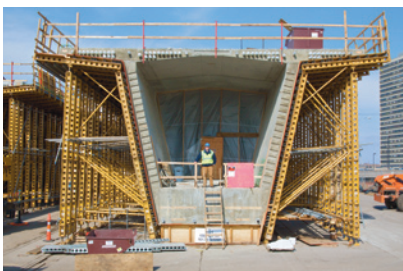
Constructing the 504' main span over the Mississippi River – The new bridge consists of two adjacent structures; one will carry northbound traffic and the other southbound traffic. Each structure has two box girders, thus there are four 504' spans being built concurrently. Prefabricated concrete sections, called segments, were cast in the shape of the box girder.

The main span over the river is being built using cantilever construction. This construction method

means that the segments are placed in sequence starting at the main piers until the sides meet in the middle.

The segments are held together with over a thousand miles of high strength steel post-tensioning strands to provide multiple levels of redundancy. The steel strands are encased in grout, pipes and concrete for multiple layers of protection.

STEP 1 – PREFABRICATE THE CONCRETE SEGMENTS.



The main span segments range from 11' - 25' tall and weigh from 150 - 200 tons each.



Keys (circled in red) cast into each segment are used to align segments on the bridge so they fit together properly.

STEP 2 – TRANSPORT THE SEGMENTS.

The segments are picked up with a segment hauler and loaded onto trailers, which take them to the area next to the river on the south side.



STEP 3 – LOAD SEGMENTS FOR CONSTRUCTION OF THE MAIN SPAN.

The segments are lifted by “Bohemian Blue”, the large blue crane, and placed on barges which then meet up with “Big Ben”, the large ringer crane.



I-35W ST. ANTHONY FALLS BRIDGE



STEP 4 – LIFTING THE SEGMENT

"Big Ben" then lifts the segment into position in the cantilever.



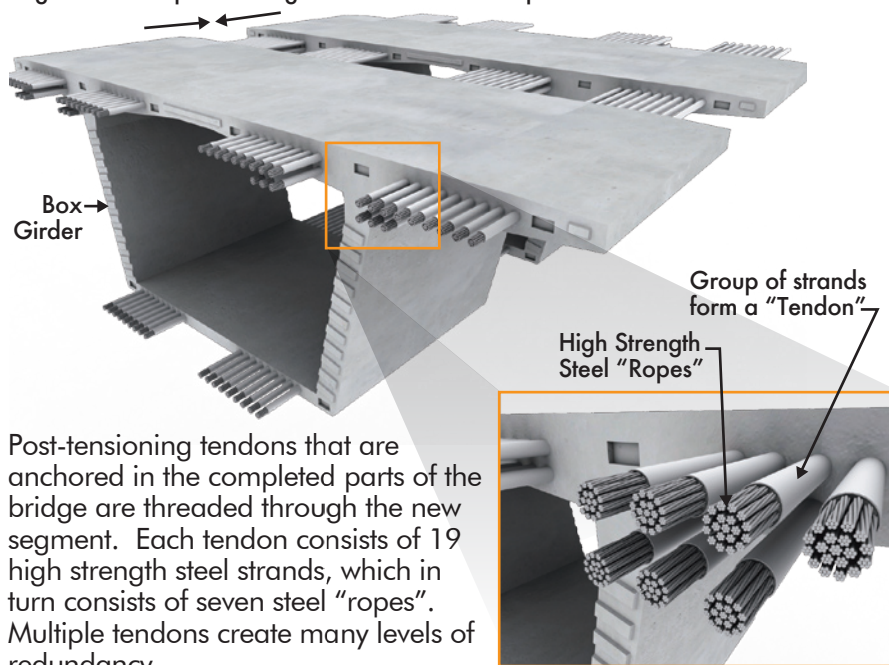
STEP 5 – POST-TENSIONING BARS ARE INSTALLED.

High strength steel post-tensioning bars are used to initially tie the segment to the previously installed segment.



STEP 6 – POST-TENSIONING TENDONS

Segments are squeezed together and locked into place



Post-tensioning tendons that are anchored in the completed parts of the bridge are threaded through the new segment. Each tendon consists of 19 high strength steel strands, which in turn consists of seven steel "ropes". Multiple tendons create many levels of redundancy.

STEP 8 – REPEAT ENTIRE PROCESS.

Segments will be set on both sides of the river sequentially, in all four box girders.

STEP 9 – CLOSURE JOINT.

Main span erection operations will continue until the box girders approach each other and meet in the middle of the span. The final concrete in the center of the spans will be cast-in-place, completing the bridge.

STEP 7 – STRESSING THE TENDONS.

Anchor



After the tendons are threaded through the segment, an anchor is positioned on the tendons, then a jack (silver piece of equipment) is used to pull the strands in each tendon to approximately a million pounds of force. Once the proper stress is attained, the wedges in the anchor prevent the strand from losing tension. The jack is removed and an anchor cap is put in its place.