WHERE CONCRETE MEETS BEDROCK

CONTRACTORS HAVE OPTION ON PIERS FOR RIVER BRIDGE

Engineers have completed about 75 percent of the design on the new Mississippi River Bridge, and have started finalizing design of the foundations for the bridge's piers (the portion of the bridge that will be in the Mississippi River.)

However, they are allowing the winning contractor to determine how to construct those foundations. Engineers are designing two different types of foundations; the winning contractor will indicate their choice as part of their bid.

"The costs of both a dredged caisson and a drilled shaft foundation are very close on the Mississippi River Bridge," said Randy Hitt, P.E., Missouri Department of Transportation MRB deputy project director. "We believe we can get more competition and a better price if we allow the contractor to pick from two foundations – both of which are effective."

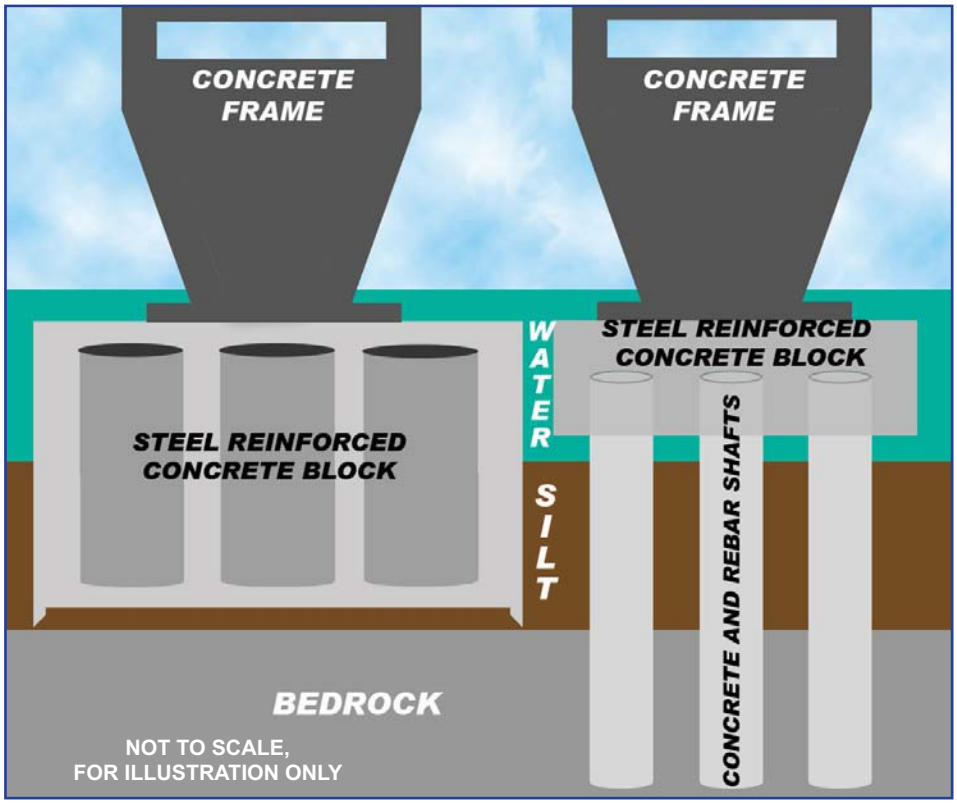
The two foundations look very different; the process to construct the two are slightly different, as well.

With the dredged caisson, crews will construct a special type of dam – called a cofferdam – in the river. They will then construct a caisson – a huge metal rectangle divided into smaller square sections – in the cofferdam.

Crews will remove the sand and silt under the caisson, which gradually lowers to the top of the bedrock. As the material is removed, water flows in to replace it. Once all the material is removed, crews will use a special process to pour the concrete, while removing the excess water. This process continues until the caisson is completely full of concrete.

When constructing a drilled shaft, crews drill into the bedrock and will use steel to form a casing to keep additional soil and debris out of the shaft. After the crews have finished drilling, they lower a mesh of rebar into the casing.

Crews will then pour a concrete mix around the rebar. In the current design for the river bridge, engineers have planned for 14 ten-foot diameter drilled shafts for the river pier foundations.



Contractors may construct either a dredged caisson (left) or a drilled shaft foundation for the new Mississippi River Bridge.

DID YOU KNOW?

- Although concrete and cement are normally used interchangeably, cement is an ingredient of concrete.
- Concrete does not dry -- it cures. Curing is the hardening process that occurs because of the chemical reaction between cement and water. Concrete needs to be kept moist during curing.
- Although concrete cures under water, flowing water can cause problems during the curing process.