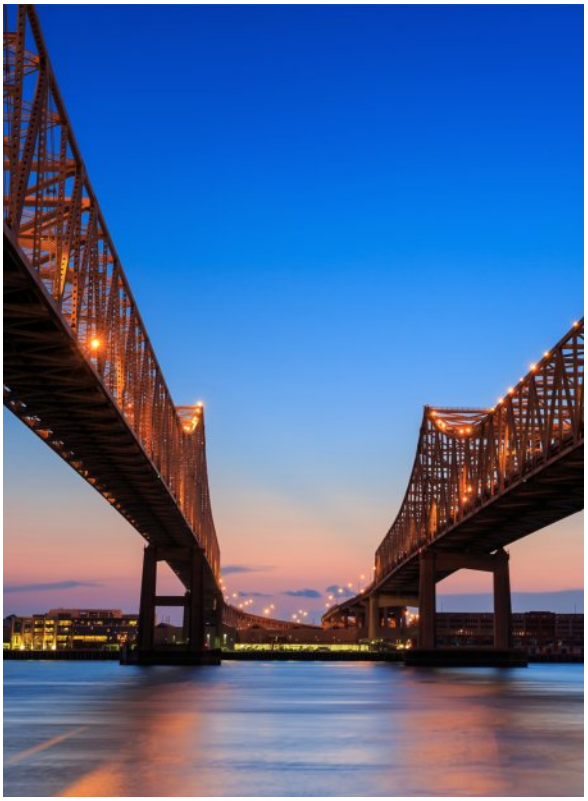
Bridging the Mighty Mississippi



As our nation doubles down on infrastructure spending, the condition, safety, efficiency, and reliability of our bridges has been brought to the forefront. Bridges serve as vital connections for millions of Americans and play a strategic role in connecting people and goods traveling throughout the country.

Connecting the Digital Divide

Few people take the time to consider another reason bridges are important to our country and to our economy. While millions of people cross bridges every day, there is also an abundance of data transmitted across them as well. Bridges are a vital link in the vast network of telecommunications conduit, fiber optic cable and wires that are transmitted across them. As consumers continue their demand for high-volume, high-bandwidth connectivity, bridges are helping to "bridge" the phenomenon we've come to know as the digital divide.

What Lies Beneath

With utility lines, telecommunications lines and various other cabling being attached underneath of our bridges, it makes you wonder what lies beneath these bridges and what it takes to get it there.

MaxCell® is helping deploy critical infrastructure on bridges, railway spans, viaducts and overpasses. The team knows the challenges related to installing telecommunications infrastructure under bridges and how bridges are playing a key component in our nation's connectivity.

Boring under a river can be time consuming and very expensive. It is much easier to deploy the critical communications infrastructure underneath existing or new bridges. There are some challenges though that bridges pose when installing pathways for fiber optic cables.

- There are weight load guidelines on what can be installed on bridges, which can limit the number of traditional pathways being furnished for communications cabling
- Space is usually limited so it makes for tight workspaces to maneuver materials and equipment
- Bridges are exposed to the elements so communications infrastructure must be protected from outdoor

exposure to harsh weather, salt water, and moisture

- Bridges expand and contract on a regular basis as a result of temperature variances, so the product associated with a communications installation on a bridge must not be affected by temperature variations
- When deploying infrastructure on bridges you must meet all standards as determined by the individual project requirements. This means that the product being used for bridge-related infrastructure installations must meet local, State and/or Federal DOT jurisdiction requirements specified for any of these projects
- Many bridge-related infrastructure project installations are considered dangerous as they are usually over water and/or are at higher elevations
- Under bridge installations can become a choke-point for critical communications cabling deployments
- Much of the infrastructure work under the bridges is done at night so as to lesson bridge delays caused by the construction

But why would the flexible, multi-celled fabric innerduct solution from MaxCell be the perfect solution for bridges, viaducts, railway spans and overpasses? It is specifically designed for network construction and for easy pathway creation. The unique fabric construction allows MaxCell to conform to the shape of cables placed within, greatly reducing the wasted space associated with rigid innerduct. MaxCell occupies 1/7th of the volume of HDPE which allows installers more room to maneuver in tight workspaces. With space constraints a problem on bridge-related installations, using this MaxCell product is a game changer.

Another benefit to MaxCell is its 1/8th of the weight of traditional HDPE while providing as much as 3X the pathways. This minimizes the weight load on bridges.

The MaxCell team has had many engineers tell them that they prefer to utilize the MaxCell flexible fabric innerduct on their bridge installations because it expands and contracts 8X less than polyethylene conduit.

While the MaxCell product has been used on bridge-related communications projects for decades, there are some that have been more interesting than others. For example, the bridges that span the mighty Mississippi River show the versatility and flexibility of the solution.

Crescent City Connection – formerly the Greater New Orleans Bridge (GNO), is the firth-longest cantilever bridge in the world and the farthest downstream bridge on the Mississippi River. This bridge opened for traffic in 1958 and is the fifth most traveled bridge in the U.S. It is also the widest and most heavily traveled bridge on the lower Mississippi. They recently completed an installation of approximately 20,000 feet of MaxCell across this span. Starting on one side of the river, they ran the MaxCell flexible fabric innerduct up the bridge columns and across the entire length of the structure across the Mississippi River, and ultimately ended at the Ernest N. Morial Convention Center. As the project traversed this span, it had multiple bends and turns that had to be made to complete the process. Mike said that in one particular 500 foot cable run, there were six 90 degree bends that needed to be made. While this does not follow industry recommendations by

the NEC and BICSI (not more than three 90 degree bends in an approximate 400 foot run), it was necessary because of the tight working constraints on this installation and limited access for the usage of cherry pickers or other equipment under the bridge.

Vicksburg, MS Railroad Bridge – was originally built in 1930 for use as both a railroad bridge and for motor vehicle traffic. It was the first bridge over the Mississippi River south of Memphis. It transitioned to being utilized as a railroad bridge in the late 1990's and is still a vitally important railroad bridge. It spans the Mississippi River between Delta, Louisiana and Vicksburg, Mississippi and is used by the Canadian Kansas City Railway. There is approximately 20,000 feet of MaxCell that has been installed to carry communications infrastructure underneath the span of this bridge to transmit critical shipping information for multiple railroad companies.

Hale Boggs Memorial Bridge (also known as the Luling-Destrehan Bridge) – is a cable-stayed bridge over the Mississippi River in St. Charles Parish, Louisiana. With a total length of 10,699 feet (3,261 m; 2.0263 mi) it is one of the longest bridges in the world. This bridge also has over 20,000 feet of MaxCell installed underneath it to provide a pathway for communications infrastructure. Some sections of this project resulted in long pull lengths, with one particularly long pull of approximately 3,000 feet.

Sunshine Bridge – is a cantilever bridge over the Mississippi River in St. James Parish, Louisiana. This bridge is a convenient river crossing for residents of Baton Rogue and plays an important role in storm evacuation and in industrial development along the Mississippi. Besides providing a transportation route to and from this area, this bridge is also being utilized to carry communications infrastructure along the same route across the water. MaxCell's flexible fabric innerduct was attached to the bridge to provide the pathway for the cabling to cross the river at this point.

I-10 Lake Pontchartrain Bridge – consists of twin parallel concrete raised bridges. These parallel bridges cross the eastern end of Lake Pontchartrain in southern Louisiana from New Orleans to southeastern Louisiana. In the last decade, over 120,000 feet of MaxCell flexible fabric innerduct has been installed on this bridge. The pull boxes were built into the bridge and spaced roughly 2,500 feet apart. The Louisiana DOT liked using MaxCell for this particular project because it does not have the thermal expansion and contraction problems that can be experienced with traditional HDPE installations.

Gramercy Bridge (officially known as the Veterans Memorial Bridge) – is a cantilever bridge over the Mississippi River connecting Gramercy, Louisiana to St. John the Baptish Parish. It is the second newest Mississippi River bridge in Louisiana. This bridge is 165 feet above the water and is 3,101 feet long. This was a challenging deployment as reels of MaxCell had to be "handed" over the edge of the bridge and dropped down 15 feet to the catwalk under the bridge to complete the installation. As a point of reference, he told us that a 5,300 feet reel of MaxCell weighs approximately 600 lbs.

Bonnet Carré Spillway Bridge – is a bridge that carries train traffic over the Bonnet Carré Spillway and a portion of Lake Pontchartrain in southeast Louisiana. During times of river flooding, water is diverted from the Mississippi river into the lake. It is considered one of the longest railroad bridges in the world. When the Mississippi River gets high, the spillway is opened and water is diverted into the lake. This MaxCell installation was over 9 miles long over alligator infested water. It was a very challenging installation because there was little to no ground access, but because of the ease of installation of MaxCell's flexible fabric innerduct, it went quickly and smoothly.

Covenant Bridge (also known as the Horace Wilkinson Bridge) – is a huge cantilever bridge that is over 14,000 feet in length and carries Interstate 10 traffic across the Mississippi River in Baton Rogue. With Louisiana being the land of massive continuous steel truss bridges, this bridge is the biggest, as well as the highest (175 feet above the water). The land in this region is very close to sea level. Combine that with ocean-going ships traveling the Mississippi River meant that this high, monster bridge be built in order for ships to navigate the channel. Because of the length of this bridge, it required long pulls of MaxCell and the installers were successfully able to pull over 3,000 feet in one pull. This bridge was challenging because there was restricted ground access under portions of this bridge due to various businesses located in the vicinity. These included a grain processing facility, a refinery, a casino and the U.S.S. Kidd Destroyer Ship Museum.

Why MaxCell?

As you can see, while bridges provide crucial access between regions and cities for people and essential services, they are also a key component in today's communications infrastructure.

Bridge construction sites usually mean working at great heights, in traffic, and with fast river conditions and current. Having a product that can be quickly and easily installed by the construction team helps speed up the process.

MaxCell offers a lightweight, economical, easy-to-install alternative to traditional HDPE conduit used in bridge projects. This flexible fabric innerduct meets the temperature and corrosion requirements required to provide protection to the fiber optical cable placed within it. And most importantly, the lack of expansion and contraction of the MaxCell product is a big advantage.

These projects give some insight into the unique pathway constraints that nearly every bridge installation poses and how MaxCell is helping to solve these challenges.

MaxCell is helping to span bridges over troubled waters and keeping us all connected.
Contact us before your next project to learn how MaxCell's flexible fabric innerduct fits.

PHONE: 888.387.3828 MAIL: INFO@MAXCELL.US WEB: WWW.MAXCELL.US