



Photographs of concrete segmental bridges throughout the United States that represent solutions for sites with environmental sensitivity, tight urban right of way, long spans of water, crossing over active highways, and serving multi-modal transportation. Best value benefits have been recognized with over 350 awards for bridge owners.

Concrete Segmental Bridges

The Best Value Solution for Economy, Sustainability, and Beauty

by Linda Figg, FIGG

Bridge owners share common interests and responsibilities to achieve multi-modal transportation results that have the longest service life, lowest maintenance costs, are built quickly and efficiently, incorporate sustainable solutions, and are appreciated by the local and regional communities they serve. In creating sustainable solutions, the best value comes from a combination of economic efficiency, environmental sensitivity, and social involvement. When all of these factors come together, combining functionality, sculptural form, and a focus of over a 150-year service life, the bridge result is inspiring.

Economical Bridge Solutions

In the late 1970s and for a number of years beyond, alternate bridge design types were competitively bid against each other in construction whenever federal funds were over \$10 million dollars. Often, concrete segmental bridges were bid against other concrete and steel bridge types simply based on low cost as the selection factor. Concrete segmental bridges proved themselves in the marketplace with lower costs derived from repetition and speed of construction. Using local materials

and local labor, longer spans, fewer and more slender singular pier shapes, and construction methods that reduced activities in environmentally sensitive or traffic-packed sites made a difference to economical, efficient bridge solutions. These bridges were also recognized for pleasing aesthetics, which was simply a natural outcome of the overall design. The concrete segmental bridge industry grew throughout the United States building on the outstanding results in constructability and value. One example is given on the next page showing the photograph of the Interstate 93 (I-93) bridges in Boston and the description of cost savings.

Sustainable Success

One of the triple bottom line areas for sustainable success is economy. In addition to initial cost, reduced maintenance budgets for many owners mean best value solutions now take into account lower maintenance costs for saving money in the future. Also, environmental sensitivity and social involvement are other key areas evaluated in determining factors for resilience in our growing communities. Technology in concrete materials, equipment, and

cable-stay systems have aided in advancing concrete segmental bridges with new opportunities to reduce site footprints with longer spans. Examples include the new Harbor Bridge in Corpus Christi, Texas, with a 1655 ft concrete segmental cable-stay main span, and the new I-35W Bridge in Minnesota with a 504-ft concrete box girder main span.

Precast concrete segmental construction methods provide superstructure assembly from the deck level without using cranes on the ground. A good example is the Selmon Expressway in Florida shown on the next page. This allows traffic to remain in operation throughout construction while building in limited right of way. In Selmon's case, the bridge doubles vehicular capacity while only using a 6-ft-wide column in the medium of the existing 4-lane highway. The 9-mile AirTrain JFK in New York carries rail on a precast concrete segmental bridge down the middle of the busy Van Wyck Expressway. Over 160,000 vehicles a day were maintained during construction.

Social success means that the bridge respects the community it serves.



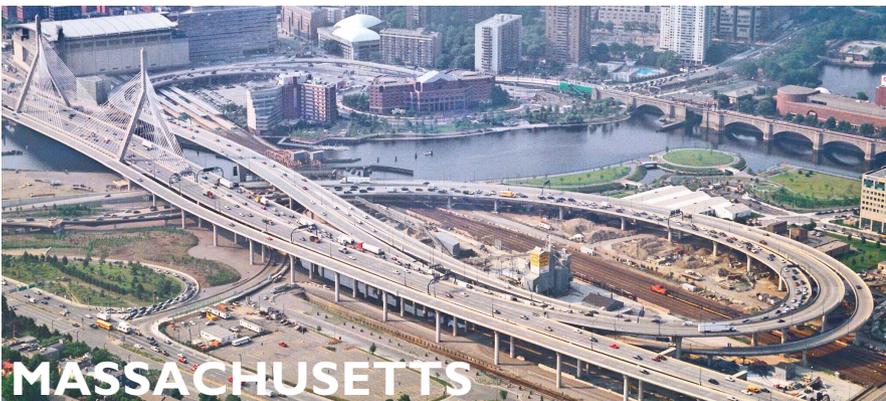
Rendering of the new Harbor Bridge in Corpus Christi, Tex., exemplifies benefits of concrete segmental bridges for long spans. The 1655-ft-long concrete segmental cable-stayed main span provides pier locations on land preserving the full channel for shipping needs with enhanced security and resilience, further preserving the natural and built environment.

It enhances the quality of life by preserving existing mobility during construction and creating the smallest footprint possible to keep adjacent lands for other growing community needs. Each bridge should honor the existing landscape and be in harmony with the surrounding environment while considering local plans that look to the future. Consciously integrating the bridge as a landmark with its function as a transportation asset provides the best value.

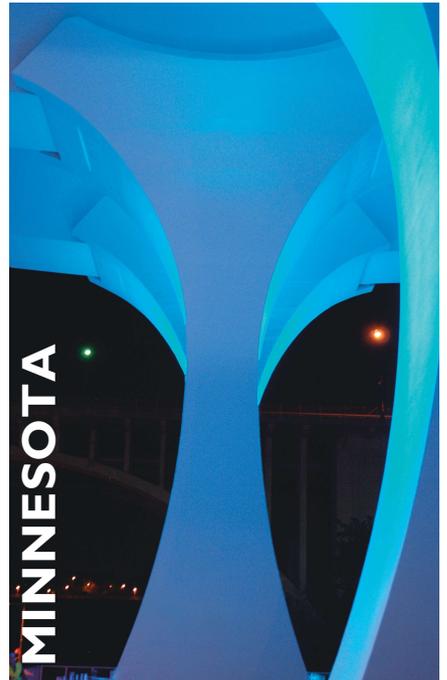
The Bridge's Beauty

The flexibility of concrete segmental construction to transform into many sculptural shapes and maintain efficiency in construction make it an ideal choice for aesthetically beautiful

bridges. The box-girder shape with long cantilever wings, a small bottom soffit, and smooth flat continuous shape with openness and light. Piers that transition with the box-girder bottom soffit are slender. Blending the superstructure and substructure shapes can appear as a holistic structure of one unified design. Each bridge is special with its own functional character for purpose and sense of style for beauty. Each bridge reveals a vision that the owner and community define as the best value solution to serve their goals. The FIGG Team is grateful for the opportunity to help many owners achieve their visions with sustainable, concrete segmental bridges for the future. 



Aerial view of Interstate 93 concrete segmental bridges curving over 9 active railroad tracks twice in downtown Boston, Mass. The multi-level bridges had radii as tight as 212 ft. Segmental concrete boxes competed against steel boxes and provided a \$27 million savings on a \$79 million construction bid.



The new I-35W Bridge in Minnesota exemplifies the benefits of concrete segmental bridges for accelerated bridge construction (ABC) and long spans – the 10-lane, 504-ft main span was built with 120 precast segments in just 47 days; the entire bridge was designed and built in 11 months, 3 months ahead of schedule. Shown here is one of the 70-ft-tall curved concrete piers with sustainable LED lighting.



The 5-mile, concrete segmental Selmon Expressway in Tampa, Fla, was bid for \$65/ft² and opened in July 2006. Shown here is one of the precast segments placed from the previously completed bridge with span-by-span construction of 142-ft spans. Traffic keeps moving below. 2400 ft of bridge superstructure was built in a month.

Concrete segmental bridges shown and discussed in this advertorial were all accomplished by FIGG for its customers. They include design, design/build, design/build/maintain, innovative financing, construction engineering inspection and related engineering services during construction to help get bridges built. FIGG is a family of companies exclusively specializing in bridges since 1978. For more information please visit figgbridge.com or call 800.358.3444.