Prefabrication, Old and New

BY TOM KLEMENS

Notes on two steel structures from a recent trip to the Emerald Isle.

IN MID-APRIL I spent several days exploring the city of Dublin, Ireland. I enjoy cities, and am always fascinated by the wonderful things one can discover. While roaming this very walkable city, I came across two remarkable examples of steel construction from opposite ends of the structural steel timeline.

A Monumental Bridge

Dublin is a port city on the River Liffey, which on its eastern end empties into the Irish Sea. The city's newest river crossing is the Samuel Beckett Bridge, a cable-stayed movable span named for the Nobel Prize-winning Irish writer, which opened December 10, 2009. The bridge looks very much like an Irish harp lying on its side and is the second bridge in Dublin designed by architect Santiago Calatrava.

The top of the new bridge's arching steel pylon is 157 ft above the river's high water level. The cable-stay anchorages run down the center of the bridge separating its two northbound and two southbound traffic lanes.

The Samuel Beckett Bridge is notable for two reasons. First, the entire 6,300-ton structure was fabricated in Rotterdam, the Netherlands, beginning in 2007. Two years later, the 394-ft bridge made a seven-day journey on a 295-ft by 85-ft barge, arriving in Dublin on May 11, 2009.

The second notable feature is that the entire structure is supported on a single, off-center pier located out of the main navigation channel, about 92 ft from the south quay. It can rotate 90 degrees on that pier to allow taller vessels to pass.

Rivets, Rivets Everywhere

A 30-minute walk upstream from the Samuel Beckett Bridge is the Guinness brewery, which is home to what may be the most significant steel structure in all of Ireland. At the turn of the 20th century, Guinness planned a massive new storehouse to accommodate its continuing growth. The storehouse was completed in 1904 and was the first multistory steel-framed building in the British Isles.

The firm's 40 plus in-house engineers designed the 120-ft-high structure working with Sir William Arrol & Company of Glasgow, Scotland, who supplied the steel. Arrol's previous projects included the landmark Firth of Forth railroad bridge, in Scotland, and London's Tower Bridge.

The 3,600 tons of steel was "highly prefabricated at Arrol's girder works in Glasgow, which cut down on construction time." However, the storehouse was unique in that it required a good deal of on-site riveting. So, for the first time, many of Arrol's riveters were deployed to the field.

Today the storehouse has been converted into a seven-level visitor center. It offers a fascinating education in the art of brewing and associated activities. For example, one area is devoted to the disappearing cooperage trade. At one time Guinness coopers were making 1,000 casks a week to keep up with output, so its staff was among the most skilled and productive in the world.

For those with an interest in structural steel, a visit to the Guinness Storehouse is a pilgrimage. On the self-guided tour you learn that the structure was built in the style of the new Chicago School, using structural steel rather than the walls to support the roof and the rest of the structure. In addition to the columns and beams, the building also had steel plate floors.

Walking through the building is a real celebration of structural steel, and highlights the accomplishments of the people who planned and executed this project. If you ever want to be moved by the heritage of quality upon which this industry is built, plot a course to Dublin and spend an afternoon at the old Guinness Storehouse. And then, of course, take in the city's historic and modern bridges, too.

Better yet, discover the steel structures in your own area. And feel free to send us a note about them, and photos as well. Happy exploring. MSC

To see more photos of the Samuel Beckett Bridge and the Guinness Storehouse, go to ***www.modernsteel.com/photos****.*

Senior editor Tom Klemens joined the staff of Modern Steel Construction *in 2009. Among other adventures, he spent one summer of his college years as a laborer in the hot strip mill at J&L Steel's South Side Works in Pittsburgh, and has had rust in his veins ever since.*

Inside the Guinness Storehouse

The Samual Beckett Bridge

Have an opinion you'd like to share in "Topping Out"? Send your feedback to Tom Klemens, senior editor, at klemens@modernsteel.com.