

HSS: DESIGNS FOR THE 21st CENTURY



This 158-foot-long pedestrian railroad overpass with ramps in San Luis Obispo, California, typifies the use of HSS in spans built by Steadfast Bridges.

COMPRESSIVE STRENGTH, APPEARANCE, PAINTABILITY MAKE HSS THE CHOICE FOR FIRM'S PREFABRICATED BRIDGES

Bob Graham believes pre-engineered, prefabricated bridges are a product whose time has come, much like pre-engineered, prefabricated steel buildings in the 1950s and 1960s. The company he heads, Steadfast Bridges, has become a leading U.S. supplier of these bridges, and Graham credits much of its success to the strength and appearance of steel Hollow Structural Sections (HSS), the principal material used in them.

Steadfast Bridges was formed as a division of Biltolast Industries, a steel fabricator, in 1989 to tap the growing market for prefabricated bridges.

“In the beginning, most of our business was pedestrian bridges, with clear spans up to 220’ in length” Graham says, “but over the past few years we’ve pioneered a cable-stay design for pedestrian bridges up to 400’ long and have begun fabricating two-lane vehicular bridges. We’re now certified to prefabricate major bridges with fracture-critical requirements, and with federal T-21 funding, we’ve found a number of state highway departments now beginning to specify our bridges on their rights-of-way.”



Cable-stayed pedestrian bridge, Ocoee, Tennessee



Installation of modified bow bridge, Albuquerque, New Mexico



Bridge fabrication at Steadfast's Fort Payne, Alabama plant

The company's selection of bridges include bow truss, modified bow, Pratt truss and X-brace truss designs, as well as box bridges, cable-stay bridges, box girder overpasses, golf course bridges and Oriental-style Edo bridges.

HSS Accounts for 80% of Steel Used

Graham says that about 80% of the steel used by Steadfast Bridges is HSS.

“Since the beginning, HSS has been the backbone of our structures because of its compressive strength, particularly in the top chords of bridges,” he says. “These chords are much like a column, since they’re always in compression. The strength of hollow structural sections lets them excel over other steel shapes in this application.”

He also cites the high strength-to-weight ratio of HSS, noting that “we



Bow truss bridge, Murphreesboro, Tennessee



Above and right — “Double-deep” bow truss pedestrian bridge, Providence, Rhode Island

use 50,000-lb yield steel, and its very consistent in strength and product quality.”

Most of the HSS used by Steadfast Bridges is square or rectangular in shape. Sizes range from 3/4” to 1-1/2” squares and rounds for picket rails and hand rails up to 14” squares and equivalent rectangles with 5/8” walls for top and bottom chords. In general, the trusses in the company’s bridges are formed by square or rectangular HSS in a size range from 4” to 10” and wall thickness from 1/4” to 3/8”.

‘Clients Prefer Smooth Appearance of HSS’

The pleasing visual appearance of HSS is also important to Steadfast Bridges. “Most of our clients prefer the smooth, rounded corners of hollow structural



sections to the sharp edges and irregular shapes of other steel structurals,” Graham says. “Generally, where there’s high visibility we use HSS.”

Graham adds that the shape of HSS makes it easy to paint, another BIG plus.

Because they’re shipped by truck in most cases, Steadfast bridges are made in sections up to 12’ in width and 70’ in length. All splices and joints in the shop are welded. Bolted joints are used for connecting sections in the field, using splice plates that are bolted to both sections.

The company has fabricated more than a dozen “double-deep” bridges. Because of their 18-22’ depth, they have horizontal as well as vertical splices bolted together.

Steadfast Bridges does all of its own design work and has shipped bridges from Alabama to every state in the U.S. as well as to Canada and Puerto Rico. The company operates manufacturing facilities with a total of 85,000 feet of space in Fort Payne and Greenville, Alabama.