

HSS: DESIGNS FOR THE 21st CENTURY



Effideck™ precast concrete deck panels utilize rectangular HSS as support members.

NEW BRIDGE PANELS, USING HSS, HELP END A 70-MILE DETOUR—IN LESS THAN FIVE DAYS!

Effideck™ Lets Repairs Be Completed Quickly, and at Minimum Cost

The closing of Vermont's Missiquoi Bay Bridge, part of the northernmost U. S. crossing of Lake Champlain, was no minor inconvenience to motorists, since it caused a detour of 70 miles. But thanks to a revolutionary new bridge deck replacement system, *Effideck™*, that utilizes steel Hollow Structural Sections (HSS), the

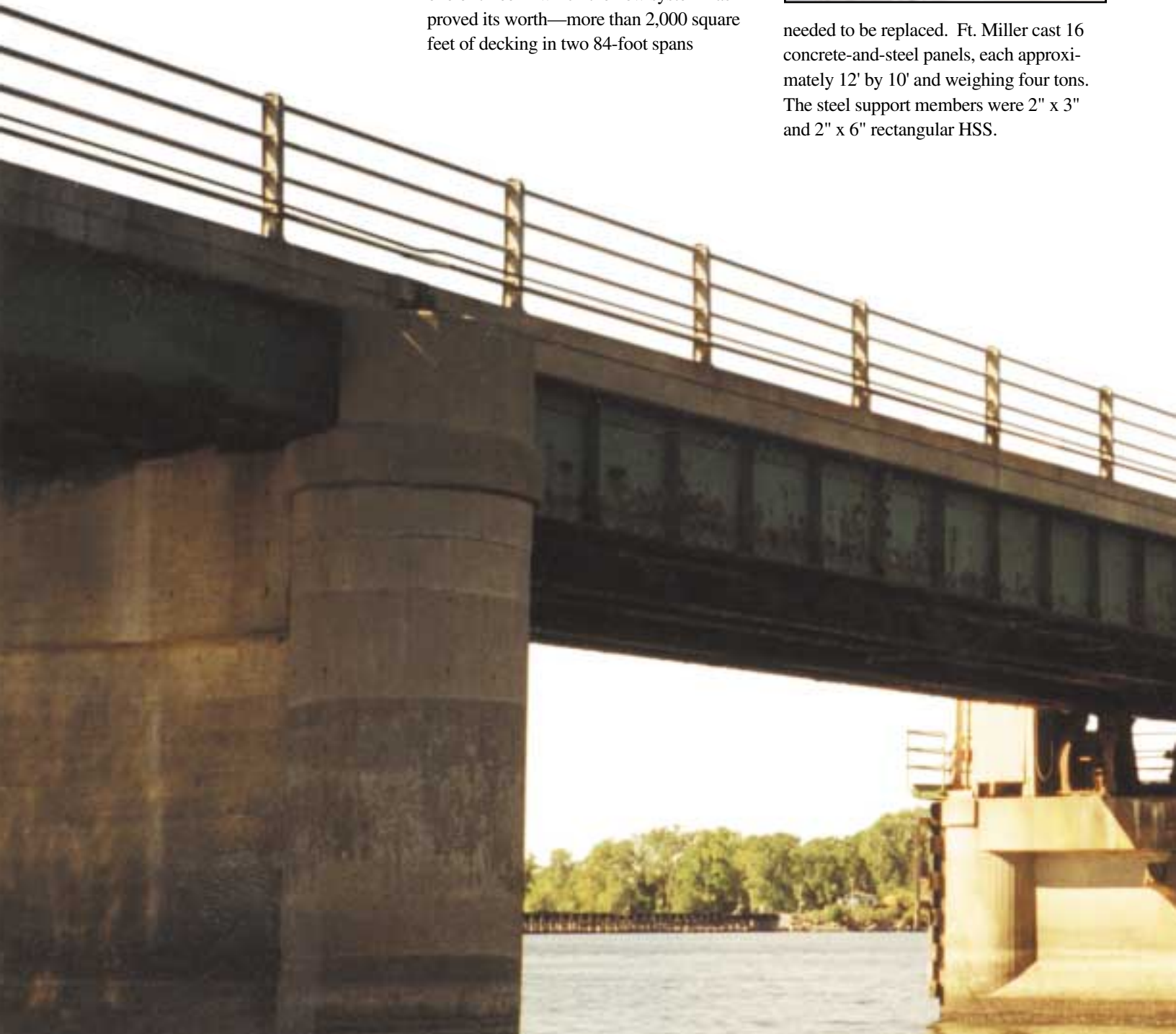
heavily-traveled span was closed to traffic for less than five days.

Effideck was developed by The Fort Miller Co., Inc., a precast concrete company located in Schuylerville, New York. Ft. Miller chose HSS for the support members of the system's precast concrete deck panels because of its high strength-to-weight ratio, exceptional size range and ready availability.

In the Alburg-Swanton Bridge project—one of three in which the new system has proved its worth—more than 2,000 square feet of decking in two 84-foot spans



needed to be replaced. Ft. Miller cast 16 concrete-and-steel panels, each approximately 12' by 10' and weighing four tons. The steel support members were 2" x 3" and 2" x 6" rectangular HSS.



Can Be Installed From Bridge Deck

Because of the lengthy detour, the Vermont Agency of Transportation required the contractor, Bridgecorp of Augusta, Maine, to work around the clock. Bridgecorp capitalized on the *Effideck* system's unique top-down installation that eliminates the need for costly and time-consuming scaffolding. *Effideck's* efficient connection system allowed the contractor to remove the old deck, install the new panels and reopen the span in about 113 hours.

Peter J. Smith, P.E., Ft. Miller's Vice President, Market Development and Product Engineering, says *Effideck* panels are formed by a thin—usually 5"—concrete slab cast over closely-spaced HSS structurals. The slab has a single layer of reinforcement and is attached to the HSS with conventional stud shear connectors.

"One of the system's most useful features is the unique method in which it's connected to the supporting bridge stringers," he says. "Typically, panels are set on leveling bolts that permit vertical adjustment from the top of the deck. After adjustment is complete, steel shims are installed between the HSS and the stringers, and the

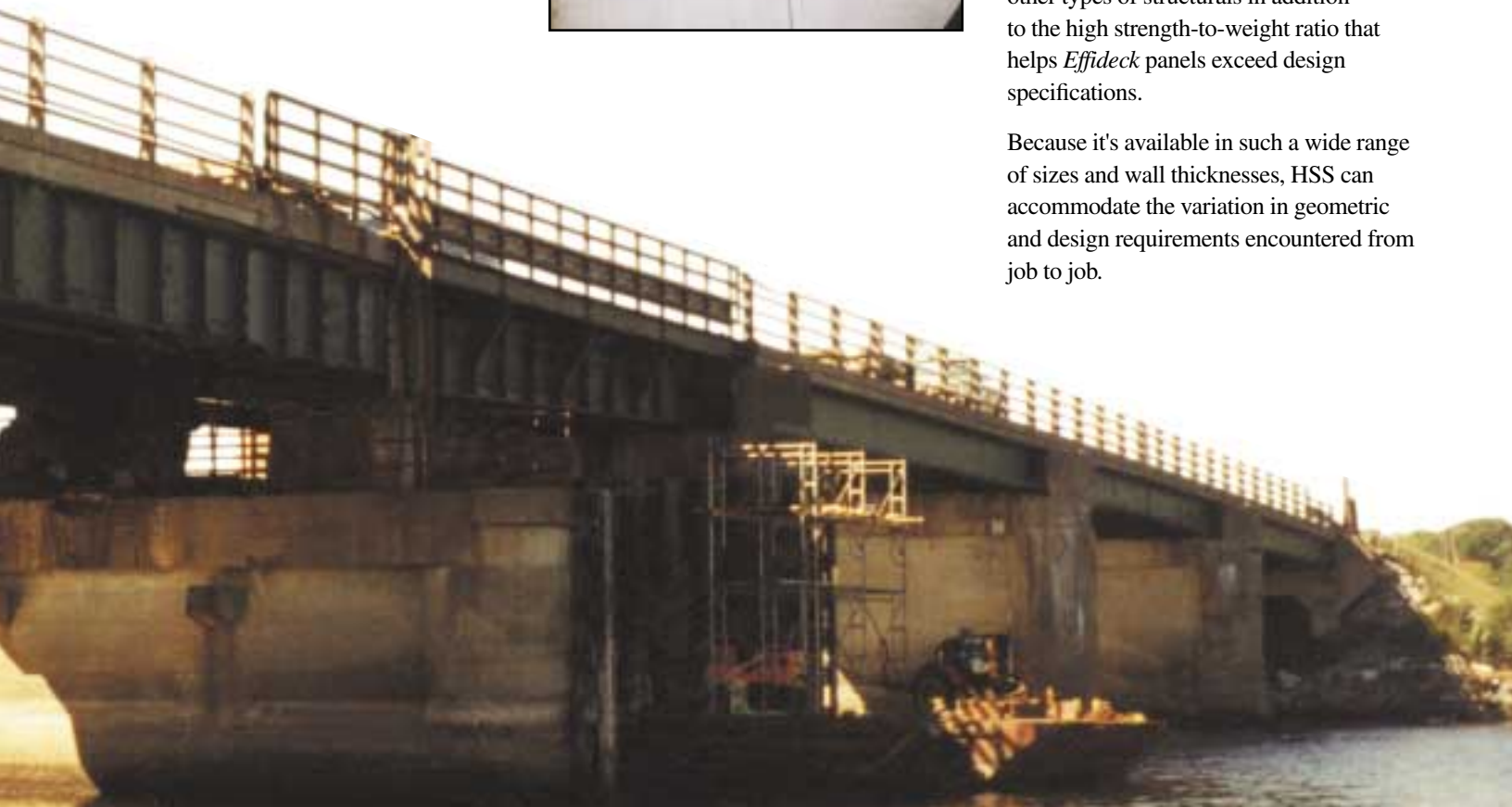


boltdown connection is made, also from the top of the bridge deck." Mr. Smith says that after bolting is complete, traffic may use the deck, providing full composite action with the stringer below is not required. However, full composite action with *Effideck* is achieved only after the pockets for stud and panel connections have been grouted and fully cured.

Strength, Size Range Among HSS Advantages

Mr. Smith says that square or rectangular HSS offers a number of advantages over other types of structurals in addition to the high strength-to-weight ratio that helps *Effideck* panels exceed design specifications.

Because it's available in such a wide range of sizes and wall thicknesses, HSS can accommodate the variation in geometric and design requirements encountered from job to job.





The straight sides of square or horizontal HSS make it easy to assemble concrete forms around them, keeping panel fabrication costs low. And the availability of HSS gives it a big advantage over grid decks that require long lead times to procure and fabricate.

Ft. Miller's *Effideck* system has been utilized in two other New England bridge projects—replacement of 23,000 square feet of panels in a parking deck over the New England Thruway at Larchmont, New York, and a 117-foot-long bridge over a

stream that provides the principal access to an outlet mall in Lee, Massachusetts. Ft. Miller is also marketing *Effideck* panels to simplify and speed parking deck retrofit projects.

Effideck is presently undergoing extensive testing to meet the standards of the New York State Department of Transportation, among the most stringent in the nation.



**Steel Tube
Institute**
OF NORTH AMERICA

2516 Waukegan Road, Suite 172, Glenview, IL 60025 • Tel: 847.461.1701 • Fax: 847.660.7981
E-mail: STINA@steeltubeinstitute.org • Website: <http://www.steeltubeinstitute.org>



American
Iron and Steel
Institute