Online Database Provides a One-Stop Shop for Simple, Cost-Effective Short-Span Steel Bridges and Culverts

By Mike Engstrom, Technical Marketing Director, Nucor-Yamato Steel

The Short Span Steel Bridge Alliance (SSSBA) will launch a unique database in June that will house standard designs and details for short-span steel bridges and culverts.

The move is timely. Approximately 310,006 (52%) of the bridges in the U.S. are classified as a city/county/township bridge (typically short-span bridges). Approximately 77,566 or 25% are structurally deficient or functionally obsolete (www.betterroads.com/category/bridge-inventory/).

The new design tool—dubbed eSPAN140—will help engineers respond more quickly to this challenge with steel-based prefabricated and modular bridge designs. The eSPAN140 database contains information about rolled beam, plate girders, corrugated steel pipe and structural shapes, as well as design details such as elastomeric bearings, bearing stiffeners, intermediate and end diaphragms and connections. It also includes specific modular bridge and coating systems offered by SSSBA member companies.

“This database takes a lot of guesswork out of the design process,” says Dan Snyder, director of the SSSBA, a business unit of the American Iron and Steel Market Development Institute (SMDI) partner. “The tool will simplify the sizes of steel needed, making the process more time- and cost-efficient for bridge producers, fabricators, engineers, designers and owners.”

The new standards for bridges that are 140 ft or less stem from a multi-year effort to review more than 3,000 potential designs. The far-ranging team included SMDI, the National Steel Bridge Alliance, the National Association of County Engineers (NACE) and professors at West Virginia University, led by Dr. Karl Barth, the school’s Jack H. Samples Distinguished Professor and a nationally recognized expert in the field of steel bridge analysis, design and rating. The team also included the expertise of 20 SSSBA partners representing all facets of the steel industry—fabricators, service centers and steel mills, including Nucor-Yamato Steel and Nucor’s plate group—that met several times over the past three years.

The eSPAN140 database helps users quickly find the optimal and most cost-effective steel bridge solutions. To begin, a bridge owner or designer creates a profile in the eSPAN140 system, including contact information for the individual and company. Then, the individual adds specific information about the bridge under design, such as:

- Project name
- City, state, roadway
- Span length
- Number of striped traffic lanes
- Roadway width
- Pedestrian access information
- Skew angle
- Average daily traffic
- Design speed
- Waterway area
- Height of cover

With the basic bridge data, the design tool creates a unique “Solutions Book” in a PDF file format that provides standard steel-based design options based on the following standards:

- Rolled beam and plate girder, per the standards developed by West Virginia University
- Corrugated steel pipe and corrugated structural plate, per the National Corrugated Steel Pipe Association
- Specialized modular steel bridge solutions from SSSBA member manufacturers’ Steel Solutions

After reviewing the design options, the bridge owner or designer can request additional personalized technical input from the SSSBA’s Bridge Technology Center via the SSSBA’s website www.ShortSpanSteelBridges.org.

Mark Servi, president of NACE, says, “As a county engineer and president-elect of NACE, I am keenly aware of our country’s need to replace short-span bridges quickly and cost-effectively. The SSSBA’s new eSPAN140 web-based design tool allows county engineers to choose from a variety of available steel solutions customized to their project requirements, saving time and money. It even includes standard designs and details for bridges 20 ft to 140 ft. This will help us to get a bridge project started faster, on budget, utilizing local crews and resources. eSPAN140 provides county engineers with all of the information necessary to select a cost-effective steel bridge or culvert customized to their specific project needs.”

To learn more about eSPAN140 timesaving design solutions or get a schedule of upcoming technology transfer events, visit www.ShortSpanSteelBridges.org.
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