Steel Bridge NEWS
NATIONAL STEEL BRIDGE ALLIANCE
MARCH 2006

New "Ewes" for Steel Sheep Bridge

A steel "sheep bridge" in McCall, Idaho will soon find a new use as part of a pedestrian and bike path that will circle the town. About 100' long and 16.5' wide, the bridge originally served as a county road bridge in the early to mid-1900s. Logging trucks eventually moved it to its present location over the North Payette River to serve as a sheep crossing—horses and cattle could swim across the river, but ewes, lambs, and calves could not.

Boulder Creek Engineering in nearby Donnelly, Idaho will upgrade the bridge to current standards. According to Dwight Utz, P.E., the bridge will get new concrete abutments as well as a new wooden deck and timber stringers. Wide-flange steel cross beams spaced at about 17' will support the deck and stringers.

"The bridge is in surprisingly good shape," says Utz. "Nevertheless we're going to take it apart wherever possible to check things like I-bars and pins," he says. "Then we'll sandblast the bridge, paint on a protective coating, reassemble it, modify the existing railing to meet AASHTO code, and move it back into place."

Utz adds that while pedestrians and bicycles will soon use the bridge, sheepherders will retain their permanent right to cross it with bands of sheep.

Photo courtesy of Dwight E. Utz, P.E.

Standing the Test of Time

The Goethals Bridge spans the Arthur Kill linking Elizabeth, N.J. with the Howland Hook area of Staten Island, N.Y. The Goethals Bridge is a memorial to Major General George W. Goethals, builder of the Panama Canal and the first consulting engineer of the Port Authority.

The Goethals Bridge and the Outerbridge Crossing, which are similar in design, were the first facilities constructed by the Port Authority of New York and New Jersey. The 135' channel clearance of the Goethals Bridge permits passage of deep-sea vessels through the Arthur Kill.

A steel truss cantilever design by John Alexander Low Waddell, the bridge has a 672'-long central span and supports four lanes of traffic. It is 8,600' long in total, 62' wide, and has a clearance of 135'.

The port authority had $3 million of state money and raised $14 million in bonds to build the Goethals Bridge and the Outerbridge Crossing. Construction of the bridge began September 1, 1925 and cost $7.2 million. Both the bridge and the Outerbridge Crossing were opened June 29, 1928.

The Goethals Bridge replaced three ferries and augmented the existing Arthur Kill rail bridge. Its unusual mid-span height was a requirement of the New Jersey ports. Connecting to the New Jersey Turnpike, it is now one of the main routes for traffic between Staten Island and Brooklyn via the Staten Island Expressway and the Verrazano-Narrows Bridge. Until the bridge to Brooklyn was completed in 1964, the Goethals Bridge never turned a profit. The total traffic in 2002 was 15.68 million vehicles.

The Goethals Bridge has two 10' lanes in each direction, which do not meet today's 12'-wide highway design standards, and has no shoulders for emergency access. To meet modern standards, a new parallel bridge is planned, dividing the westbound and eastbound traffic between the old and new bridges.

A MESSAGE FROM THE
Executive Director

As we begin the new year, the National Steel Bridge Alliance is unveiling changes in the way we will communicate with the steel bridge industry. The incorporation of our newsletter into *Modern Steel Construction* on a once-per-quarter basis will broaden our base of readership to include the structural steel design and construction industry. (Make sure you continue to look for our newsletter in the June, September, and December 2006 issues of MSC.) Additionally, our web site, **www.nsbaweb.org**, is undergoing a facelift, with modifications that will make it more interesting, more informative, and easier to navigate. We look forward to rolling out the new web site by the first of March. Any suggestions for fine-tuning the site will be appreciated and should be sent to Jody Lovsness at lovsness@nsbaweb.org.

Our work for the steel bridge industry continues in the form of technical development, information awareness and transfer, and legislative affairs. Our efforts with these initiatives will foster growth in market share and increase the acceptance of steel as the material of choice for the bridge industry.

We look forward to serving you with any of your bridge needs and hope 2006 will bring you good health and prosperity.

Sincerely,
Conn Abnee
NSBA Executive Director

Pipe Truss Bridge to Carry Light Rail

Final delivery and installation of steel pipe trusses for the $21.5 million Town Lake Bridge project in Tempe, Ariz. took place in December 2005. The bridge will serve the Valley Metro light rail that connects Phoenix to Tempe and other neighboring communities.

The new bridge measures 1,530' in length, with each truss section measuring about 75' to 93'. Two trusses each carry a track—one for each direction. The designer, T.Y. Lin International of Tempe, selected a pipe truss design for strength and aesthetics.

Stinger Welding, Inc., an AISC Major Bridge Shop, assigned at least 50 welders to the project. The welders worked for approximately 10 to 11 months from the time of order to final delivery of the main components. December 2005 marked the end of a six-week shipping cycle from the Stinger plant in Coolidge, Ariz. to the project site.

Corrosion in Northern Marine Environs

BY DENNIS NOTTINGHAM, P.E.

Atmospheric corrosion in northern environs such as Alaska is noticeably less severe than in southern climates, which is likely the result of lower temperatures and other factors. This offers the possibility to reduce both initial and maintenance costs by using uncoated steel properly detailed to avoid ponding water.

Case in Point

In 1973, conceptual studies began to assess the feasibility of construction of a dock near Cook Inlet's North Foreland, just south of the Village of Tyonek in Alaska. At this location, Cook Inlet features a gently sloping seabed, requiring long approach structures to reach adequate water depths.

Timber and chip ships required a water depth of 25' below mean lower low water (El-25± MLLW) at the dock face to go with a tide range of nearly 35'. To complicate matters, this area is subject to six months of ice cover riding the ebb and flood tidal currents.

Orthotropic Steel Box Girders

Adequate water depths required the dock be sited 1,500' offshore. Ice floes dictated a minimum number of costly piers. The solution for this marine location suggested 250' spans with a 16'-wide approach roadway designed for HS20 trucks. Designers chose long sections of lightweight orthotropic steel painted box girders as the best solution. The deck consisted of an epoxy/grit surface layer.

Construction in 1974 by Kodiak Lumber Mills had a few setbacks caused by difficulty with pier construction in fast currents, but these were overcome and the project was put into service.

30 Years Later

Inspection after 30 years in this northern marine environment (61 degrees north latitude) indicated that the steel superstructure was nearly devoid of significant corrosion. Paint was worn on traveled surfaces and some rust was noted at irregularities that could hold water. Inside the box girder, topside field-cut holes had allowed water to enter. Some corrosion had occurred around stiffeners on the box bottom, but it was not serious.

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