

Rare design wins a new life for old Howard County bridge

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The Route 32 Bridge



The old bridge (right) over River Road in Carroll County is one of seven in the United States with an aluminum girder system. (Sun photo by Doug Kapustin)

Motorists cruising on Route 32 in northern Howard County likely have never noticed anything exciting about the highway bridge just south of Sykesville.

But according to the State Highway Administration, the bridge is one of seven in the United States with an aluminum girder system. It is also the longest of only three bridges made with a specific triangle-shaped internal support system

designed by aeronautical engineers at a company in Hagerstown, officials said.

Because of those elements, the bridge over River Road, the Patapsco River and the CSX Railroad will be left standing when a replacement bridge - under construction - opens in the spring.

"It is highly significant if for no other reason than it is exceedingly rare," said Rita Suffness, cultural resources manager for the State Highway Administration. Aluminum bridges "were built in such small numbers in this country relative to the vast universe of steel and concrete beam bridges."

Also, she said, "It's an important milestone in terms of experimenting with new materials and fabrication techniques."

During a statewide inventory of bridges in the 1990s, Suffness determined its unusual structure made the Route 32 bridge eligible for inclusion in the National Register of Historic Places. She added it to a state Historic Bridge Inventory.

Then SHA concluded that the bridge had deteriorated in several areas where the aluminum is in contact with steel, such as where steel bearings connect to the aluminum girders.

Repairing the Route 32 bridge would be extremely difficult, Suffness said, requiring the entire structure to be lifted in place, which could cause it to buckle. She championed a plan to "keep it in good condition until we find a way to fix it."

With approval from the Maryland Historical Trust - which must provide input on any projects affecting a historical structure or area under the National Historic Preservation Act - SHA accepted Suffness' plan to keep the bridge as a historic landmark.

Highway officials will also create an educational display with descriptions and photographs to be placed below the bridge along River Road.

"It's a very unique thing they are doing to recognize the significance of the bridge," said Gil Kaufman, a metallurgical engineer and consultant for the Aluminum Association Inc. "I don't know of any other site in the U.S. where you will be able to see an aluminum bridge, especially of this design, and to learn something about it."

In the late 1950s and 1960s, the country was expanding its highway system and seeking new materials for the many bridges it needed, said Kaufman, who lives in Columbus, Ohio. At the time, steel was somewhat scarce, and engineers, encouraged by aluminum manufacturers, considered the light, durable metal as an alternative.

Few people had experience designing bridges that used aluminum, but Kreider-Reisner Aircraft Co., a unit of Fairchild Engine and Airplane Corp. in Hagerstown, used the material for commercial and military aircraft. Workers there designed an aluminum bridge with a cross-section containing nine interlocking triangles.

"It has great strength even though materials that make up the triangular beams ... are really quite thin," Kaufman said.

Today, states are unlikely to build aluminum bridges. They don't need to be painted and are light enough to fabricate elsewhere and then move into place, Kaufman said, but they also cost up to 50 percent more to build than steel and concrete spans.

Instead, SHA hopes the Route 32 bridge - with its educational display - will stand as an example.

"It epitomizes a unique period when there was experimentation," Suffness said.

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