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MERIDIAN MEETS ITS DESTINY

NDOR Chooses Nox-Crete Vertical Stain For Beauty & Durabiliy On New Landmark Bridge

Listed as a historic bridge on the Federal Highway Administration's website, the Meridian Bridge at Yankton, South Dakota, stands as testament to the engineering of its designers and the foresight of its original owners, local Yankton businessmen. Spanning the Missouri River, the Meridian bridge has been this area's main transportation link between southeastern South Dakota and northeastern Nebraska and a visual landmark for over 80 years.

Officially open for traffic in 1924, the 19-span, double-deck structure was designed to carry vehicle traffic on the top deck and rail traffic on the lower. It was also designed with riveted Pratt vertical-lift truss that allowed the bridge span to be lifted for passage of larger river traffic.

The lower deck never saw rail traffic and the lift span was used rarely, prompting the lower deck to be converted to southbound traffic lanes with the upper deck for northbound traffic in 1953. At that time, the lift mechanism was also removed.

A 2001 study by the Federal Highway Administration concluded that the life span of the bridge was limited. When annual rehabilitation costs factored out to be more than replacing the aging structure, planning began for the Meridian's replacement.

As a joint project between the Nebraska Department of Roads (NDOR) and the South Dakota Department of Transportation (SDDOT), construction began on the citizen-named Destiny Bridge in June of 2007, approximately 1,000 yards upstream from the existing bridge. The cover photo and the aerial shot included with this article show the proximity of the bridges. General Contractor for the project was Jensen Construction Company, Des Moines, Iowa.

Understanding the importance the old bridge has played in the history of the region and recognizing the almost emotional connection that many area citizens had with the existing structure, all involved in the new bridge project recognized the need to construct not just a replacement, but also a new landmark. The old bridge stood out visually because of the upper and lower deck design. Creating equal visual appeal for the single-deck replacement structure without increasing the budget required careful planning by the design team.

The new bridge is 1,590 feet long and 74 feet wide, allowing for 4 traffic lanes, and features 5 piers and 2 abutments with 280 feet between each. The visual appeal of the new bridge is directly tied to the inclusion of 14 lighted towers above the piers, each 55-feet tall. Each tower is constructed of 10 separate precast concrete elements which taper in circumference as they reach the top height. These precast elements are connected by precast collars and the final, top section is capped with a similar piece.

Produced by Enterprise Precast in Omaha, Nebraska, the precast pieces were cast using formliners to create the look of natural stone. The artistry of subcontractor Sparkle Wash, also of Omaha, gave the precast pieces the coloration of natural stone using Nox-Crete's Nox-Carb line of vertical exterior concrete stains with integral water repellents.

Unlike traditional paints and coatings, Nox-Carb penetrates the invisible micro-pores of the concrete surface where it chemically and permanently bonds. This produces highly stable coloration results combined with long-lasting water and chloride absorption protection. And since Nox-Carb will not peel or flake, it is not unusual for a Nox-Carb project to go 10 years or longer before requiring recoating.

This durability has earned Nox-Carb a spot on the NDOR's list of accepted products and they have used it on various bridges throughout eastern Nebraska. While the initial up-front purchase of Nox-Carb is more costly than traditional paints, the NDOR and SDDOT will continue to be involved with this structure throughout its lifespan and they easily recognized the value of a stain/water repellent that has a functional lifespan that far exceeds paints. According to Craig Christensen, owner of Sparkle-Wash, the rehab costs to replace peeling, fading paint on a structure such as the Destiny Bridge "can easily be 5x the amount of doing it right the first time with Nox-Carb."

Because he wants to be able to firmly stand behind the products he uses on his clients' projects, Craig has conducted his own Nox-Carb fade test. He says that after 1 year of being left outside in direct sunlight, a Nox-Carb treated concrete block showed no visible fading when compared to the block he had treated at the same time, but left inside. Craig also liked the fact that there is absolutely no blushing, something he has experienced with other water repellents.

To achieve the color effects on the Destiny Bridge's precast elements, Craig says various combinations and application methods were tried before a sample was approved by the NDOR. The approved final sample was a result of a base coat of Buff with Riverside Grey applied over the joint areas and then various combinations of Iron Red, Mission White, Mocha, Sky Grey and Concrete Grey on the "stones."

Application took place at Enterprise's precast yard in Omaha before the pieces were shipped north to the project site. Because Nox-Carb is a chemically reactive, penetrating product, best results are obtained when the concrete is a minimum of 28 days old. As they were cast, the pieces were carefully tagged for origin date so that Craig's crew would not make application any sooner than the 28 days. Once installed at the job site, touch ups were done as well as the application of Nox-Carb Buff to the precast collars.

This was Sparkle Wash's first decorative concrete job of this size and intricacy and, while there was a learning curve initially, the time necessary to complete each piece had improved significantly by the time the project was complete. Craig's 3-man crew was able to complete the project in 25-30 days. The results are phenomenal and the new bridge opened for traffic with much ceremony and fanfare in October, 2008, exactly 84 years to the date that the ribbon cutting was held for the original bridge. Total cost of the Destiny Bridge project was approximately $24 million.

As for the Meridian, because locals were unwilling to demolish such an important part of their local history, the SDDOT is currently examining the possibility of converting the old bridge into a pedestrian/bike bridge.

Final touch-up on installed pieces.

Precast pieces awaiting installation.

Sparkle Wash

Current owner Craig Christensen's father David originally launched Sparkle Wash in 1984 as a mobile truck washing service. Reinventing the company as market needs changed and opportunities arose, Sparkle Wash has also been involved in commerical cleaning, the application of protective coatings and masonry staining.

Craig took over ownership along with his sisters in 1997. After his sisters left the business, Craig remained as sole proprietor.

With as many as 5 different crews in the field at one time, Sparkle Wash is able to handle a variety of projects at once, such as masonry and concrete cleaning, color staining and water repellent application.

Deck view showing installed columns with lighting.

Installation of final cap piece.

Craig Christensen, Owner, Sparkle Wash of Omaha, Nebraska.