The new Sturgeon River bridge was located near Edmonton, Alberta, the site for many bridge construction projects. Stainless steel differs from carbon steel because it contains chromium. 5% to 30% chromium content of the steel allows the stainless steel to resist corrosion. For a free subscription to this newsletter, change of address, or copies of previous issues, contact NCBC at 5420 Old Orchard Road, Skokie, IL 60077-3099. (Voice) 847-968-6020, (Fax) 847-968-9760, e-mail: ncbc@impactassoc.com.

HPC Bridge Views is published jointly by the Federal Highway Administration and the National Concrete Bridge Council. Readers are reminded that the selection of high-performance concrete (HPC).* We will now discuss some of these accomplishments for fiscal years 1998-2002 under the IBRC program. In a few instances, HPC full-depth precast, prestressed concrete bridge decks have been used. An extensive bridge deck pavement database has been assembled and maintained by NCBC for this purpose. In some cases, HPC bridge decks have been used to cover the structural actions of more than one layer of pavement. It is expected that the inspections and condition surveys of existing bridge decks will provide a database of future pavement service life and their condition correctly by employing high-performance concrete. More than half of these projects have funded HPC projects in a period of applications.

References

Bridge Views

Number of Projects

Alternante Reinforcement

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The specified value of chloride penetrability should be selected based on the importance of the bridge element, the exposure conditions, expected service life, and practical achievability with acceptable materials. For example, lower values can be achieved more easily at exposed locations than at more sheltered locations. A penetrability value can be selected that will allow the concrete to satisfy the chloride requirements that can be achieved. Test results at 28 days are required, accelerated conditioning should be specified. Selection of the specified value should be based on the importance of the structural component, exposure conditioning, curing of the test specimen, and achievable results.

Based on the above considerations, a maximum value of 2000 or 2500 coulombs at 56 days with standard curing represents a good starting point for bridge deck concrete. In some cases, lower RCPT values may be achievable and should be considered. It is expected that the inspections and condition surveys of existing bridge decks will provide a database of future pavement performance. Inhibitors Association. Bridges were reinforced as follows: steel and un-strengthened concrete. All bridges were reinforced as follows: steel and un-strengthened concrete. All bridges were constructed using standard concrete. The specified value of chloride penetrability should be selected based on the importance of the bridge element, the exposure conditions, expected service life, and practical achievability with acceptable materials. For example, lower values can be achieved more easily at exposed locations than at more sheltered locations. A penetrability value can be selected that will allow the concrete to satisfy the chloride requirements that can be achieved. Test results at 28 days are required, accelerated conditioning should be specified. Selection of the specified value should be based on the importance of the structural component, exposure conditioning, curing of the test specimen, and achievable results.

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In conjunction with the Third Lane Widening project, the Ohio Turnpike plans to realign the I-71/I-80 interchange and eliminate the high-level bridge over the Cuyahoga River. The new bridge is located near Akron, Ohio, the new 18-span structure is 2681 ft (818 m) long and has 200 ft (61 m) spans. The main span, 1100 ft (335 m) long, is one of the longest and highest structures on the Ohio Turnpike, and is located in the inner zone. The project has a total construction cost of $125 million.

The new structural form, consisting of precast, post-tensioned girder sections, was opened to traffic in October 2001. The old steel girder structure was substan-

ditionally designed. The new structural form, consisting of precast, post-tensioned girder sections, is designed to carry the traffic load for the next 75 years.

The new bridge consists of three units, Unit No. 1, consisting of a 100-in. (2.5 m) girder, Unit No. 2, consisting of a 149-in. (3.8 m) girder, and Unit No. 3, consisting of a 186-in. (4.7 m) girder. In total, there are 42 precast, post-tensioned girders, 1641 tons (1571 t) of reinforcing steel, 3400 cu yd (2560 cu m) of concrete, and 10,000 tons (9100 t) of shotcrete.

The specified concrete compressive strength for the new girder is 7000 psi (48.3 MPa) and 10,000 psi (69 MPa). The concrete mix proportions included 752 lb/cu yd (446 kg/m³) Portland Cement, 10,000 psi (69 MPa). The concrete mix proportions included 752 lb/cu yd (446 kg/m³) Portland Cement, 8.0 cu ft/yd³ (230 l/m³) water, 0.55 water/cement ratio, 300 psi (2.1 MN/m²) air entrainment, 0.004 in. (0.01 mm) term camber, since much of the camber due to drying occurs in the first few hours after placement. The girder was designed using the AASHTO-LRFD (Ref. AASHTO-LRFD 1994) design methodology.
High strength concrete was used in the bridge girders of the Washington Street Bridge among other bridges.

![Image](https://via.placeholder.com/150)

**Deck**

- Deck in northbound, bottom, and upper girders and expansion joint, and on the northbound deck of the bridge in the 430-600 ft (131-183 m) range.
- The westbound deck of the bridge is constructed using HPC with a specified 32 ksi compressive strength (224 MPa).
- This bridge utilized ground granulated blast furnace slag (GGBS).
- The actual average strength was 500 psi (3.4 MPa). Deck thicknesses in (in., mm) are as follows: 4.25 in. (108 mm) in Unit 1 and 4.0 in. (102 mm) in Unit 2. Two new reinforced GABOs were used on all deck placements.

The deck 4 hosp was designed utilizing HPC with a specified compressive strength of 40 ksi (275 MPa).

**Further Information**

For further information, contact the author at lou.triandafilou@fhwa.dot.gov or 410-274-2081.

**Further Information**

Further information on the northbound bridge deck is available at 40-249-2081.

**Concrete数学**

- The compressive strength was specified to be 40 ksi (275 MPa).
- The concrete was designed with 750 psi (5.2 MPa) of Type I/II Portland cement and 50 lb/yd³ (340 kg/m³) of lightweight aggregate, plus a total unit weight of 90 pounds/cubic yard (115 kN/m³). This was achieved through the use of lightweight aggregates.
High strength concrete and steel in the latest guidebook of Washington State

The Methow River Bridge, currently under construction in Okanogan County in Washington State, is a state-of-the-art, single-span, twin-ribbed precast girders. The Methow River Bridge, opened in 2004, is the first bridge in Washington State to be constructed with high performance concrete (HPC).

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In conjunction with the success of TEA-21, the FHWA created the Team for a Bridge of the Future (TDT) to bring HPC to the forefront. Under 1999 Team for a Bridge of the Future legislation, Congress made funds available for demonstration projects. One specific product of TDT, described in Issue No. 19, is the FHWA's proposed Structures Research and Development Program (SRDP). The author would like to thank John M. Zinn of the FHWA for his suggestions on this project.

Finally, post-TEA-21 legislation has mandated HPC accomplishments that have resulted in a high degree of activity across the country. Ohio and New York have incorporated HPC specifications for routine bridge deck construction in the design of their bridges, which Ohio and New York have implemented a demonstration program for. In conjunction with the success of TEA-21, the FHWA created the Team for a Bridge of the Future (TDT) to bring HPC to the forefront. Under 1999

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Ohio and New York have implemented a demonstration program for the use of high performance concrete in their bridge projects. In addition, several states have implemented their own demonstration programs. In late 2001, the Ohio Turnpike Bridge, spanning the 241-mile (388-km) Ohio Turnpike in Summit County, near the Cuyahoga River Bridges.

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Hierarchical Design

Sturgeon River Bridge: 100-Year Life Service

The construction of a bridge at the Sturgeon River bridge incorporates a number of innovative high performance (HP) design concepts, including geometric constraints to achieve these objectives. The deck and gulls were designed using a span of 131 ft (40 m) for the profile picture, prestressed concrete girder with high performance concrete in the deck and gulls.

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The selected design consists of a single geometric constraint. Integral abutment L-shaped strands to be substituted for the ever, geometric constraints allowed only with high performance concrete in the cast, prestressed concrete girder bridge. The new Sturgeon River bridge was 100-YEAR SERVICE LIFE. Using high performance concrete in bridge decks is corrosion of the top layer of deck reinforcement. This provided a high quality deck with greater resistance to carbonation and a minimum 100-year period for chloride diffusion to be the expected between 100-year service life, a more innovative solution. The relationship between results from the rapid chloride penetrability test (RCPT) as a base, the test results at 28 days are required, accelerated curing may be specified. Selection of the strength, high modulus of elasticity and reduced creep. As a result, the deck concrete is more like-...