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## **136.8-foot Super-Girders Used to Replace Washington's Miles Creston Bridge**

*Lincoln County and Nicholls/Kovich Engineers specified an optimized girder shape, known as a "Super-Girder"*

**LINCOLN COUNTY, Wash.** - As part of the Lincoln County Bridge Replacement Program, Oldcastle Precast of Spokane, Washington fabricated 136.8-foot-long prestressed concrete super-girders for the new Miles Creston Bridge in Lincoln County, Washington.



The term "super-girder" resulted from the efficient shape of this new bridge girder family, which utilizes high strength concrete and .6" diameter prestress strand to maximize span length and minimize the number of girders.

Precast, prestressed concrete girders have been used in bridge construction for over 65-years

and have proved to be economical and durable across the U.S.

In many states, especially Washington, prestressed girders, combined with a cast-in-place deck, or an all prestressed girder including precast deck, constitute the superstructure system of choice for bridges that span to over 200-feet.

As has become customary, Lincoln County Public Works Department, working with their consultant Nicholls/Kovich Engineers of Spokane, WA, specified WSDOT WF 58 optimized girders, known as "Super-Girders", for the replacement of the existing Miles Creston Road Bridge Over Hawk Creek in Lincoln County, due to its substandard load carrying capacity, thus requiring a high priority replacement bridge.

General contractor Wesslen Construction, Spokane, Wash., the low bidder on the project, awarded Oldcastle Precast-Spokane the contract to manufacture and haul the wide-flange super-girders for the new Miles Creston Bridge.



At 125,438-pounds each, Oldcastle Precast manufactured five, wide flange "Super-Girder" bridge beams, measuring 58-inch-tall by 136.8-feet-long. The bridge girders were used to build the bridge superstructure, with a conventional cast-in-place concrete deck.

Accordingly, the optimized girders were designed with a 49-inch wide top flange and a 38-inch wide bottom bulb. These wider flanges give much more lateral stability during transport than the shapes they replaced, and utilize a much larger

prestress force to increase spans and minimize the quantity of girders. In this case, spanning 136.8-foot with only a 58-inch depth of girder provides an aesthetically pleasing profile as well as providing adequate clearance above the river for 100-year flood passage.

Each “super-girder” is custom manufactured in Spokane and transported on trucks specially-designed to hold the weight. Due to their size, the girders must be transported to the construction site on steerable rear supports. Once the girders arrive on site, crews used two cranes to set them on top of the new bridge abutments.

Oldcastle Precast Sales Manager Chuck Prussack stated, “Long-span precast, prestressed concrete girder standards have allowed WSDOT and other bridge owners to extend the span capability of the construction material they prefer to use. Using long-span precast, prestressed concrete girders can eliminate the need for falsework, reduce on-site construction activities and schedules, reduce environmental impacts at water crossings, and minimize hazards, delays and inconvenience to the traveling public.”

Miles Creston Road Bridge Replacement project consisted of the following steps: 1) Install a temporary detour; 2) Remove the existing bridge, abutment walls and footings; 3) Install piling and pile cap abutments; 4) Install precast superstructure with cast in place deck and bridge rail; and 5) Install bridge approaches with approach steel rail to match up to the existing roadway width.

Several years ago, the “super-girder” family of girders originated when WSDOT worked with the industry to create an optimized family of girder shapes that would be capable of longer spans, have more stability during shipping, present a shallow profile for stream clearance and aesthetics and fully utilize High Performance Concrete (HPC) with its higher strengths by using .6-inch diameter prestressing strands.

As one of the leaders in the use of the new optimized girder shapes, the Northwest has been using the “Super-Girder” shape at a 100-inch depth on spans more than 200-feet for many projects, with many more structures in this span range being designed!



**About Oldcastle Precast:** Oldcastle Precast is the clear choice for building products and services for North American infrastructure projects. We are a leading provider of engineered product solutions nationwide to a number of market sectors including: Water, Communications, Energy, and Transportation.

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