Des Plaines River Valley Bridge on I-355

Lemont, IL

The 1.3-mile Des Plaines River Valley (DPRV) bridge on Interstate 355 near the Chicago suburb of Lemont, IL, is the state's first to use post-tensioned, prestressed, precast spliced bulb-tee girders. The structure combines concrete spliced bulb-tee girders with the bulb-tee girders.

The new approach was instigated because of volatility in material prices as the bridge was being designed. To address these fluctuations, officials included a performance-based bid specification that allowed contractors to propose their own design.

The DPRV spans two canals, several railroad lines, two local roads, the Des Plaines River and a forest preserve. The spliced-girder design allowed long spans, which minimized the bridge's impact on all of these areas. The bridge has a total of 34 piers for 35 spans and features 18 simple prestressed spans and 17 post-tensioned spans.

The spliced girder's length minimized the impact on the wetlands through which it passes. The simple spans are made continuous with closure pours over their pier caps. Epoxy-coated reinforcing steel protruded from the ends of the beams into 1-foot gaps between the ends of the bulb-tee girders over the piers.

Falsework supported the beams on both a pier and the falsework. Two beams would extend toward each other, leaving space for a drop-in segment of 124 to 150 feet long. Once the girder was released from the crane, the post-tensioning ducts were coupled, and epoxy-coated reinforcing bar was set. The closure pours then were completed, allowing them to act as monolithic diaphragms.

The 270-foot girders were haunched to 120 inches over piers (instead of the typical 102-inch depth), where the maximum negative moment occurred.

The deck was poured over epoxy-coated reinforcing steel (ECR rebar) to ensure the highest level of corrosion resistance for the service life of the bridge.

Team

Owner:
Illinois State Toll Highway Authority, Springfield, IL

Designer:
Janssen & Spaans Engineering Inc., Indianapolis, IN

Builder:
Walsh Construction Group, Chicago, IL

General Contractor:
Dominion Fairmile Construction Ltd.

Design Criteria:
- Choose between steel plate-girder and segmental concrete box-girder options
- Minimize impact on wetlands below the bridge
- Span 1.3-miles with minimal piers

Total Project Cost: $125 million

Photography:
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