

# Concrete Bridges for the Expressway Authority

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The Orlando-Orange County Expressway Authority (OOCEA) was established as an agency of the state under Chapter 348, Part IV, of the Florida Statutes in 1963. The current system consists of 105 centerline miles of limited access expressway (over 500 lane miles), 57 interchanges, 13 mainline toll plazas, as well as a non-system 2-mile-long tolled roadway (Goldenrod Road), 58 ramp toll plazas, and 286 bridges covering SR 408 (Spessard Lindsay Holland East-West Expressway), SR 417 (Central Florida GreeneWay), SR 528 (Martin Andersen Beachline Expressway), SR 429 (Daniel Webster Western Beltway), and SR 414 (John Land Apopka Expressway).

Approximately 85% of the OOCEA's bridges are concrete, utilizing many structure types. Concrete slab bridges are common for short spans and low-profile structures, AASHTO beams for the older medium span structures, and more recently, Florida bulb-tee beams, concrete U-beams, and Florida I-beams for the newer, larger structures.

OOCEA plans and constructs its expressways to bring value to the community through economical new designs and aesthetic appeal. The Goldenrod Road project was the first in Florida to include the design and construction of 72-in.-deep concrete Florida U-beams for use over vehicular traffic. Two spans totaling 265 ft 10 in. in length (the largest being 145 ft long and 8 ft wide) were set over SR 528. The U-beams were chosen for their appearance, improved maintenance of traffic, and lower maintenance costs. The Expressway Authority also utilized the U-beams as an economical alternative to steel box girders on structures for SR 429, SR 408, the I-4/SR 408 interchange, and the SR 414/SR 429 interchange.

When developing concepts for the widening of SR 408 through downtown Orlando, a non-traditional design approach to increase traffic capacity was needed to satisfy the diverse communities it spans. OOCEA added a degree of architectural creativity to its always-sound highway engineering. The resulting design incorporated decorative concrete architectural precast concrete panels, typically used for buildings, to create a facade concealing the sloped pavement and bridge piers. The precast concrete panel facade used native Florida stone in two shades of earth tones to blend into native landscaping and improve the overall look of the bridges. The signature component at each bridge was precast concrete pylons that matched many of the craftsman-style homes along the frontage.



Close-up photos of decorative concrete pylons. All photos: Orlando-Orange County Expressway Authority.



Decorative architectural precast concrete panels were used on the expressway widening through downtown Orlando.

The concrete industry is robust in central Florida; concrete is typically the material of choice for short- and medium-span bridges. It has also provided options and competed well with steel in the long-span bridges through segmental structures. The use of Class VI, 8500 psi compressive strength concrete and the new Florida I-beam shapes have helped extend the range of concrete shapes now available.

This past year, a value-engineering redesign replaced a two-span steel plate girder on CR 437 over SR 429 with a new Florida I-84 beam, providing a six-figure cost savings to the

OOCEA. With the added benefit of cost savings, combined with the increased durability and reduced maintenance, concrete continues to be a viable option for use in the OOCEA system. **A**

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