

I-205 COLUMBIA RIVER BRIDGE COFFERDAMS

Portland, OR



Bell shaped cofferdam mating to pre-fabricated reinforcing cage

PROJECT INFORMATION

Year of Completion: 1976

Construction Cost: \$200M

Client: Oregon Department of Transportation

Contractor: Willamette-Western, General Construction and Alaska Constructors JV

SERVICES PERFORMED

- ◆ Design of 100-ft deep cofferdams for 2 North navigation channel piers
- ◆ Design of Bell-Pier cofferdams for 22 North channel approach piers
- ◆ Design of cofferdams for 26 piers on South channel crossing

The Columbia River Bridge is a pre-stressed box girder bridge with a main span of 650 ft. The superstructure was constructed using balanced cantilevers with both precast and cast-in-place segmental construction methods.

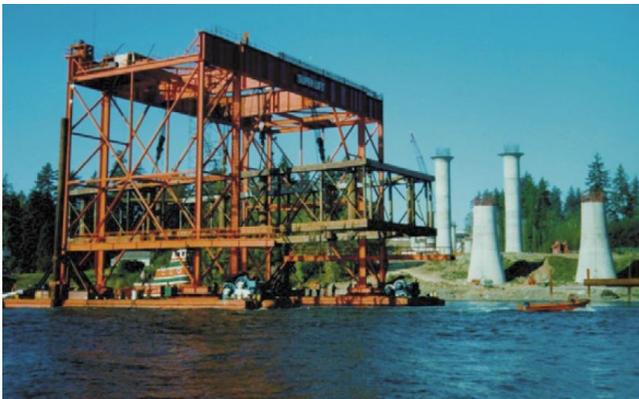
As the Chief Engineer for the Willamette-Western Corporation, Robert Bittner was responsible for the design of all cofferdam systems for both the North Channel Crossing and the South Channel Crossing. The entire crossing includes two 3,120 ft long cast-in-place structures across the South Channel and two 7,460 ft long segmented box girder bridges across the North

Channel. The foundation construction for the South Channel required 26 cofferdams. The North Channel foundations were built using two unique cofferdam systems.

The first of these two systems utilized interlocking 100 ft long H piles to form two cofferdams 145 ft by 58 ft in plan and 100 ft deep for the 2-main piers flanking the navigation channel. The second system, used for the 26 approach piers, consisted of two immense bell shaped steel forms. The larger of the two forms was 83 ft by 66 ft in plan, 62 ft high and weighed 450 tons. This form was externally stiffened for a designed hydrostatic head of 54 ft. The

sequence of construction, which was completed in 23 months for all 26 approach piers, for this unique cofferdam system was:

- Pre-excavate underwater site
- Place gravel bed and level
- Drive H-pile foundation
- Set Bell-Pier form with pre-installed reinforcing cage pre-installed within the Bell-Pier form
- Place 8-ft deep tremie slab
- Dewater cofferdam and complete casting pier in-the-dry
- Strip 62-ft high Bell-Pier cofferdam form in one piece for re-use



Installing wale tremie for 100-ft deep cofferdam



Placing 1200 CY tremie seal with floating batch plant



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