

**1995 NOVA AWARD WINNER****Bird Island Flats Concrete Tunnel Roof Casting Machines**

The Bird Island Flats segment of the Boston Central Artery Project requires almost 1 1/2 miles of cut and cover concrete tunnels of widely varying dimensions. Width varied from 40' to 90', roof slope varied from 0 to 4%, and the invert varied in slope from 2 to 4% and in cross slope from 0.8 to 6%. Roof height varied from 17' to 31', and roof slab varied in thickness from 6.5' to 10'. The roof met the side walls at 45 degrees which increased roof depth by 4' 6" at its longitudinal edges. The sides of each roof pour flared by as much as 4' per side.

Faced with these variations, the joint venture of Modern Continental and Obayashi contracted with Conesco to design and fabricate a series of custom made machines to precision cast the concrete roof sections. The form system that was developed allows quick and easy hydraulic adjustments in height, width, side slope, longitudinal slope, and flare. There are 3 sizes of machines, built for different basic widths of tunnel. The machines are self-propelled and steered to move between placements. All adjustments of height and width for different placements are provided by hydraulics that adjust for changes in super-elevation cross slope, center line slope, roof height, roof width, and flare on both sides of the roof section. These machines replaced standard heavy duty shoring components or less sophisticated moveable shoring units that require substantially more labor.

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