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Connaught Bridge Replacement, Vancouver, BC

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The Connaught Bridge in Vancouver, Canada crosses a navigable tidal inlet which is approximately 165m wide. Other constraints such as property ownership, requirements of navigation and road and rail overpass clearances dictated the final bridge length of 1100m including a main span of 84 metres. Typical spans are between 33 and 39 metres in length.

Because the structure crosses a major urban redevelopment area which will also be the site for Exposition 86, i.e. a major "people" place, the clients were willing to pay a premium for an aesthetically pleasing structure. The chosen design utilizes a cast-in-place spine beam supporting precast, pretensioned "wing" elements which act as permanent cantilever forms for infill deck concrete. A typical cross-section is shown in Figure 1. After the infill concrete is placed, the structure is post-tensioned longitudinally using a combination of 12 and 19 -15mm strand tendons. The composite deck is post-tensioned transversely to carry the applied live loads. The superstructure is continuous between expansion joints which are spaced between 250 and 300 metres apart.

Ground conditions at the site are generally poor with loose fills overlying soft clays and silts to a depth of 10 metres. Expanded base piles formed on glacial drift were used to support the structure. In a departure from conventional expanded base piles, a permanent steel liner was placed and filled with normal concrete to give better lateral resistance to seismic forces.

The cost of the structure based on tenders received is about C\$950 per m².

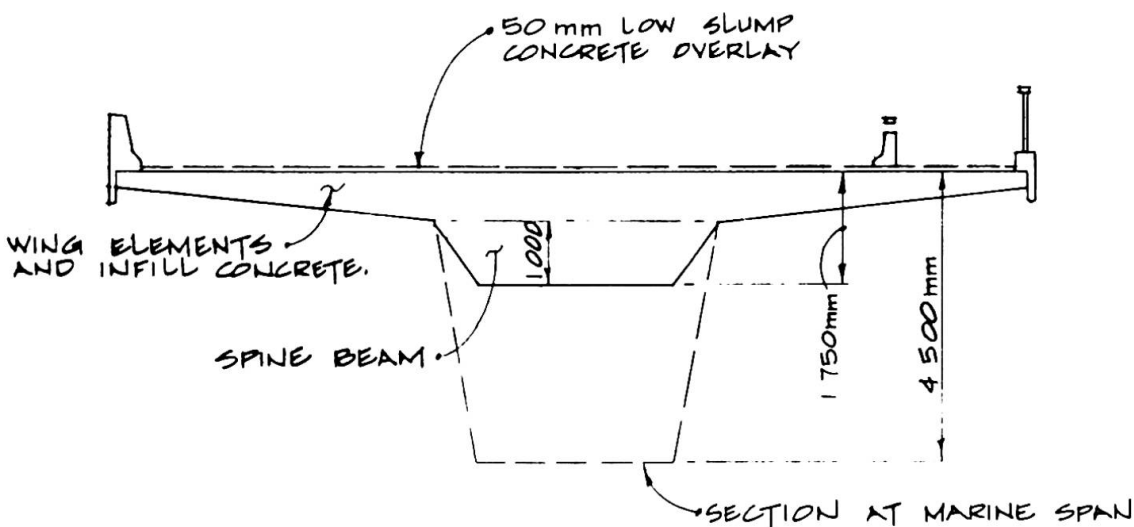
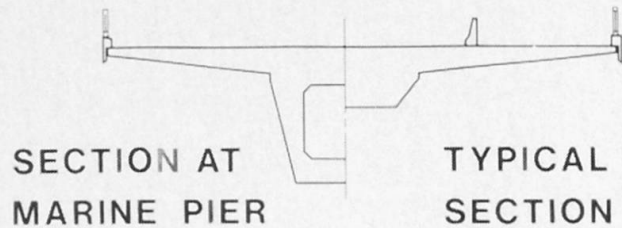


FIG. 1

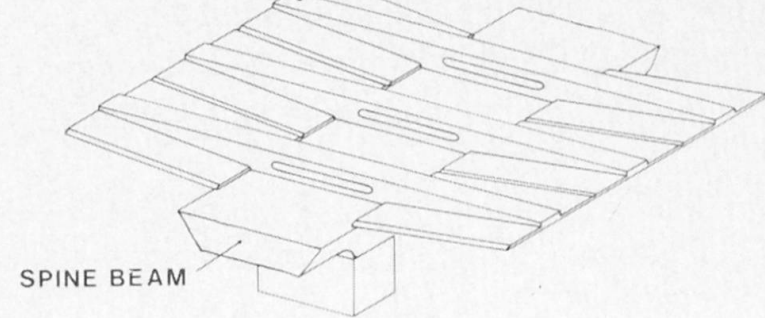
CONNAUGHT BRIDGE REPLACEMENT, VANCOUVER, B.C.



WING ELEMENTS

RIB PRE-TENSIONED TRANSVERSELY FOR ALL DEAD LOADS

PRECAST WING ELEMENT



SPINE BEAM AND WING ELEMENTS

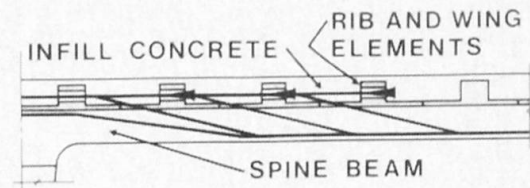


COMPLETED STRUCTURE

CONNAUGHT BRIDGE

OWNER - CITY OF VANCOUVER
 COST - \$35,000,000

The cast-in-place spine beam supports precast, pretensioned 'wing' elements which act as permanent cantilever forms for infill deck concrete. After the infill concrete is placed, the structure is post-tensioned longitudinally, using a combination of 12 and 19-15mm dia. tendons. The composite deck is post-tensioned transversely for applied live loads.



SECTION LONGITUDINAL POST-TENSIONING