White Cart Viaduct
for the Scottish Development Department

Design Office
Crouch and Hogg

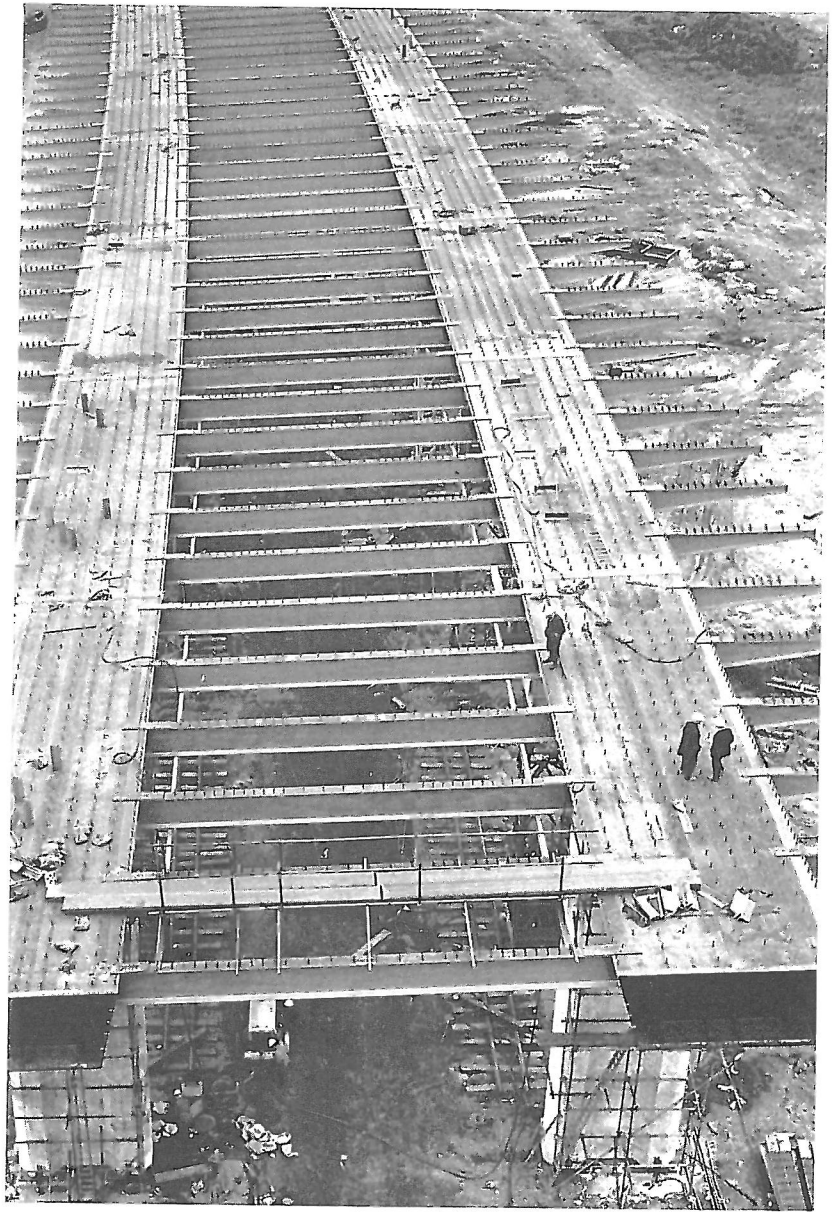
Independent Architects
Cullen Lochhead & Brown

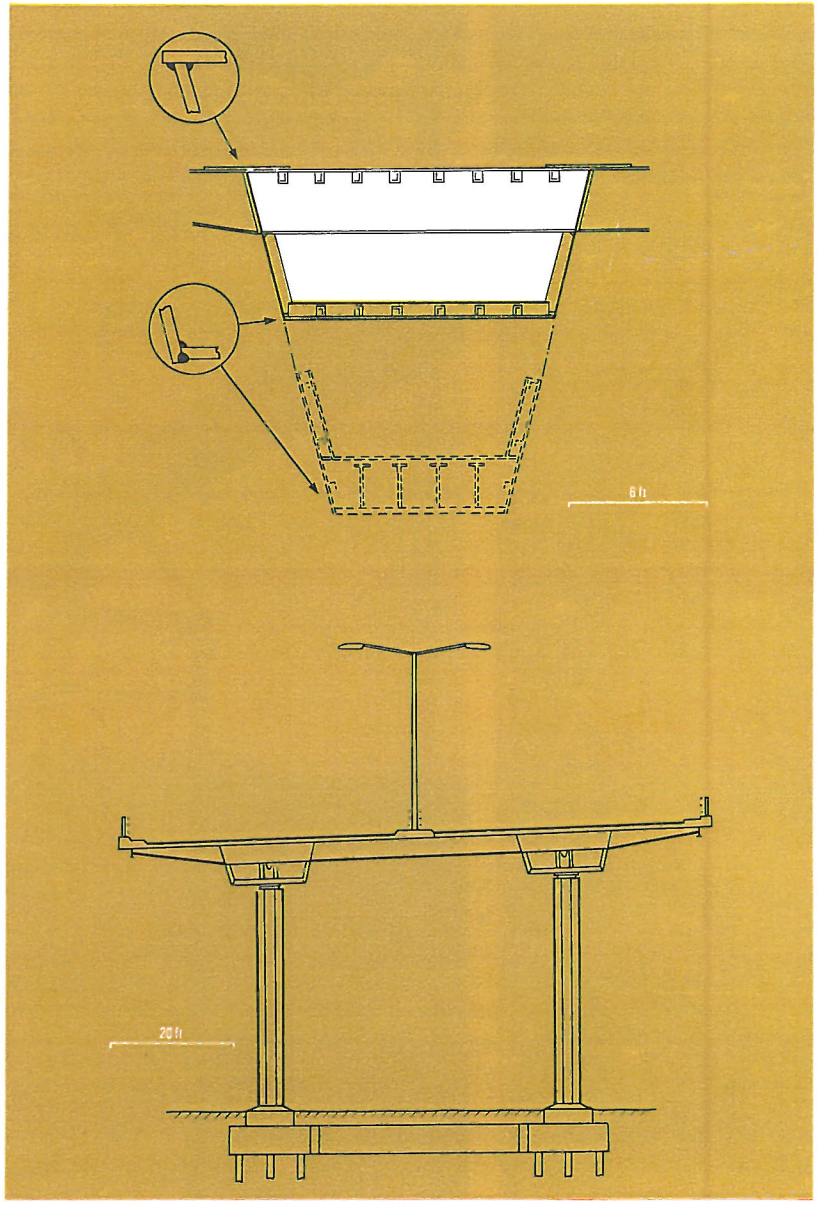
Steelwork Contractor
Sir William Arrol & Co. Ltd

Judges comments

Twin continuous box girders of mild steel and trapezoidal section were found to give the lowest weight of steel per square foot of deck. The corresponding reduction in dead load, compared with other materials of construction, resulted not only in significant savings in cost of both superstructure and foundations but also produced a pleasing design of high aesthetic merit.

The longest span over White Cart Water



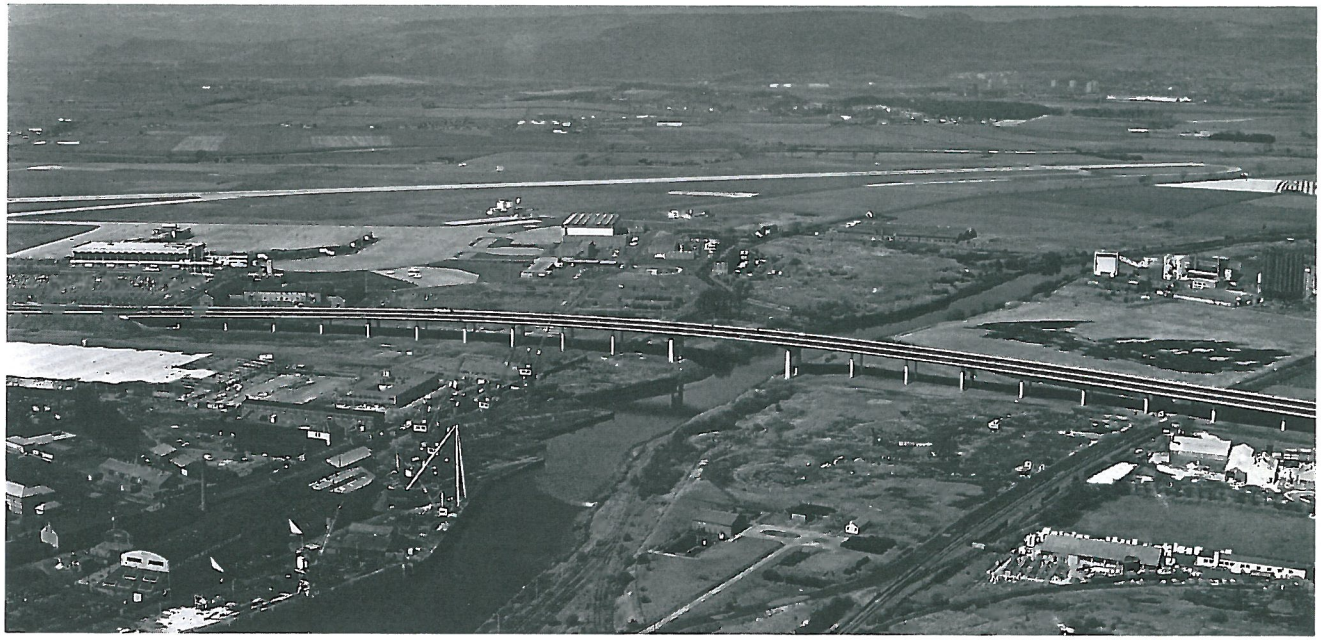


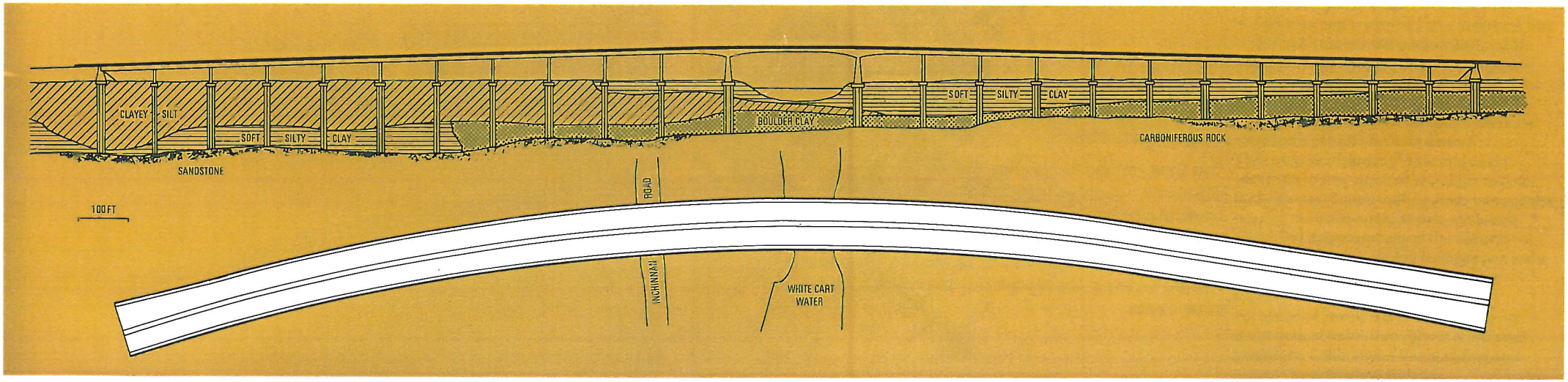
Description

White Cart Viaduct forming part of the M8 alongside Glasgow Airport, is 2,700ft long and has two 36ft, three lane carriageways. There are 23 spans varying from 105ft at the abutments to 250ft over the river. The extremely difficult foundation problems caused by the deep silts overlying geologically shattered rock were solved by the use of 60,000 lineal feet of 90lb steel H piles for which cathodic protection is provided as a safeguard against possible corrosion.

A continuous running surface was achieved by incorporating only two expansion joints, one at each abutment and carrying the deck on rocker piers except for the two main river piers which provide the longitudinal anchorage. The deck is carried on two box girders of trapezoidal cross section with top plate 15ft wide, bottom plate 12ft wide and a depth of 6ft 6in. They were fabricated in straight 55ft sections and spliced on site with friction grip bolts. The total weight of the girders is 3,640 tons. Stainless steel was employed on the ends of the girders for the river span as there is now no access to them.

Precast and in-situ concrete were costed in comparison with steel but the saving in deadload, using a composite steel and concrete structure with the resulting savings in foundation costs, decided the issue.




CLAYEY SILT
SOFT SILTY CLAY
SANDSTONE
BOULDER CLAY
SOFT SILTY CLAY
CARBONIFEROUS ROCK
100 FT
ROAD
INCHINNAN
WHITE CART WATER