Bridges – Friarton Bridge, Scotland

Project:
Friarton Bridge, Scotland

Date:
1975 - 1978

Client:
The Scottish Office

Structural Engineer:
Freeman Fox and Partners

Main Contractor:
Cleveland Bridge and Engineering Company

Project details:

The Friarton Bridge is a road bridge across the Firth of Tay on the southeastern outskirts of Perth, Scotland. The bridge forms part of the eastern spur of the M90 between junctions 10 (Craigend) and 11 (Broxden), the most northerly motorway junction in the UK. It also forms part of the important east coast road corridor from Edinburgh through to Dundee and Aberdeen.

It is a two-lane dual carriageway; unusually for a motorway, neither carriageway has a hard shoulder.

The structure was designed and built to BS 153 and the IDWR. The start of construction was delayed because of the need to check designs against the Merrison standards. Construction on the Bridge began in 1975 and the final cost was approximately £8,000,000.

Eight pairs of reinforced concrete pillars carry the deck. The nine spans of the bridge vary in length from 63 metres to 174 metres which is the river span. The bridge is a box girder bridge.

On the Bridge the width of the box girders is 4.3 metres. The girders form parallel lines. Each girder carries a reinforced concrete deck and the deck carries one carriageway of the new road. The carriageway is 7.3 metres wide.

The box girders vary from 10.5 metres to 25m in length and were brought by road to the site. Between the piers the box girders were built on an upward curve so that they would deflect and sag between the piers when the concrete carriageway was laid. Very high precision and accuracy was required.

The concrete deck was formed using Lytag® lightweight aggregate coarse and fine aggregate, which reduced the concrete deck weight and overall bridge cost. There was 200mm thickness of reinforced concrete followed by a layer (20mm) of maestro asphalt (water proofer) and finally a 45mm layer of rolled asphalt.