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Artikel: Standard bridges as highway overcrossings (United Kingdom)
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7. Standard Bridges as Highway Overcrossings (United Kingdom)

Owner: Department of Transport, United Kingdom

Dimensions:

clear lengths (4 span bridges) excluding side spans:
from 24.20 and 35.70 m
bridge widths: from 9.9 and 11.70 m and 9.9 and 11.70 m
angle between axes highway/overcrossing: 65 o to 90 o
maximum grade: 4 o/o

Quantities of materials used pro m2 of bridge:

0.425 m3 concrete for superstructure 4 span bridge (10 m+17.5 m+17.5 m+10 m) and width of 11.70 m
0.625 m3 concrete for substructure (usual foundation conditions)
179 kg steel
11.1 kg steel for prestressing

Work's duration:
Date when available for use: 1977

A Department of Transport project for the design of standard bridges is just nearing completion. The aim was to prepare designs for commonly occuring bridges. From surveys carried out it was decided to produce designs to carry roads with carriageways of 5.5 m and 7.3 m (each with 2 x 2 verges) over dual two lane trunk roads and dual three lane motorways. The designs cover the following ranges:

- Skew angle of 0 o – 25 o
- Gradients from 0 o/o – 5 o/o
- Crossfall from 0 o/o – 3.3 o/o
- Headroom from 5.1 m – 6.3 m
- Overwidening bridge to cater for radius from ℄ – 740 m on side road
- Overspanning bridge to cater for radius from ℄ – 1840 m on main side
- Foundations to be designed for a permissible bearing pressure of 200 and 300 KN/M^2

Two span and four span designs are offered in five deck types of which only the RC slab deck is of continuous construction. The deck types are:

- Reinforced concrete slab deck (Fig 1) incorporating voids in the centre spans of the 4 span scheme, for dual 3 motorways.
- Prestressed concrete inverted Tee beams (Fig 2) with insitu concrete infill – over dual 2 lane trunk roads only.
- Prestressed concrete M beams (Fig 3) at 1.5 m centres acting compositely with an insitu concrete deck slab.
- Prestressed concrete U beams (Fig 4) at 2.5 m centres acting compositely with an insitu concrete deck slab.
- Rolled steel beams (Fig 5) at 2.5 m centres acting compositely with an insitu concrete deck slab.

The simple spans of the decks with prefabricated beams are linked together so that all the expansion takes place at the two ends of the bridge. There are no 'fixed' bearings and the longitudinal forces are shared between the intermediate supports. Service bays are provided under each verge.

The standard bridge package includes reinforced concrete abutments and bank seats which are interchangeable for all 5 deck types. The standard pier design is also interchangeable for deck types b, c, d and e while deck type a has individual circualr columns. The photographs show artists impression of such standard bridges.

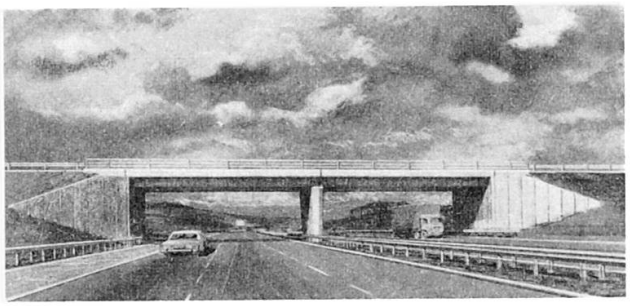

Fig 6 a 2 span overbridge of U beam construction

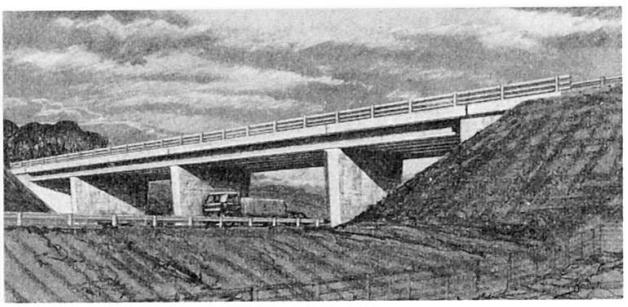

Fig 7 a 4 span overbridge of M beam construction

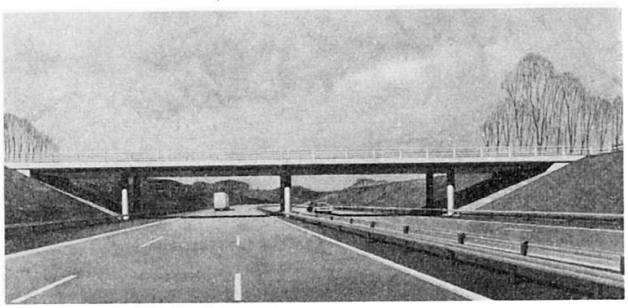

Fig 8 a 4 span overbridge of Reinforced concrete slab deck with individual columns

Standard drawings have been prepared and a user manual describes how to complete the drawings for a given bridge situation. The designs have been prepared for the Department of Transport by the following:

W S Atkins & Partners in association with the Department's South Eastern Road Construction Unit,
EWH Gifford & Partners in association with the Department's North Eastern Road Construction Unit,
G Maunsell & Partners in association with the Department's Eastern Road Construction Unit,
Constructional Steelwork Research and Development Organisation.

(K. Sriskandan)

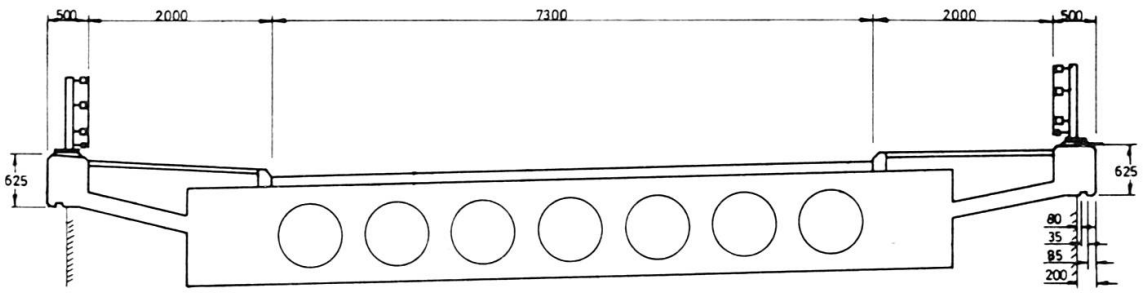

Fig 1 Reinforced Concrete Voided Slab

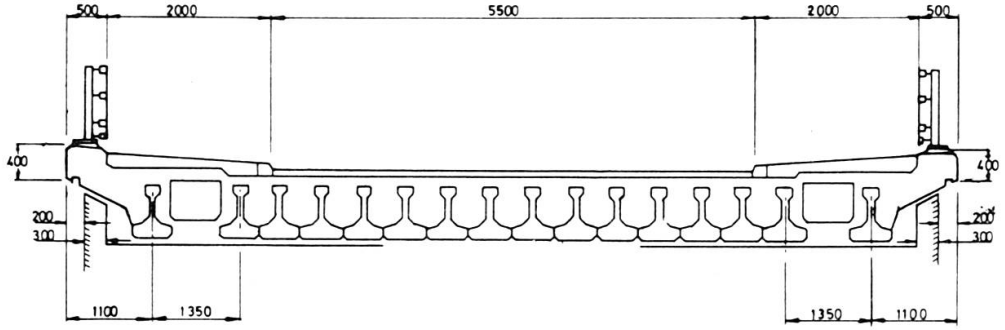

Fig 2 Pre-Stressed Concrete Inverted T-beam with in-situ concrete in-fill

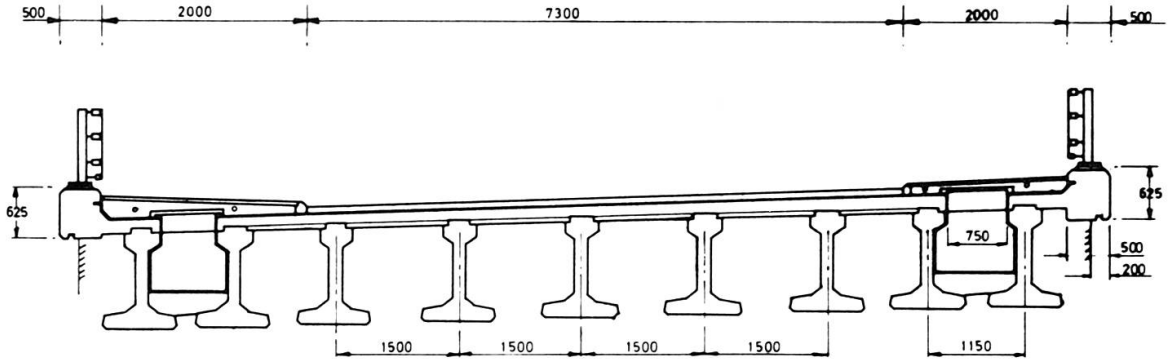

Fig 3 M-beams with composite in-situ slab

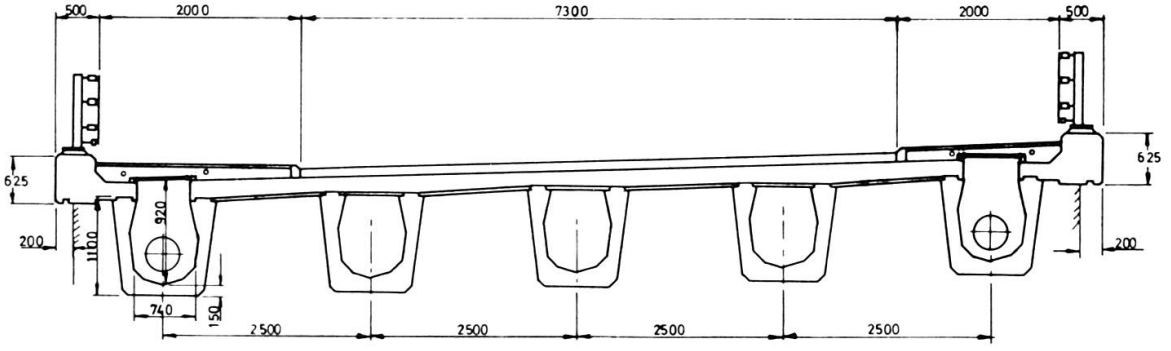

Fig 4 P.C. U-beams with in-situ composite slab

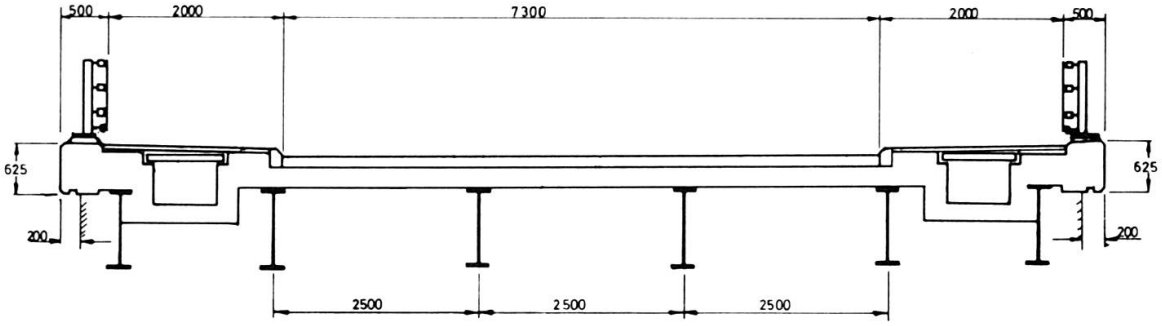

Fig 5 Rolled Steel Beam with composite R C Slab