

Bredon Bridges

on M5 Motorway for the Department
of the Environment

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Judges' Comments

Two bridges of similar design which merge smoothly with the embankments between and beyond them, and fit unobtrusively into the countryside. The modular dimensioning of the steelwork made maximum use of shop fabrication and the clean cut lines ensure economy in maintenance costs.

The Bredon Bridges carry the M5 motorway across the Bredon Valley near Tewkesbury in Gloucestershire. The main bridge over the Avon has five spans totalling 567ft while the secondary bridge crossing a flood-relief stream has three spans of 283ft total length. Importance was attached to providing simple, well-proportioned bridges which would not disrupt the horizontal emphasis of the long embankment necessary in this flat valley. For visual unity as well as economy the bridges were considered as related structures.

The steel box-girder design was selected from six designs for its appearance and economy which were mainly attributable to:

1. Continuous construction with a well-proportioned span layout.
2. The inherent virtues of box-girder construction namely:
 - (a) Excellent torsional rigidity.
 - (b) Good lateral stability during construction.
 - (c) Reduction of web material to a minimum.
 - (d) Avoidance of thick plates with attendant welding problems.
3. Use of high yield steel for all main members.
4. Significant weight reduction compared with concrete, thus reducing cost of piled foundations.

The steelwork was self supporting during concreting as propping would have been difficult at this site where the ground is flooded for several months each year. Stud shear connectors are used on all girders, longitudinal and transverse, thus ensuring composite action under live load.

Box-girder site joints, near points of contraflexure, were welded while cross-girders and cantilevers were connected by high-strength friction bolts.



Opposite: The two bridges seen over the Avon. Bredon Hill is in the distance.

Above: The cantilevered beams on the bridge over the Avon.

Below: The bridge structure showing transverse beams and continuous box-girders.



