



Figure 6.4
The actual bridge design of the Severins Bridge owed its unusual design to the external constraints

this point the linear grid form disappeared only to resurface again as an approach to the surrounding landscape.

External constraints can be just as influential and inspirational at the other end of the spectrum of design. In his classic book on graphic design, Paul Rand (1970) explains how what he calls 'the given material' forms an important starting-point in advertising graphics. Rand's 'given materials' are in essence the external constraints of graphic design. The product to be promoted, the format and medium of the advertisement and the production process itself. Such factors are not under the designer's control, they

already exist and the designer must work with them. On the other hand, the external constraints are the very essence of the special, and possibly unique, circumstances which make a design different. The modern movement in design has tended to play down the role of the specific and special in its search for more general, possibly even universal, solutions. In the 1990s we are returning to a period in the history of design characterised by a greater interest in external constraints. Nowhere is this more true than in architecture. The great modernist Mies van der Rohe was one of the pioneers of the modern movement international style with his clean minimalist lines. Le Corbusier called for buildings to be like ocean-going liners keeping a uniform internal environment wherever in the world they were constructed. In fact there was an alternative tradition of modernism, championed by Hans Scharoun, whose famous concert hall in Berlin demonstrated entirely site-specific architecture. Peter Blundell Jones (1995) has pointed out that Scharoun's predecessor, Hugo Haring, actually shared an office with Mies and demonstrated how they debated and contested the universal and the specific. It is interesting to note that the universalists won the debate and it is with the international style that the modern movement is associated. Perhaps this has more to do with our own laziness in terms of understanding design than with any particular merits of the argument!

The role of internal and external constraints

The essential significance of the domain of a constraint lies in the freedom available to the designer. Internal constraints generally allow a greater degree of freedom and choice since they only govern factors which are under the designer's control. Of course both internal and external constraints can be generated by designers, clients, users and legislators. We now extend our model of design problems by adding more building blocks and creating a kind of wall (Fig. 6.5).

To return to the housing example, in achieving the client's desired relationship between kitchen and dining-room the designer is able to position both. External constraints are not so simple. The client's wish to have a sunny living-room is in a sense a more demanding requirement, since much though at times they might like to, architects cannot control the movements of the sun! For this reason external constraints, although they may sometimes only constitute a