The different roles of the generators of constraints

The first four building blocks of our model of design problems can now be put in place. If we stack each of the four generators of design constraints into a sort of tower, we can see that the constraints become more open for debate and discussion as we climb the tower (Fig. 6.2). Each of the generators of design problems identified here impose constraints upon the design solution but with different degrees of rigidity. The most rigid being those imposed by legislators and the most flexible those generated by the designer.

For example in designing the layout for a shop interior, constraints will be imposed by each generator. In order to ensure safety in case of fire the fire officer will require the surface materials to achieve a specified rate of resistance to flame spread, and may determine the number and position of escape doors and the width of corridors and gangways. Other legislation may control the display and storage of food, the working conditions of staff and so on. The client too will generate many design constraints connected with the primary objectives of attracting custom and selling goods. Unlike the legislator's constraints the designer is able to discuss the client's constraints and establish priorities. Conflicts between the design implications of the client's objectives are not uncommon, and here the designer is able to go back to the client and jointly they may re-appraise the client constraints. For example, on the one hand the client for our shop may want the display furniture to be designed and arranged so as to make the goods look attractive

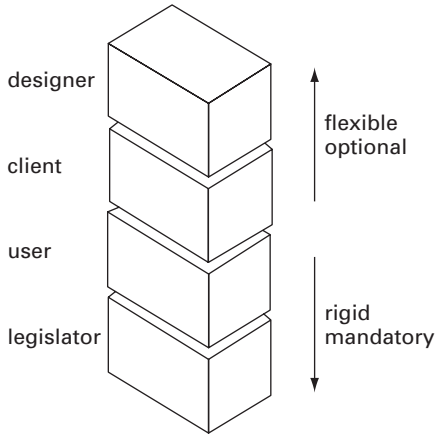

Figure 6.2
The four groups of generators of design constraints stacked in order of flexibility

and to tempt prospective purchasers. On the other hand it will certainly be important to minimise the likelihood of shoplifting or damage to unbought items. These two requirements are at least to some extent in conflict. In Alexander's terms they interact negatively. However, the exact balance of satisfaction for such requirements may not be clear to the client until the designer explores the various possibilities in physical three-dimensional terms. Our client may not be able to say exactly what degree of risk of loss from theft is acceptable in order to achieve effectiveness of display until the designer actually proposes some designs.

Clearly from the designer's point of view, client constraints are not absolute as are legislator constraints. Rather they all carry a relative value which is open to a certain amount of discussion. In this example the designer too is expected to generate constraints. Our shop designer is supposed to come up with an integrative idea, an overall concept which organises and unifies the whole interior. Thus designer-generated constraints may restrict the range of colours and materials and establish geometric and dimensional rules. The goods for sale in the shop may range from items as small as buttons through books and stationery to clothes and furniture. The shopfittings must be capable of displaying all these goods and perhaps establish a distinct but related image for each department. One design idea might be to devise a range of fittings constructed of bent plywood covered in brightly coloured laminates combined with curved chromium plated tubular frames. Having established the constraint of these materials and forms the designer would have to create actual fittings for clothes, food, jewellery and so on.

It is obvious that these designer-generated constraints are comparatively flexible. If they cause too many difficulties, or just simply do not work out the designer is free to modify or scrap them altogether. Design students often fail to recognise this simple fact but instead continue to pit their wits endlessly and fruitlessly against insuperable problems which are largely of their own making. One of the most important skills designers must acquire is the ability critically to evaluate their own self-imposed constraints and we shall return to this again in Chapter 11. For the time being it is important to recognise the different contributions to the problem made by each of the major generators of constraints. As we have seen the legislator's demand is fixed, the users may well not be around to be consulted, the client may adjust priorities as the design implications unfold and the designer may think of a new set of constraints altogether.