Table 1.5 Imposed loads for residential buildings (BS 6399 Part 1 Table 5)

Floor area usage	Intensity of distributed load (kN/m^2)	Concentrated load (kN)
Type 1: self-contained dwelling units		
All	1.5	1.4
Type 2: apartment houses, boarding houses, lodging houses, guest houses, hostels, residential clubs and communal areas in blocks of flats		
Boiler rooms, motor rooms, fan rooms and the like including the weight of machinery	7.5	4.5
Communal kitchens, laundries	3.0	4.5
Dining rooms, lounges, billiard rooms	2.0	2.7
Toilet rooms	2.0	—
Bedrooms, dormitories	1.5	1.8
Corridors, hallways, stairs, landings, footbridges, etc.	3.0	4.5
Balconies	Same as rooms to which they give access but with a minimum of 3.0	1.5 per metre run concentrated at the outer edge
Cat walks	—	1.0 at 1 m centres
Type 3: hotels and motels		
Boiler rooms, motor rooms, fan rooms and the like, including the weight of machinery	7.5	4.5
Assembly areas without fixed seating,* dance halls	5.0	3.6
Bars	5.0	—
Assembly areas with fixed seating*	4.0	—
Corridors, hallways, stairs, landings, footbridges, etc.	4.0	4.5
Kitchens, laundries	3.0	4.5
Dining rooms, lounges, billiard rooms	2.0	2.7
Bedrooms	2.0	1.8
Toilet rooms	2.0	—
Balconies	Same as rooms to which they give access but with a minimum of 4.0	1.5 per metre run concentrated at the outer edge
Cat walks	—	1.0 at 1 m centres

* Fixed seating is seating where its removal and the use of the space for other purposes is improbable.

Having discussed the types of loading encountered, let us look at some examples. These illustrate how the designer has to convert information about the construction into applied loads on individual structural elements such as beams and columns.

Example 1.1

Timber beams spanning 4 m and spaced at 3 m centres as shown in Figure 1.1 support a timber floor comprising joists and boards together with a plaster ceiling. The load imposed by the dead weight of the floor joists and boards is 0.23 kN/m^2 and by the ceiling 0.22 kN/m^2. If the floor has to support a residential imposed load of 1.5 kN/m^2, calculate the total uniformly distributed load that a single timber floor beam supports.

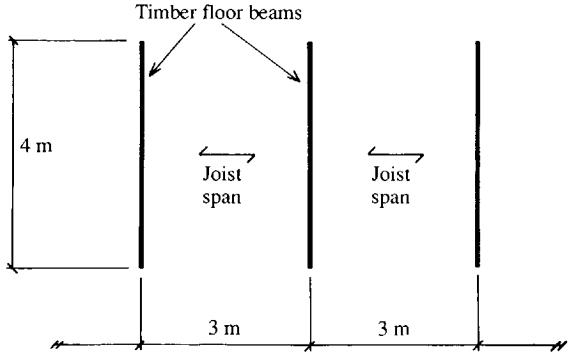

Figure 1.1 *Floor plan*

In this example the structural element under consideration is a timber floor beam. Before a suitable size for this member can be determined the designer must first ascertain the total load it supports. To do so the beam together with the load it carries, which in this instance is a uniformly distributed load (UDL), must be visualized removed from the building (see Figure 1.2).

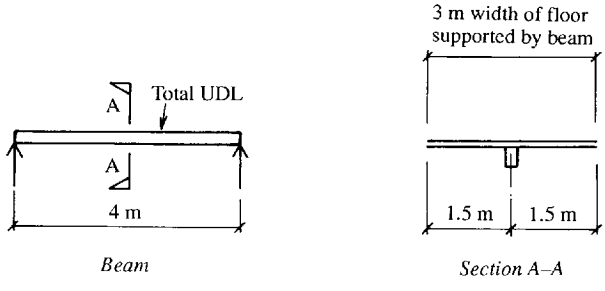

Figure 1.2 *Isolated timber floor beam*

Dead load: joists and boards	0.23
ceiling	0.22
	0.45 kN/m^2