with respect to achieving economy by repetition and reuse. Perhaps the three most essential requirements for formwork are the following:

(a) It should be capable of carrying all working loads and pressures without appreciable deflection, during placing of the concrete.
(b) It should ideally be self-aligning, and all panels, bearers, props and other components should be capable of being easily assembled and dismantled in the desired sequence.
(c) The size of formwork components should be such that they are not too heavy to handle and will give repeated use without alteration.

Timber formwork may be designed directly in accordance with BS 5975, which contains information on all the necessary stresses and modification factors. The general principles employed are similar to those in BS 5268, with slight variations because of the temporary nature of falsework. Reference still needs to be made to BS 5268 for information on the various properties of the timber sections.

BS 5975 recommends that SC3 timber should be the minimum quality adopted for falsework, and it gives wet exposure grade stresses for SC3, SC4 and SC5 timber.

One essential difference between BS 5975 and BS 5268 is the load duration factor K_3 for timber used in falsework. Values of K_3 for falsework are given in Table 5 of BS 5975, reproduced here as Table 2.11. The periods given in the table relate to construction times; it should be noted that these are cumulative over the life of the timber, unless there is a time lapse between load periods at least equal to the time the timber was previously loaded.

Table 2.11 Modification factor K_3 for duration of load on falsework (BS 5975 1982 Table 5)

Duration of loading	K_3
1 year	1.2
1 month	1.3
1 week	1.4

Compared with BS 5268, the permissible shear stresses for timber falsework given in BS 5975 are increased by a factor of 1.5 because of the temporary nature of the loading.

Deflection of formwork is an important factor since it directly affects the appearance of the finished concrete face. It is therefore recommended that formwork deflection be limited to the lesser of 0.003 × span or 3 mm.

Reference should be made to BS 5975 for guidance on the loads that formwork must sustain. These should include an allowance for construction operations together with all permanent loading from the concrete and the self-weight.

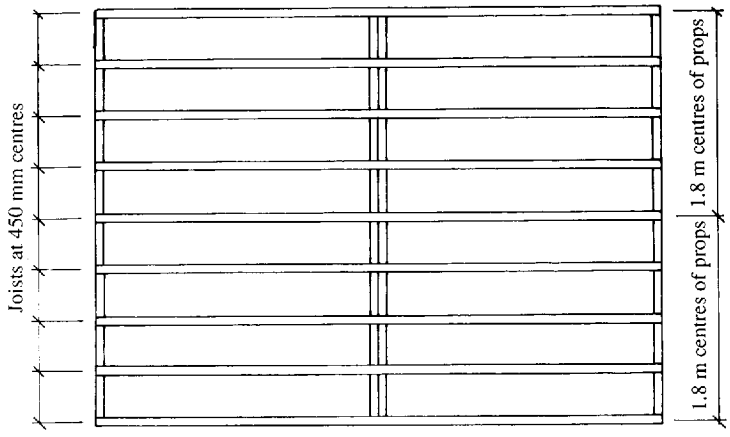
As an alternative to designing formwork for a specific purpose, standard solutions are available from proprietary manufacturers. A standard solution usually involves the selection of suitable components for which the design information is presented in a tabular form by the manufacturer. Commonly available are systems for waffle slab construction, flat slab soffits, wall faces, beams and columns. The systems may utilize steel and aluminium as well as timber.

The following example illustrates a typical design for formwork in accordance with BS 5975.

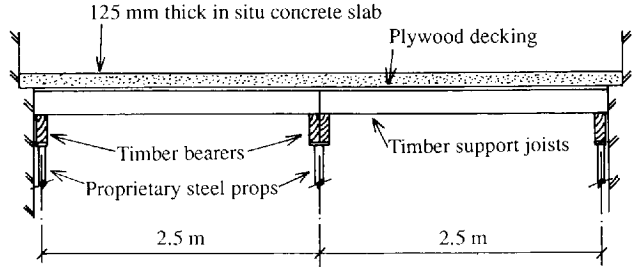
Example 2.9

The arrangement for a system of formwork to support a 125 mm thick reinforced concrete slab is shown in Figure 2.10. The following data are given:

Load due to weight of reinforced concrete: 24 kN/m^3
Load due to self-weight of timber sheeting: 0.1 kN/m^2
Load due to self-weight of joists: 0.12 kN/m^2
Imposed load due to construction work: 1.5 kN/m^2



Plan



Section

Figure 2.10 *Formwork supporting a reinforced concrete slab*