

## CHAPTER FOUR – CONSTRUCTION ASPECTS

### 4.1 Steel Erection and Slab Construction

**Structural steel frames in combination with in-situ concrete slab on metal decking enables activity on various levels and in different zones to be undertaken almost simultaneously.** The schematic diagram (Figure 4.1) and the construction program (Table 4.1) illustrate how prop-free construction enables work below a level to proceed. Basically there are two commonly used methods involving either working off the concrete or off the steel decking. The choice depends on many factors including floor area, number of cranes and size of work crews.

The first technique involves dividing the floor into zones with trade teams moving from one zone to the next, working around the floor and up the building in a spiralling fashion. With good co-operation, multi-skilling and co-ordination, the numbers of workmen and the waiting time between trades can be reduced. This method involves **‘working off concrete’** and requires careful placement of timber dunnage and stillages over the supporting beams rather than on the midspan of the slab. The use of small motorised scissor lifts allow the riggers to move around freely both horizontally and vertically, quickly placing them at the correct height for bolt installation.

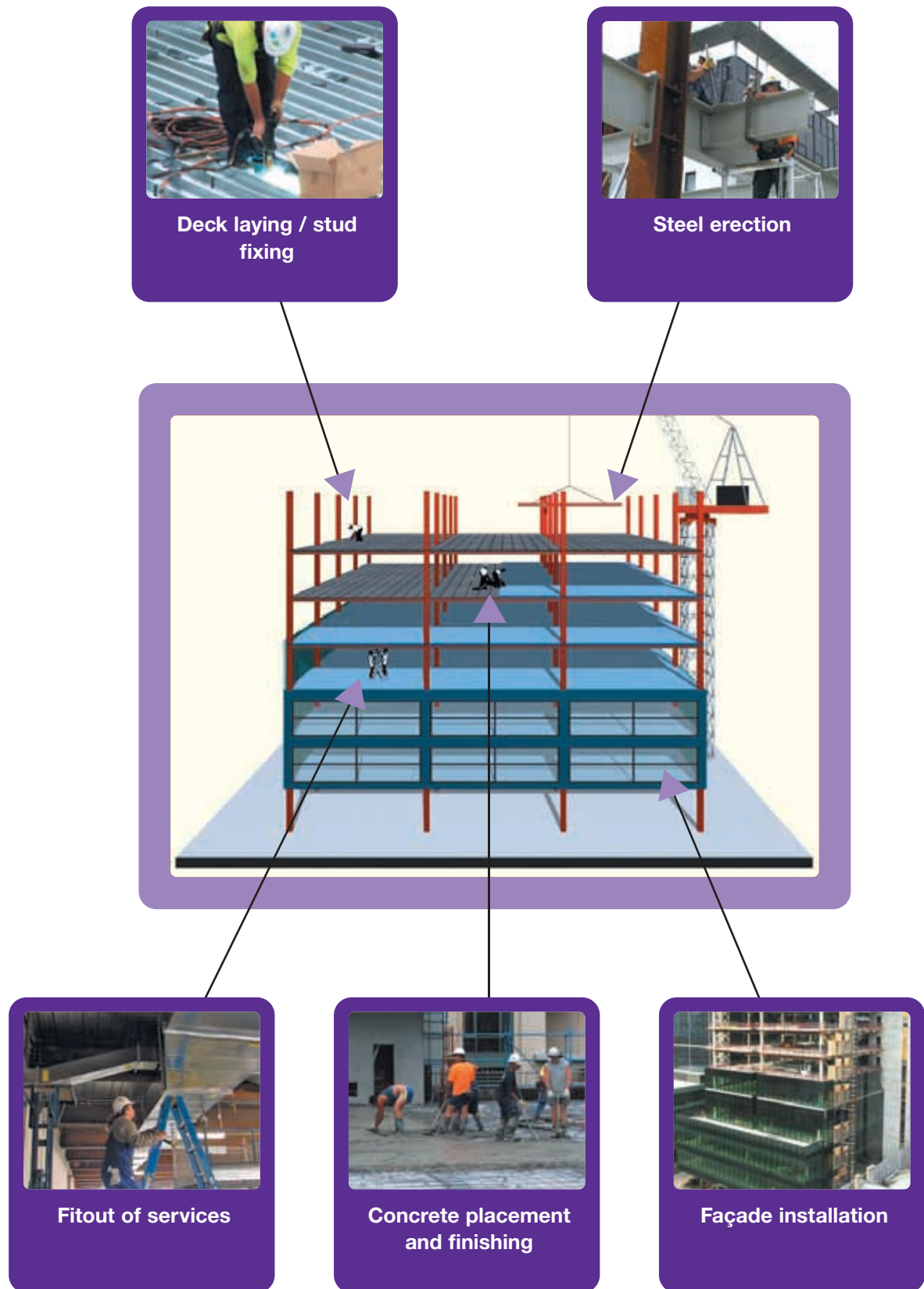
In the second technique, concrete can be placed under cover of a decked out upper level and the following trades can proceed to lower levels immediately after the concrete has been poured and before it has attained its full strength. This method involves **‘working off the decking’**, requiring the use of ladders or moveable platforms and considered not as easy or safe as working off the slab using scissor lifts. The height of the platform is fixed and limited to allow the handrail to pass under the deepest beam. This means that the riggers have to reach overhead to install the bolts which may result in a loss of speed. The landing of the steel stillage legs also requires careful placement onto the decking pans directly over the supporting beams as well as avoiding any stud locations. One advantage of this method is the weather protection provided by the overlying decking.

The following example of a typical construction program, trade resources and milestones has been based on the ‘working off concrete’ technique.

The construction program in Table 4.1 covers the steel erection and concrete placement beyond the foundation stage for one complete floor level in a typical 12 storey building. This program can be considered as typical for a similar building on a site with reasonable access requiring good project management and co-ordination. Erection of the concrete core precedes the steel beam erection by two to three weeks to allow clear installation of jump forms and decks.

The construction sequence and durations in Table 4.1 assume one central crane and the trades / resources as listed in Table 4.2 together with a good deal of multi-skilling and co-operation.

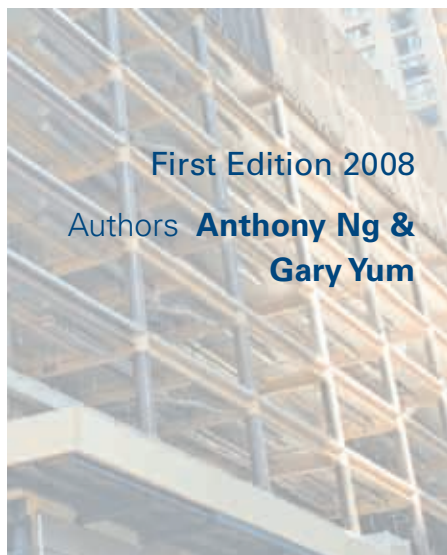
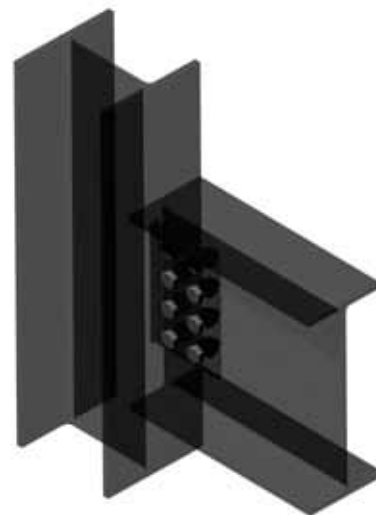
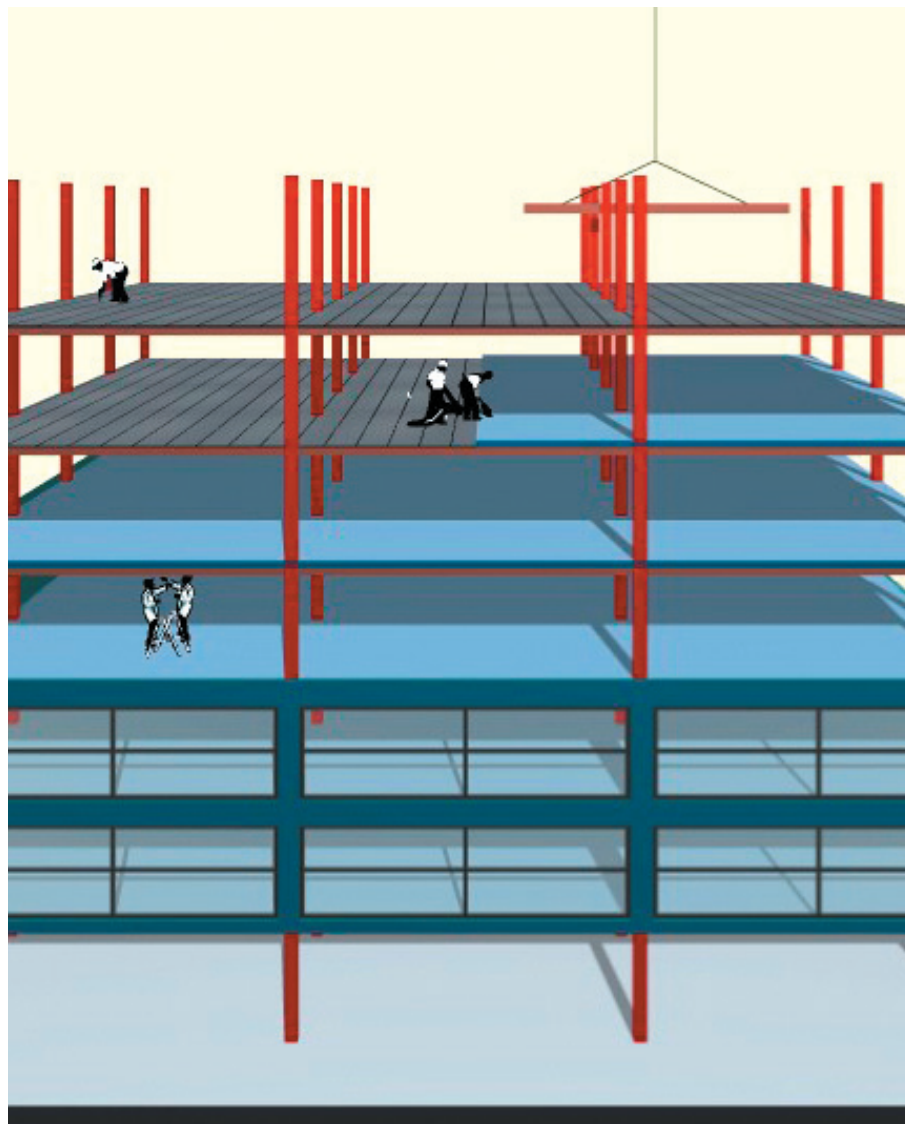




**Figure 4.1 Construction schematic - construction can progress on a number of fronts.**



# Design aspects for construction – Composite steel framed structures



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