

TILTING OF NEWLY CONSTRUCTED CORNER-TERRACE HOUSE

Type of building work

This involves re-constructing a single-storey corner terrace house to a two-storey corner terrace dwelling house. The sub-soil condition consisted of a thick layer of very soft marine clay. The new building was on a raft foundation supported by bakau piles.

What went wrong

During the construction of the new building, the site was backfilled with earth to raise the platform level by 1.5m in order to comply with drainage requirements. However, the effect of this surcharge load from the backfill was not taken into account, resulting in excessive and uneven settlement.

When the building was nearing completion, it was found to have tilted, with the top of the building displaced laterally by 236mm relative to its base, and the building suffered a settlement of 655mm.



The adjacent unit of the terrace house was also affected by the rotation of the new building. Cracks measuring as wide as 200mm appeared on walls and beams of the adjacent house.



Figure 2: adjacent unit affected by tilt of the corner terrace

As the structural frame of the new house could become unstable, the newly constructed building was demolished and re-built. The adjacent house was also demolished and re-built.

Learning points

- a) Even a small and simple job requires close attention to details throughout the whole process of design and construction.
- b) Sufficient considerations should be made at the design stage for works during the construction stage, for example, for loading effects from surcharge and construction equipment and changes to site condition.
- c) Bakau pile may not be effective as a foundation system for buildings in poor soil condition.