TEMPORARY SHEET PILE EARTH RETAINING WALL CAUSING EXCESSIVE GROUND MOVEMENT

Type of building work

This project comprised a cluster housing development with a basement. The difference in level between the excavated site for the basement and the adjacent properties was 8.5m. A combination of existing 2.5m high rubble retaining wall, earth slope and sheetpiles with two layers of inclined struts were adopted as earth retaining system for the excavation. The earth slope between the top of the sheetpiles and the existing rubble retaining structures was protected with lean concrete.



What went wrong

Excessive movements caused cracks to develop on walls, floors and ceilings at various locations in the adjacent detached house. Immediate safety measures had to be implemented which included backfilling of gaps behind the sheetpiles with concrete grout and installation of additional struts to reinforce the existing retaining wall and prevent further soil displacement.

The affected portion of the adjacent building had to be demolished eventually and re-built to its original condition.



Learning points

- a) The impact of the soil movement on the stability of adjacent properties, such as old rubble retaining wall and existing building founded on shallow foundation, which are sensitive to ground movements should be studied very carefully prior to the selection of the temporary earth retaining system. A more rigid temporary retaining structure should be adopted.
- b) The additional surcharge due to presence of slope adjacent to the temporary earth retaining wall and the shallow foundations of the adjacent buildings must be considered in the design of the temporary earth retaining structures.