

# TEMPORARY EARTH RETAINING STRUCTURES/EXCAVATION WORKS FAILURES

## Type of building work

This involves construction of a 6-storey building with a basement. The temporary earth retaining wall proposed for the construction of the basement was that of cement-soil-mix jet grout wall, with excavation and strutting to be done in stages.

## What went wrong

Instead of carrying out the excavation and strutting in stages, the builder excavated the site with a vertical cut to the full depth of 4m without the struts or earth berm on one side of the excavation as proposed. The jet-grout wall on the side which was not strutted collapsed and brought down with it the adjacent road pavement which was stockpiled with building materials. The other 3 sides of the excavation where struts were installed did not collapse.



**Figure 1: Excavation site with struts on 3 sides**



**Figure 2: Collapsed part of excavation**

## Learning points

- a) Sequence of excavation and installation of struts must be clearly shown on the construction drawings and followed closely. Any adjustments to be made to suit site constraints must be checked and approved by the PE who carried out the design prior to execution.
- b) There must be no stockpiling of materials next to the excavation, unless the temporary wall has been designed for the surcharge loading.
- c) Site supervisor and QP must be vigilant in their supervision to ensure that works are carried out in accordance with approved design. Non-compliance with

approved design, including the sequence, which could compromise safety should be reported to BCA.