



Working Near Walls

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This document alerts people to the potential hazards of construction work adjacent to walls including alteration and demolition. It gives guidance about precautions to prevent the walls from becoming unstable during the work.

Background

Several brick wall collapses in NSW occurred at both industrial and domestic construction sites, with serious consequences.

Brick walls often appear to be substantially constructed due to the type of materials used and the nature of their construction. However, their stability depends largely on their foundations and the lateral support from the rest of the structure.

A foundation transfers the loads from the structure it supports to the earth by distributing the forces generated into the underlying soil. The ability of a foundation to perform this function depends upon a number of factors, especially the following:

- i. the strength and constituency of the underlying soil
- ii. the arrangement of the foundation in the underlying soil
- iii. the arrangement of the structure on the foundation
- iv. the type of foundation used
- v. the loads applied to the foundation.

Altering any of these may greatly reduce the adequacy of the foundation, resulting in an unstable supported structure.

Freestanding walls are those not attached to or supported by another structure. They are particularly vulnerable to instability problems because their ability to withstand lateral forces greatly reduces as the height of the wall increases. Of particular concern are walls that were not constructed to be freestanding but have become freestanding through some subsequent alteration. In this case the wall and the foundations would not have been designed to resist the forces such a structure is subjected to.

In all the collapses, the wall and its foundation were structurally sound when they were built. However, subsequent operations altered the soil/foundation configuration and/or the wall support system, rendering the wall unstable. In some cases, the wall had become unstable before the on-site work began,

Typically, the walls collapsed for one of two reasons -

1. Excavating alongside a wall reduced the stability of its foundation to such an extent that the remaining soil could no longer support the loads generated by the wall. This caused the collapse of the foundation, and the wall fell over. The actual collapse may have been induced by an external factor, such as a gust of wind.
2. Parts of a building were demolished, altering the nature of a wall, typically from an integral part of a stable structure to an individual freestanding one. As the wall was not intended to be freestanding and its foundation was not specifically designed to support such a structure, the increased loads on the foundation weakened it so that a gust of wind, heavy rain, excavating alongside it or other additional works caused it to fail and the wall to collapse.

Recommendations

Before starting construction or demolition work, an engineer or other competent person should conduct a comprehensive risk assessment of the site to identify any unstable or potentially unstable structures on it or nearby. It is essential that this assessment encompasses all stages of the works to identify potentially hazardous conditions that might arise, e.g. demolition may alter the nature of a structure or part of a structure, or excavation may undermine the foundations of an adjacent structure.

In general, the potential for an excavation to affect the stability of adjacent structures depends on its depth. As the depth increases, its horizontal influence extends proportionately. This is illustrated in Figure 1. Care must be taken when carrying out any excavation near an existing structure to ensure that the work does not encroach on the foundation to such an extent that it affects its stability.

Where the stability of a wall or other structure may be compromised by on-site activities, a system must be implemented to support it; e.g. by propping it, or stabilizing the foundation by underpinning or other means.

The engineer or person responsible for assessing the site needs to be informed of on-site conditions during the course of the works in case further assessments are required.

Note: Engineering advice should be obtained prior to excavating near structures. Requirements of occupational health and safety legislation

It should be noted that Sections 15 through 17 of the *Occupational Health and Safety Act* obligates employers (including the self-employed and those in control of a workplace) to ensure the health and safety of everyone there, including members of the public who may be present.

In addition, Chapter 8 of the *Occupational Health and Safety Regulation 2001* specifies the provisions for construction work, including the need to provide safe work method statements.

Further information

For further information contact the WorkCover Information Centre on **13 10 50**.

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