

DROUGHT- RELATED CRACKING TO BUILDINGS

Property owners are often concerned when cracks appear in their buildings. The following note provides some advice to assist owners with understanding the causes and provides some direction for assistance with the problem.

As a result of recent periods of drought, subsoils with a significant clay component have been subject to shrinking as they dry out. Where buildings are supported on such soils (also known as reactive soils) they will tend to settle unevenly as shrinkage takes place. This often leads to cracking in brickwork and stonework, particularly around window and door openings.

Conversely after periods of rain the dry clays will tend to swell. This tends to lift buildings (also called heave). Again this can be uneven and can cause cracking in different places to the shrinkage cracking.

In some cases the shrink and swell cycles will simply open and close cracks without significant extra damage.

Reactive clay soils are common throughout New South Wales and such cracking is not unusual. The cracking itself does not necessarily indicate a major structural lack of safety or stability, unless walls tilt to a substantial degree or there is a danger of falling material or dislodgement of lintels, floor or roof structures.

There are several measures that can be taken to reduce the amount of movement and damage. Some measures include remedial works to drainage, site grading, moisture control by paving or buried membranes, crack reinforcing, wall jointing, tree removal and in some cases underpinning.

Where owners are concerned about structural stability or safety, or wish to reduce the amount of cracking they should consult a structural engineer experienced in dealing with reactive soils.

The engineer may also recommend geotechnical investigation by a specialist geotechnical engineer to assist with design and specification of appropriate remedial works.

It is usually not possible to completely eliminate cracking of existing buildings on reactive clay soils, however it can usually be managed to allow the building to remain habitable and serviceable.

Because of current climatic conditions some buildings which have not previously experienced movement are cracking. Sometimes this cracking occurs relatively suddenly, which can be alarming for owners. This is often a result of stress relief in a building which has been subject to ground pressures for some time which eventually exceed the building's ability to resist.

Monitoring performance before, during and after remedial works is important. This data, which often has to run over a significant period (eg up to five years), is fundamental to decisions. Provided there is no immediate structural stability or safety issue, the 'wait and see' approach is often a valid way of moving forward and can avoid unnecessary wasted expense. When a crack initially appears, for internal walls a simple pencil line across the crack marked with date and crack width is an effective means by which to start the monitoring process. For external walls clear photographs are useful.

Further information can be obtained from the Heritage Office, Department of Planning, website. See *Technical Note: Cracking of Buildings due to Shrink/Swell in Clay Soils* on the Technical Advice page.

Local council engineering departments, local yellow pages, or the Association of Consulting Engineers Australia (ACEA) will be able to assist in locating a suitable structural engineer who has appropriate qualifications and experience to assist.

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