

1977/20. Damage to a house at Punchbowl Road, Launceston.

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An investigation was made of damage to a nine year old brick home situated at 145 Punchbowl Road, Launceston, underlain by Tertiary clay sediments. The house is reported to have shallow footings, with some piers extending 1.3 m into the subsoil. The floor of the basement is a concrete ground slab.

There are large cracks in the southern wall and foundations, where the mode of movement appears to be downwards and away from the middle third of the wall. Lesser cracking is evident in the other three walls and the basement floor. Neighbouring houses, garden walls and paths also show damage by cracking.

Drainage around the house is poor. Outside and inside walls show 'tide marks' of rising damp, and excavations which were open at the time of inspection were partially filled with water. These excavations revealed that part of the footings rest on ironstone, whereas most of the footings are founded in clay.

The nature of the clay is such that it swells when wetted, and shrinks during drying: this is a common cause of house distress. However when clay becomes very wet its bearing strength becomes low, and it is subject to consolidation under a relatively small load.

It is difficult to establish the exact causes of distress in this house, but in view of the excessive wetness of the subsoil, and the mode of failure of the southern wall, it is probable that there is heave of the subsoil beneath the centre of the house due to increased moisture, and that there is also settlement of the footings due to consolidation under load. There may also be edge effects due to seasonal drying and shrinkage of near-surface clays.

#### RECOMMENDATIONS

Ironstone is known to occur as thin layers within the clay sediments and therefore excavations are unlikely to find rock on which to support the footings.

The priority is to improve surface and subsurface drainage of the house site.

Surface grading, and gutters around the house will improve surface runoff away from the house.

Storm water should be piped away from the house. Drains should be dug to below foundation depth and be back-filled with gravel so that both surface and subsurface water is intercepted. It is most important that the drains should be graded in such a way that the water can flow freely away.

Pipes and plumbing should be pressure tested to ensure that there are no breaks.

These drainage procedures will strengthen the subsoil and also prevent further heave effects. With improved drainage the subsoil will become dryer and there may be difficulty with seasonal shrinkage effects, especially at the edge of the northern wall. These can be minimised by laying a concrete slab, or polythene sheet, as an apron around the house so that a constant-

moisture environment is kept. This cover will need regular maintenance to ensure that it is not cracked, and it must be sealed against the house walls.

Structural strengthening of footings and footing walls may be necessary. Footings can be extended, or underpinned to a suitable depth of stiff clay subsoil. An engineer or builder should be consulted about strengthening the footing walls.

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