

171202

FLOOR TILES. LACK OF MOVEMENT JOINTS

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THE ISSUE

The tenants occupying the top level of a two storey unit complex noticed a significant failure of a row of tiles on an external concrete balcony.

The failure was the lifting of the two rows of tiles by approximately 60mm vertically across the full width of the balcony.



OBSERVATION

An inspection of the tiled balcony confirmed significant upward movement of two rows of tiles extending across the full width of the first floor external concrete balcony. The balcony was orientated such that it received reasonable amounts of direct sunlight throughout the day.

The upward movement of the tiles increased significantly in the spring/summer period therefore exposing the tile system to temperature differentials.

It was observed that there were no perimeter or intermediate movement joints incorporated in the tile system. The tile system was bound on three sides by brick walls forming the external fabric of the unit complex.

The vertical movement of the tiles presented the occupants with an obvious trip hazard and upon further failure, the exposure of sharp edges with the potential to cause injury.



REASON FOR FAILURE

The primary reason for the failure in this case is attributed to the lack of any perimeter and intermediate movement joints. As the tile system was bound on three sides by brick walls and exposed to temperature differentials there was no ability for release of tensile stresses into compressible movement joints.

CORRECTIVE MEASURES

The problem was corrected by:

- Detaching the tiles from the substrate and reinstalling the entire tile system incorporating perimeter and intermediate (max spacing at 4.5m) movement joints.

PREVENTION

All floor tile systems should be installed giving consideration to the orientation and bounding construction surrounding it. Movement joints should also be installed in accordance with the requirements Australian Standard 3958.1-1991. Particular attention should be paid to areas of tiles exceeding 4.5m and internal and external corners surrounding wall systems.

REFERENCES

Australian Standard 3958.1-1991 Ceramic Tiles – Guide to the Installation of Ceramic Tiles

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