

Value to the Strata Industry

# Spit Road MOSMAN

## Magnesite Damage to Concrete Floors

Senior Engineer: **Barry Guyer**  
Design Engineer: **David Wright**  
Contractor: **Laby Building Pty Ltd**  
Strata Manager: **Linders Property Group**

The building was constructed some 40 years ago.



During renovation work to a number of units it was revealed that damage to concrete floors had occurred in the form of corrosion to reinforcing steel and subsequent spalling of the concrete cover.

**Linders Property Group**, on behalf of The Owners Corporation, commissioned **Strata Engineering Solutions** to inspect the building and prepare a report on the cause and the extent of damage to the floors and to provide the remedial solution. The cause of damage to the concrete floors was determined to be caused by moisture interacting with the magnesite topping on the floor.

Magnesite is a floor levelling and sound attenuating medium that was applied as a topping to floors in the 70's and 80's. In service it has been revealed that in contact with moisture it produced a weak solution of hydrochloric acid due to the presence of chlorides in the magnesite.

Over a long period of time the solution migrated through fine cracks in the concrete and acted on the reinforcing steel causing corrosion and subsequent expansion product of corrosive steel causing the concrete to delaminate and spall from the substrate. This in effect caused structural damage to the slab in that the effective area of reinforcing steel was reduced and the protective cover layer of concrete was damaged.

The source of moisture to initiate this process is most commonly found in wet areas of the units or adjacent to external walls where water infiltrates through the walls, windows or doorways onto the floor.

Following a review of the report the **Owners Corporation** made the decision to carry out detailed investigation of each floor on a progressive basis.

Discussions between the **Owners Corporation** and **Strata Engineering Solutions** resulted in a plan for remedial work that involved the following steps:

- Select a floor for investigation.
- Carry out the investigation work utilising the assistance of a remedial works contractor to evaluate in detail the location and extent of damage and the remedial work required.
- During the investigation if the remedial work in a unit was found to be minor then carry out the remedial work immediately. If the proposed remedial work was significant to the extent of causing disruption to the occupants then the area was temporarily reinstated and the proposed work was then put into a negotiated programmed for the work to be carried out at a suitable time in the future.
- During the investigation process as units opportunely became available due to lease or ownership changes, the investigation work was carried out and any remedial work required carried out immediately while access was available.

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Insurance Reporting

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Forensic Engineering

Building Refurbishment

Access Systems & Rope Access

Project Management

July / August  
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## Value to the Strata Industry

To facilitate the work a schedule of rates contract was placed on **Laby Building** for investigation and remedial work.

The remedial work specification, progressive inspections of the work in progress and financial reporting is currently being carried out by **Strata Engineering Solutions**.

The work commenced in June 2006 and will continue in a progressive manner to address the damage to all affected units.

### INVESTIGATION PHASE



This phase identifies the area of damage and determines the extent.



Area 1



Area 2

### PREPARATION FOR THE REINSTATEMENT OF THE FLOOR

In this phase the damaged concrete is removed, the reinforcing steel is replaced or treated and the area made ready for the placement of reinstatement concrete.



Area 1



Area 2

### COMPLETION OF WORK

The areas have now been reinstated, the structural integrity of the floor restored and the floor is ready to receive floor finishes.



Area 1



Area 2

The work is proceeding smoothly and efficiently due to the excellent cooperation between all parties; **Linders Property Group**, the **Owners Corporation** and **Laby Building**.

The **Linders Property Group** and the **Owners Corporation** are to be congratulated on adopting this systematic and pro-active approach to resolve the problem.