

The Black Dust Mystery

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The scene:

**Recently built
Luxury Apartment block**

some distance North of Sydney

photograph and address withheld

The Development:

High quality residential building with 5 levels of apartments over 2 Car Parks: one commercial, the other for the residents

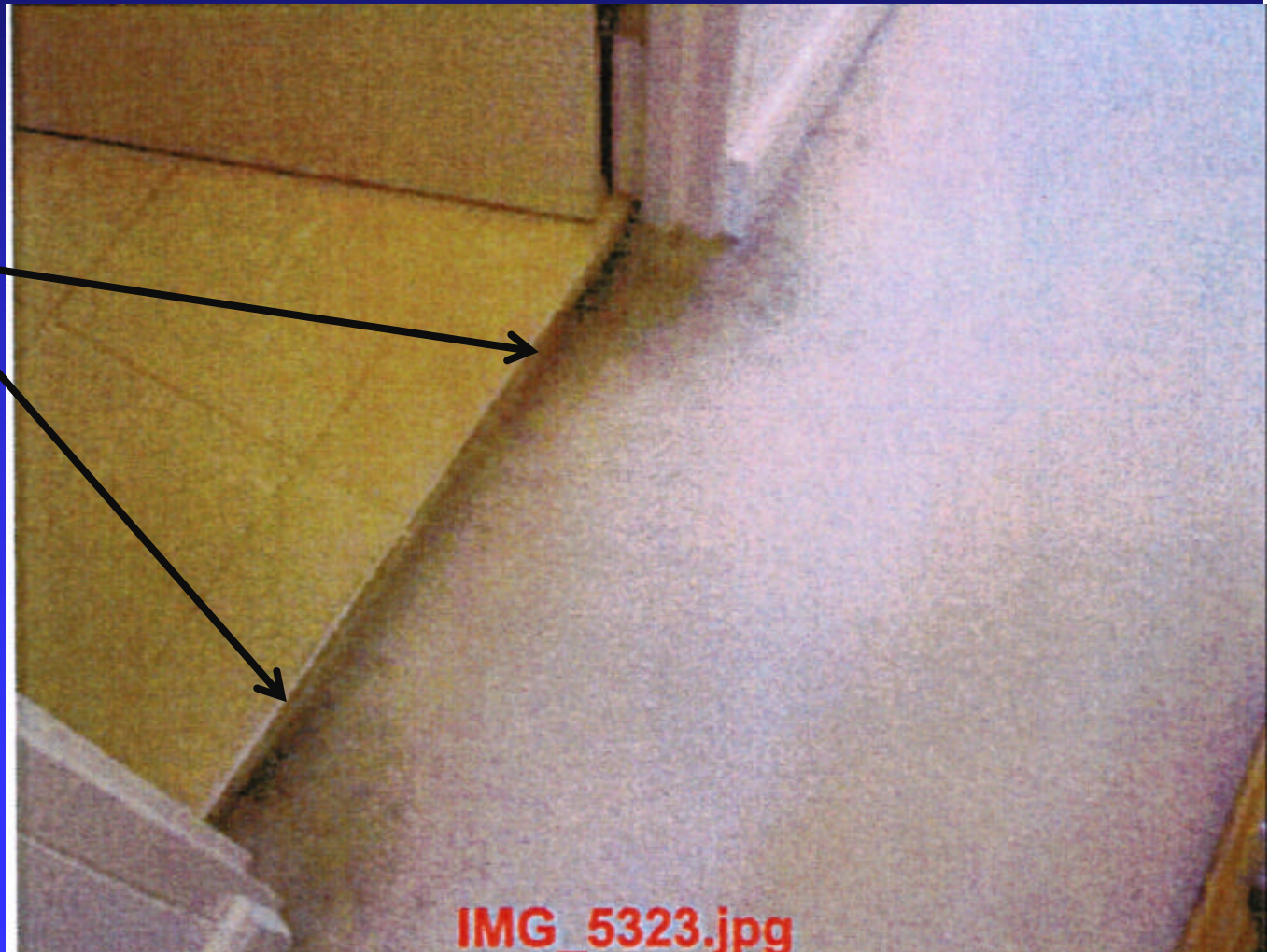
The residents are worried

Black dust on
the carpet



More worries

**Black dust at
the front door**



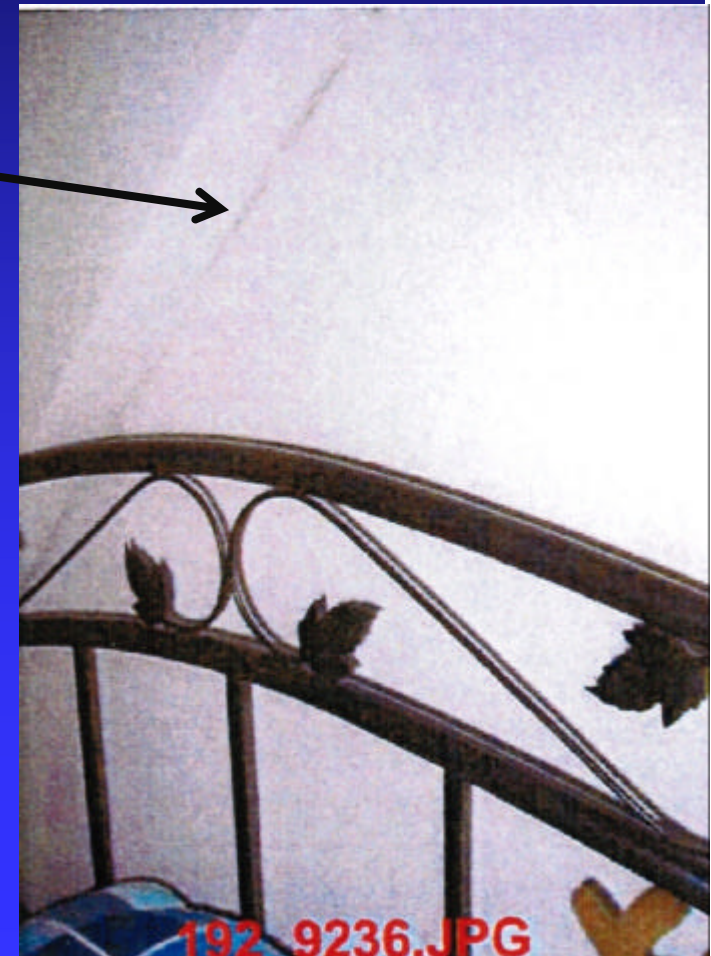
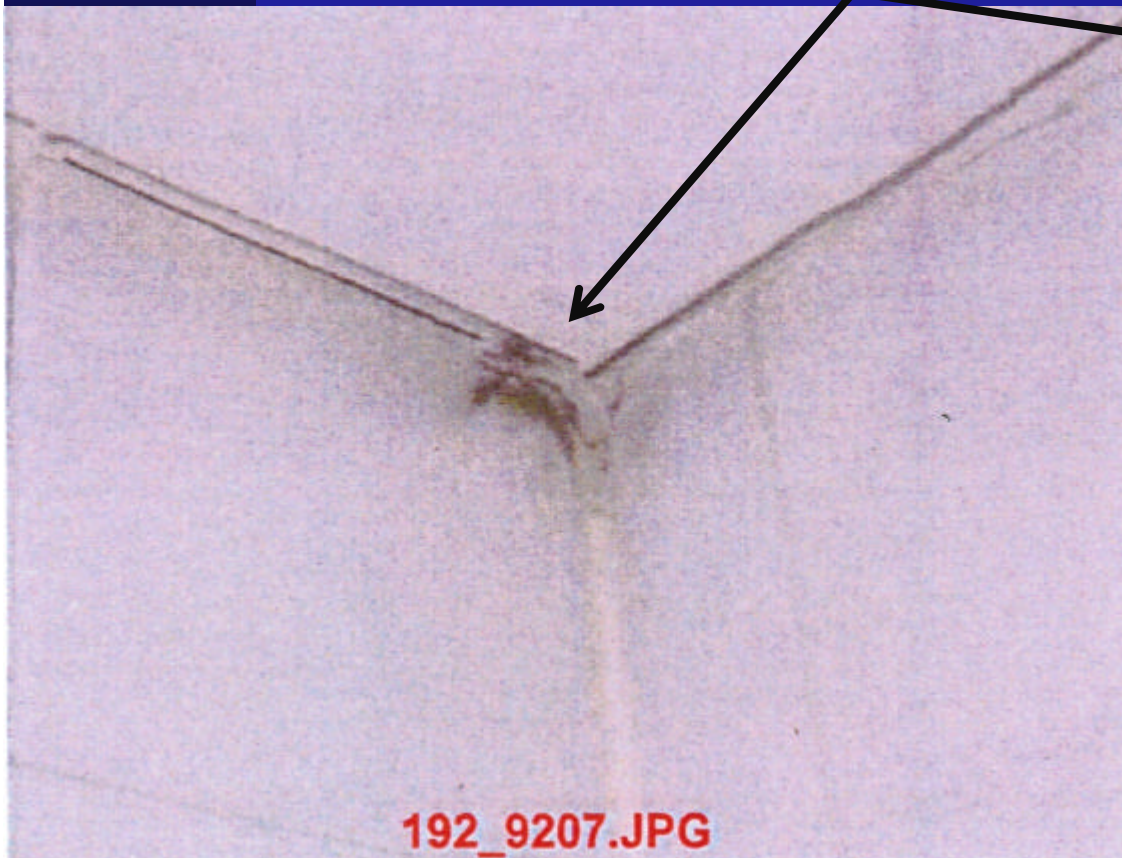
Is it invading our homes?

It's coming
through the
power outlets

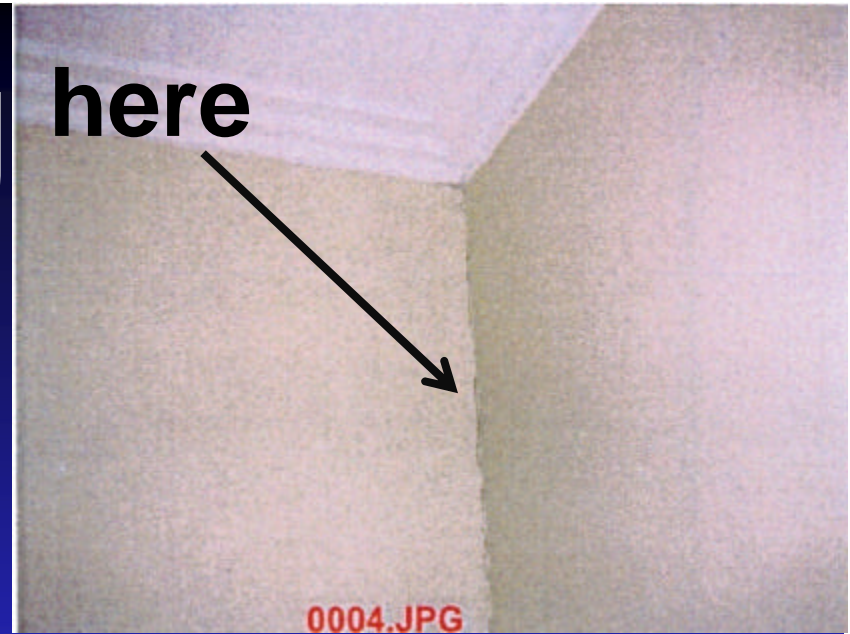


It's coming from everywhere!

Through the Cornices



**It's even coming
through the
walls!**



What is it?

Is it toxic?

How does it get here?

Genuine concern

Is it a residue of toxic material on the original building site?

Is it contaminated air from the commercial Car Park?

Is it being “pumped” by the Lifts?

Tests showed no asbestos or heavy metal

Primary Causes?

Higher than usual exhaust ventilation rates and

Negligible allowance for make-up airflow

Details

All these apartments have a bathroom, plus at least 1 ensuite and a laundry

Designer adopted a “best practice” approach, using exhaust rates 50% to 60% above AS 1668.2 minimum values

HVAC contractor exceeded design airflow rates by 10% to 20%

Details

Construction is very “tight”, plus good quality windows & ceiling/wall detailing

Windows closed when no-one home

Building meets BCA Natural Ventilation prescription. No need for outdoor air mechanical ventilation or permanent outdoor air openings

The physics of the “Black Dust” invasion

**Effective exhaust airflow rate approx.
7,000 m³ per day.**

**AS 1668.2 minimum airflow approx.
3,900 m³ per day.**

**Make-up airflow only enters via gaps at
doors & windows or building cracks**

Entrained dust is dumped on entry

The cure

Leave at least one window open when not at home, or

Install permanent natural ventilation inlet louvre in an outside wall.

OR the expensive option (for a new building) install filtered mechanical outdoor air supply

Other ventilation issues

AS 1668.2 exhaust rates are MINIMUMS

- **Keeping a mirror condensation free requires more than 25 L/s**
- **Avoiding condensation from clothes dryer in laundry requires 35 to 40 L/s. NOT 20 L/s**

Other ventilation issues

- Section J of the BCA implies exhaust ventilation must not exceed AS 1668.2 values by more than 50%
- With openable windows mechanical outdoor air ventilation not needed
- Would you open your windows in a Cairns summer or Hobart winter?

**When is too much
ventilation still not
enough!**