

## MARKET APPLICATION FOCUS

High Rise Buildings  
Glass rectification & Protection  
Glass contaminations

Project: Pinnacle Apartments, Dind Street, Milsions Point  
Owner: Sydney, Australia  
Company: Multiplex

Contractor: Karabiner Access Pty Ltd , Alexandria ,Australia  
Year: 2007/2008

### THE PROBLEM



The Pinnacle Apartments in North Sydney are a prestigious residential development. While its proximity to the harbour and CBD offer amazing views, it suffers from intense exposure to the elements and big city pollution problems. Over time these conditions have caused such a severe build up of contaminants on the glass, views through the windows have been largely obscured. Additional leaching from the rendered facade elements which collected the pollution and saltspray created contaminations on the glass which is extremely stubborn and hard to remove.

The condition became so bad that a solution had to be found.

The options were to replace the glass or to try and clean the glass surface.

### Evaluation and Trials

Inspections by the facade engineers from Connell Mott MacDonald and the crew from Karabiner Access and Nanovations indicated that it was possible to remove the contamination.

**Rectification-** Over a period of nearly 3 years numerous different methods have been used and some attempts have damaged the glass leaving deep scratches. Not deterred, KA and Nanovations have pulled out all stops to find an efficient cleaning method. After seeking further assistance from their scientists partner and working with the KA crew and a compound removal process was developed that did not damage the glass.

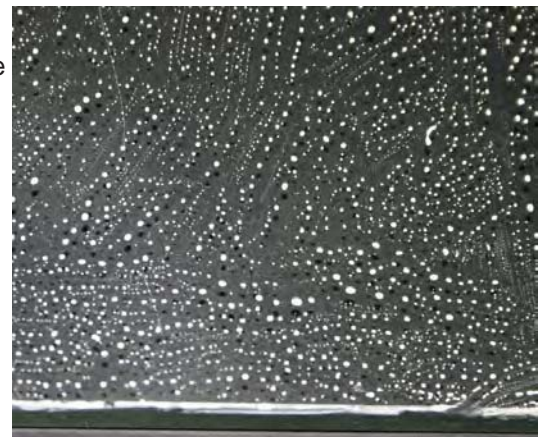
While the cleaning issue has now been solved, it appeared that a perfect clean glass will attract new contaminations in a short period of time.

**Protection -** Several glass protection coatings were applied on sample widows after the cleaning to test the durability and protective properties over a period of time. The best performing glass treatment was a product based on a new technology and supplied by Nanovations Pty Ltd.

While the product did not have much of a track record the commenced monitoring process implemented by Karabiner Access over a two year period, showed significant reduced contaminations.

The final inspection by the engineering team from Connell, Mott, McDonald was conducted earlier in 2007.

The system was found to be successful, with the glass now free of any compound build up. The treatment still fully functional and hydrophobic is easy to clean and showed a significant better performance than other coatings used.



Typical glass condition at the Pinnacle

## THE SYSTEM

While there are several systems and methods on the market to remove glass contaminations, the real challenge was to develop a method to work on a much larger scale. There are over 400 windows with a combined surface area of over 5000 square metre at the Pinnacle that required cleaning and protection.



Karabiner developed a system that is fast, effective and that delivers a scratch free result. The complete system includes products and machinery from 3 continents. An intensive on site training with the team and scientists and engineers from all suppliers followed. Karabiner Access has now a team of 12 knowledgeable maintenance personnel that is not only skilled in high rise maintenance work, but also in this glass restoration process.

At the moment Karabiner access is the only company in Australia which is able to undertake projects of such scale, and to provide trained personnel for the glass cleaning, protection and also for the complete maintenance of the building.

## THE PROTECTION:

Nanovations Pty Ltd is supplying the protection system for the glass after the cleaning.

Extensive testing before and during the evaluating showed excellent durability and functionality. The product outlasted any other product tested on the glass surfaces. The glass treatment, which is about 5 million times thinner than the glass itself creates an easy to clean water repellent surface which protects the glass from :

- Water run-off from concrete or plaster surfaces.
- Hard water sources (high calcium concentration)
- High concentrations of silica or hydrogen sulphide in rainwater. (Pollution)
- Alkalis from agricultural paddock or crop dust.
- Sealer rundown.



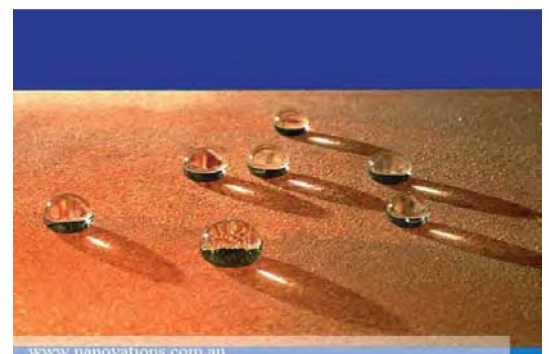
Test area with mineral contamination



Calcium shows weak bond and can be removed with a micro fiber cloth.



Water droplets pick up dust and dirt from a treated test panel. (self cleaning effect)



Hydrophobic effect on test panel panel.

## THE TEAM

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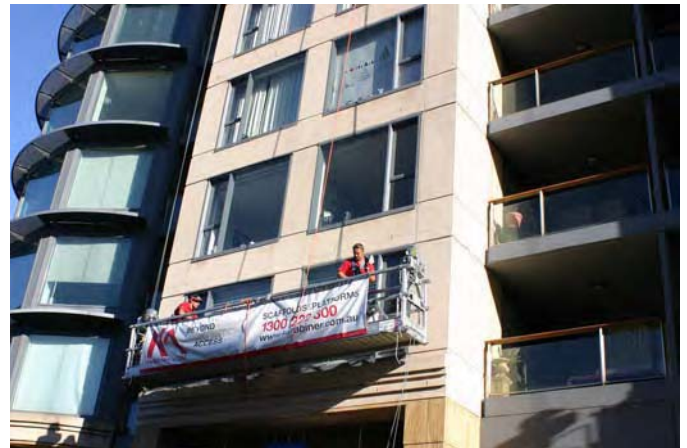
### Karabiner Access Pty Ltd:

Karabiner Access was established in 1988 and since then have become Australia's most innovative building maintenance, high access and height safety solutions provider.

The highly specialized team of Karabiner provides the access solutions for the Pinnacle and also the trained work force to undertake the highly specialized glass repair work, and the application of the glass surface treatment.

Karabiner's maintenance division provides a range of skilled tradespersons and specialist access technicians that can tackle all types of building asset maintenance, repair and replacement tasks. The staff can undertake projects on all types of building asset such as strata and commercial high rise buildings, bridges, dams, towers and internal spaces that present extremely difficult access solutions.

The experienced project management team utilise not only proven methods of maintenance but also new products and services that can provide efficiencies and quality. Karabiner Access will provide innovative solutions that add real value to your building asset.



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### Connell Mott MacDonald :

World class engineering and management Connell Wagner is one of Asia Pacific's largest and most experienced multi disciplinary consulting practices. Providing planning, surveying, engineering, environmental, scientific, business advisory and project management services to transportation, buildings, urban development, water, environment, energy, industrial, defence and telecommunications.

Working with Connell Mott MacDonald made it possible to use innovative systems and products. Connell Wagner also provided specialist skills for the facade details and problem solutions to improve the used system and the long term durability of the repair work at the Pinnacle.

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### Nanovations Pty Ltd :

Nanovations is an Australian company which supplies and develops high tech product solutions for speciality and niche markets. Nanovations works with companies that are key players in their market segment and add value and sustainability to products by using the latest technologies available.

Nanovations Pty Ltd has sales offices and partners in many countries.

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