CRC Construction Innovation
BUILDING OUR FUTURE

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Industry Seminar
Tuesday, 26 April 2005
Brisbane City Hall

Bringing Innovation to Facility Management

BRISBANE CITY

Ebsworth & Ebsworth LAWYERS

'yes' OPTUS

Defining Reference Service Life: An Open Innovation Approach

Presented by Michael Ball

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Queensland Government
Department of Public Works

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Department of Main Roads

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The Factor Method

$$PSLDC = RSLC \cdot f_A \cdot f_B \cdot f_C \cdot f_D \cdot f_E \cdot f_F \cdot f_G$$

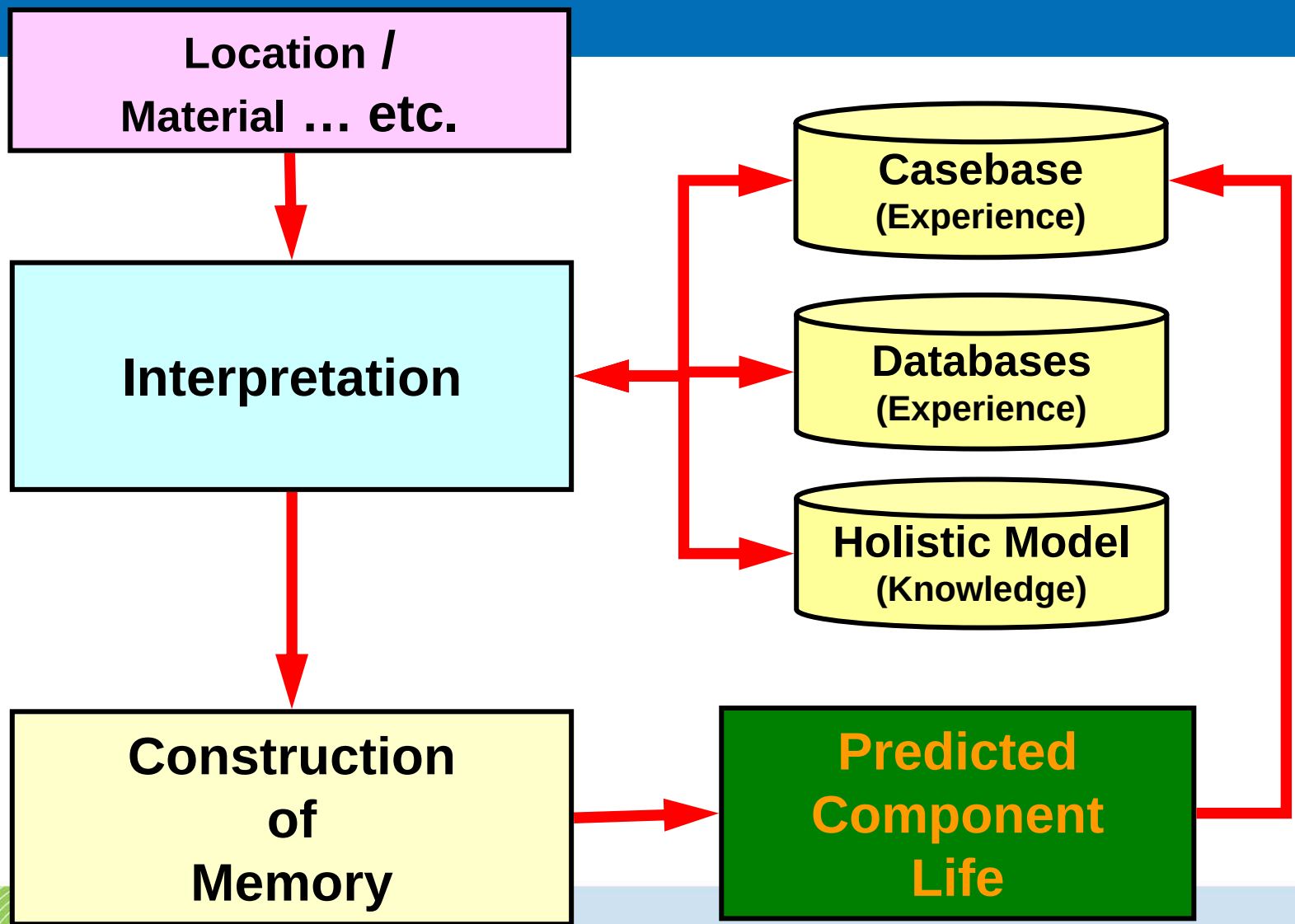
- **PSLDC is the Predicted Service Life Distribution of the Component based on the Reference Service Life RSLC. The factor indices are for**
  - **A quality of component**
  - **B design**
  - **C work execution**
  - **D indoor environment**
  - **E outdoor environment**
  - **F in-use condition**
  - **G maintenance**

Typical metal components

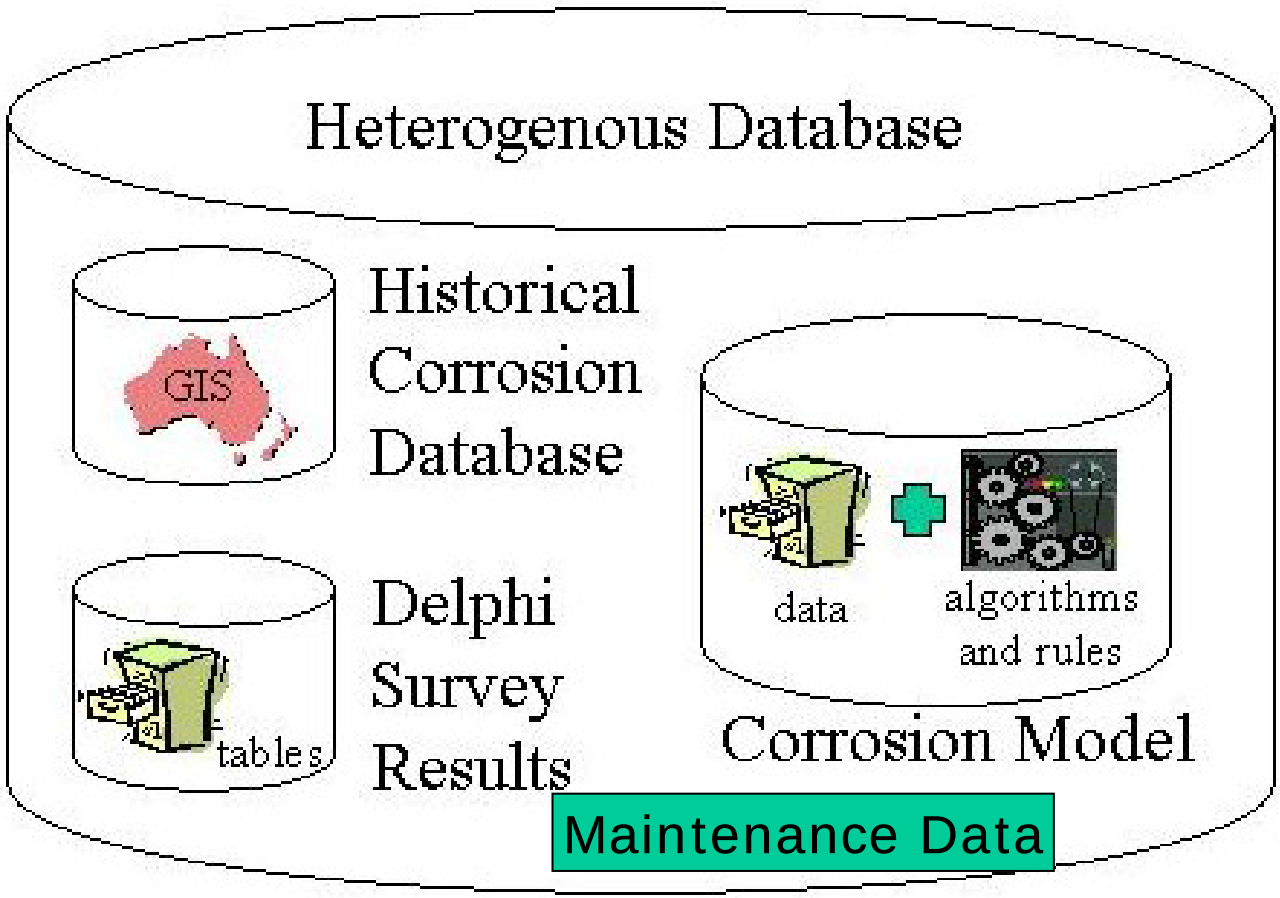
- **Fully exposed – external**
  - **roof sheeting**
  - **flashings**
  - **gutters**
  - **wall cladding**
- **Wall cavity**
  - **bracing**
  - **nails**
  - **brick ties**
  - **bolts**
  - **plumbing pipework**

- **However there are 300 + components in a building with 2-3 material types and 2-3 coatings**
- **RSL required for 2000+ distinguishable components**

Case-Based Reasoning Method



Heterogeneous Data Base

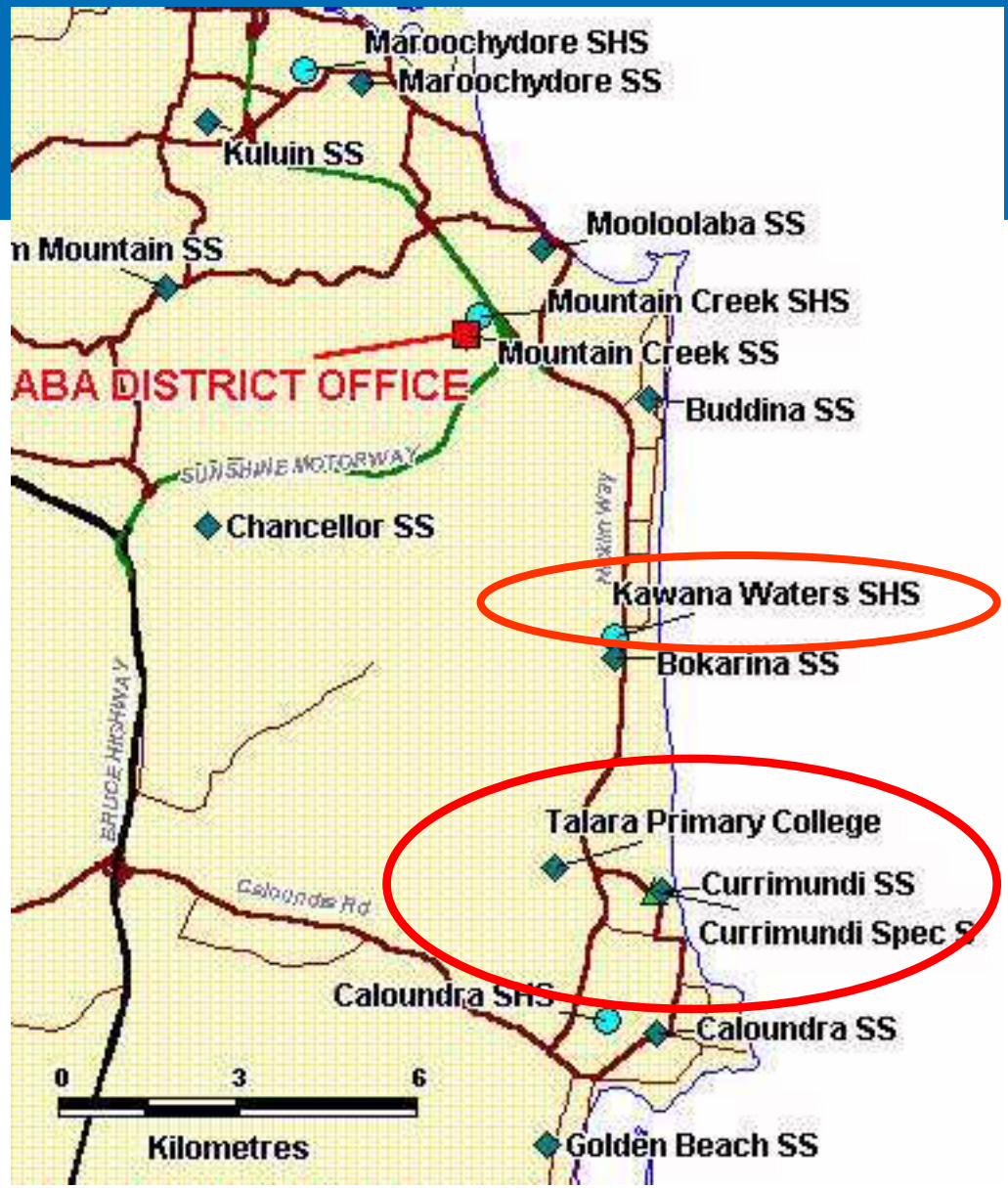


Case Based Reasoning in Construction and Infrastructure Projects

2002-059-B

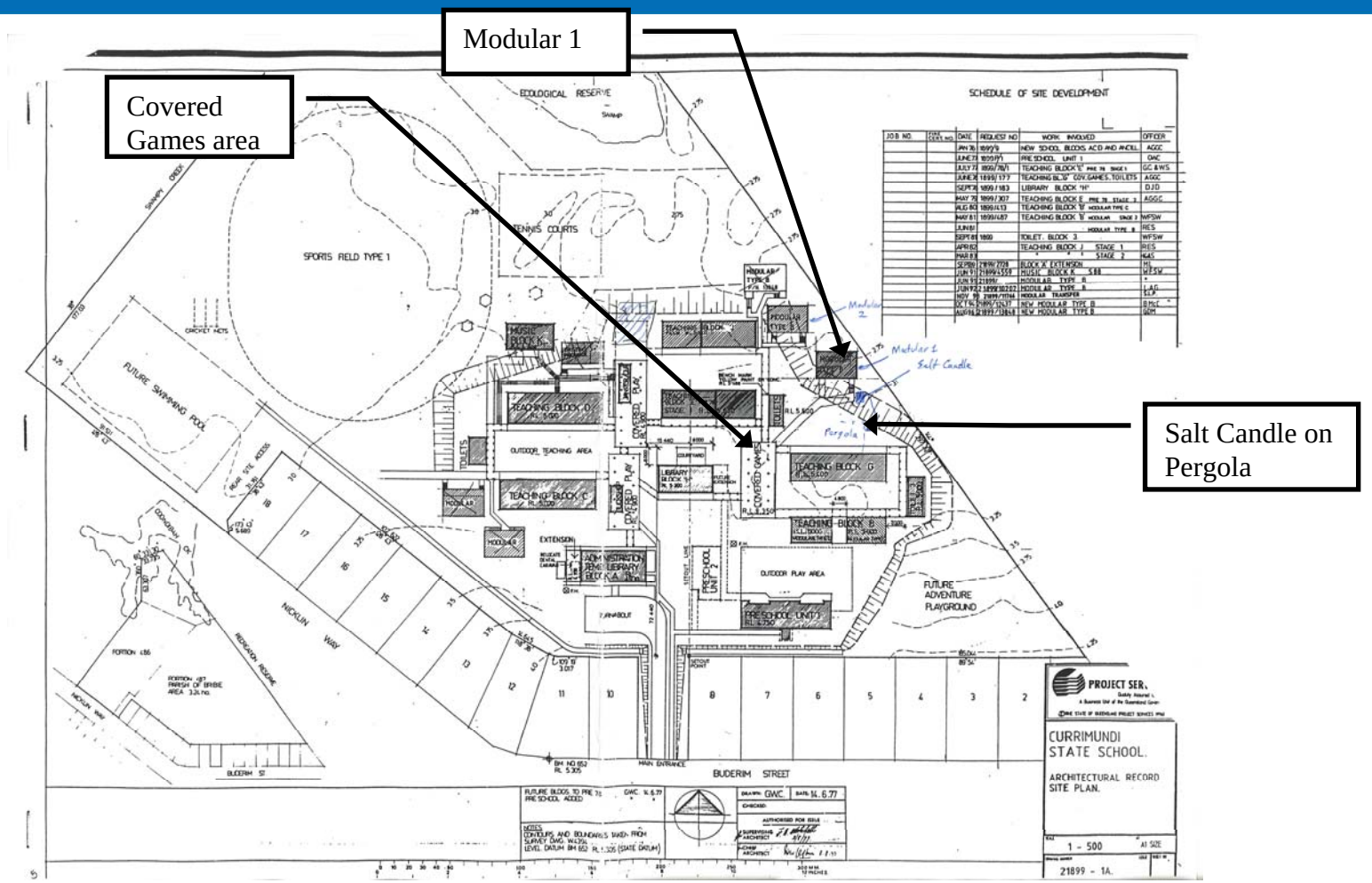
Trip to Sunshine Coast Queensland
September 2004

Inspection at Schools



Currimundi State School

Plan of Currimundi State School



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Currimundi State School

Currimundi State School

Modular 1 class room at Currimundi State School

Currimundi State School

Close up of rusting and deterioration on gutter on Modular 1 showing that problems are associated with the joints.

Currimundi State School

Sub-floor of Modular 1 showing significant deterioration of sub floor metallic components

Currimundi State School

Stump support of

Modular 1

Currimundi State School

Close up of stump of Modular 1

Currimundi State School

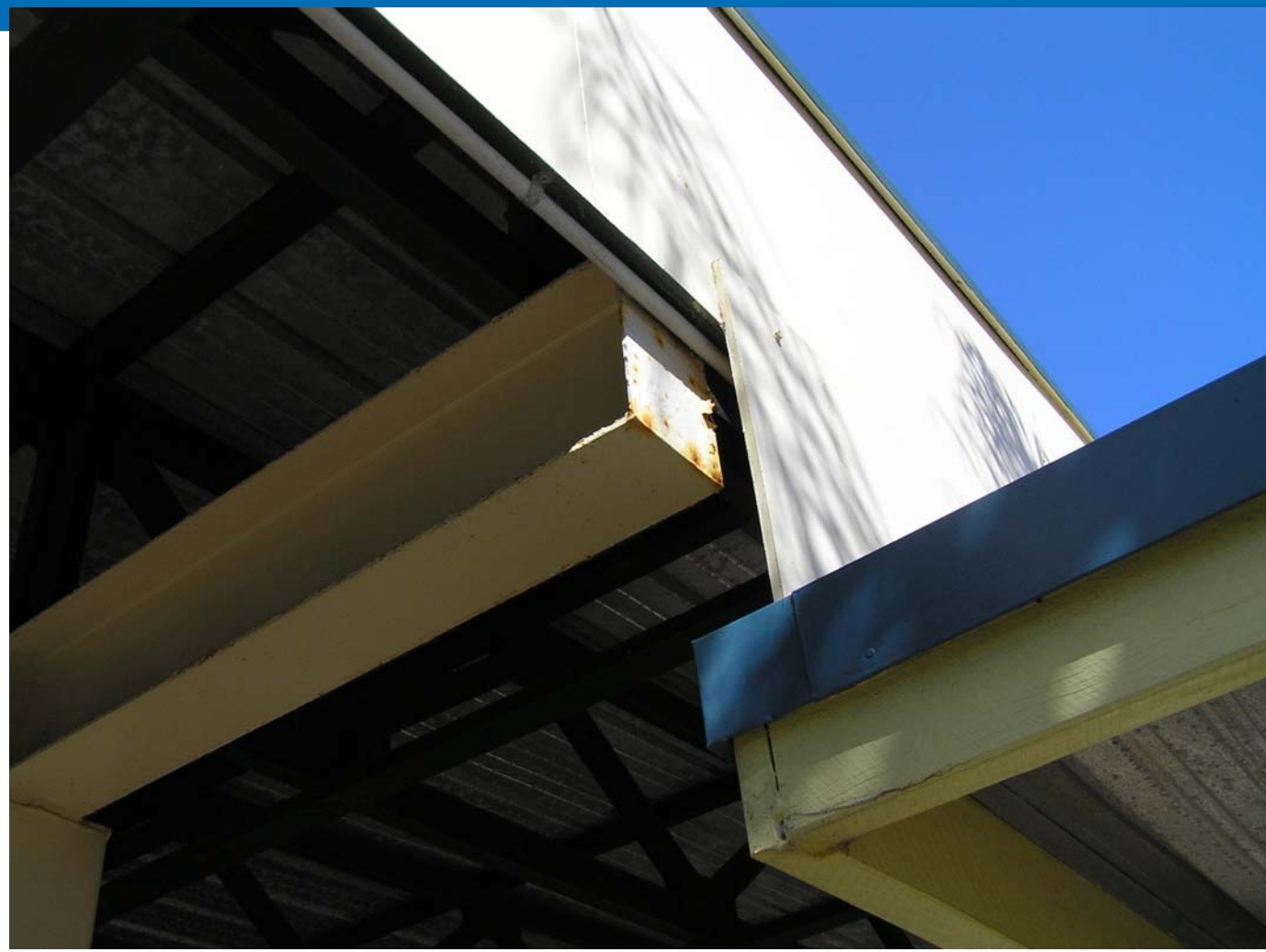
Fasteners on roof of Modular 1 showing rust staining on to sheeting

Currimundi State School

Footing of steel support showing red corrosion product

Currimundi State School

End of steel beam showing red rust break through.



Currimundi State School

Inside covered games area showing corrosion of underside of roof sheeting and rust on painted gang nail plates

Close up of gang nail plates on inside of covered games area

Currimundi State School

Close up of inside of roof sheeting of covered games area showing significant white corrosion product and some red rust.

Currimundi Special School

Stainless steel equipment box showing signs of rust where signs were affixed with tape

Currimundi Special School

Covered walkway, fastener shanks are red rust and undercutting seen on Colorbond sheeting.

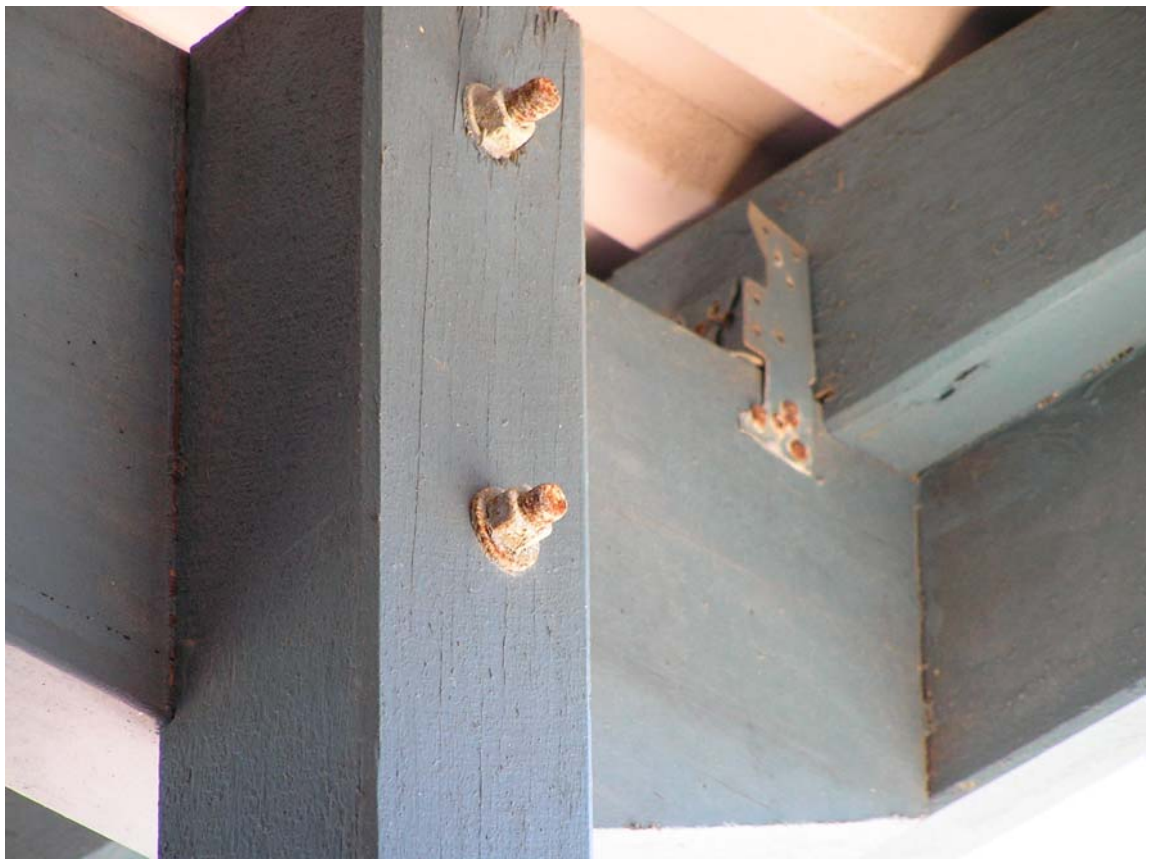
Currimundi Special School

Covered set down showing red rust of stainless steel strapping not in contact with roof sheeting and red rust on roof sheeting where stainless steel strapping is in contact.

Currimundi Special School

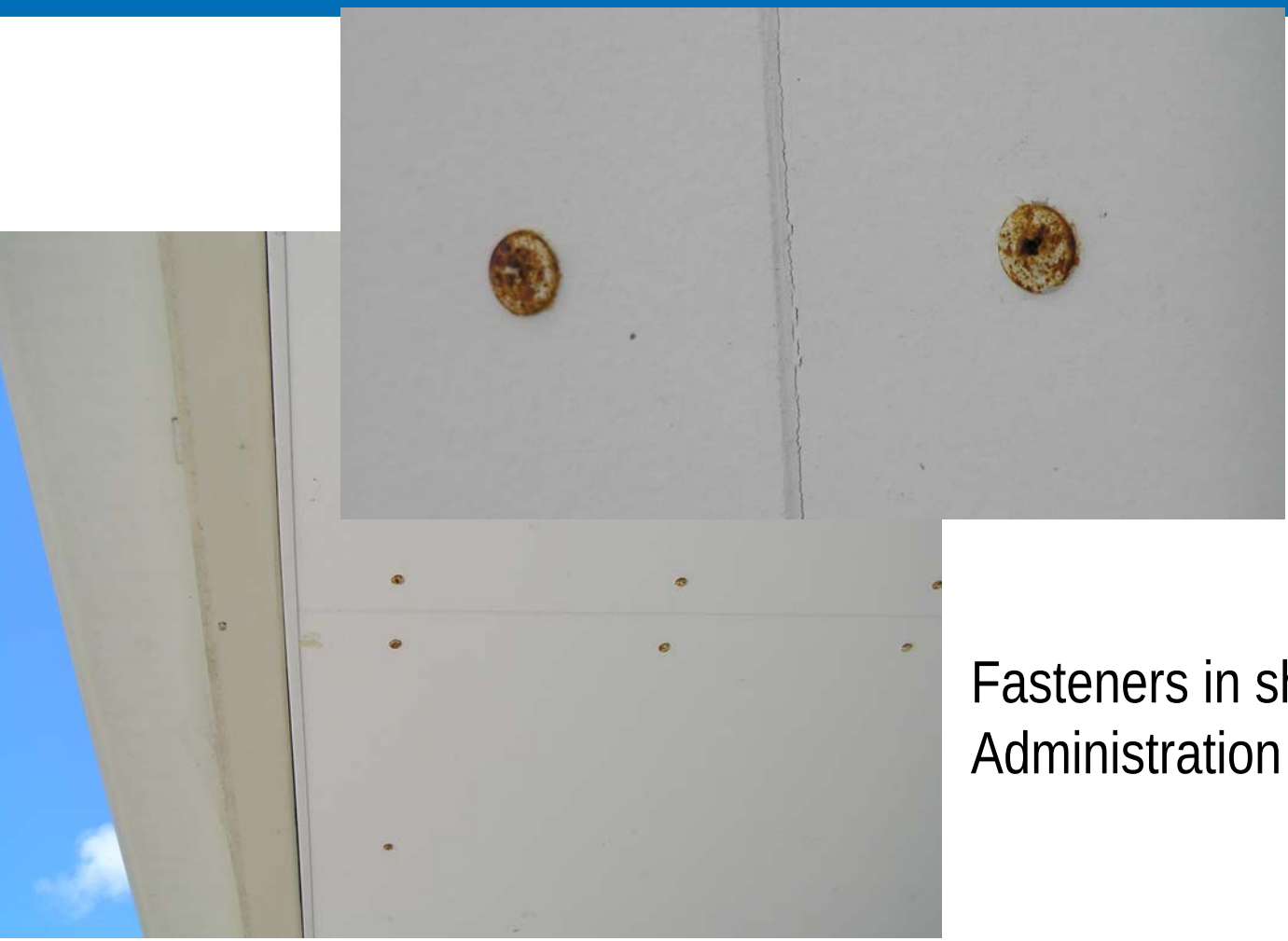
Triple grips on structure of covered set down showing signs of deterioration and roof fastener shank to red rust.

Currimundi Special School



Triple grips and bolts on structure of covered set down showing signs of deterioration

Talara Primary School



Fasteners in sheeting on porch of Administration Block.

Talara Primary School

Galvanised post on Administration Block and close up showing signs of white corrosion product.

Talara Primary School

Corroded strapping on covered court

Talara Primary School

Corroded fasteners in covered walkway

Talara Primary School

Degradation of gutter at join.

Talara Primary School

Salt candle installation at Talara College Primary School, in Pre-School playground

Kawana Waters State High School

Position of Salt candle shelter at Kawana Waters High School

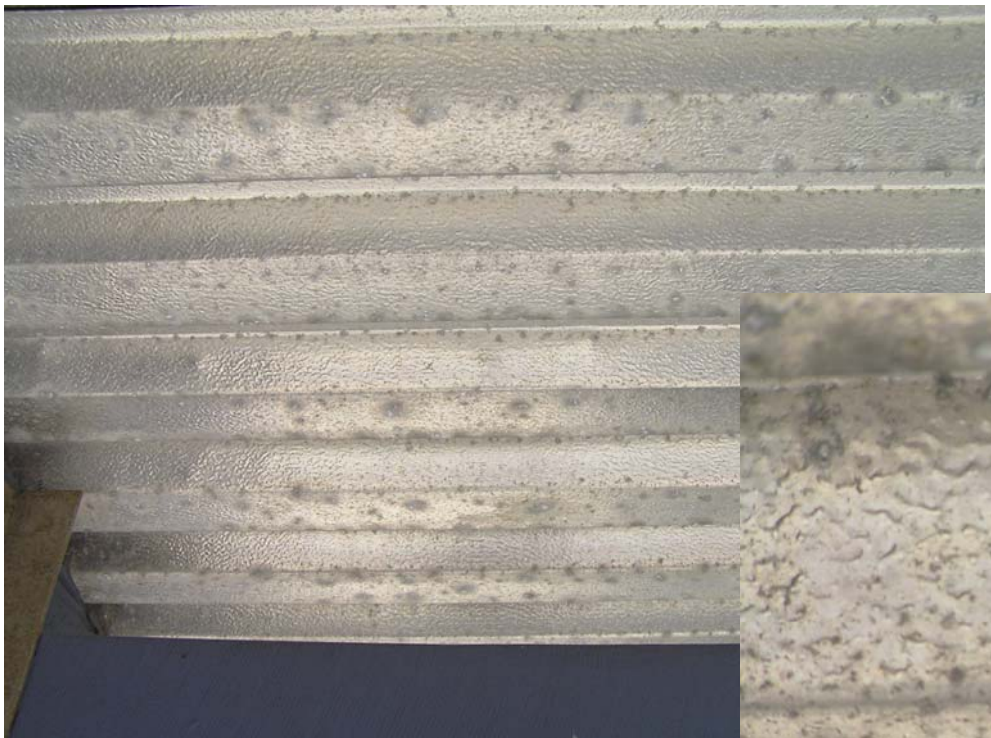
Kawana Waters State High School

Bottom of square section, steel completely rusted away

Kawana Waters State High School

Top of downpipe also showing rusting of bracket from downpipe to support and stainless steel plates on walkway beams.

Kawana Waters State High School



Underside of aluminium roof sheeting of covered walkway

Kawana Waters State High School

Heavily corroded fastener in sheeting of covered walkway

Kawana Waters State High School

Close up of fasteners showing red rust and white corrosion product

Kawana Waters State High School

Underside of all gutters were significantly corroded

Kawana Waters State High School

White corrosion product on painted steel brackets

Kawana Waters State High School

Colorbond sheeting and aluminium gutter showing significant growths.

Kawana Waters State High School

Deterioration around joint between gutter and downpipe

Kawana Waters State High School

Structural downpipe showing that water has come through the join to the gutter and red rust can be seen in U section.

Kawana Waters State High School

Close up of U section from under the eave , red rust can be seen and also the wood beam which is rotting

Kawana Waters State High School

Close up of U section showing significant red rust.

The research described in this report was carried out by CSIRO

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