

# The Changing Face of Façade Design



## Introduction

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There are a number of factors which contribute to how design trends are influenced over time. The changing aesthetic preferences, performance requirements, functionality and of course cost of the design and materials used will be evidenced in the architecture of that era.

As the element that sets the tone for the entire building, the façade is one of the primary aspects of a project when looking from a design standpoint. Its contribution and importance to building functionality has also evolved over time, from simply keeping the weather out thousands of years ago to now playing a significant role in the energy efficiency and sustainability of a project.

This has seen dominant façade materials change often over time from timber, to concrete, to steel, to glass and now it seems to have gone full circle, with technological advancements in composite timber alternatives seeing a revival in the use of timber in architectural design.

## Timber

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Timber is perhaps the oldest of all building materials and can be found in the most important construction from civilisation throughout the ages from ancient Egypt and ancient Greece through to the Renaissance and the first European settlers.

But in the past two centuries the environmental impact and deforestation, purported fire risk and the rise of industrialisation and new construction methods using iron, steel, concrete, glass and plastics slowly reduced the use of timber<sup>1</sup>.

And while the timber weatherboard is a defining feature of the late 19th century and early to middle 20th century Australian housing landscape, the use of timber as a façade material in commercial and institutional construction have become non-existent, replaced by the single most widely used material in the world – concrete.

## Concrete

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Today, construction of buildings across the world is dominated by concrete.

With some examples dating back over 7000 years, concrete is one of the world's oldest building materials. In Australia examples of concrete construction can be traced to the 1860s, with concrete having been a crucial part of Australian architecture since the late 19th century.

Despite concrete being used heavily in housing and institutional construction from the 1920s, it was some time before concrete gained the aesthetic acceptance to appear in its raw state as the façade of a building<sup>2</sup> with the emergence of Modernism and then Brutalism.

The Brutalist style of architecture which was especially popular with governmental and institutional projects, was exemplified by its typically massive exposed block concrete construction. However the cold and inhuman

feel of Brutalist design fell out of favour in the 1980s, leaving behind iconic buildings such as the High Court of Australia in Canberra, the Sirius building apartment complex in the Rocks district of Sydney and the “ugliest building in NSW” the UTS Tower.

Another drawback is the risk of Concrete cancer which has been labelled a ‘ticking time bomb’<sup>3</sup> and an ‘epidemic’<sup>4</sup> in some building circles, as the extent of concrete cancer in Australian buildings becomes more evident.

Concrete cancer occurs when the steel reinforcing inside the concrete is exposed to moisture and rust. As the steel reinforcing rusts, it expands, causing the concrete around the steel to be displaced, which leads to cracking and will eventually break away<sup>5</sup>. Concrete cancer is leaving buildings throughout Australia with cosmetic and structural damage.





## Glass Façades

Since the turn of the century, the trend amongst multi-residential construction as well as large-scale commercial buildings has leaned heavily towards floor-to-ceiling glass, however this trend is seemingly in direct competition with the move towards more sustainable design.

In general an increase in glazing means an increase in potential space for solar heat gain and glare, even if a lot of money is spent on high performance glazing and shading systems.

The expectation for new commercial buildings in any of the capital cities to have a minimum 5 Star Green Star and 5 Star NABERS Energy means the cost of specifying high performance products to satisfy these schemes is a very expensive exercise.

Recent testing and analysis have shown that even if a lot of money is spent on high performance glazing and shading systems it is still difficult to justify fully glazed facades from an energy, comfort or daylight perspective. A ratio of 50% glazed to solid area considered a good starting point when considering the design of a façade<sup>6</sup>.

Increasing energy prices, climate change and pressure to ensure buildings reflect sustainable building practices has left designers and developers searching for new alternatives, with a keen desire to balance aesthetic and functional appeal.

This has seen the return of timber, or more accurately composite timber, as a very viable choice for façade's. The popularity of using timber to soften and add warmth to the cold and clinical look and feel of raw concrete and glass facades is facilitating the push to composite timbers.



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## Composite Timber

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As a construction material, timber has gone from near ubiquity to marginalisation to a contemporary resurgence. The resurgence in timber is being driven strongly by the technological advancements in composite timber products.

Modern composite timber is a sophisticated construction material capable of mimicking the look and feel of traditional natural timber, whilst still providing the highly desirable warmth and character not provided by any other building material.

With composite timber providing the benefits of wood without the drawbacks of traditional natural timber, the design trend seems to be coming full circle as timber is again used in the facades and cladding of residential, commercial and institutional architecture.

In the United States alone the composite timber market is expected to increase more than 10% annually to \$8.4 billion in 2018. While Australia has been relatively slow to adopt composite timber as a façade material when compared with the rest of the world, much of the uncertainty and scepticism that has existed in regards to composite timber is waning as projects reach the ten and twenty year old mark and the quality and longevity of the material remains intact.

Composite timber provides seven key benefits when compared with other façade materials as well as traditional natural timber:

**Low maintenance:** Composite timber is a low maintenance material. Rather than needing regular recoating like traditional timber, often all composite timber needs to help it looking its best is sweeping or washing down with water.<sup>7</sup>

**Lightweight:** Compared to solid natural timber, some composite timber products deliver a weight reduction of up to 75 per cent in certain applications.<sup>8</sup>

**Safety:** Composite timber has a smooth and splinter free finish. It is split resistant, making it safer for bare feet, small children and pets.<sup>9</sup>

**Resistance:** many composite timber products are resistant to termites, rot, insect infestation<sup>10</sup>, water and fire. Unlike traditional timber, some are self-extinguishing if subjected to fire.<sup>11</sup> It is important that the correct fire rating system (Group Number, BAL or AS1530.3) are compiled to if required by the BCA or NCC.

**Long term cost:** Composite timber is often much more cost effective over time than timber, as there is much less wear and need for maintenance.<sup>12</sup>

**Standardisation:** due to the way in which composite timber is made, profiles with systems designed into them can be achieved. Resulting in little to no visible fixings with concealed brackets and reinforcing ribs.

**Environmentally friendly:** Composite timber is made from a combination of recycled timber and plastic. Composite materials are an environmentally friendly alternative to traditional timber because instead of harvesting rainforest or plantation trees, by-products of the timber industry such as sawdust, wood chips and recycled waste are used. In some cases, all or some of the plastic used in manufacturing composite decking comes from recycled plastic as well.<sup>13</sup>

Research shows that using wooden products in place of other materials can lead to a significant reduction in greenhouse gasses, while also allowing for an increase in global forest cover if sustainable forestry practices are employed.<sup>14</sup>





## INNWOOD Sustainable Composite Timber Solutions

INNWOOD is an Australian company and leader in the design, manufacture and supply of composite timber products since 2005. The ideal sustainable timber alternative, INNWOOD composite timber products provide the look and feel of natural timber without the negative challenges.

INNWOOD products contribute to the prevention of forest depletion through the sustainable use of recycled material and energy management. INNWOOD products are sustainable, low carbon, eco-friendly, and energy efficient timber alternative. INNWOOD supplies high quality products and systems that are utilised in a number of commercial and residential applications in both domestic and international markets. The company is committed to maintaining the highest standard of customer service and also offers full design and installation services.

InnoClad is an architectural composite timber cladding system that enhances outdoor facades and internal linings, and is ideal for new buildings, renovations or extensions in residential and commercial projects, indoors or out.

INNWOOD external cladding systems come in your choice of shiplap, concealed clip fixing and flat joint cladding systems. They can be orientated vertically or horizontally, delivering a clean finish with consistently spaced shadow/join lines. With the ability and flexibility of being incorporated into an energy efficient ventilated façade system.

InnoClad lining systems can be used to create a feature of internal walls. They come in your choice of a concealed clip lining system or a tongue and groove shiplap lining system, giving them the flexibility to orientate vertically or horizontally.

For more information on how INNWOOD could enhance your design, or to see how others have used INNWOOD in their residential, commercial, public and educational projects, visit:

<http://innowood.com/>



## REFERENCES

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