

recreational



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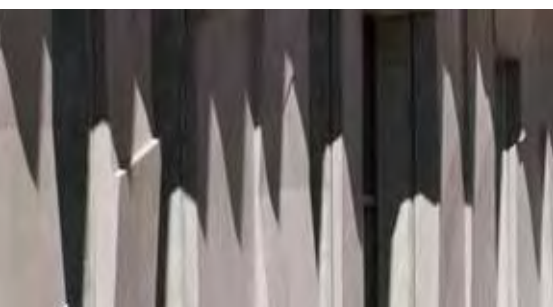




[contents >](#)



- [Mater Christi College Page 1 >](#)
- [Sport and Recreation Hall Page 3 >](#)
- [AXA Building Page 6 >](#)
- [Concrete and Colour Page 8 >](#)



Mater Christi College >

Precast concrete shade structures have achieved a perfect marriage of function and form on the latest built addition to Mater Christi College, in the outer Melbourne suburb of Belgrave.

The public face of the new building is punctuated by the concrete shade structures, which seemingly grow out of the ground to the full two-storey height of the building.

According to architect Tom Jordan, of Hayball, two considerations were at play in designing the simple yet elegant concrete forms.

The first was about providing oblique shading of the glass curtain wall on the north-east façade of the building.

The glazing, particularly on the ground floor level, is predominantly about achieving a balance between the need to open up the view and invite in the light, and control solar heat gain. Accordingly, the geometry of each concrete element carefully corresponds with the location of the openings.

The upper floor has significantly reduced window areas, with skylights providing natural lighting.

"The second consideration was about providing a layered architectural presentation to the street," Jordan says.

"The building is set on a steeply sloping site, fronted by a wide verge of trees – almost a

woodland setting. The shading devices echo this treescape in a monolithic way.

"They also help create a nice contrast - the monumental nature of the concrete versus the fine, fragile glass behind."

The grey concrete shade elements have a sculptural, three dimensional quality, with the leading edge sweeping out to a knife-edge.

Elsewhere, precast concrete panels have been used for the load bearing external and internal walls.

Because of the difficulty with site access and the steep fall across the site – the equivalent of a whole floor – precast was a natural choice for the project.

"We looked at a few options but precast came out ahead in terms of speed of construction, the ability to crane it onto the site, the fact that we could also use it as a retaining structure at the rear and sides of the building, and its architectural materiality," Jordan says.

education





From an ESD perspective, the use of so much concrete – particularly the exposed internal walls and unlined concrete soffits – has also delivered a huge amount of thermal mass.

The new building nestles comfortably into the hillside site, with its distinctive public façade giving it a unique personality in its semi-rural setting.

Client – Mater Christi College

Architect – Hayball

Landscape Architect – Land Design Partnership

Principal Contractor – Buildcorp Commercial

Principal Engineer – Adams Consulting

Specialist Concrete Subcontractor – Antonello Precast Concrete

Photography – Peter Clarke

Sport and Recreation Hall >

From afar, it would be easy to dismiss the NSW Sport and Recreation Hall at Berry, on the NSW South Coast, as simply that – a somewhat modest little hall.

Yet stand closer and the building starts to speak. The finesse of the design, the undeniable attention to detail, marks it as something special – a fact confirmed when it was recently named Best Sports Building at the World Architecture Festival Awards in Barcelona.

The multi-purpose hall sits amongst a collection of institutional buildings as part of the more expansive Berry Sport and Recreation Centre.

The site is surrounded by lush, green paddocks and grazing cows - and in many ways, this pastoral scene has helped shape the design.

Cut into a hillside, the building appears – in form and scale – more akin to a farm shed. Yet the external walls running down either side of the building are unlike anything seen on a run-of-the-mill cow shed.

These walls, each made up of 11 precast concrete panels, are punctuated with 'starlight' holes, a seemingly random array of small, amoeba-like, glazed openings.



Photograph – AJ+C Photography



Photograph – Anthony Brownell

“We thought that by perforating the concrete walls we could break down the perception of weight, giving the building a playful edge and newfound lightness and life,” says Michael Heenan, Principal with architects Allen Jack + Cottier.

“We even imagined that this massive, heavy farm-like building could melt into the night sky.”

And melt it does. In the evening, with the lights on inside the hall, the building from a distance mirrors the appearance of the night sky – a constellation of glowing lights.

During the daytime, the situation is reversed. The perforations invite natural light inside the building, with the light shafts changing in intensity and colour according to the track of the sun.

The design, off-site manufacture and on-site placement of each of the 22 precast wall panels was carefully considered and executed.

Photographs above – AJ+C Photography

recreation



Photograph – AJ+C Photography



Photograph – Anthony Browell

Initially, a 1.5 tonne test panel with five alternative light shaft prototypes was tested in real production conditions. During erection on site, the panels were alternately flipped to ensure a random scattering of the perforations.

The use of precast concrete on the project met a number of criteria, not the least being economy, robustness and environmental performance.

Indeed, the building itself is a living, breathing lesson in ESD principles, with the various heating, cooling and water collection initiatives

explained to hundreds of visiting school children each week.

Moreover, the Berry Recreation Hall is a lesson in how to introduce life and light into simple architectural forms, while at the same time creating structures that are very much in touch with their surrounds.

Client – NSW Department of Sport and Recreation

Architect – Michael Heenan and John Whittingham, Allen Jack + Cottier

Landscape Architect – Mather and Associates

Principal Contractor – Ablock Builders

Specialist Concrete Subcontractor – Hanson



AXA Building >

AXA's new corporate headquarters in Melbourne features a concrete podium that seemingly rises from the earth to create an engaging and distinctive public precinct.

Designed by Cox Architects and Planners, the AXA building is part of a new city precinct that links Melbourne's CBD with the Docklands waterfront.

One of the strengths of the building design is the way in which it enhances accessibility across the precinct and integrates the disconnected elements surrounding the site.

In both a practical and aesthetic sense, the podium establishes a strong foundation for the building on a site that falls away quite dramatically. It seemingly rises out of the ground into a solid base of steps, terraces, undercrofts, canopies and retail tenancies. At the same time, it achieves the necessary separation of the glass tower above from the street below.

The distinctive pattern of lines and angular forms on the podium façade is the work of Sydney based Kamilaroi/Wiradjuri artist, Jonathan Jones.

Jones drew inspiration from the ancient stone tools quarried from rock sourced at Mount William, in the Grampians.

This rock was something of a 'cultural currency' among the local indigenous population, and Jones has endeavoured to reflect this idea of cultural exchange in his design.

"In essence, we took the shape of a stone axe head quarried at Mount William and mapped it out as a landscape," he says.

The design process was undertaken in close collaboration with both the architects and the indigenous landowners of the area.

"Because we were working with Kulin (the traditional landowners) cultural knowledge and history, it was important they were happy with our reinterpretation," Jones says.

The forms are recreated on precast Glass Reinforced Concrete (GRC) panels fixed to the insitu concrete base. GRC was chosen for its light weight and integral strength.

The panels have a Class 1 finish that embellishes the fine detailing of the pattern. Indeed, the sharp lines and uneven surface planes create a wonderful play of shadows, reinforcing a sense of place.

Over 300 individual GRC panels were manufactured for the project. These were derived from five 'base' moulds - one 4x2m mould and four 2x2m moulds - which together made up one complete wall of the initial three dimensional design concept produced by Jones.



Photograph – Cox Architects and Planners



In effect, each individual panel was taken from some discreet part of the macro design, and located such that its position within the original pattern was not apparent.

This provided obvious advantages in terms of speed and economy without compromising the artistic vision. Indeed, each cast panel has been very deliberately positioned and fixed to create something that is seamless without being repetitious.

The GRC panel sculpture wraps around the Collins Street, lower road and laneway frontages. The panels have also been applied to a new external staircase on the eastern face of the building.

Jones says that while the design strongly references indigenous history, it also has a

'strangely formal' relationship to Federation Square, helping to reconnect the otherwise disconnected elements of the surrounding built environment.

Complementing the podium panels are burnt orange-coloured screens, made from steel plate in a chevron pattern borrowed from a Kulin shield – an appropriate motif given the cultural connection and the practical function of 'shielding' the building from the sun.

Client – Grocon

Architect – Cox Architects and Planners

Artist – Jonathan Jones

Principal Contractor – Grocon

Specialist Concrete Contractors – Upgrade Commercial Interiors, Enviro Interiors

Photograph – Dianna Snape Photography

Indigenous Concepts

Concrete and Colour >



An unlimited range of colours can be provided on the surface of concrete. This article provides an overview of colouring concrete and outlines the key points to achieve the required result.

Overview

Colour consistency is usually an important consideration in architectural concrete. Its achievement requires an understanding of the many factors that can influence the colour. These include the concrete constituents and their proportions, pigments, method and duration of curing, form oils, release agents, and the type and absorbency of the formwork.

The key to colour consistency is to keep all aspects of the concrete composition and construction method as consistent as possible.

It should be noted that colour variations are more apparent in plain surfaces than textured surfaces, where they are – to varying extents – masked by the texture.

Cements

Cements in Australia are produced in grey and off-white colours. White cement is imported.

The availability of concrete made with off-white and white cement should be checked with the supplier prior to specification. Concrete made with off-white cement is generally available in most major cities; the availability of concrete made with white cement is limited.

Pigments

Most pigments are oxides of iron – reds, yellows, browns and black. They can be naturally occurring minerals or manufactured, with the latter often referred to as synthetic oxides. Some colours such as blues and greens may cost more as they are special metal oxide pigments. Titanium white oxide pigment is also available and, when used with off-white cement, may be an economical way to obtain a 'white' concrete.

Pigments can be added directly to the concrete (integral colour), contained in a topping or render, or applied to horizontally cast surfaces by using the 'dry-shake' method.

Aggregates

The fine and coarse aggregates will influence the perception of colour in exposed-aggregate finishes.

The colour of sand or fine aggregate (and the cement matrix) will tend to dominate in the case of light abrasive blasting or acid etching; the colour of the coarse aggregates will dominate with techniques such as heavy abrasive blasting, tooling, water washing, honing and polishing. The size and colour of the aggregates, along with their proportions, should be specified if they are to be exposed.

Chemical stains, dyes and tints

Chemical stains are liquids that penetrate into the concrete and react with the constituents of the concrete to permanently colour it.

Along with dyes and tints (coloured liquids), which can be used to produce vibrant colours and extend the palette of available colours, a vast range of colouring solutions is possible for both small and large projects.

Because these products rely on penetrating the concrete surface, they are more commonly used on horizontally cast elements where the stain can be allowed to pond on the surface. Due to the variability with which they penetrate the surface, a uniform colour cannot be achieved, rather a uniquely mottled finish will be produced.

The colour intensity depends on various factors such as the cement colour and permeability of the concrete surface, which in turn will be affected by the degree of concrete compaction, curing and surface trowelling.

As chemical stains react with the calcium hydroxide produced by the hydration of the cement, the time of their application will influence the colour intensity achieved. Chemical stains should be used in accordance with the manufacturer's recommendations.

Applied finishes

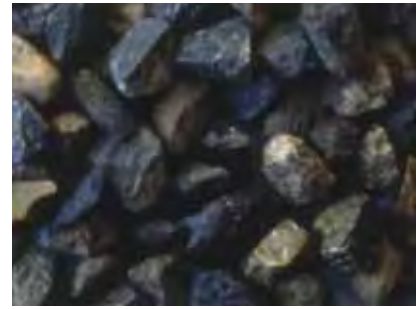
Applied finishes include cement renders, applied coatings and paint. They are normally specified if a consistently uniform colour is required over a large area, as a moisture/durability coating, or to provide some texture to the surface.

Advances in paint technology have resulted in longer-life paints and a greater range of applied finishes.

Key points for specifiers and builders - off-white and white concrete

- > There are many different shades of off-white and white, and if these colours are required, a test panel should be provided to confirm the acceptability of the concrete colour.
- > To minimise the risk of colour variations it is advisable to specify that the cement be from a single source for the duration of the project.
- > Colour consistency over large areas tends to be less of a challenge with off-white concrete, as it is more consistent in colour than grey concrete.

Aggregates come in a range of sizes and colours



Key points when using pigments

- > The use of pigments is the most common method of colouring the full depth of concrete, providing a coloured surface on all faces of a concrete element and eliminating the need for subsequent surface coatings/paints.
- > Pigments are available as either powders, granules which dissolve, or liquids. The ultra-fine particles of pigments do not dissolve and stain the concrete materials, but disperse as fine solids throughout the concrete matrix and are bound into the concrete in the same manner as the aggregates.
- > Pigments are not affected by ultraviolet rays (eliminating fading), are insoluble (do not leach out of the concrete), chemically inert (do not react with the concrete constituents), alkaline resistant and once bound into the concrete matrix they provide a permanent colouring solution.
- > As a guide, the amount of pigment required is generally 5% to 8% of the mass of the cementitious material in the mix. At these percentages pigments are not expected to affect the potential strength of the concrete.
- > For exposed aggregate finishes, the amount of pigment required is typically reduced to about 1% or 2% as the predominant colour will come from the aggregates.
- > As the colour achieved is affected by the pigment concentration and the tinting strength of the pigment, colours should be specified by either selecting a particular colour from a manufacturer's range, or specifying a colour in conjunction with the manufacturer.
- > The colour of the cement will affect the final colour of the concrete.
- > If pigments are added on site, the concrete should be thoroughly mixed to ensure an even distribution of pigment.
- > The use of pigments will generally mask minor colour variations between different batches of concrete.

For more information on this topic, refer to CCAA Briefing Note 3: *Colour and Texture in Concrete Walling*, available as a free download at www.ccaa.com.au



Four coats of red dye sprayed onto walls to achieve deep yet translucent red colour. (Shrine of Remembrance Courtyards, Melbourne)



Dyes and tints (used for flowers and red background) produce vibrant colours. Green area was chemically stained

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