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# DESIGNED FOR HEALING

Modern Ceiling Systems and their impact on health and wellbeing



“Ceilings influence how well patients rest and recover, offer a sense of privacy and anonymity, aid in staff accuracy and error prevention by improving the clarity of voice, and are a major factor in patients’ perceptions of cleanliness ...”

## Introduction

According to the shifting demographics of the Australian population, demand for healthcare and aged care will eventually outpace supply. Recent reports estimate that the number of Australians aged 85 years and older will increase from 400,000 in 2010 to 1.8 million by 2050.<sup>1</sup> In this context, greater scrutiny is being placed on the design and construction of healthcare and aged care facilities and how they can improve the lives of patients and residents.

The COVID-19 pandemic hit these two sectors of the population—the elderly and those with pre-existing medical conditions—the hardest. Throughout 2020 and 2021 it became clear that we need better healthcare spaces to not only stop the spread of infection but also to reduce the impact of social isolation amongst these groups within our society.

It is critical for designers to keep up with new developments in building technology and materials that can enhance end users’ experiences and support evolving medical practices. A population that is living longer thanks to increasingly sophisticated treatments and the realisation that biophilic design can improve health outcomes by addressing the relationship between physical health and the built environment calls for a rethinking of conventional design thinking.

High-performing, adaptable and fit-for-purpose ceiling systems offer one of the quickest and most cost-effective ways to deliver improved health and wellbeing outcomes to the general population. This white paper addresses the capabilities of modern construction materials and their role in healthcare spaces.







“The pandemic taught us that spaces need to be adaptable in addition to being functional and welcoming. Beyond providing the basic hygienic standards required in each of these areas, attention must be paid to enhancing the mood and overall ambiance.”

## Evolution of healthcare design: Key themes

The design of healthcare spaces is a complex field that is ever evolving. While there have been many factors accounting for recent changes to the healthcare landscape, the most significant has been COVID-19. The pandemic exposed major deficiencies and sped up the need for innovation in the healthcare industry, with many of the lessons learned over the past three years set to change the way healthcare facilities are designed forever. Below we discuss three overarching themes.

### Patient experience

The healthcare sector has changed to become more consumer-driven, with customers now able to choose from a wide variety of options for how, when, and where they receive medical care. To stay in business, healthcare institutions have had to take measures to set themselves apart from the competition; one focus has been on improving the end-to-end patient experience. From the moment a patient checks in, up until they leave, the goal is to address all points of engagement to create a holistic, comfortable user experience.

Even moreso during the pandemic, a key factor for success in this area is how the built environment impacts patients' physical and mental wellbeing. Studies in this field are well documented, with aspects such as the thermal, audio and visual environment observed to influence patients' health outcomes. For example, certain studies indicate a decrease in patients' anxiety, pain, and stress levels when exposed to certain built environment design interventions.<sup>2</sup>

The importance of aesthetics is also better appreciated across the industry. Colour and design have not been proven to be a guaranteed treatment for disease and ill health, but poor conditions in buildings that have not been renovated with care have undeniably had a negative impact on employee morale and recovery rates.<sup>3</sup> The incorporation of biophilic elements, in the form of natural forms, organic textures and access to outdoor views, for example, has been a popular design trend used to improve the quality of the indoor hospital environment and patients' ability to recover.

### Is bigger actually better?

According to emerging data, smaller aged care facilities and hospitals experienced fewer illness outbreaks and lower death rates than larger ones. In a study led by the University of New South Wales, aged care facilities with a cottage model design had an infection rate almost half that (26%) of a more traditional institutional-style facility (50%).<sup>4</sup> This conclusion was supported by a United States study showing lower infection rates in small nursing homes with 10-12 beds and home-like settings.<sup>5</sup>

One of the key contributors to higher infection risks in large institutions is the constraints of traditional design. Most hospital layouts feature separate, specialised areas for the most vulnerable and contagious patients.<sup>6</sup> These specialised areas were in short supply during the epidemic, forcing numerous hospitals to scramble to provide accommodation for sick patients. Ventilation and airflow were also requiring closer scrutiny, particularly as it was common for air in rooms of sick patients to be funneled into busy corridors.<sup>7</sup>

### Rising costs of construction

Before the pandemic, healthcare design was characterised by trade-offs with a focus on delivering cost benefits over improving patient outcomes. While the emphasis on improving the patient experience has shifted this thinking, the inflationary pressure on construction materials throughout the world is forcing architects, designers and builders to do more with less.

Cost and schedule pressures often have a significant influence on decision-making throughout the initial planning stages of healthcare initiatives. The issue we currently face is that historical cost data and previous construction projects do not provide an adequate comparison because healthcare design is moving quickly and the unprecedented increase in construction costs is being exacerbated by a shortage of supplies, and a labour shortage.



## Flexibility and adaptability: The best response

The pandemic taught us that spaces need to be adaptable in addition to being functional and welcoming. Beyond providing the basic hygienic standards required in each of these areas, attention must be paid to enhancing the mood and overall ambiance.

Today's architects and planners are debating how to construct healthcare campuses and building structures with true flexibility. Flexibility, in this context, means being ready for anything and having the ability to react to changing circumstances and patient needs, including shifting patient occupancy requirements and even the placement of screening or triage in public areas. With a flexible design, services and spaces can change quickly and effectively.

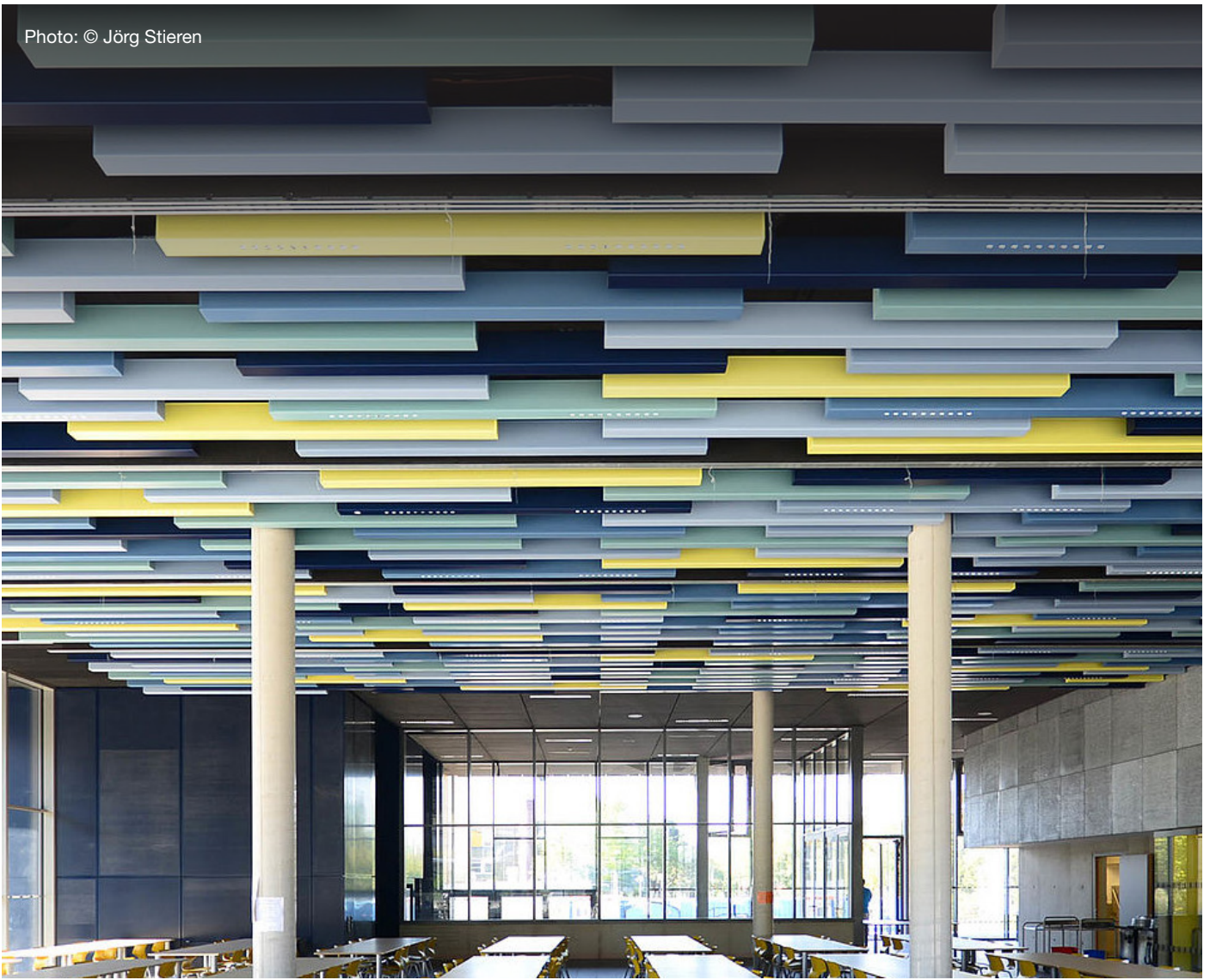
When it comes to construction, prefabrication techniques and modular systems address the complex needs of healthcare buildings while enabling adaptability. Many healthcare building components can now be produced off-site and assembled onsite for higher quality, more effective construction. Think of whole patient and treatment rooms constructed interstate and transported separately for assembly on site, as an example. Agile space innovations allowing progressive transformation

in outpatient and inpatient healthcare spaces include moveable walls, vacuum plumbing, and flexible gas connections.

Interior construction and material standards should also be given plenty of care and consideration. Designers must be confident in their capacity to use their creativity to produce an original design that is both affordable and compliant with strict hygiene standards. Although the idea of infection control is not new, COVID-19 has increased our awareness of the materials we choose for all spaces, whether they are used for healthcare or not.

There are several examples of designers pushing boundaries in this space. Take, for example, University of Virginia Health System's Hospital Expansion Project in the United States. The lobby, with its warm white walls and flooring and light-colored wood ceiling, is not only beautiful but also serves as an overflow waiting area for the emergency department thanks to its cleanable and long-lasting materials.<sup>8</sup> The use of wood and other biophilic design and construction techniques that mimic nature have also been shown to improve occupants' general health and wellbeing as well as patient recovery rates.<sup>9</sup>





## How ceiling design impacts our wellbeing

It is critical for architects and designers to recognise the numerous ways that ceilings aid in attaining the goal of creating a flexible healing environment. Ceilings influence how well patients rest and recover, offer a sense of privacy and anonymity, aid in staff accuracy and error prevention by improving the clarity of voice, and are a major factor in patients' perceptions of cleanliness.

According to research, environment appearance—rather than staff appearance, staff behaviours, or actual cleanliness—is the most crucial element in determining patients' perceptions of cleanliness. Even if the surroundings are actually extremely clean, stained or damaged ceiling tiles create the appearance that it is dirty. On the other hand, a well-kept and presented hospital setting may have enough influence to convince patients that it is “clinically” clean.<sup>10</sup>

The ability to keep surfaces clean and the quality of the air in healthcare facilities are crucial since many hospital patients have immune systems that are impaired.

Manufacturers of ceiling tiles have developed a variety of methods to guarantee that their products are appropriate for healthcare settings. This includes hygienic features and anti-microbial technologies that inhibit the growth of bacteria, fungi, germs, noroviruses, and multi-resistant pathogens on the surface of the ceiling tile. There is also a greater focus on testing materials in terms of compatibility with different types of disinfectant products.

In various locations throughout healthcare facilities, particularly in patient recovery rooms where it is crucial to minimise noise for sleep, maintain privacy, and maintain confidentiality, ceilings are the key component of a well-designed space. Current ceiling systems, such as suspended ceilings, are cost-effective and have great acoustic qualities, but they lack visual appeal because they are often white, have relatively few design options, and are susceptible to damage from regular use. Due to inflation, suspended ceilings are coming close to the price of metal ceiling systems, making the latter a viable choice in new builds.



## Modern ceiling solutions for today's healthcare projects

Network Architectural specialises in supplying high-quality architectural façade and ceiling solutions to architects and specifiers across Australia. Their comprehensive range of ceiling systems are customisable down to the smallest area with zero minimum order quantities. Network Architectural offer in-house design services that can work with your design team from the conceptual beginning to delivery and supply of ceiling systems.

Ideal for healthcare projects due to their performance, durability and flexibility, durlum metal and OWA Mineral Fibre Ceilings offer superior hygienic properties that are robust, infinitely customisable with the only limit being the designer's imagination.

### **durlum Metal Ceilings**

Exclusively distributed by Network Architectural in Australia, durlum offers bespoke ceiling systems that integrate custom natural lighting and elements of nature to create feelings of connection and wellbeing using modern materials and colour. durlum metal ceilings are available in an array of colours, textures, perforations and finishes, which can be mixed and matched to meet design aesthetic criteria. durlum's integrated ceiling-lighting solutions can also go beyond simple practicality to be configured to highlight design features and create senses of warmth and space.

Metal ceilings are favoured for their strength and being less prone to cracks and damage. Metal ceilings are also resistant to water damage, mould and mildew, which means they are easier to clean and can significantly reduce building maintenance and operational costs. durlum ceilings are manufactured to the highest Australian Standards and are fire-resistant, making them an ideal choice for healthcare facilities to protect patients and staff.

### **OWA Mineral Fibre Ceilings**

OWA is a market leader in mineral fibre ceiling tiles and has been an established world-wide supplier of ceiling systems for several decades. OWA offers complete, technically sophisticated ceiling systems, for any conceivable application.

Ideally suited to healthcare spaces, OWA ceiling tiles range of products are designed to meet the following requirements:

- acoustic rated, sound absorption and attenuation;
- fire rated;
- hygienic ceilings (medical facilities);
- moisture resistant including mould and mildew resistance; and
- air purity requirements (suited for clean rooms).

Manufactured from quality mineral fibre wool and finished in flawless white, these tiles are available in a variety of sizes and patterns. A market leader for over 50 years, OWA uses its own materials to make its products. OWA Ceilings have achieved Ecospecifier Global Green Tag Level A certification providing the commercial building industry with recyclable ceiling products.

## REFERENCES

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All information provided correct as of March 2023.