



THE HIGH-PERFORMANCE HEALTHCARE FACADE

Balancing Fire Safety, Durability, Sustainability and Design



Network
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Introduction

Healthcare buildings place unique demands on their facades. Hospitals and aged care facilities operate around the clock. They house occupants who may not be able to evacuate unaided. They are expected to remain in service for 30+ years. Over that period, the external wall must protect occupants, resist weather and wear, support the building's environmental goals and present a welcoming face to patients, staff and the community.

This paper explores healthcare facade design through a framework of five key considerations:

- Fire safety and compliance
- Durability and whole-of-life cost
- Human-centred design
- Resilience and sustainability
- Operational continuity

Throughout, it treats the facade as a complete wall system, in which cladding, framing, insulation, membranes, fixings and sealants work together. It closes by applying this framework to the specification of a non-combustible cladding system.

Fire performance in healthcare facades

Healthcare buildings house occupants who may not be able to evacuate without help. Patients may have limited mobility or be connected to medical equipment, and aged care residents often depend on staff to move them to safety. Because many cannot leave quickly, and some must be protected where they are, fire spreading across the facade poses a greater risk to life than it does in most other building types.

NCC requirements

Under the National Construction Code (NCC), hospitals are generally classified as Class 9a and residential aged care facilities as Class 9c. In Type A and Type B construction, the Deemed-to-Satisfy Provisions (C2D10) require external walls to be non-combustible, demonstrated by testing to AS 1530.1 or through the concessions in C2D10(5).

Where a design departs from these provisions, a Performance Solution must show compliance with Performance Requirement C1P2. One pathway is Verification Method C1V3, which uses full-scale facade fire testing to AS 5113. Under NCC 2025, this testing must be carried out by an Accredited Testing Laboratory. An AS 5113 classification is one part of a Performance Solution, not evidence of compliance on its own.

Compliance applies to the whole wall

A non-combustible panel does not make a compliant facade if the substrate, insulation, sarking, fixings, sealants or cavity barriers fall short. C2D10 specifically applies to all components incorporated in an external wall, including the facade covering, framing and insulation.

Each component should be compatible with the others and appropriately documented. Cavity barriers, while

not mandated under the NCC, should be detailed to limit fire spread within the wall cavity. Manufacturer installation guides and typical details help architects coordinate these components and write specifications that reflect how the system was tested and certified.

Evidence for each product or system should be checked as well. CodeMark certification gives independent confirmation that a product or system complies with the NCC provisions listed on the certificate. Check that the certified product variant and thickness match those documented and that the certificate is current and covers the intended application.

Warranties often depend on correct installation. Confirm the warranty applies to the specified product and application. Note any installation or maintenance conditions needed to keep it valid.

Requirements beyond the NCC

Health authorities may apply requirements beyond the NCC. Healthcare buildings have been a focus of regulatory scrutiny since the Lacrosse and Grenfell fires.¹ State health departments in Victoria² and New South Wales³ audited their building portfolios and found non-compliant cladding on hospital buildings.

Government health projects may also impose sector-specific design requirements. In NSW, Health Infrastructure issues Design Guidance Notes that set minimum expectations for its projects, covering matters such as sustainability and facade design. Other state health agencies issue their own guidelines, and private hospital and aged care operators often set requirements through the project brief.



Designing for a 30+ year asset life

In a hospital or aged care facility, facade work rarely happens in an empty building. Repairs, recoating or recladding mean scaffolding beside occupied patient rooms, possible restrictions to entryways, and noise and dust near patients and residents. Durability and whole-of-life performance are therefore core design requirements.

Every future intervention carries a cost, both financial and operational, so whole-of-life cost can differ significantly from upfront material cost once maintenance, recoating and replacement are included. Value engineering proposals should be assessed on this basis. A lower-cost substitute may need earlier replacement and may shift risk onto the building owner.

Service life of the whole wall system

Cladding, insulation, membranes, framing, fixings and sealants each have different expected service lives. Some will need replacing well before the building reaches the end of its life. Concealed components carry the greatest risk. A corroded fixing or failed waterproofing element can compromise the whole facade and repairing it means opening up the wall. To reduce this risk, architects should:

- select components that are compatible with each other;
- select materials that are resistant to corrosion and suitable for the climate and environmental conditions of the site; and
- detail the wall so that key components can be inspected and replaced.

Maintenance in a live facility

Cleaning frequency, access equipment and cost all affect lifecycle performance. In healthcare settings, maintenance must also work around operational wards,

entries and ambulance bays. The facade design should make clear who is responsible for maintenance and how it will be recorded over the life of the asset.

Coatings and appearance

Australian facades face some of the harshest exposure conditions in the world, from high UV across much of the country to salt-laden air on the coast and pollutants in industrial areas. These conditions break down coatings over time, causing fading, loss of gloss and chalking. On a hospital, recoating early is costly and disruptive, so the coating largely determines how the facade will look in 20 years.

For aluminium systems, FEVE and PVDF coatings generally offer excellent UV resistance, retaining colour and gloss over the long term. Architects should ask for test data, including performance against recognised benchmarks such as AAMA 2605, rather than relying on product descriptions.

Warranties

A warranty shows how long a manufacturer is prepared to stand behind its product's performance and determines who carries the cost if that performance falls short. Most facade warranties are shorter than a healthcare building's service life, so the actual terms of the warranty are critical. A warranty that excludes the project's environment or lapses because maintenance was not recorded offers little protection. When reviewing a warranty, check:

- what it covers (the finish, the panel or the system);
- how long it lasts;
- what exclusions apply; and
- what maintenance conditions must be met to keep it valid.

From institutional to human-centred healthcare

Research links well-designed healthcare environments with better outcomes for patients and staff.⁴ Hospitals once tended towards large, uniform facades that conveyed an institutional aesthetic. Contemporary practice aims for buildings that feel calmer, easier to navigate and more connected to their communities.

The facade contributes through colour, texture, articulation and scale. Changes in material, colour or plane can break a large hospital into smaller volumes, bringing it closer to a civic or domestic scale. This matters most in aged care, where the building is also a home.

The facade also supports wayfinding. Distinct materials or colours at main entries, emergency departments and drop-off points help people find their way, often at stressful moments. At a broader scale, the facade gives the health service a recognisable identity in its community.

These design goals depend on the facade keeping its appearance. A colour scheme that fades or a finish that chalks within a decade undermines the identity and welcoming impression the design set out to create. Design intent is therefore tied to coating selection and whole-of-life performance.

A lower-carbon product that needs replacing midway through a building's life may have a higher lifecycle impact than a durable alternative.

Resilient and sustainable building envelopes

A resilient facade keeps performing under the conditions it will face over its life. A facade that lasts longer and needs fewer repairs or replacements uses fewer materials and less embodied carbon across the building's life. For a healthcare building, resilience also protects continuity of care.

The facade, as part of the building envelope, also greatly influences operational energy performance. Hospitals run around the clock with high heating and cooling loads, so insulation, airtightness and thermal bridging in the facade have a lasting effect on energy use.

Resilience across the wall system

In this context, resilience is the facade's ability to withstand extreme events and harsh site conditions without losing its protective function. Australian healthcare facades face very different conditions depending on location: cyclonic wind in the north, hail in south-east Queensland and New South Wales, salt-laden air on the coast, and extreme heat and UV inland. Resilience depends on every layer of the wall:

- **Cladding** must resist UV, hail and impact.
- **Framing, brackets and fixings** carry wind loads and must resist corrosion, particularly in coastal environments.
- **Wall wraps and membranes** manage water that gets past the cladding. Correct lapping, sealing and drainage prevent hidden moisture damage to fixings and insulation.
- **Sealants, joints and detailing** keep the wall weathertight and are often the first components to need maintenance.

Energy performance

Hospitals are often large, complex facilities that run around the clock with vulnerable occupants who require stable indoor temperatures. Heat lost or gained through the facade is therefore costly to offset. The facade can reduce these loads through several design decisions:

- **Continuous insulation.** Placing insulation outside the structural frame, behind the cladding, limits gaps and reduces heat flow through the wall.

- **Thermal bridging.** Thermally broken framing and well-planned fixing layouts reduce heat transfer through the cladding support system. NCC energy efficiency provisions require wall R-values to account for thermal bridging.
- **Airtightness.** Sealing junctions, penetrations and openings limits uncontrolled air leakage.
- **Solar heat gain.** A ventilated cavity behind the cladding helps dissipate heat, and lighter, more reflective finishes absorb less solar radiation.
- **Condensation.** Insulation and membranes should be detailed so moisture cannot condense within the wall. Mould is a particular concern where patients are immunocompromised.

Assessing sustainability claims

Healthcare accounts for around 7 per cent of Australia's carbon emissions, and capital expenditure on buildings is one of the sector's largest sources.⁵ Health services are under growing pressure to reduce their footprint and that includes the embodied carbon in new and refurbished facilities.

Embodied carbon refers to the greenhouse gas emissions associated with a product's materials, manufacture, transport, installation and eventual replacement or disposal. As operational energy use falls, embodied carbon makes up a growing share of a building's lifecycle emissions. It should be weighed against longevity, because a lower-carbon product that needs replacing midway through a building's life may have a higher lifecycle impact than a durable alternative.

Environmental claims should be supported by product-specific evidence. Environmental Product Declarations (EPDs) report verified lifecycle impacts but can vary in their scope. Two products can only be compared fairly when their EPDs follow the same rules and use the same functional unit. Third-party certifications and rating tool contributions, such as Green Star, should likewise be assessed. Architects should also consider end of life, including whether facade components can be separated and recycled.

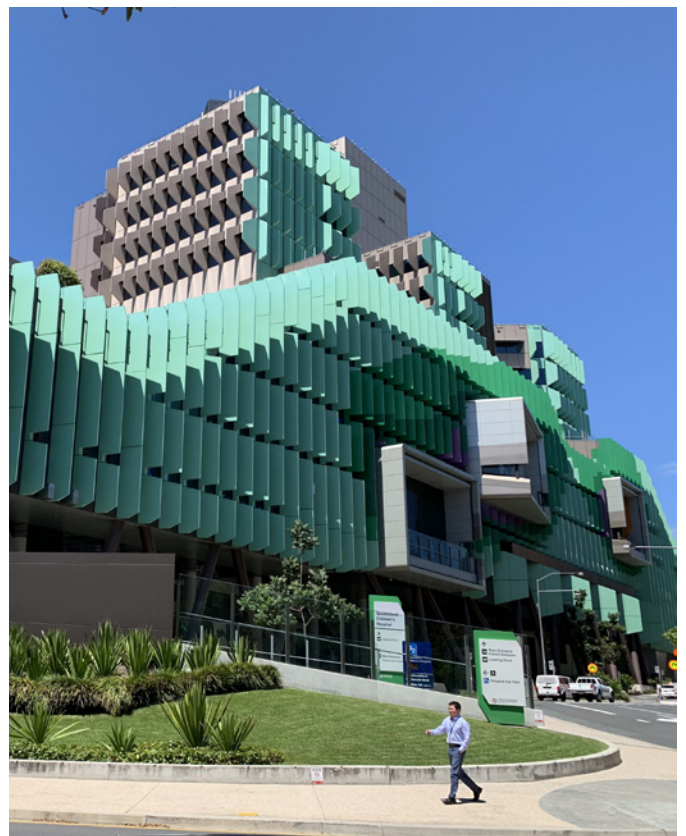


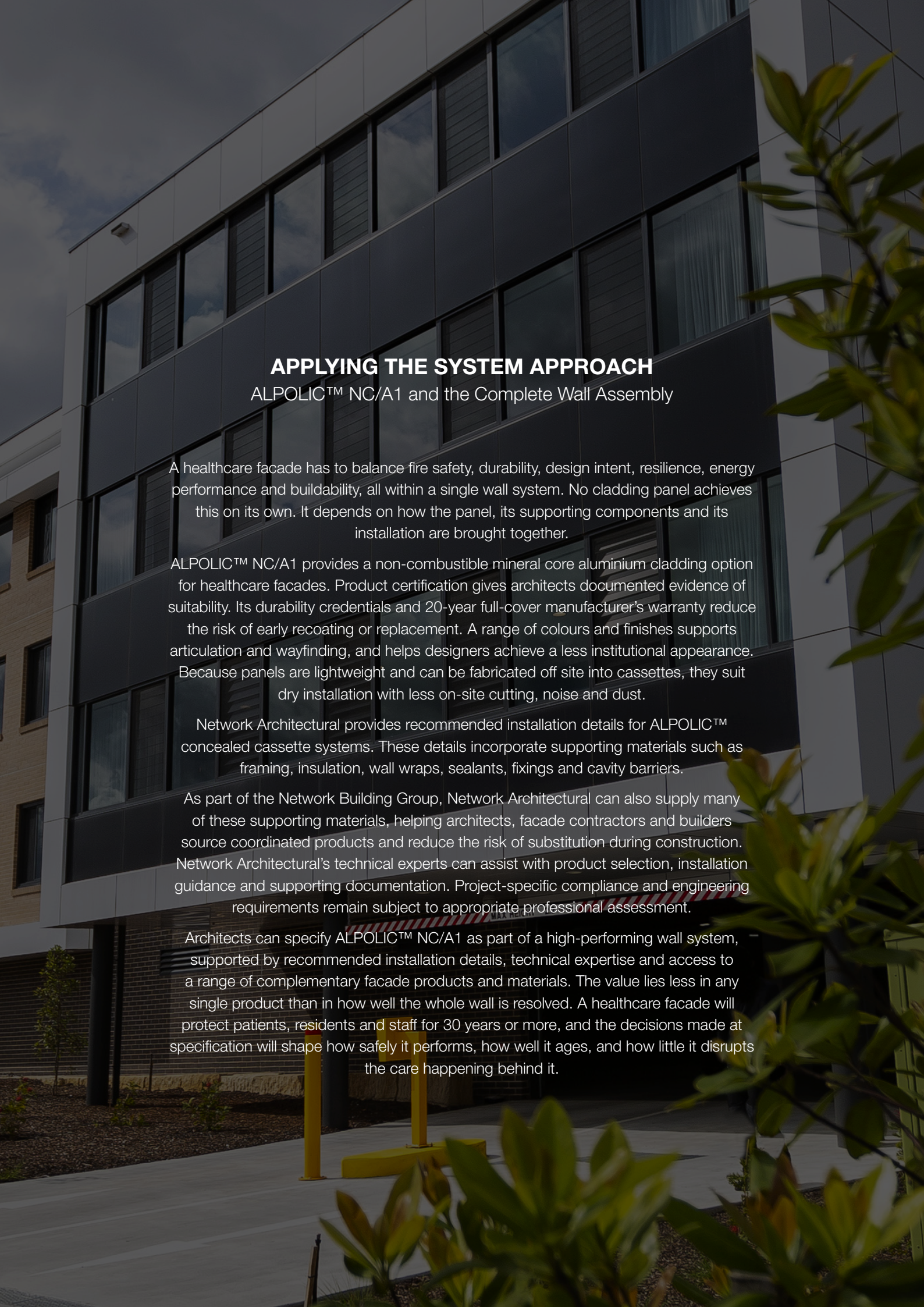
Operational continuity

Many healthcare projects are extensions, refurbishments or recladding works on facilities that must remain operational. Facade work may take place metres from patient rooms, operating theatres and emergency entrances, so the choice of facade system can affect how much disruption patients, residents and staff experience during construction.

The facade system can reduce these impacts in three ways:

- **Lightweight systems.** These reduce structural loads, which matters when recladding or extending existing buildings. They can also reduce crane size and lifting time.
- **Prefabrication.** Panels cut and formed off site reduce on-site cutting, noise and dust, and shorten installation time.
- **Dry installation.** Mechanically fixed systems avoid wet trades and curing times, allowing work to proceed in smaller, faster stages.





APPLYING THE SYSTEM APPROACH

ALPOLIC™ NC/A1 and the Complete Wall Assembly

A healthcare facade has to balance fire safety, durability, design intent, resilience, energy performance and buildability, all within a single wall system. No cladding panel achieves this on its own. It depends on how the panel, its supporting components and its installation are brought together.

ALPOLIC™ NC/A1 provides a non-combustible mineral core aluminium cladding option for healthcare facades. Product certification gives architects documented evidence of suitability. Its durability credentials and 20-year full-cover manufacturer's warranty reduce the risk of early recoating or replacement. A range of colours and finishes supports articulation and wayfinding, and helps designers achieve a less institutional appearance. Because panels are lightweight and can be fabricated off site into cassettes, they suit dry installation with less on-site cutting, noise and dust.

Network Architectural provides recommended installation details for ALPOLIC™ concealed cassette systems. These details incorporate supporting materials such as framing, insulation, wall wraps, sealants, fixings and cavity barriers.

As part of the Network Building Group, Network Architectural can also supply many of these supporting materials, helping architects, facade contractors and builders source coordinated products and reduce the risk of substitution during construction. Network Architectural's technical experts can assist with product selection, installation guidance and supporting documentation. Project-specific compliance and engineering requirements remain subject to appropriate professional assessment.

Architects can specify ALPOLIC™ NC/A1 as part of a high-performing wall system, supported by recommended installation details, technical expertise and access to a range of complementary facade products and materials. The value lies less in any single product than in how well the whole wall is resolved. A healthcare facade will protect patients, residents and staff for 30 years or more, and the decisions made at specification will shape how safely it performs, how well it ages, and how little it disrupts the care happening behind it.

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References

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- ⁴ Roger S. Ulrich et al. "A Review of the Research Literature on Evidence-Based Healthcare Design." HERD: Health Environments Research & Design Journal, Vol. 1, No. 3 (2008): 61–125.
- ⁵ Arunima Malik et al. "The Carbon Footprint of Australian Health Care." Lancet Planetary Health, Vol. 2, No. 1 (2018): e27–e35.

All information provided correct as of October 2026.