

# Concrete Sandwich Panels: A Smart Building Alternative

Energy Efficient – Durable – Affordable – Safe & Healthy – Design Friendly

## WHAT ARE CONCRETE SANDWICH PANELS?



Sandwich panels are made up of concrete interior and exterior walls with styrofoam insulation in the middle. They are an efficient, all-in-one construction method where walls are built by pouring concrete onto large (wall-size) steel forms reinforced with structural rebar, allowing it to set, laying down insulation, and pouring another layer of reinforced concrete. After the concrete has hardened, a crane is used to lift the sandwich panel into place. One layer of concrete forms the inside structural wall and the other layer of concrete is the outside wall and siding. Together the concrete walls provide a durable external and a strong internal structure for the home without the need for framing with wood.

## SANDWICH PANEL BENEFITS

Concrete sandwich panel homes offer a range of benefits for homeowners and the environment. These homes are energy efficient, resilient and affordable. They provide safe and healthy environments. Plus, concrete's versatility enables a wide range of design flexibility in both architecture and finishing. All these features mean these homes will stand the test of time for the good of their inhabitants and the planet.

Read on to discover the full range of advantages of concrete sandwich panel homes.



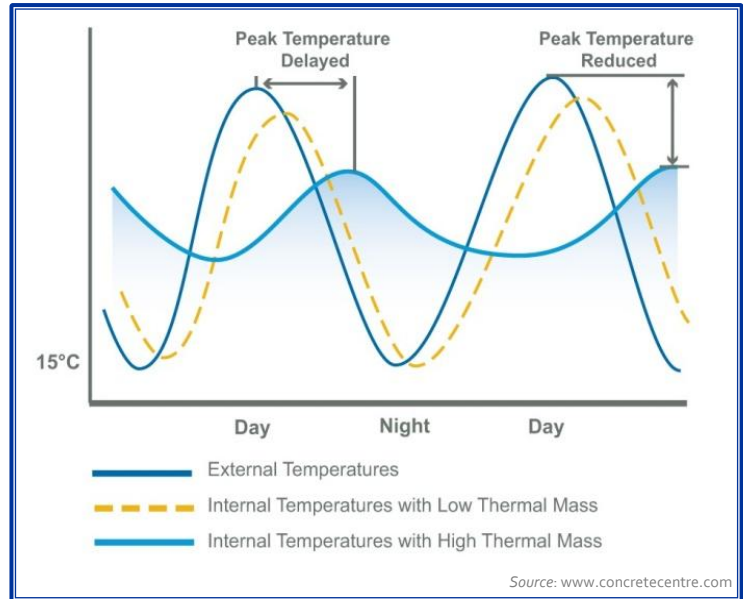
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## ENERGY EFFICIENT

Building with concrete can reduce total heating and cooling energy requirements by up to 25% compared with a wood-frame home by using concrete's natural heat storing abilities and solid construction method.

### Temperature moderation

Concrete has a higher thermal mass (ability to store heat) than conventional building materials. When homes are designed to use the sun to as a heat source, concrete walls and floors absorb heat during the day, releasing the heat when the outside air cools at night. Concrete's temperature moderating effect creates a pleasant, stable environment as people often experience mood changes when temperatures fluctuate.



### Airtight Material

Solid materials and an all-in-one construction method prevent heat loss in concrete sandwich panel homes. Heat simply has fewer escape routes. Concrete is a dense, airtight material and the home has a blanket wrap of insulation without studs that are pathways of heat loss ([thermal bridging](#)) in most wood-frame homes. Architectural designs may also limit pathways for heat to escape. Moisture is controlled through cross-flow ventilation used in the design of the home and/or mechanical ventilation systems.

## DURABLE



### Structural Strength

As a strong structural material, concrete provides solid high quality construction that can bear heavy loads and withstand earthquakes. Pre-stressed concrete floors can provide high load carrying capacity reducing the need for internal support columns.

### Long life and damage resistance

Concrete structures will outlast most other building materials. Even in the most adverse weather conditions concrete offers the most reliable performance. Concrete is the least likely construction material to result in leaky buildings. It will not rust, rot, corrode or warp like other materials. Walls and floors are impenetrable to insects and vermin. Concrete's sheer durability over decades of use goes a long way towards waste reduction.



## AFFORDABLE



### Rapid construction times

Concrete sandwich panel construction is a simple and efficient building method, requiring approximately 30% less time and labour to lock-up than timber frame construction (this includes exterior siding, insulation and interior wall finished to the taped stage of the external walls). A build can go from floor slab to roof height in as little as 2 days. A single panel can be four to six stories high, significantly reducing the time to put up multi-story structures.

### Fewer materials and labour hours

Because the sandwich panels have inside & outside walls, insulation and finishing already built-in, there is no need for drywall, vapour barrier, plywood sheathing, building paper, rainscreen and the labour associated with trying to seal up a typical wood-frame home. All this means fewer materials and lower labour hours which translate into cost savings.

### Operating costs

Concrete sandwich panel structures cost less to run and maintain over their lifetime through reduced energy costs, low maintenance requirements, and resilience to damage and deterioration.

### Favourable return on investment

With current market prices, concrete sandwich panel homes cost approximately 10% more to build than a wood frame home. With lower operating costs, however, a homeowner will see that added investment returned many times over during the long life of the home.



## SAFE & HEALTHY

### Earthquake resistant

The ductility of reinforced concrete and panels absorbs the vibrational energy of earthquakes reducing shaking and structural damage

### Fire resistant

Concrete walls are fire and heat resistant, effectively inhibit the spread of smoke and flame, while also retaining their structural integrity.

### Wind resistant

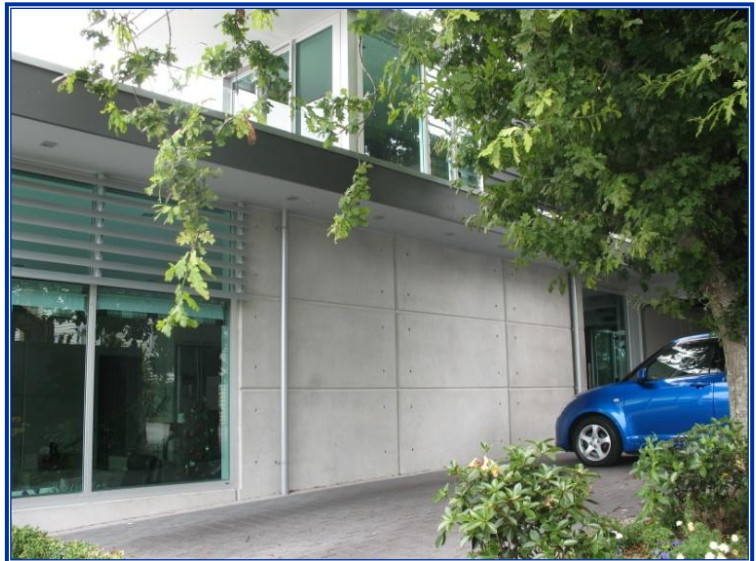
Weather is becoming increasingly extreme. You can feel safe in your concrete home. They can withstand winds of up to 280 km/hr.

### Mould resistant

Unlike typical -frame and drywall construction, concrete is much less likely to leak and is naturally mould resistant which is an important feature on BC's west coast. Mould can result in respiratory illness in a building's occupants.

### Acoustics

Concrete homes provide the necessary sound reducing qualities to provide the kind of quiet comfort we all look for in a home. Noise from outside can be lessened by up to two-thirds compared with a wood-frame home.



### Air quality

Concrete has a low emission rate for volatile organic compounds (VOCs), emitting at a rate four times slower than gypsum drywall. This means clean, fresh, chemical free air for the building's occupants.

## DESIGN FRIENDLY

Concrete frees the designer from many of the constraints found when using conventional materials. Buildings can vary in shape and size. Pre-stressed floors remove the need for internal support columns allowing the designer to create wide open spaces. Designers have a great deal of flexibility in finished looks as concrete can be finished in many ways from

exposed aggregate to polished concrete to coloured concrete. Formliners may be used to provide textured effects or impressions. Concrete is a superior base for paint and textured coatings. Concrete house design is only limited by project budget and the designer's imagination.