Performance specifications

The PanLbilt Steel & Foam Cement Panel is tested against fire, wind, seismic, and acoustic standards, and engineered for a 70-year service life.

Structural & environmental performance

Figures below reflect PanLbilt's published product specifications.

ASSEMBLY

Rapid

Factory-fabricated, rapidly assembled on site

WEATHER

Withstands heavy rain

BIOLOGICAL RESISTANCE

Mold & mildew proof

SERVICE LIFE

70 years

Energy performance is driven by conduction, convection, radiation, and thermal mass.

A1

Fireproof, Class A1 level

8.219 kN/m²

Snow pressure rating

FIRE RATING
SEISMIC RESISTANCE

Richter 9

Earthquake resistance, up to magnitude 9

SNOW RESISTANCE
SOUND INSULATION

40 dB

WIND LOAD

140 mph

Rated wind speed

WALL SHOCK RESISTANCE

500 kg

Concentrated force

IN-WALL UTILITIES

Built-in

Electrical wire & water conduits run inside the wall

STRUCTURAL FRAMING

No added steel

Supports up to 3 stories without supplemental steel

Thermal performance

01 **Thermal conductivity — 0.1035 W/m·K**

A 90mm PanLbilt wall has the same thermal conductivity as a 350mm brick wall.

02 **Thermal resistance — 0.869 m²·K/W**

Measured resistance to heat flow through the panel assembly.

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03 **Outperforms framed buildings**

Reduced conduction and convection, combined with high thermal mass, outperform conventional stick-framed construction.

FIG. 01 — MALE/FEMALE INTERLOCKING PANELS

Why the panel outperforms

SPEED **Rapid assembly — under 5 days to erect the structure**

Including rapid rebuilds of a permanent house after a natural disaster.

STEEL **ASTM A36 galvanized steel frame**

Minimum yield strength of 36 ksi (250 MPa), tensile strength 58-80 ksi (400-550 MPa). Track and support beams are galvanized to roughly 70 µm.

WEIGHT **230 kg/m³ core density — about 80% lighter than block**

The foam cement core is far lighter than a cement hollow brick wall (1,500 kg/m³) or a solid cement wall (2,400 kg/m³).

FIRE **Fire resistance exceeds 3 hours**

Class A1 fire performance from the cement-and-galvanized-steel panel body.

SOUND **Sound absorption coefficient 0.8–1.4**

A porous foam cement structure reaches first- or second-level sound-absorption standards.

EMF **Electromagnetic shielding**

Foam concrete absorbs and eliminates electromagnetic waves.

SEISMIC **Integrated seismic installation**

Steel plates are tightly connected into one integrated structure so the building resists collapse in a major earthquake.

QC

3-station factory quality control

Every panel is pre-assembled and inspected at 3 discrete QC stations before shipment, with each component uniquely numbered to streamline on-site assembly.

Panel construction details

How the frame, board, and connections come together.

FRAME **Q235 hot-dip galvanized steel frame, 18-gauge**

Each panel's steel frame is built from 1 male member, 1 female member, 2 arch members, 2 angle members, and 6 square tubes.

BRACING **Internal square-tube bracing**

24-gauge, 19/32" square tubes brace the panel body; 20-gauge, 1" angle steel members reinforce walls taller than 8 feet.

BOARD **3/8" fiber cement board sheathing**

Boards are fastened to the steel frame with #6 x 1" self-tapping screws, spaced 24" o.c. along vertical edges and 6" o.c. along horizontal edges, 1/2" in from the panel edge.

CONNECTION **Interlocking panel-to-panel joint**

A 14-gauge square tube seats into the groove of the top and bottom arch members joining two panels, secured with #12 self-tapping screws spaced 3" or 6" o.c., staggered front to back.

SIZE **Standard panel dimensions**

3-3/4" or 5-3/4" thick, 2' long, 23-5/8" net face width, in heights from 122" up to 141-3/4".

Seismic & hurricane resilience

Modeling behind the headline

seismic and wind load ratings.

SEISMIC

Seismic Resilience and Response Spectrum Modeling

Seismic performance is a critical design criterion for any modern infrastructure. The PanLbilt system's resilience to seismic events is analyzed through response spectrum analysis, which evaluates how the building responds to different frequencies of ground motion. The inherent stiffness of the precast concrete panels provides a high fundamental frequency, which often keeps the structure out of the resonance range of many common earthquake signatures. Moreover, the modular nature of the system allows for controlled energy dissipation at the connections. By engineering the ductility of the panel-to-panel fasteners and utilizing energy-absorbing joint materials, the PanLbilt system can absorb and dissipate seismic energy, significantly reducing the risk of brittle fracture. Comparative studies indicate that PanLbilt structures maintain their structural integrity in seismic zones where traditional masonry would suffer catastrophic failure. The system's performance is further enhanced by its lightweight relative to traditional concrete, which reduces the inertial forces generated during ground motion. This section explores the seismic design strategy of PanLbilt, demonstrating how it provides a high level of safety for residents in earthquake-prone regions.

HURRICANE

Hurricane Proof Model: Wind Load and Debris Impact Resistance

For regions prone to extreme weather, the hurricane proof model of PanLbilt provides unparalleled safety. Wind load resistance is a function of both the building's aerodynamic profile and its sheer structural mass. The density of the PanLbilt matrix ensures that the structure remains anchored even under extreme uplift forces. Furthermore, the monolithic behavior of the joined panels creates a pressurized envelope that is highly resistant to debris impact—a major cause of structural failure during hurricanes. Finite element analysis reveals that the stress distribution under 250 km/h wind loads remains well within the elastic limit of the material, preventing permanent deformation. This ensures that the building remains habitable and structurally sound after the storm passes, a key factor in long-term resilience for coastal prefab construction solutions. The integrity of the windows and doors—integrated during the prefabrication process—is also tested to ensure they match the wind-load rating of the wall panels. This holistic approach to hurricane protection provides peace of mind for homeowners in vulnerable areas.

Code compliance & certifications

Evaluated against U.S. building codes and third-party test standards.

CODES

Recognized under IBC, IRC & IECC (2015, 2018, 2021)

Also evaluated against the Florida Building Code — Building and Residential editions (2020, 2023).

STANDARDS

Tested to ACI 318 & ASCE/SEI 7 criteria

Panel strength and structural performance evaluated per ASTM E72 (strength), ASTM E330 (transverse wind load), and ASTM E2126 (cyclic/seismic shear resistance).

TESTING

Independent, accredited testing

Testing and inspection performed by ISO/IEC 17025-accredited laboratories and ISO/IEC 17020-accredited inspection bodies, with review by a licensed Registered Design Professional.

APPROVED

Approved by the City of Los Angeles

Listed under the Center for Building Innovation Certificate of Approval, License TA24945, and recognized under the federal Manufactured Home Construction and Safety Standards (24 CFR Part 3280/3282).

Ready to size a project?

Send your CAD drawings and full elevations for a quote to allano@PanLbilt.com.

REQUEST A QUOTE