



# REALITIES OF PRECAST CONCRETE PANELS

PRECAST CONCRETE PANELS AREN'T WHAT THEY USED TO BE. The dull, gray concrete of old has been replaced by panels in an array of colors and finishes, offering attractive options to contractors and architects.

But not all precast concrete panels are the same. Different panel structures have distinct advantages and disadvantages, which is a factor that buyers should consider when selecting precast concrete. To make the right choice, it's crucial to understand the benefits of precast and the fundamental differences between the two types of panel designs—"composite" versus "sandwich" panels.

## What is Precast?

Precast concrete is cast and cured in a manufacturing plant, then shipped to a construction site and installed quickly, often in just a number of hours. That makes precast a time-saving alternative to standard concrete, which is poured on-site and must cure for about 30 days to gain its full strength and stability.

But even after weeks of curing, poured concrete can't compare to precast when it comes to structural integrity. Precast-concrete foundation panels have a design strength of up to 5,000 pounds per square inch, compared to 3,500 for poured concrete walls.

Precast wall panels offer many other advantages. Because they are produced in a controlled environment, precast panels are more uniform and durable than concrete that is poured and cured out in the elements. Factors that affect construction quality on a job site – such as temperature and craftsmanship – are eliminated on the plant floor by skilled technicians operating under consistently optimal conditions.

The result: Precast concrete is less likely to deteriorate under the stresses of weather and time. The panels are also adaptable when it comes to customer tastes, with finishes ranging from ribbed walls to exposed aggregate to mock brick.

## Below the Surface: Precast Panel Design

After understanding the benefits of precast over poured concrete walls, it is important to understand and evaluate the two design concepts associated with precast concrete panels.

"Composite" and "sandwich" panels share many advantages of the prefabrication process, but they are fundamentally and structurally different.

A composite panel features two faces of prestressed concrete. Between the two faces is a layer composed of steel, insulation and concrete reinforcements that tie the two faces together. The components are completely bonded together, acting—and reacting—as a single structure.

This can cause a problem when it comes to the weather. For example, hot summer temperatures can cause the outside of a building to expand, while the air-conditioned interior remains cool. Because the two faces are completely bonded together, the wall may bow outward. In effect, the panel is like a wire that is bent back and forth continuously. After a while, the bent spot weakens until it finally snaps. In the same way, thermal bowing can compromise the structural integrity of a building.

A sandwich panel, on the other hand, features an exterior layer that accommodates temperature extremes. This more flexible face, featured in the design of the VersaCore panel from Fabcon, is not structurally tied to the rest of the panel, so it can safely expand and contract. The stress may result in small fissures on the exterior face, but these will likely close up as the panel sits in place for about a year, so there's no need for fixes like caulking. Sometimes, the fissures appear wider after a rainfall. After the water dries, though, the fissures may disappear. If a crack does appear in your precast concrete panel, the best solution is to call your supplier, who can advise you on the best way to ensure the crack cures correctly.

The best news—these are only aesthetic and don't harm the structural integrity of the panel or the building.

The sandwich design is one more reason that the use of precast concrete panels has grown exponentially, becoming widely used for office buildings, retail stores and entertainment facilities. Builders and architects have learned that precast sandwich panels offer flexibility, energy efficiency and structural integrity in an aesthetically pleasing product.