



## Benefits of using precast - cost savings

The smart and effective use of materials is becoming increasingly important in the design of all buildings, from the smallest residence to the tallest high-rise commercial building. When the smart use of precast concrete is considered then the focus on the initial cost of precast concrete is central to many discussions. Often, with the briefest amount of design input a decision will be made to use precast based on a square metre rate, a tonnage rate or someone's recollection from a past project. Often, with this haphazard approach, this will lead to the remark that 'precast is too expensive for my project'

Precast comes in many forms from architectural precast walling made from purpose built moulds through to precast flooring manufactured in highly mechanised factories. There are many aspects that a precast manufacturer must assess in determining the selling price for any precast element. All precast concrete elements must be handled by cranes, by either a small mobile crane or the use of a tower crane on site. Therefore, the size of the element is probably the most critical consideration

in determining the initial cost of precast. The danger of using rates without understanding the number of elements in any project will almost always lead to errors in a building cost plan, confusion or unnecessary angst in the tender process.

There are five good simple rules to follow to ensure the best possible initial price for precast concrete is achieved.

- Make the precast elements as big as possible with transport and site crane limitations usually the controlling influences.
- Use standard moulds/forms or processes wherever possible.
- Have sufficient lead time to manufacture the precast in the most efficient way.

- Produce good consultant's drawings that encourage a quick and once only shop drawing process.
- Use element connections that are easily assembled on site.

But this is only a third of the story to establish the true cost of precast. The initial cost is what most people think about but the true cost is actually much less.

Here is how precast can minimise the cost of construction and the cost of a building throughout its life... cost savings which reduce the initial cost of the precast.

### **Cost savings in Construction**

Precast construction can deliver significant savings in the construction of any building. A recently constructed 4 storey total precast building of 60 apartments saved 4 months over the insitu concrete/blockwork option first considered for this building.

**Faster construction:** Precast elements can be delivered just in time for fast erection, reducing unnecessary handling and equipment use. With minimal propping and bracing, and with precast flooring providing an immediate working platform, precast concrete allows other trades to begin work more quickly, speeding the construction time and saving costs. Fast construction on site also means fewer disturbances for surrounding properties.

**Uses less concrete, cement and steel:** Being factory manufactured (with more advanced mix designs and better vibration), precast concrete requires less concrete, cement and reinforcing steel.

Less concrete is also used in precast flooring systems such as hollowcore, bubbledeck and Ultrafloor than insitu alternatives. Long spanning precast flooring means reduced material use for any supporting structure.

**OHS benefits:** Safety can be improved on site with less trades, equipment, workers and materials... reducing site congestion. Construction sites are also cleaner and tidier. Precast floors provide a safe immediate working platform for the construction team.

**Minimises waste:** Exact precast elements are delivered to site, generating less air pollution, noise and debris on site than other building options. Recycled aggregate, recycled steel, grey water, stormwater runoff and waste materials which would otherwise be used in landfill (such as slag and fly ash) are very often incorporated into the precast mix design. Any waste produced in the precast manufacturing process is easily captured and most is recycled.

**Locally supplied:** Precast elements are usually locally manufactured and supplied to sites meaning reduced haulage and fuel costs. Materials used by precast manufacturers are also usually supplied locally. This further reduces haulage and fuel costs. Local highly skilled erection crews erect precast concrete elements safely on site.

### **Cost savings of the building**

Every day we hear, read or see how building designers are thinking more about sustainability - the capacity to

endure - as the primary design input when a building is first considered. Precast concrete's inherent properties make it a natural choice for achieving sustainability with today's modern buildings.

**Energy efficient buildings:** The high thermal mass of precast concrete enables it to absorb, store and later radiate heat. Using precast concrete in passive solar designs allows natural heating in winter and cooling in summer, thereby reducing the need to rely on artificial heating and cooling. Systems such as insulated sandwich panels provide an exceptional solution for energy efficient buildings.

**Improved internal building amenity:** Use of precast concrete can even out internal diurnal building temperatures and some precast systems (such as TermoDeck®) can improve indoor air quality, providing fresh air inside the home.

**Good acoustic performance:** The high thermal mass of precast concrete assists with sound insulation to reduce noise and absorb noise impact.

**Fire resistant buildings:** Precast concrete is non-combustible, does not melt and therefore does not require additional fire-proofing applications. Precast concrete does not emit toxic fumes under fire and can limit smoke spreading in buildings.

**Environmentally considerate buildings:** Precast concrete is an inert substance which does not emit or give off gases or compounds. This is a huge relief to allergy sufferers. Precast does not attract mould or mildew. Precast concrete

absorbs CO<sub>2</sub>. Being termite proof means the unlikelihood of requiring chemical spray to reduce termites and vermin which is safer for the environment.

**Recyclable precast buildings:** Precast concrete elements from redundant buildings are easily recovered for reuse, or crushed and used as aggregate for road bases or construction fill, providing economic and environmental savings. Alternatively, whole precast building structures can remain and simply be refitted.

**Durable, low maintenance buildings:** Precast structures are durable with a long life expectancy of up to 100 years. Precast is tough and can withstand wear and tear, is easy to keep clean and requires minimal repairs or maintenance.

Precast concrete can be moulded into almost any form and finish. Precast concrete gains strength as it ages, won't shrink, distort or move and will not deteriorate with exposure to climatic change. Being flood resistant, precast concrete does not erode or rot therefore is suitable for river and coastal barriers to protect against high tides and storms. Precast concrete is impact resistant and hard to cut, offering security and protection against terrorist acts.

When considering the true cost of precast it is wise to consider not only the initial tender cost, but also to factor in the construction and building cost-savings. Ignoring this total evaluation

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will often lead to poor decision making, the overuse of materials and the strong possibility that an inferior building has been constructed.