

HOME IN THE TREES



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Building a new family home can provide financial and emotional security for households and typically represents their largest lifetime investment. Not surprisingly, builders are seeking strong and durable construction solutions that can also reduce costs over the life of the home.

BACKGROUND

On Sydney's leafy North Shore a young family planned for a new home to replace their tired timber dwelling, and looked beyond the normal focus of selecting just fittings and colours. The priority for this home was for a solid structure that would last generations and outperform other new builds in maintenance and energy efficiency. Add to this a site with exaggerated slopes traversing both the side and rear, leaving the design team and builder with a great challenge.

DESIGN

The large family home spreads across three levels, to accommodate the front-to-back slope, with the various living areas connected by a central staircase. From the wide expansive balconies on the upper two floors you move from sharing the heights with the local bird species, down to a level lawn area that is supported by concrete retaining walls.

Concrete walling systems in the garage and all exterior walls, plus the interior walls in the lower two levels, support the solid concrete floors on levels one and two.





“I do wish that, in the future, more homes are constructed this way as I sincerely believe that it can be an economical and environmentally friendly means especially as the building ages”
Home owner, Greg Curtis

CONSTRUCTION

After researching all construction options, the decision was made to use concrete in most of the walling and floor elements of the home. Insulating concrete forms (ICFs) were selected to provide the thermal mass and insulating properties required in the design brief. The only structural timber used is in the interior stud walls on the top floor and for the roof frame. This significantly reduces the risk of termite infestation and minimises future maintenance and repairs.

The retaining walls throughout the property are a PVC permanent formwork system that is concrete filled similar to ICFs and provide a sealed surface that can be finished with paint, render or panelling. The garage walls also use this system and provide greater interior space due to the thinner wall profile. Even bad weather didn't delay construction, with the assembly and pouring of walls continuing through two days of rain. These are the type of efficiencies that builders are seeking and in this case enabled the builder to deliver the new home within nine months.

ENERGY EFFICIENT AND DURABLE

The thermal mass properties of concrete, combined with the insulating properties of the ICFs and solid concrete floors, means that the energy costs to heat and cool the home will be significantly less than conventional brick veneer homes. The reinforced concrete walls provide exceptional strength and provide a durable solution for a home that will last a century, not decades.



BIULDING WITH ICF'S

Insulating Concrete Forms (ICFs) consist of fire-retardant polystyrene foam blocks or wall panels that are stacked, steel reinforced and filled with concrete, which completes wall construction in one easy step. During the last three decades, tens of thousands of ICF homes have been built in Europe and North America, testament to the high performance walls with substantial thermal mass and structural support.

Research shows that houses built with ICF exterior walls typically require 44% less energy to heat and 32% less energy to cool than comparable timber frame houses¹. The materials that make up ICF construction will normally suffer little or no degradation over the life of a building and ICF's estimated durability is excellent.

The iconic image of a single house left standing after Hurricane Katrina was of an ICF home.



Project: New family residence

Location: Sydney, NSW

Design: Berri John Building Design

Builder: Optima Constructions

Engineer: Waddington Consulting

Photography: CCAA

Concrete systems

Walls:

Insulating Concrete Forms – Zego Building Systems

PVC Permanent Formwork - Dincell Construction System

Floors:

Waffle pad slab-on-ground and suspended concrete slabs