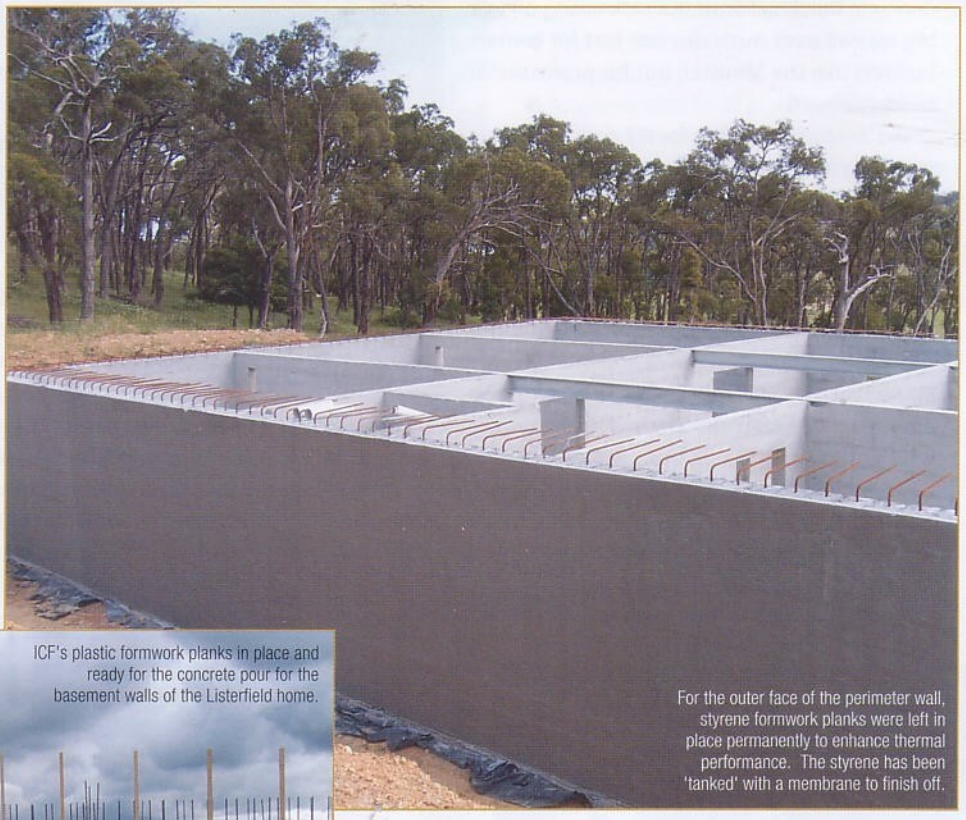
An ideal 'Combo' for building walls **with better thermal performance**

Combining styrene formwork and lightweight concrete are 'green' solutions for home construction. The introduction of stricter 'green' building codes around Australia is driving interest in an innovative styrene formwork system that can improve the thermal performance of concrete walls in residential housing.

Supplied by Melbourne-based ICF Contracting, the 50mm thick lightweight styrene planks are used as formwork when pouring concrete walls. But rather than being stripped out once the concrete is cured, the styrene formwork can be left in place permanently on both sides of the wall, providing an additional 100mm of thermal insulation. On the external face of the wall the planks can be rendered over, while on the internal face plasterboard can be attached directly to the styrene, eliminating the need for timber stud walls.



For the outer face of the perimeter wall, styrene formwork planks were left in place permanently to enhance thermal performance. The styrene has been 'tanked' with a membrane to finish off.

ICF's plastic formwork planks in place and ready for the concrete pour for the basement walls of the Listerfield home.

ICF Contracting Managing Director, Ari Schupak, says the raft of new 'green' building codes has prompted a surge of interest in the product.

"I've been getting calls from all around Australia." "The interest is being driven by changes like the Building Sustainability Index (BASIX) in NSW, and Victoria's 5 Star house energy rating system." "Governments are demanding more sustainable building solutions, and architects, builders and homeowners are looking for systems that deliver," he said.

Although styrene formwork has been used in the US for some time, it is still relatively new in Australia. ICF Contracting is best known for a lightweight plastic formwork system that has been used successfully on commercial projects, such as the lift core of a 23-level office project in the heart of Melbourne. The easy to handle, reusable plastic planks were ideal in the confined spaces of the William Street building.

ICF is currently supplying both its plastic and styrene formwork systems for the construction of a new home at Listerfield, an outer Melbourne suburb. For the concrete-walled basement level, the plastic planks were used as formwork for all the internal walls and the styrene planks as external formwork for the perimeter wall. Once the walls were cured, the plastic planks were stripped away to expose the raw concrete finish, while the styrene formwork was left in place to enhance the thermal performance of the outer wall.

ICF's latest product is lightweight concrete that perfectly complements the styrene and plastic formwork systems. A specially developed chemical foam is added to the concrete mix to create the free-flowing, lightweight aerated concrete.

"The big advantage is that it can be produced on site using a portable foaming generator." "The concrete is suitable for both non-load and load bearing walls, with bulk densities of between 300 kg/m3 to 1800 kg/m3 and with compressive strengths ranging from One MPa for the lowest, to 25MPa for the highest." "It has excellent thermal and sound-proofing qualities and is non-combustible."

"And from an environmental sustainability viewpoint, because lightweight concrete uses less cement and sand it means we can make these very limited raw resources go much further," Schupak said.

Contact: ICF Contracting Pty Ltd Ph 03 9846 4841

Take Advantage of **Unique Formwork System**

An innovative formwork system that utilises plastic and styrene planks is providing an effective and time-saving solution on a restrictive inner city building site in Melbourne. The in-situ concrete walls of the three-level commercial/residential development in Toorak are being formed up with formwork supplied by Melbourne-based ICF Contracting. The lightweight, strippable plastic planks are used as formwork for the exterior facade of the external wall, while the styrene planks are used on the internal face as permanent insulation. ICF Contracting has worked closely with concrete supplier Readymix to develop a specific concrete mix for optimum flow inside the formwork.

David Grant, of construction contractor Avanzi Constructions, said the ICF Contracting system is ideal for the tight Toorak site. Although tilt-up panels were used for the basement carpark walls, they were not an option for the three upper levels because there was no crane access to the bottom of the 45 metre long by 12 metre wide site. "The project was originally designed for concrete blockwork, but when we had a look at the ICF Contracting system we were impressed with its versatility and cleverness," Grant said. "It's a much simpler and faster alternative than the old way of forming up with plywood."

The use of the styrene planks as permanent formwork on the interior faces also delivered some significant time saving advantages in terms of finishing off, as well as design benefits.

"The insulation value of the styrene planks was a major factor in our decision to go with the system. But the potential time savings were also a big plus," said Grant. "If we'd gone with conventional blockwork we'd have had to frame up with a lightweight stud frame, then install the insulation.

"The ICF Contracting system acts as both structural support and insulation. You fix the plasterboard directly to the plastic ties in the styrene and that's it. "It also makes for a much cleaner site. You don't have mud and mess everywhere as you do when you're laying blocks."

ICF Contracting Managing Director, Ari Schupak, says the 50mm styrene planks used on the Toorak project have an insulation value of 1.5, which in combination with the 150 mm concrete wall delivers an overall rating of 1.78. He says the styrene planks can also be used as permanent formwork for external facades for even greater thermal and acoustic insulation benefits.

"In the case of external facades, you simply render over the styrene and paint," he said. Schupak said the major advantage of the lightweight plastic planks is their ease of handling. They can be stripped in and out quickly and can be reused up to 50 times.

"We manufacture the plastic planks here in Melbourne, and the design is so successful that we're now exporting them overseas," he says. The ICF system is also currently being used on another inner city commercial site at Albert Park, in Melbourne.

For more information contact ICF Contracting Ph. 03 9846 4841

Hot Concrete Construction shown at World of Concrete

The market is red-hot for concrete homes and likely to gain even more steam as energy prices continue to escalate with no end in sight. The most recent residential market data compiled by the US National Association of Home Builders show that 16.1% of all new single-family homes used a concrete wall system, with the percentage forecast to increase to 25% in the near future. In 1993, the market share for concrete homes was a humble 3%. One of the main reasons for this double-digit growth is the superior energy efficiency of concrete homes when compared with typical wood-frame construction. Building exterior walls using insulating concrete forms (ICFs) or other concrete wall systems can potentially save hundreds of dollars annually in heating and cooling expenses. Because concrete homes are so inherently energy efficient, owners can easily get by with smaller-capacity heating and cooling equipment. Insulating concrete forms (ICFs) have been gaining steam in the residential market during the last 10 years. Now, with the escalating cost of energy architects and builders are also exploring ICFs as an option for light commercial construction, capitalizing on the system's energy efficiency, durability and ease of construction. Commercial structures built with ICFs are poised to reap the environmental benefits of the building system on a grand scale, creating longer-lasting, more comfortable businesses that will provide healthy environments for employees. The government and the corporate community are seeking out alternative building products that provide lower life cycle costs and more durability – concrete is seen as the answer. This has resulted in ICF walls being built up to five storeys high for commercial buildings.