CHEAPER, GREENER, FASTER, STRONGER

CAN YOU BUILD A VILLA SUPERSTRUCTURE IN 24 HOURS? APPARENTLY IT'S NOT THAT DIFFICULT. THIS WEEK *CW* LOOKS AT SOME OF THE INNOVATIVE WALL CONSTRUCTION SYSTEMS BEING TOUTED AS CHEAPER, GREENER, STRONGER AND FASTER THAN CONVENTIONAL TECHNIQUES

By Benjamin Millington

A positive spin-off of any recession is that innovation is often brought to the fore, and this is already starting to show in the Gulf's construction industry.

Consultants are now searching for cheaper and more efficient methods of construction, which might otherwise have been overlooked in the boom times.

As such, some of the most innovative companies in wall construction say fresh contracts and inquires are growing at unprecedented rates despite the downturn.

GREEN PRECAST

After starting operations in the UAE six months ago, Australian company Green Precast has already secured a number of sizeable projects including a US $109 million (AED 400 million) contract to build villas in Abu Dhabi.

CEO Salvatore Saker says the firm has also received more than 50 invitations to work in Saudi Arabia, Qatar and Kuwait, a staggering figure considering the lack of new contracts being signed at the moment.

The secret to the company's success is its precast concrete building system, which uses computerized hydraulic moulds to produce 3D monolithic structures at the site of the project.

The system operates like an onsite production line and as such is ideally suited to large scale villa projects that require a fair amount of repetition.

Saker explains the production process: "First is the fabrication of the steel element. Steel cages are produced every six hours and then go inside a mould. You then fit all the MEP, which also goes inside the mould. Then you pour the concrete.

"After nine-twelve hours you can lift the module out of the mould. Installation takes between 2-2½ hours to put together a 500m² villa by dropping the modules into place.

"So basically in 24 hours you have a cycle that produces anything from one to ten villas depending on the number of moulds committed to the project."

Apart from speed, Saker also promises that the Green Precast method will be greener, stronger and cheaper than regular blockwork construction.

First of all, there is much less transportation of materials required and almost zero wastage on-site, which not only reduces costs but also the carbon footprint, he says.

GREEN PRECAST CEO SALVATORE SAKER

Secondly, Green Precast has developed its own thin wall technology which uses around 1/3 less steel and concrete while maintaining strength and insulation.

"Basically our internal 9cm thin wall is equal to a regular 30cm thick wall," says Saker.

"Our external walls are 20cm to achieve the thermal rating that the GCC requires. We have two insulations, sandwich panel insulation and an external UV paint coating which can give us a U-value between 0.28 – 0.38 W/m²°K.

"This is significantly better than a standard wall and helps to keep the running cost of the building cheaper by 50%."

In terms of strength, Saker says all walls are load bearing, fire-proof and earthquake-proof. The system also incorporates controlled joints, 2cm of mastic filler, between each module which acts as a shock absorber preventing up to 90% of on-going maintenance for cracks in the walls, he says.

Overall, Saker says the Green Precast system will save developers between 5%-50% on construction costs. The cost saving is mainly dependent on how quickly the developer wants to build, he says.

CASE STUDIES AT A GLANCE

GREEN PRECAST

Project brief: To build 4500 family homes near Riyadh in Saudi Arabia using their onsite precast system to produce and install both modular and flat panel elements. The client also requires that all external surfaces are sand blast finished for longevity. A total of 60 moulds will be operational onsite to produce 3D monolithic modules.

Project size: 4500 family villas

Timeframe: Three years a rate of six villas per day for 280 days a year

Construction cost: confidential

Workforce: 980 people (720 for fabrication)

Thermal rating of walls/U-value: external 200mm wall achieves a U-value of 0.495 W/m²°K which can be lowered to 0.38 W/m²°K with 20mm added insulation

Other advantages:

- Speed of construction up to 70% quicker than traditional methods
- Construction costs are around 50% less than traditional concrete frame and block work construction
- Material wastage is minimized down to 1-3%
- Longevity of the villas is significantly increased due to strength of the precast 3D module
- Integrating a UV-IR reflective paint solution will ensure saving of up to 50% on ongoing cooling costs