Designer residence sets new ICF standards

The Janacek Residence in Princeton Texas is an exemplar of how ICF lends itself to construction on a grand scale. This designer home took 15 months to build, of which, only 60 days were needed install NUDURA ICF.

The Janacek Residence is a 21st century landmark in the town of Princeton, Texas, and lies about 25 miles northeast of Dallas. With 1,450m^2 of indoor space on six levels and an octagonal tower rising more than 33m above the foundations, it is truly a flagship project. Its crowning glory, the observation tower, houses a 3.05m diameter, antique stained glass dome to beautiful effect.

In total, the scheme used more than 1,500m^2 of NUDURA ICF forms (152mm and 305mmcore); 186m^2 as interior walls and an additional 930m^2 of Insuldeck EPS floor decking including a 185m^2 patio.

The project; constructed by Cameron Ware of ICF installers, Double Eagle Builders and supplied by distributors FutureStone; was built using 765m^3 of concrete. The three key challenges unique to this bespoke project were; the sheer scale of the building, its geometry and the heavy loads amassed by the concrete floors.

Georgia architectural home designer, G. Frank Dollar teamed up with his Texas client to design and build this custom-built, energy efficient dwelling. The homeowner, a busy cardiologist, acted as main contractor and his requirements were well established in his own mind before appointing Dollar. The design of the mansion, an outcome of an ever increasingly

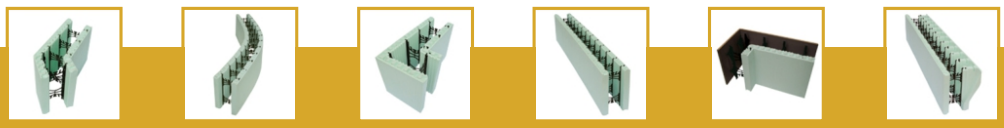
PROJECT STATISTICS

Location:
Princeton, Texas

Building:
1,450m^2 of indoor space on six levels and an octagonal tower rising more than 33m above the foundations.

ICF:
1,500m^2 of NUDURA ICF forms; 186m^2 as interior wall and an additional 930m^2 Insuldeck EPS floor decking

ICF Installer:
Cameron Ware, Double Eagle Builders





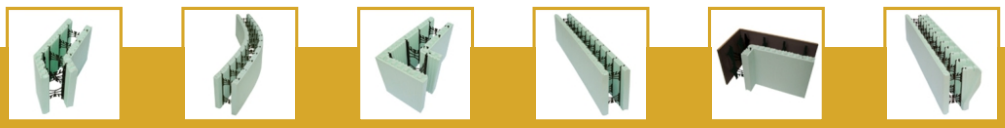

digital world, was developed in Georgia and client liaison comprised telephone and e-mail conversations while documents and drawings were couriered overnight. Mr. Janacek's vision was to build a luxury home, while retaining the need for durability, all-round efficiency and sustainability.

Janacek's Concrete Challenge

The home includes six floor elevations, all of which are constructed of concrete: sump room, storm shelter/safe room, first (ground) floor, second floor, attic floor and tower levels. Load calculations for the tremendous weight of the floors and interior ICF walls required a major feat of engineering, especially as the floor plan required that some of the second floor columns and ICF walls to be offset from those below.

Structural engineer, Jerry Coombs used transfer beams and cantilevers within the floor deck to collect the floor loads and carry them to the foundation. Beams varied in size from 915mm x 510mm to 610mm x 430mm and all were poured monolithically with the Insul-deck wall system.

The arched arcade, which surrounds most of the first floor, was cast in place using removable forms. It also supports approximately 185m^2 of the outdoor patio. Janacek himself designed an ingenious thermal break which isolates all external concrete decking from the interior concrete floors which was implemented by the ICF installers.



Each segment of the U-shaped home extends approximately 30m, long enough to cause concerns about floor deck shrinkage. Since an expansion or movement joint was undesirable, special consideration had to be given to floor cracking in the reentrant corners as well as ensuring that deck shrinkage did not cause excess irregularity to the walls.

Janacek sits on expansive clay. To compensate for poor site soil conditions, the foundation sits on 98 concrete piers each extending 7.6m into the soil. Radius floors and landings in the tower were poured monolithically with the walls. All arches in windows and doors were built out of ICF and poured.

The observation deck is the highest point of the building, created with ICF fully around its perimeter, and is supported at the attic level. Since a proportion of the walls were supported on the perimeter wall of the house, and the other on the Insuldeck, the engineer also had to resolve concerns about differential deflection.

The interior is well appointed, a central feature being the broad spiral staircase which enables access to all floors.

The finished home offers outstanding energy efficiency. To date, the Janacek Residence has recorded energy bills which average about $250 a month. Instead of a typical well system, a lake on the property facilitates a geothermal heating/cooling system. Some 930m^2 of living space is conditioned for approximately $90 per month which represents a miniscule sum for a home of this size in the Texan heat.

The Janacek Residence has many other unique features. In addition to ICF construction and the illuminated stained glass dome, residential home automation and an all-LED interior lighting system have been installed. The project won Annual Insulated Concrete Form (ICF) Builder Awards in the Unlimited Residential category (over 550m^2) on the basis of the project's design complexity, striking architecture, and the construction challenges overcome. Janacek has set a new standard for the entire ICF industry and during construction was visited regularly by engineers, architects, and homeowners interested in ICF. The builder discussed the project in detail in an on-line ICF forum which received more than 50,000 views.

For further information contact Jean Marc Bouvier, Director of Sales and Business Development – International on 07766 118711 or visit www.Nuduraicfs.co.uk