

Concrete makes this new house unique

Photographs and article by Walter Horylev

Once the siding and roof shingles are installed, the house fronting Hickory Hollow, directly north of Spencerport High School on Lyell Avenue, will look like a typical high-roofed ranch house.

In reality, this home utilized some very high-tech methods of construction unique to this area which makes it extremely quiet inside, very energy-efficient, able to withstand 200 mph winds and very stable in tornado and earthquake situations.

Instead of the usual 2x4 or 2x6 fir-studded and fiberglass-insulated walls along the wooden trusses to support the roof, this house features polystyrene foam panels and concrete along with special laminated wood spacers and ridge beam.

It's all part of the technology used by Spencerport-based MDR Construction Inc., says company president Marc Robinson. "We use ICFs, Insulated Concrete Forms, an expanded polystyrene material with plastic spacers and attachment bars as a basic building block. These 48-inch long by 16-inch high forms are stacked on top of each other to create the outline of the outside walls. Rebars, metal reinforcement rods, are laid both horizontally and vertically inside these forms. Then, a special cement, called high slump cement, is poured into the top of the stacked forms; the cement flows easily because it has chemicals added to it for that purpose."

It took about an hour to pour the walls, using 22 yards of high slump

concrete. The forms have plastic strips imbedded in them at regular intervals under about a half-inch of plastic. This permits attaching siding to the outside of the forms and sheetrock to the inside. Electrical and plumbing lines are placed in channels that have been routed out of the inside walls and spot glued in place before applying the sheetrock.



Marc Robinson, president of MDR Construction, Inc., holds an ICF, an Insulated Concrete Form, which is an expanded polystyrene material that is stacked up and becomes the wall in a concrete house after concrete is poured down the interior of the form. This makes a wall that is almost eleven inches thick.



A stack of SIP's (Structural Insulated Panels) sits on a pallet. These panels will form the roof and provide an R value of about 40, eliminating the need for additional attic insulation. For this home 22 panels will be used, 11 on each side of the ridge beam. In this type of construction no trusses are used.



Two sections of an Insulated Concrete Form were broken out to reveal the plastic pieces imbedded behind about 1/2 inch of polystyrene. These two inch plastic panels are used as anchor points which allow attaching siding to the outside wall of the form and sheetrock to the inside wall of the form. Electrical and plumbing lines are routed out of the inside wall before the sheetrock is attached.



The feed system utilizes a concrete pump truck and a boom with articulated control arms from which metal tubes are suspended, ending in a ten-foot rubber tube which delivers the concrete slurry to the forms. The slurry is held in a tank on the back of the truck which is fed from concrete delivery trucks.



Brent Bricklin, president of O'Bricklin Mason Contractors, feeds the slurry into the top of the forms. It took about one hour to finish the walls, using 22 yards of high slump concrete.

It's concrete!

“Normally this method of construction is used for commercial buildings,” Robinson said. “About seven percent of commercial buildings in the United States are built this way. It costs about 15 percent more to use this technique; the payback is the R-value (a measure of the insulating quality) of the walls. In a typical home with six-inch wood-studded walls and fiberglass insulation, the walls have an R-value of around 25. These walls have an R value of 60!”

Robinson estimated that the cost of heating and cooling this 1,200 square foot house would be about \$50 per month. The house qualifies the owner for a \$1,500 rebate through the Energy Star program.

The U-value, a measure of air passage through the walls, is extremely low with concrete walls, so low that the home requires an HRV, a Heat Recovery Ventilation unit, connected to the furnace to bleed air into and out of the house to circulate fresh air. The unit includes UV treatment to purify inside air. The walls are essentially sound-proof.

One unique feature of the construction of this house is a cathedral ceiling running the full length of the house. The only ‘normal’ ceilings will be above the bathrooms, closets and stairwell to the basement.

The roof consists of 22 pre-formed plastic foam panels (11 on each side) sandwiched between 5/8 inch plywood facing. The foam is 7.25 inches thick. There is a cutback in the foam at the edges to allow the use of Microlam, a special laminated wood material, to be inserted after a sealant is applied, to connect each panel to the next one. This construction prevents air leaks. The roof is held up by a ridge beam consisting of three Microlam boards 12 inches wide by 1.75 inches thick nailed together. Two internal posts support these.

How unique is this kind of construction? Robinson said, “This is the eighth house to be built in this fashion in the Rochester-Buffalo area and the first in the Ogden area. The Parma Historical Society building on the Parma town campus was also built using this technique.”



Brian Cansdale inches the second ridge beam up to the support post. The ridge beam consists of three side-by-side OSB's (Oriented Strand Boards), each one a 15 layer laminated board which is denser than plywood.



The house on Lyell Avenue in Spencerport before the concrete was poured. All the window and door openings are braced to withstand the pressure of the concrete.



This interior view shows the support poles holding the ridge beam with half a roof yet to be fitted with panels.