

Insulated Concrete Panels

Benchmark has produced a high performance insulated concrete wall system utilizing the new technology of insulated concrete panels — ICP's. The panels are built on a jig in the controlled environment of a fabrication plant where 4' x 8' sheets of extruded polystyrene are attached to both sides of a structural steel frame. Window and doorway openings, corners, beam pockets, and brick ledge are prefabricated. The panels are delivered to the job site, set on conventional footings, fused together, and then filled with concrete. The extruded polystyrene is protected on the exterior by a waterproofing membrane below grade and finished with brick, stucco, or siding above grade. The interior is ready to finish with drywall that can be screwed to pre-built furring strips.

The Benchmark ICP is an innovative alternative to constructing an insulated concrete wall with conventional wood or aluminum forms, concrete blocks, or insulating concrete forms (ICFs). Compared to these construction methods, the Benchmark ICP saves 20% of labor and material costs. The result is an affordable insulated concrete wall that improves the energy efficiency (R-value of 20), air quality, durability, and overall comfort of the building.

One of the key innovations of the Benchmark ICP is the structural steel frame, which acts like a spine, keeping the walls straight, both vertically and horizontally, during and after the concrete pour. Finished dimensions are more accurate than alternative concrete wall construction methods.

Another key innovation of the Benchmark ICP is the panelization process, which has proven to:

1. Boost the finished wall quality due to the dimensional accuracy of fabricated panels
2. Improve worker safety due to many functions being moved indoors, where workers are shielded from adverse weather and challenging terrain
3. Cut overall building costs due to reduction of on-site construction time

Pre-cast concrete walls also realize the efficiencies of panelization. The biggest difference, however, between the Benchmark ICP and pre-cast concrete walls is that the Benchmark ICP is poured in place, creating a monolithic concrete wall that is perceived by many to be structurally superior to pre-cast panels that must be bolted and caulked together at the seams.

Benchmark Resources, Inc., originated the Benchmark ICP, in Auburn Hills, Michigan. Since April of 2000, it has been used to construct residential foundations in twenty cities and townships in Southeastern Michigan. In August of 2000, it was utilized for a three-story commercial building, which will be poured in three lifts, in Rose Twp, Michigan. It is expected to be used in over 20 locations throughout the country within the next three years through franchising of the panelization and installation operation. Patents applied for and pending.

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Insulated Concrete Panel (ICP) forms, pre-assembled at Benchmark's plant, are set on the footings and connected.

A special adhesive bonds the foam panels together to provide a seamless form. The steel studs provide strength for the assembled form to hold the pressure of the concrete as it is placed in the wall. Minimal bracing is needed to ensure the walls are straight, plumb, and square.



Steel studs provide vertical steel reinforcement to the concrete mass and reduce flexural cracking caused by lateral pressure. Knockouts in the stud allow concrete to flow horizontally, and accommodate placement of horizontal re-rod at 24" centers, reducing the incidence of shrinkage cracks.

An insect shield, at the top of the wall, prevents termites, ants, other insects and rodents from entering the sill plate through the foundation.



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