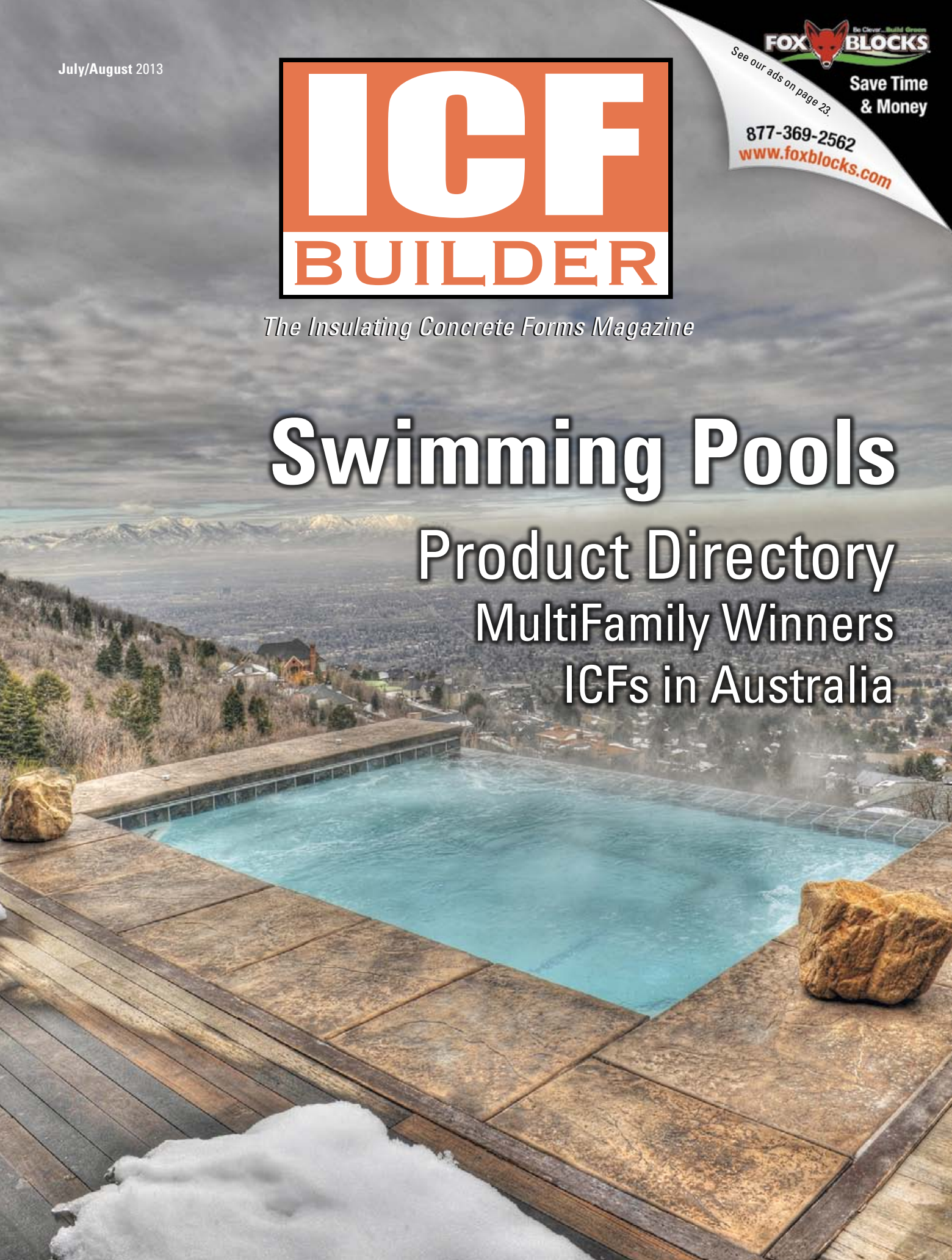
July/August 2013

ICF BUILDER

The Insulating Concrete Forms Magazine



Swimming Pools

Product Directory

MultiFamily Winners

ICFs in Australia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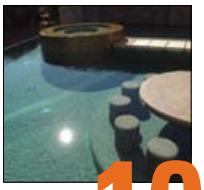
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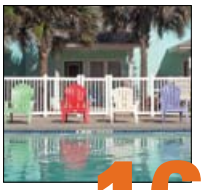
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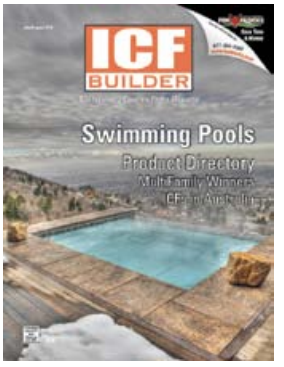

On the Cover: *This "hot tub on stilts" is built into the side of a mountain overlooking Salt Lake City to take advantage of the stunning vista. ICFs provided the strength and insulating properties this project required. See story on page 10.*
Photo courtesy Dan McCullough

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As I See It

by Clark Ricks

Genuine Recovery

In the first six months of 2013, construction indicators have shown unmistakably positive signs. Home prices are rising (10% over last year in most markets). Residential construction starts are at five-year highs. The price of building materials has increased significantly due to demand, and the stock prices of major homebuilders are red hot. In the ICF niche, most of us are also seeing more jobs and more cash inflows.

Yet it would be folly to say we're "getting back to normal." At trade shows and in phone calls, many readers have expressed the same frustration: we're busier than before, but the profit margins are stubbornly slim. During the Great Recession, many in the industry—from the manufacturer to the installer—made a habit of submitting zero-profit-margin bids just to stay afloat. Now the customer has gotten used to these prices, and is extremely reluctant to allow prices to rise back to sustainable levels.

During the Great Recession, many made a habit of submitting zero-profit-margin bids just to stay afloat.

It's because good-paying jobs just aren't there for potential homebuyers. A *New York Times* story reports, "While a majority of jobs lost during the downturn were in the middle range of wages, a majority of those added during the recovery have been low paying." The jobs now available don't pay enough to make home ownership a reality. This is exacerbated by the fact that The Great Recession has hit young people the hardest—the same group that forms the vast majority of new households. From 1997 to 2007, about 1.5 million households were formed on average each year in the United States. In the ensuing three years, the rate fell to 500,000 per year.

So, while it's true that millions of people need housing, right now only a relatively small percentage are able to afford it. A lasting housing recovery will require creating several million new jobs paying wages that make home ownership realistic. That's the sign of a genuine recovery. ■

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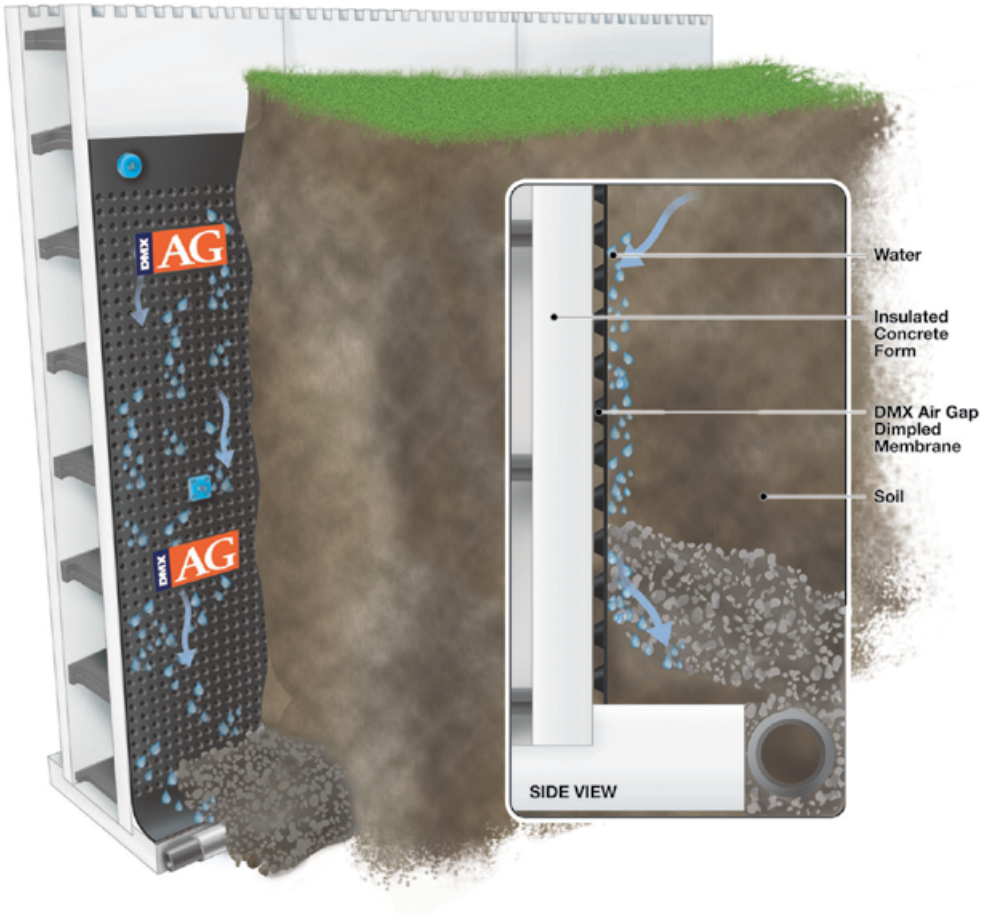

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In The News

EPA Moves to Ban EPS Flame Retardant

In March, the U.S. Environmental Protection Agency (EPA) announced that it would conduct a risk assessment on nearly two dozen hazardous chemicals, including an in-depth study on the flame retardant used in EPS foam.

Hexa-bromo-cyclo-dodecane (HBCD) is the chemical used by foam molders to make expanded polystyrene foam (EPS) fire resistant. Unfortunately, the chemical accumulates in people and animals, and has been shown to cause adverse health issues in animals. (For more information, see *Fire Retardants and ICFs* in the Aug. 2011 issue of this magazine.)

Of the 23 chemicals being assessed this year, 20 are flame retardants. HBCD is the only chemical on the list that has moved past the study phase into the "Action Plan" category. According to the EPA website, they will "assess alternatives to HBCD for use in insulation for buildings and construction… the project will not assess alternatives to HBCD in textiles and electronics." This chemical has already been banned by the European Union.

In response to the EPA announcement, the EPS Industry Alliance (EPS-IA) and the Extruded Polystyrene Foam Association (XPSA) released a joint statement pointing out, "Flame retardant chemicals employed by the polystyrene foam insulation industry have been successfully used for decades in a wide range of applications. We are encouraged that EPA already has deemed 50 flame retardant chemicals as 'unlikely to pose a threat to human health' in an earlier screening and look forward to a balanced approach moving forward."

Home Buyers Crave Energy Efficiency

According to a new study from the National Association of Home Builders (NAHB), new homeowners value energy efficiency over any other single feature.

In February, NAHB's publishing arm, BuilderBooks, released *What Home Buyers Really Want*, a study which outlines home buyers' preferences for home type and size, room layout and design, kitchen and baths, windows and doors, accessibility and outdoor features, electronics and technology in the home, energy efficiency and choosing a community. The study was conducted by NAHB's Economics and Housing Policy Group in 2012, based on a survey of home buyers nationwide.

It explains, "The housing downturn of the last few years affected not only the number of new homes that are built each year, but also the characteristics, features and size of the ones that do get built."

Energy efficiency was ranked the most desirable feature, and buyers indicated they were willing to pay for it. Nine out of ten buyers said they'd rather buy a home with energy-efficient features and permanently lower utility bills than one without those features that costs 2% to 3% less. Specifically, buyers wanted Energy-star rated appliances and windows, and an Energy-star rating for the whole home.

The second most popular feature was ample storage. Large majorities want a laundry room, a linen closet in the bath, garage storage and a walk-in pantry.

What Home Buyers Really Want is available at *ebooks.builderbooks.com*. Results from the study are available by age, income, race and census division, among other demographic characteristics.

Resilient Construction Bill Gains Traction

Legislation promoting disaster-resistant construction is gaining ground in both the U.S. Senate and House of Representatives. As reported in the May 2013 issue, the House is considering HR 5839, which would create incentives for rebuilding after a disaster with ICFs or other durable materials.

In early May, the Senate began considering a similar bill. Senators Roy Blunt (R-MO) and Bill Nelson (D-FL)—representing two states especially prone to natural disasters—introduced it as a resilient construction amendment to the Water Resources Development Act (S. 601).

The amendment would require the federal government to recommend resilient building techniques and materials to be used in response to damages from major disasters.

The job of defining resilient construction and approved materials would be delegated to the National Academy of Sciences and the Government Accountability Office.

"Homes and businesses that can withstand disasters protect occupants during storms, and as more disaster-resilient buildings are built, there will be less debris to cause additional damage," says Robert Garbini, president of the National Ready-Mix Concrete Association (NRMCA). "The amendment will ensure that the benefits of resilient construction are known so builders and contractors can best prepare for a safe future."

Wind-lock Opens Reno Facility, Adds Foam Line

Wind-lock has opened the doors to its new distribution center in Reno, Nevada to service its Western customers. "We realized that this was an area that we really needed to have a facility to reduce the shipping time and costs for these customers," explained Andrea Loud, Director of Operations for Wind-lock. "With an inventory mirroring our Leesport, Pennsylvania corporate headquarters, our Reno distribution center is sure to deliver 'what you need, when you need it" to the West."

Also, this spring Wind-lock added a line of spray foam products to their inventory to complement their existing line of insulation and weatherization products. Wind-lock is now carrying select Touch 'n Seal products from Convenience.

Items in the new product line include a single-component foam, two types of two-component foams (open and closed cell) and a CPDS (Constant Pressure Dispensing System) to apply the two-component systems.

British Building Competition Highlights ICFs

The 2012 Build It Awards, a competition recognizing do-it-yourself home improvement in the UK, has spotlighted ICFs. The program, built around a theme of "Celebrating Excellence in Self Build and Renovation" has an entire category devoted to insulated concrete forms.

A project built with Logix ICF was on the shortlist of winners, ultimately losing out to an owner/builder project using a local British ICF system named Beco. The judges noted that ICFs are "easy enough for the home owner to construct on a DIY basis " and that "the resultant house is attractive and energy efficient in its use, and shows how innovative you can be in design when building with this material."

Oklahoma Man Named Driver of Year

Rayfield Harris may be the best concrete truck driver in the United States. In January, a panel of industry judges selected Harris as the top driver from a group of outstanding applicants from all across the United States, and the National Ready Mixed Concrete Association (NRMCA) named him the Ready Mixed Concrete Delivery Professional Driver of the Year for 2013.

Harris, who has worked for GCC Mid-Continent Concrete in downtown Tulsa, Okla. for the past nine years, was honored for his career achievements, safety record, professionalism, driving competency and customer service skills.

"Anyone who comes in contact with Ray walks away feeling a little better about themselves," wrote GCC's Kim Kelly when nominating Harris for the Driver of the Year Award. Kevin Jackson, GCC Mid-Continent Metro/Midco district manager, said, "…In 30 plus years in this industry, I have never seen a more dedicated employee."

Barry Goodrich, a 15-year veteran mixer driver working for CEMEX in Fairfield, Calif. was chosen as runner-up.

Health and Safety Manager Aaron Autsen wrote, "Barry has gone more than 13 years without a rejected load and without an accident while averaging nearly 10,000 yards delivered over the past three years." ■

ICF Swimming Pools

Photo Courtesy Nicholas Nikiforuk

Insulated Concrete Forms are increasingly being used for applications besides homes and commercial structures. Retaining walls, water features, backyard fireplaces and even pizza ovens have been built with ICFs. (See *Earthworks* in the Oct. 2011 issue.) Perhaps the most common of these creative uses is ICF swimming pools.

It's a natural fit. ICFs are highly insulative and easy to adapt. In fact, swimming pools were being made with ICFs in the early 1970s, shortly after the technology was invented. But it's only been in the past five years that innovative builders have really pushed the boundaries of what's possible, creating eye-popping water features of all types. Additionally, coating manufacturers have recently developed a number of pool finishes specifically formulated for ICFs, which makes it easier than ever to make sure the client gets a beautiful, long-lasting, energy efficient pool.

Photos Courtesy Werner Gregori

ICFs have been used from swimming pools since the very beginning of the industry. This pool was poured with panelized ICF sections in June 1970.

Why ICF

Most residential swimming pools are built in conjunction with high-end custom homes, and frequently, when the owners choose to build with

These before-and-after shots of a pool built with NUDURA ICFs demonstrate how easily ICFs can create curved and radiused walls.

Photos Courtesy Cameron Ware

An increasing number of builders are using panel ICF systems to insulate the bottom of the pool slab in addition to the walls.

Photo Courtesy Jim Buttrey

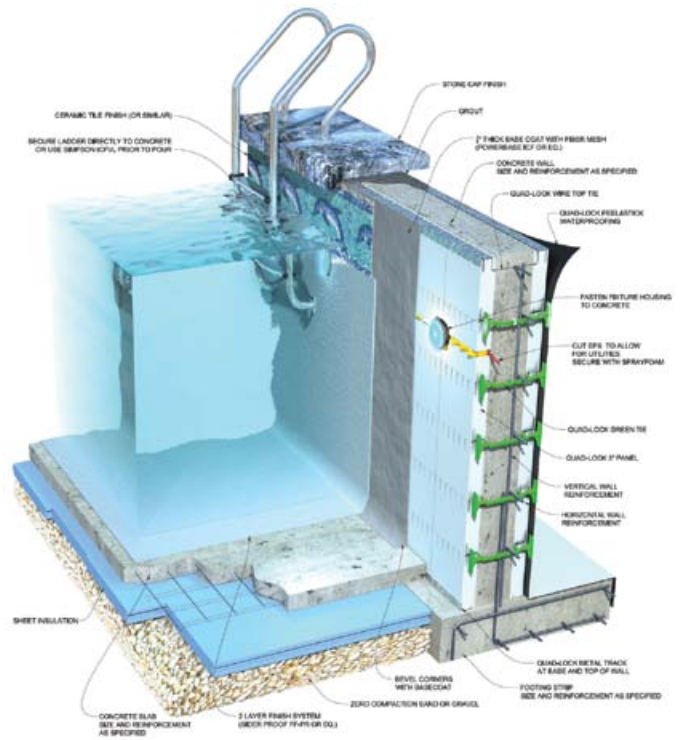


Illustration by Zoran Prostran/Quad-Lock Building Systems

ICFs for longevity and reduced energy costs, they'll choose an ICF pool for the same reason.

Quad-Lock Building Systems has received enough inquiries about pool construction that they've drawn up engineering details and full-color cutaway drawings to explain how they're built. "This is not an insulation layer applied to a swimming pool once the pool shell has been traditionally constructed," the drawings reminds us. "[ICF] forms an integral part of the swimming pool's construction – it most definitely is not a costly addition!"

The greatest cost savings, though, are long-term. Experts calculate that up to 80% of a pool's heat is lost through the sides and bottom of the pool, due to the fact that the ground conducts heat far more efficiently than air does. Considering the surface areas involved, continuous insulation is the best choice.

In addition to convenience, longevity, and construction cost savings, ICFs offer a number of advantages: The speed of build is typically faster than other poured-in-place methods. The

This massive radius edge pool uses ICF for everything, including stairs, hot tub, swim-up bar, and waterfalls. Ingenious engineering, combined with the strength of ICFs, made it possible to suspend the entire assembly over a below-ground cistern.

Photo Courtesy Nicholas Nikiforuk

lightweight, modular panels are easy to handle, and no heavy equipment is required for delivery, lifting or cutting. That can be a huge plus for a difficult-to-access backyard. Finally, ICFs adapt to curved and radiused walls more easily than most other methods.

Typical Construction

Pool construction is fairly similar to other ICF stem wall construction. After excavation, footings are poured and the ICF walls are stacked. Steel reinforcement and bracing is added per the engineer's specifications.

The pool bottom typically starts with smooth, non-compacting fill—usually sand—topped with an underslab moisture barrier and adequate insulation. Some builders that use panel ICF systems use forms for this. Others use rigid sheet foam, while others use an two-in-one product like Insultarp or The Barrier that combine waterproofing and insulation in a single product. Finally, the reinforced concrete slab is placed to complete the structural shell.

Many pools vary in depth. The most common approach is to pour the two horizontal slabs first, then pour the sloped section using the finished horizontal sections as guides.

Many contractors use spray-applied concrete (gunnite or shotcrete) as the final pool finish. If this is the case, they typically take care of creating the concrete floor of the pool at the same time they're shooting the finish on the wall. They'll also create the fillet (the radius at the floor/wall joint) in the same process. Metal lath is mechanically fastened to the wall to eliminate movement, and the shotcrete is frequently enhanced with fiber reinforcement to provide increased crack resistance. All of the leading ICF brands will withstand shotcrete application without damage if the lath is in place. Typically, a final plaster-like finish is applied in a second separate operation.

A few contractors forego the shotcrete, using a vinyl pool liner instead. Liners must be mechanically fastened at the top of the wall, and usually last for a decade or more.

Finish Options

A few state-of-the-art products make it possible to skip the

shotcrete and the vinyl liners. These beautiful, durable, waterproof pool finishes can be applied directly to the ICF foam.

Perhaps the most well-known is Sider-Plast, a cement-based polymer designed specifically for ICF swimming pools by Sider-Crete, Inc. It's a two coat system, and application is similar to acrylic stucco.

The basecoat, Powerbase ICF, is troweled on to a consistent thickness of ¼" over a standard 4.5 oz. fiberglass mesh. The floor/wall joint will still need to be filleted, which can be done with Powerbase, or by using a custom-cut foam piece. The color coat, called Sider-Proof FF-PR, is applied with a roller, then smoothed with a squeegee. The manufacturer specifies two coats to achieve the desired thickness. If tile is applied above the waterline, it's rolled on after the Powerbase but before the final plaster is rolled on.

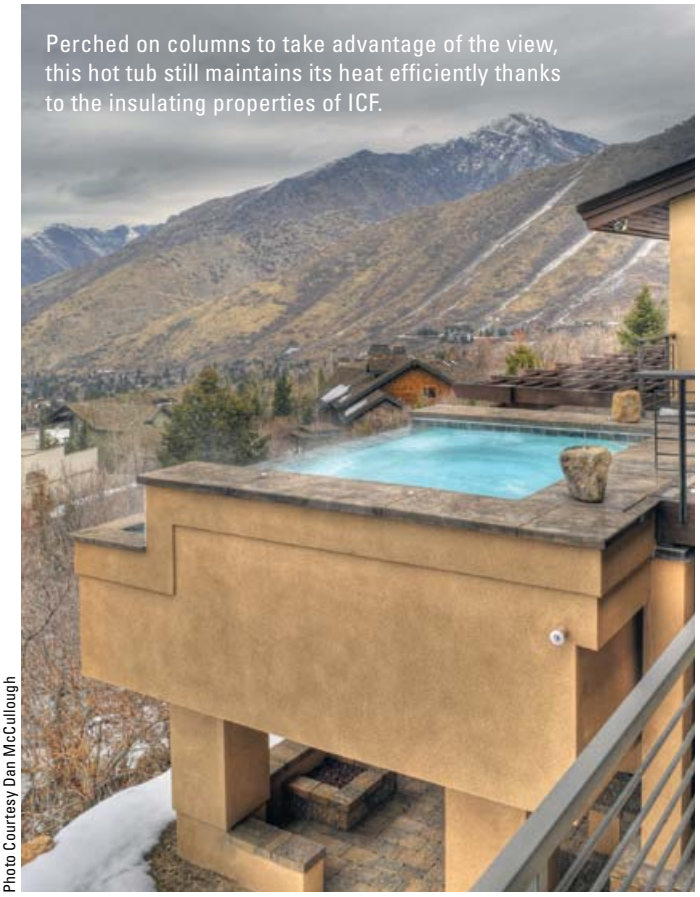
"Our ICF swimming pool finish has been very successful," reports Ivan Burgand, director of sales at Sider-Crete. "Contractors appreciate the speed of installation and the reasonable cost. Owners appreciate how durable and impact resistant the coating is. With this system there's never any worry about whether the foam substrate will be damaged."

Another finish option is Perma-Crete. Company president George Henderson developed it in the early 1990s for his personal pool, which required a much stronger surface than what was available on the market at the time. Application is similar to acrylic stucco: a basecoat troweled over fiberglass mesh, followed by a troweled finish coat available in a wide range of colors. Perma-Crete is one of a handful of products that's approved for both horizontal and vertical applications, so it can be used on the pool deck as well as the pool itself.

Two Examples

Two recent examples demonstrate what's possible with ICF pools. The first is an infinity-edge hot tub built into the side of a mountain overlooking Salt Lake City. The homeowner wanted a pool that took advantage of the stunning vista, but with a backyard slope exceeding 45 degrees, construction would be tricky to say the least.

Dan McCullough, the local Logix distributor, has been involved with half a dozen other ICF pools, but none as complex as



Perched on columns to take advantage of the view, this hot tub still maintains its heat efficiently thanks to the insulating properties of ICF.

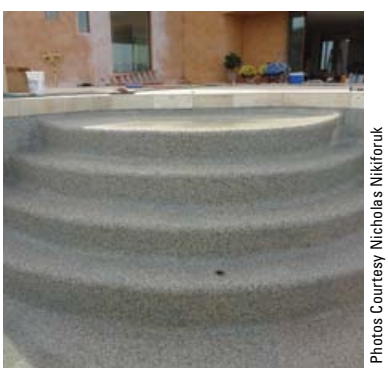
Photo Courtesy Dan McCullough

this one. "It's basically an ICF water tower, the way it's perched on columns like that," he says. While excavating the footings, the builders encountered a jumble of boulders ranging from three to ten feet in diameter. Unable to remove them, they used the rocks as footings. "Infinity edge pool installations are always exacting," says McCullough. "They have to be level within 1/16 of an inch to get the water to flow correctly, and where it was built on stilts anchored in boulders, there was some concern."

The final result, though, proves the skill of the installer and the strength of ICFs. Completed last year, the owner and his guests now enjoy the pool with a view year round.

ICFs can also create pools that are far more massive. The pool at Casa Bella Verde, a private home in Northern California, stretches more than 100 feet in length, and uses ICFs in every conceivable application. The circular spa, two waterfalls, entry steps, swim-up bar, radiused exterior walls, and catch basin are all made with ICFs. Even more mind-boggling is the fact that the massive pool, which averages 4 ½ feet deep, is suspended over another room holding a rainwater cistern.

Installation of the IntegraSpec ICFs was supervised by Nicholas Nikiforuk. The radius infinity edge wall, which runs for nearly 250 linear feet on a 50' radius, is within 1/8" of level over the entire distance. Shotcrete was used to create the fillet at the floor/wall joint and to add impact resistance. After being troweled smooth, a waterproofing membrane was rolled on, followed by the final Pebble-Tech finish.



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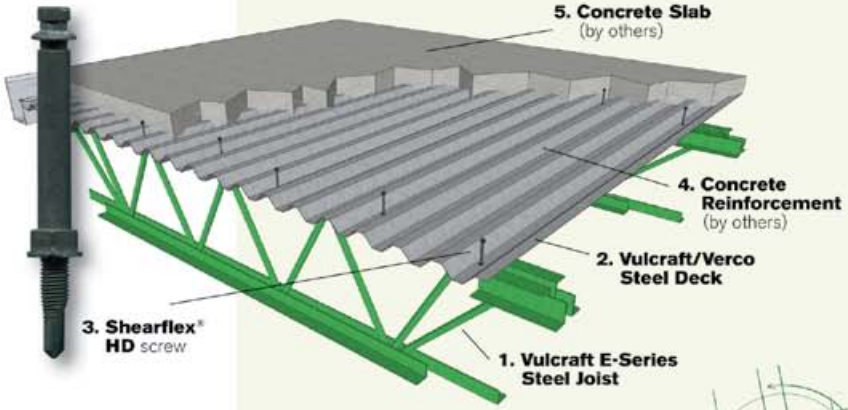

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Additional photos can be viewed at *www.icfmag.com.*

Project Statistics

Location: Port Aransas, Texas
Type: 3-Unit Townhome/ Vacation Rental
Size: 4,860 sq. ft.
ICF Use: 4,800 sq. ft. (all exterior walls) plus 1,600 sq. ft. interior walls
Cost: $400,000
ICF Start-to-Finish Time: 18 days

Construction Team

Owner: Commons at Sea Shell Drive
General Contractor: Port Aransas Coastal Homes
ICF Installer: Circle T Construction
Form Distributor: BuildBlock
Architect: Port Aransas Coastal Homes
ICF System: BuildBlock

Fast Facts

- ICFs selected for hurricane resistance and reduced maintenance
- One of the first ICF developments on the Texas gulf coast
- Featured in several local newspapers and magazines
- Additional ICF buildings planned in phased development

ICF BUILDER AWARDS

Commons at Sea Shell Drive

Photos Courtesy Brian Corder

This three-unit development of vacation townhomes on the Texas Gulf Coast faced a number of construction and design challenges. Fortunately, Insulated Concrete Forms (ICF) provided an elegant solution to virtually all of them.

The Commons at Sea Shell Drive is built on a low barrier island at the mouth of Corpus Christi Bay, so it was essential that the building be able to stand up to high winds and hurricanes. Exterior walls were constructed using BuildBlock's ICF system, which created a monolithic 8" core of reinforced concrete sandwiched between two high-efficiency rigid foam panels for insulation. This wall system has proven to be one of the most durable construction methods yet devised, easily standing up to winds in excess of 100 mph and being impenetrable to flying debris. The continuous layer of rigid foam insulation reduces utility costs, and is a perfect substrate for the acrylic stucco finish selected on this project.

The foam-and concrete construction method was also used for the partition walls between units, which provides additional structural strength but also creates a soundproof, fireproof demising wall.

These benefits come at a remarkably reasonable price: The 4,860-sq.-ft. development cost just $400,000. Combined with the reduced maintenance costs and significantly lower insurance premiums that will persist for the life of the building, it's clear ICFs were the perfect choice to maximize the return on this investment vacation rental property.

Todd Humphries of Circle T Construction, the ICF installer, reports that The Commons at Sea Shell Drive is one of the first ICF developments on the Texas Gulf Coast, and it's been featured in several local newspapers and magazines.

Because of this benchmark project, a number of similar ICF projects are now underway in the region, including the next phase of this development. ■

Additional photos can be viewed at *www.icfmag.com*.

Project Statistics

Location: Calgary, Alberta, Canada
Type: Duplex
Size: 4,200 sq. ft. (floor)
ICF Use: 7,800 sq. ft. (all exterior + most interior walls)
Cost: $2 million
Total Construction: 600 days
ICF Start-to-Finish Time: 44 days

Construction Team

Developer: New Casa Co. Ltd.
General Contractor: same
ICF Installer: Bill Coulson
Form Distributor: Amvic
Architect: Marcel Design
Engineer: Al Richards
ICF System: Amvic

Fast Facts

- Worked easily with tight jobsite and odd building footprint
- 27 corners needed to be perfect to fit pre-fab triangular roof.
- Erected despite near-constant rain and snow
- Deliveries and concrete pours require road closures
- Fines for schedule changes or overtime work.
- R-40 spray foam in roof, LED lighting, low-flow water fixtures
- Completed on time and on budget.
- Installer's 12-year track record helped familiarize area building officials with ICF

New Casa

The New Casa duplex in Calgary, Alberta, is a great example of how an experienced ICF installer can turn an extremely complex project into a beautiful neighborhood landmark.

The challenges began when it became clear the oddly shaped lot would require a triangular building, and became more complex when the city required that two of the sides resemble front entries. The tight jobsite offered zero space for material storage, so close coordination between the general contractor, ICF installer, and suppliers was essential. The site was so congested, in fact, that every concrete pour required road closures to provide adequate room for the ready-mix trucks and boom pump. Because of this, there were heavy fines if the schedule shifted or if overtime was required.

Pat Cymbala, the Amvic form distributor, says, "Coordination was the key for this project from frost wall to roof trusses."

The weather increased construction difficulties. Cymbala reports, "The rains

Photos Courtesy Pat Cymbala

came and never stopped until they turned into snow. The unusually wet fall and snowy winter caused logistic challenges from muddy feet to icy scaffolding. The fact that no work days were lost to safety concerns was due to a very experienced ICF installer."

Bill Coulson, a 12-year industry veteran, was key to the project's success. The exterior walls had 22 corners with extremely short wall segments, and five sharp-angle corners, all of which needed to be hand cut and cleated to maintain web alignment for the other trades. Most of the interior walls were ICF as well.

The roof was so complex that it was manufactured off-site, so Coulson had to get the walls "deadly straight, level and plumb"—despite the 27 corners—to ensure a good fit. (It's finished with R-40 spray foam for maximum efficiency.) The roof fit perfectly as the crew discovered the walls were accurate to within 1/8" of the design parameters.

Building officials required a two-hour fire-rated floor, accomplished by using Hambro Joists to support a concrete floor.

Joists flex differently based on the distance spanned, and because of the triangular footprint, New Casa had joists ranging from 12 feet to 36+ feet in length. This meant extreme caution had to be taken to ensure the beam pockets were properly placed. Material deliveries required road closures coordinated with the City of Calgary, general contractor, and installer.

The building features the most efficient technology available. LED lighting, low-volume water fixtures, and three single-unit ductless Samsung air conditioners keep total utility costs (water, electric and gas) to an average of $200 per month.

The project was completed on time and on budget. Cymbala says, "New Casa has set a new standard for other inner city builders to elevate their games."

Perhaps the greatest compliment comes from the owner/developer, who was so impressed that he moved into the building himself, and "thinks he may just retire in this building one day." ■

Additional photos can be viewed at *www.icfmag.com.*

Project Statistics

Location: Bronx, NY
Type: 15-Unit Apartment
Size: 19,400 sq. ft. (floor)
ICF Use: 16,200 sq. ft. (all exterior walls) plus 3,800 interior walls
Cost: $3.5 million
Total Construction: 390 days
ICF Start-to-Finish Time: 21 days

Construction Team

Owner: Lemle & Wolff, Inc.
General Contractor: Apartment Rehab Corp.
ICF Installer: Luso/Europa Construction
Form Distributor: Manning Materials
Architect: Design AIDD Architecture
Engineer: Antonucci & Associates
ICF System: NUDURA

Fast Facts

- 15 "affordable housing" apartment units on 3 floors
- Named for unique corner bay windows throughout project
- Ample windows give apartments a "house-like" feel
- Tight budget ($175/sq.ft. in New York City)
- ICF garage and laundry facilities
- 9'4" ceiling heights throughout
- Pioneered acceptance of ICFs with New York City code officials

ICF BUILDER AWARDS

Cornerview Apartments

Cornerview Apartments features 15 affordable housing units on three floors. The unique corner windows featured throughout the building are one of its strongest selling points.

"High-quality affordable housing with excellent floor plans are unfortunately an all-too rare achievement," explains Daniel Heyden, the project architect. "We seized the opportunity to use ICFs to provide corner bay windows, which are simply not feasible with the Concrete Block (CMU) construction typically used for affordable housing in New York. Twelve of the 15 apartments have both a street or rear and a side yard exposure, which is quite uncommon in affordable housing. Simply put, Insulated Concrete Forms allow for corner windows, corner living rooms, corner apartments, apartments that feel more like small houses."

The architectural firm's preferred builder is a NUDURA distributor, so choosing a specific brand of ICFs was straightforward.

The combination of ICF walls with large, operable corner windows has proven to be quite energy efficient. Heyden continues, "We maximized the number of corners in order to optimize cross-ventilation and natural daylighting, reducing the reliance on air conditioning and electricity. The 9'-4" ceiling heights, coupled with the thermal mass of the ICFs and precast concrete flooring results in significantly reduced air conditioning loads." The airtight walls also ensured the building would pass the blower-door test required to receive NYSERDA funding.

New York City is notoriously expensive to build, and funding for affordable housing is always tight. In this case, Heyden and his team at Design AIDD came in at $175 per square foot, well below the "very tight hard-cost budget" that typically runs $225/sq. ft.

Cornerview Apartments was one of the first ICF projects in the City of New York, and pioneered the acceptance of ICFs with code officials. It's the only ICF project in the New York State Energy Research Development Authority's (NYSERDA)'s pilot Multifamily Performance Program.

"On this project we have been able to prove the potential of ICFs to create a sustainable, spacious, healthy, and affordable housing project," says Heyden. "It is clear that the developer, the contractor and the architects will use ICFs again on the next similar project. ■

Photos Courtesy Daniel Heyden

International ICFs: Australia

This six-classroom addition to an Australian private school proved that, despite a relatively small market share, ICFs are becoming well-established Down Under.

Photo Courtesy Mike Schock/Formcraft

In North America, Insulating Concrete Forms (ICFs) have become fairly widespread. Although they comprise less than 10% of total construction starts, most construction professionals know what ICFs are, and hundreds of thousands of them have seen or worked on at least one ICF job. That's not the case in most other areas of the world, though. In this article—the third in a series—we're looking at the ICF industry in Australia.

Geographically, Australia is vast—only slightly smaller than the United States—and sparsely populated. The "Land Down Under" has a population of 23 million people, about 2/3 that of Canada, and most of the population lives near the coast in the more temperate southeast. The rest of the continent-sized country consists primarily of hot desert with a few regions of steamy tropical jungle. With an emphasis on concrete construction and sustainable construction methods, the country has considerable potential for the ICF industry.

Seven domestic ICF brands make up most of the market; only two North American ICF companies have established distributorships there.

History

Any discussion of ICFs in Australia starts with Thermacell, which has been selling foam formwork there since 1985. Geoff Bennett, who founded the company, imported the technology not from North America, but from Germany.

The Thermacell block is a screen-grid system, with EPS webs connecting the two exterior foam faces. Over the years the company has developed a number of different core sizes, and the corporate website claims that the form is strong enough that no bracing is needed when being filled with concrete. Designed for both the professional builder and the "do-it-yourselfer," the block enjoys a considerable following.

ZEGO began selling forms in the year 2000, offering a different screen grid system imported from Germany. A few years later, they unveiled a knock-down system with plastic ties, and even more recently, a removable panel system so the concrete face can be exposed on one or both sides. They claim to be the largest ICF supplier in the country, and are one of the few to market ancillary products, including bracing and a portable hot-wire form cutting table. They also boast a nationwide installer training program.

Shortly after ZEGO was introduced, Texas-based ECO-Block began their

Moritz Hotham, a vacation condo at a ski resort in the mountains of southeastern Australia was built with ZEGO insulated concrete forms.

Photo Courtesy Scott Evans/ZEGO

Photo Courtesy Sanjiv Gosain/EconWall

Australia has its own version of vertical ICFs, too. The system, dubbed EconWall, was used to create that country's first carbon neutral home, using 90% less energy than the average.

international expansion efforts. ECO-Block Australia began manufacturing and distributing in 2003, and while the Texas company disappeared years ago, the Australian licensee is still going strong.

Formcraft, a fourth company, began operations in 2005 offering a knockdown ICF system with a monolithic core. They also introduced EPS decking to the country as FormDeck, used both horizontally and as a tilt-up product. More recently, they've developed a system that uses ICFs to form column and beam structural elements around modular foam infill panels that form the majority of the wall.

In January, at World of Concrete 2013, the first vertical-style ICF from Australia debuted called EconWall, which has an option of leaving the inner face of the core exposed.

Challenges

One of the challenges marketing North American ICFs to Australia is that the country uses the metric system—a big reason many of the first designs were imported from Europe.

The typical Australian ICFs measure 300mm (11.8") high, with core sizes ranging from 150 to 300mm in 50mm increments. This is roughly equivalent to the North American core widths of six to 12 inches.

Perhaps it's not surprising, then, that the two North American ICFs that have

The vast majority of the Australian ICF market is residential, and a significant portion of that is aimed a do-it-yourself owner/builders.

established dealers in Australia have roots in Europe. Amvic has tooling for a fully metric system—including foam decking—based on a 50mm modular size. (Metric Amvic was used for the biggest ICF project in the world to date, a 1.5 million sq. ft. development in Siberia.) They've encountered some success in establishing a foothold Down Under.

The other, Quad-Lock, has a metric-friendly system, something that has helped them get established in 18 European countries. Its web dimensions (200-400mm) and form height (305mm) roughly matches what Australian installers are familiar with.

Opportunities

As in North America, high-end custom homes make up a significant share of the Australian ICF market. But they're also surprisingly popular with the owner-builder segment. Australia has its share of natural disasters—wildfires and typhoons especially—so the appeal of getting an efficient, disaster-resistant home is obvious. As mentioned above, several of the leading brands can be stacked and poured without bracing, making them even more user-friendly.

The commercial ICF market lags considerably behind the U.S. and Canada, but is starting to pick up steam. A few years ago, Formcraft was used to construct a 7,000 sq. ft. addition on a school in Western Australia.

Lai Perera, the school's business manager, reports, "This building was completed in nine weeks… assisted in no small part by the speed of construction of the insulated concrete walls [installed in just 10 days] by the construction team. We noticed the noise reduction and fewer temperature extremes combined with the large rooms provide the ideal classroom and a very effective learning environment."

Michael Schock, which provided the forms for the project, adds, "The use of ICF in school buildings for the first time in

Many of Australia's leading brands are all-foam screen-grid systems. Because of that, hot-knives and even hot-knife tables are commonly used for cutting forms.

Photo Courtesy Scott Evans/ZEGO

Western Australia has generated a high level of interest, particularly with the focus on energy efficient building solutions for public and commercial buildings."

The green building movement is driving ICF growth in the U.S., and it's no different in Australia. One symbol of that is a model home built near the nation's capital of Canberra. Built with EconWall ICFs, it's among the country's first "carbon neutral" (zero energy) homes. In Australia, the government administers the Nationwide House Energy Rating Scheme (NatHERS), which rates the potential thermal comfort of Australian homes on a scale of zero to 10 stars. Houses built in 1990 averaged a single star on the scale, but energy codes have significantly raised the standard, and today a well-designed home typically gets six stars. This ICF home rated nine-star-plus, using 80% less energy to heat and cool than a six-star house and one tenth of the energy of the average existing housing stock. Passive solar design is combined with extensive solar hot-water and photovoltaic panels to provide nearly all of the energy required. ■

As in the U.S., ICFs are becoming known in the education sector for creating energy-efficient, sound-absorbing classrooms that can meet tight construction schedules, such as this private-school addition in Ellenbrook, West Australia.

Photo Courtesy Mike Schock/Formcraft

2013 ICF Builder Awards

Ninth Annual Project of the Year Competition to be the Best Yet

The 2013 ICF Builder Awards are getting underway, and this year's contest promises to be even better than last year's highly successful event.

Contractors, distributors and ICF manufacturers are encouraged to submit projects for consideration. Simply download the entry form and contest rules at *www.builderawards.com*, or call the magazine at 877-229-9174 ext. 2 to request a notebook. The website also contains profiles of past winners and a short video that illustrates the entry process.

Competitions rules and judging criteria remain unchanged from last year, and tend to favor "milestone" projects with outstanding complexity, significance, and construction considerations over architecture, size and sustainability.

Clark Ricks, editor of this magazine and one of this year's judges, advises, "Remember that every entry is built with ICFs, so your entry notebook should explain how the project exceeds the current industry standards. There are dozens of noteworthy projects being built every year, and I look forward to being able to give them the publicity they deserve." ■

Sponsorships Available

As in past years, the ICF Builder Awards are made possible through the support of generous sponsors. A limited number of opportunities are still available for the 2013 event. If your company or organization wants to be a part of the premier ICF event in North America, contact Craig Shorts at 877-229-9174 or via email at *craig@icfmag.com*.

ICF Product Directory

ICF manufacturers and those that service this industry are always coming up with better products to help the contractor become more efficient and profitable. The products listed on the following pages cover many aspects of the ICF structure, from bracing to vibrators. Don't hesitate to call the advertiser for more information.

Accessories

Inexo by Ipex

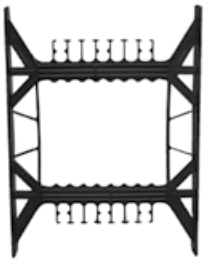
www.ipexamerica.com 1.800.463.9572

Until now there have been few choices when attempting to provide a truly professional electrical box solution for Insulated Concrete Form homes. Traditional electrical boxes are tedious to install and often require a fair amount of ingenuity and additional labor to provide a less than ideal finished product. Other boxes offered to ICF builders require installation before the concrete pour, throwing off your project time-line.

INEXO's patented design provides a truly professional solution that works with your production schedule and provides the quality installation and finished look that builders require and owners appreciate. INEXO boxes link seamlessly with existing ICF materials, tools and methods. A complete offering designed for ICF walls allow builders to standardize on the use of electrical boxes throughout the building. Commercial and residential versions of the box are available in single, double and triple gang.

Fox Blocks Ties

www.foxblocks.com 1.877-369-2562



Fox Blocks Ties have been engineered to withstand much more than the code minimum pressure and have answered the requests of contractors North America wide for strength, size and rebar placement options. Rebar notches will accept any sized rebar and allow up to #6 (20M) rebar lap splices to lay on top of each other for better concrete flow.

Ties a full 1 ½" wide match the industry standard for wood and steel studs making it easier for subcontractors to apply finishes as specified. The ties are also a full 16" tall, matching the block height, which helps minimize settlement during concrete placement and bring a smile to the faces of the drywall subcontractors who no longer need to get frustrated with attachment gaps at every block horizontal joint course line. The truss created within the 2 5/8" monolithic EPS creates a frame that will deliver a flat wall ready for stucco or other exterior finishes.

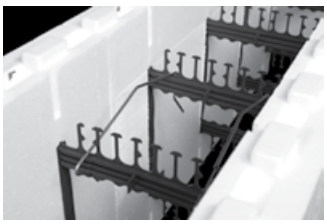
Your concrete pump operator, ready mix driver and finish contractors will all thank you when you order Fox Blocks!

Fox Blocks HV Wire Clips

www.foxblocks.com 1.877-369-2562

Fox Blocks HV (Horizontal-Vertical) Clips save wire material costs and reduce installation labor on site.

Tie spacing horizontally and vertically are both 8" on center unique in the ICF industry. Because of this form design you only need one internal wire product.

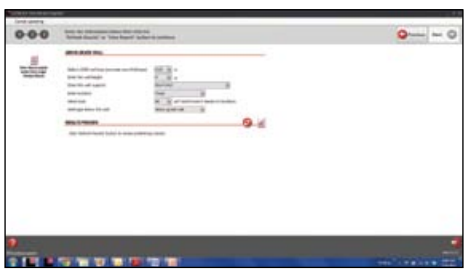


The industrial strength single row reversible interlock, combined with the monolithic 2 5/8" width EPS eliminate the need for multiple rows of internal continuous wall aligning truss wire lowering your overall cost of each ICF installation.

Your accountant will thank you when you order Fox Blocks!

Logix Makes Engineering Problems Disappear!

www.LOGIXicf.com 1.888.415.6449



Frustrated about paying for ICF engineering? Sick and tired of deciphering lintel tables? Had enough of waiting for help?

Switch to Logix ICF and enjoy the Logix One Minute Engineer!

When you build with Logix ICF, a few simple key strokes will make Logix ICF engineering appear at your fingertips – good, solid prescriptive engineering and drawing details ready to go to the jobsite or to submit to building officials.

This is the power of Logix. To use it visit *logixicf.com* and download your free Logix One Minute Engineer.

LOGIX® INSULATED CONCRETE FORMS

Logix Makes Estimating Problems Disappear!

www.LOGIXicf.com 1.888.415.6449

Are slow manual take-offs keeping you up at night? Worried about making the small mistakes that can cost big bucks?

Switch to Logix ICF and enjoy the Logix Estimator!

When you build with Logix ICF, the Logix Estimator will quickly create detailed and accurate take-offs, cut lists and more, and will generate professional and accurate customer quotes with the margins you need.

This is the power of Logix. To use it visit *logixicf.com* and download your free Logix Estimator.

LOGIX® INSULATED CONCRETE FORMS

Air Filters and Exchangers

EZ Breathe Balanced Ventilation System

www.ezbreathe.com 1.866.822.7328

Now offering specific models for crawlspaces, basements and garages! EZ Breathe Ventilation Systems provide the fresh air requirements for ICF homes by creating air exchanges 6-10 times daily and monitoring humidity levels to maintain a healthy home. The EZ Breathe products eliminate airborne contaminants such as moisture, allergens, particulates, mold and mildew. Easy to install, maintenance free, energy efficient at only $2-$4 a month and at a fraction of the cost of traditional ERVs and HRVs, EZ Breathe is the best solution for your indoor air quality concerns.

According to the EPA and the US Consumer Products Safety Commission, "Unless they are built with a special mechanical means of ventilation, homes that are designed and constructed to minimize the outdoor air that can 'leak' into and out of the homes may have higher pollutant levels than other homes." Give homeowners the energy efficiency they want and the ventilation they need to have an efficient home with fresh, pure indoor air provided by EZ Breathe Ventilation Systems.

See our ad on page 9 for more information.

Bracing

Hilltop Manufacturing

www.hilltopmanufacturing.com 1.866.627.7720

The Hilltop ICF Scaffolding and Bracing system made by Hilltop Manufacturing is an outstanding choice for all ICF contractors. The lightweight aluminum strongbacks makes transport and setup easy.

The adjustable turnbuckle has no threads at the top of the brace. That means no concrete buildup on the threads, and trouble-free wall alignment. Recently Hilltop has introduced a new extra-heavy-duty strongback for the taller wall systems. The system comes with a removable handrail support, and is available in all standard height (8', 9', 10', or 12'). Tall wall and custom heights are available.

The braces are compatible with all major brands of insulated concrete forms. Pricing and additional information is available at the phone and website listed above.

Densifiers

Bright Technologies

www.brightbeltpress.com 1.800.253.0532

Bright Technologies offers solutions for recycling EPS foam. The company sells a comprehensive line of EPS Densifiers with capacities ranging from 100 lbs. per hour to 1,200 lbs. per hour. The machinery converts waste Expanded Polystyrene into a product weighing 16-20 lbs. per cubic foot. Densifying waste foam offers numerous advantages, including reduced storage requirements and reduced hauling/handling costs. After processing, up to 40,000 lbs. of foam can fit into a single truckload. Densification also eliminates the danger of pentane gas buildup.

Bright machinery has a reputation for quality. All equipment is designed, manufactured, installed and serviced right here in the United States. The original EPS Densifier, installed in 1995, is still in use today.

A video of the densifier is online at *http://sebrightproducts.com/media-center*.

Flooring and Decking

Amvic

www.amvicsystem.com 1.877.470.9991

Scan for more info.

The AmDeck Floor & Roof System is a modular, lightweight, stay-in-place form made of Expanded Polystyrene (EPS) and used to construct concrete floors and roofs for commercial, industrial and residential uses.

When installed properly, the system provides structural strength through reinforced concrete and insulation through EPS. The system utilizes 10-inch lightweight steel framing studs which carry the temporary construction loads until the concrete gains its required strength and act as furring strips to which interior finishes can be attached.

This system perfectly complements your Insulated Concrete Form (ICF) structure and together they provide a complete structural and thermal "building envelope" for your floor or roof.

The AmDeck Floor and Roofing System comes in standardized, small, lightweight modular units. This means that the system is much easier to use and handle, since pieces are not as large and bulky. Also The AmDeck Floor and Roofing System is fully reversible, reducing labor time and construction waste on the jobsite.

Hambro

www. hambro.com 1.800.546.9008

Canam offers an array of structural components to create better, more functional buildings, including the well known Hambro joists, used to create an economical steel and concrete floor system.

The Hambro D500 floor system creates solid, reliable elevated slabs supported by proven floor joists. Compatible with all traditional structural systems, the Hambro D500 floor combines the flexibility of the D500 joists with the strength of a reinforced concrete slab.

It's fast and easy to install, and offers maximum room for duct work. It simplifies installation of HVAC, electricity and plumbing systems. It uses less concrete and reinforcing steel than conventional slabs, which minimizes costs, and makes it possible to create long spans without load-bearing walls below. Hambro is compatible with all traditional structural systems, offers exceptional fire protection and outstanding sound dampening properties. Hambro D500 is more than just a floor.

Footings

The Foothold

www.thefootholdicf.com 1.860.523.1222

The Foothold is an innovative footing system for ICFs now being marketed by ICF Building Company LLC.

Company president James Ryan, who developed the product, says it simplifies and speeds the process of making a Frost Protected Shallow Foundation.

"We're extremely excited to not only bring The Foothold to market but to make insulating concrete form construction easier and more economical," says Ryan. "The Foothold allows us to set our footings at just 16 inches below grade whereas we used to be required to be 42 inches below grade. This results in a cost savings of more than half for the excavation, concrete, labor, etc."

The Foothold is a molded plastic form tie compatible with 2-inch-thick EPS or XPS rigid foam insulation available at the local building material supply center. The foam and ties are left in place after the pour, and Ryan says his system is compatible with all major brands of ICFs.

"We're out in the field every day. We realized we needed The Foothold to improve our ICF construction projects, but the problem was The Foothold didn't exist, so we created it." Ryan said.

The ties are sold in boxes of 32 for $84.99, enough for approximately 50 lineal feet of footing.

Vibrators

Oztec

www.Oztec.com 1.800.533.9055

An addition to Oztec's ICF consolidating equipment is the "Rebar Shaker." Placed over the top of vertical steel reinforcement, the Rebar Shaker vibrates at 10,000 - 12,000 vpm, ensuring excellent concrete consolidation inside insulating concrete forms.

The Rebar Shaker allows contractors to use a stronger, lower slump mix and still produce void-free walls, since the shaker gives the trapped air time to escape. The Rebar Shaker also tends to slowly rotate the rebar; packing concrete between the rebar and form, resulting in excellent bonding..

Walls with wide rebar spacing will be more effectively consolidated using a combination of Oztec's internal flexible shaft vibrators and the Oztec Rebar Shaker.

Wall Systems

BuildBlock

www.buildblock.com 1.866.222.2575

BuildBlock Insulating Concrete Forms provide a complete installer-friendly solution for any ICF project. Simple labor saving benefits such as the molded-in tape measure, full reversibility, and tight interlocks are just a few reasons to choose BuildBlock.

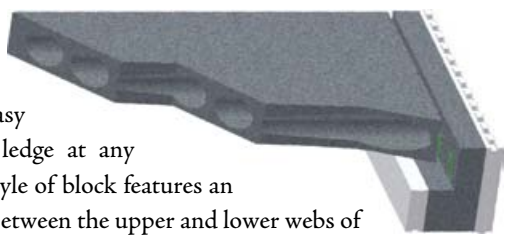
Our product family includes BuildBlock ICF, BuildLock knockdown ICF, BuildDeck for floor and roofing, and GlobalBlock the all-foam ICF. BuildBlock always delivers cost-effective superior performance for any structure.

Our interior BuildCrete Plaster and exterior BuildCrete Stucco are waterproof, impact and fire resistant coatings that bond directly to the EPS foam. BuildBlock ICF products are designed to deliver results on time and on budget. Call or visit our website today for product information, specifications, and project estimates.

Direct online ordering, 12 manufacturing locations, and competitive pricing are just a few reasons why your next project should be a BuildBlock project.

Curb Block From Fox Blocks

www.foxblocks.com 1.877-369-2562



The patent pending Curb Block from Fox Blocks makes it easy to create a floor ledge at any height. The new style of block features an extra attachment between the upper and lower webs of the tie so the block maintains rigidity even when half (or more) of one side is cut away.. It's currently available as Straight and 90˚ corner blocks in the 8" core width, and is molded with a green tie for easy identification.

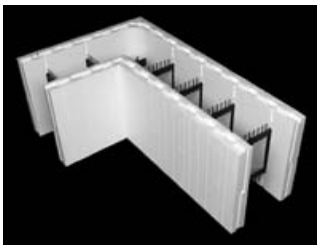
Curb Block can be used with virtually any floor system, including hollowcore, precast, truss, wood, pan deck, and Hambro. Curb Blocks can also be cut to facilitate garage slabs, or on the outside face to create brickledge or taper-top block.

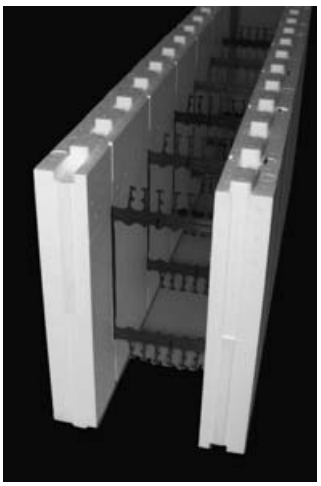
To use the Curb Block, just cut one face of the block at the desired height, then snap the upper ties with a hand saw. As much as 11" of block can be removed from one side without affecting performance.

Extra Curb Block can be saved for the next job or used as regular blocks within the walls being built, as the shape and size of the Curb Block is identical to the black tie design.

Straight and Extended Corner Blocks from Fox Blocks

www.foxblocks.com 1.877-369-2562





On most projects over 95% of blocks used are straight and corner blocks; it is just common sense that these should be the best performing part of your job for you to be profitable.

Blocks that are reversible with a strong single row interlock are showing to deliver the best and lowest installation man hour rates, reducing costs and saving time.

ICF installers have looked for a corner form that did not slow them down and performed like a straight forms for years. The Fox Blocks Extended Length corner added two additional ties and a patented full-height corner bracket and 16" in length.

Now the corner you grab is the corner you need and you can place concrete with confidence.

Your crew will thank you when you order Fox Blocks!

Superform

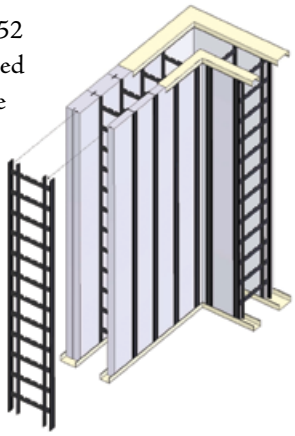
www.superformicf.ca 1.403.627.3555

Superform ICFs are intended to replace conventionally poured concrete foundation walls in residential and light commercial construction. Because the Superform wall system accomplishes forming, framing and insulating in one step, it provides a finished wall far superior to any other framing method. The rigid EPS provides both the form for the retention of wet concrete, and the thermal insulation for the exterior wall. The EPS also provides superior sound barrier insulation for interior party walls. The plastic ties in the blocks are recessed slightly to prevent thermal bridging, allowing for proper placement of reinforcing bar, and also serve as a furring strip to which inside and outside finishes are attached.

The 2 5/8" of rigid EPS on each side of the wall provides a tested thermal insulating value of R-28, and has been treated with a flame-resistant additive for fire protection. A typical wall has a fire resistance rating of three hours and a sound transmission (STC) rating of 55.

TF Forming System

www.tfsystem.com 1.417.200.0052



TF Forming Systems developed the first vertical ICF shortly after the company began in 1994. It has proven to be extremely successful, allowing for taller, straighter walls, increased design flexibility, and reduced construction time. It also allows individual panels to slide up for inspection before and during pours. More than 15 years later, TF's vertical ICF products have been used in hundreds of successful projects nationwide. Recently, the company added a second product line, TransForm, a hybrid between traditional removable concrete forms and TF's original Vertical ICF system. TransForm is an industrial strength wall system perfect for commercial projects.

TF is currently helping rebuild Joplin, Missouri, site of a devastating tornado, in order to equip homeowners with safe, energy efficient homes.

Waterproofing

Epro Spray-Applied Waterproofing for ICFs

www.eproserv.com 1.800.882.1896

Epro Services Inc.'s products have waterproofed more ICF foundations than any other fluid applied system in the industry.

The reason is that Epro provides a complete system from a water-based, seamless, high performance liquid membrane to extremely durable and tough HDPE protection courses and drainage composites that just work better than any other system.

Unlike sheet (peel-and-stick), membranes, which have seams and rely on an adhesive for bonding, the Epro fluid applied membrane forms a seamless barrier even at the most critical points (transitions, terminations and penetrations) and provides its own tenacious adhesion.

The protection course and drainage composite protect the waterproofing membrane while controlling and directing hydrostatic water pressure away from the foundation. Their HDPE construction provides unparalleled chemical resistance guaranteeing a long lasting system.

This adds up to the best ICF waterproofing system solution. ■

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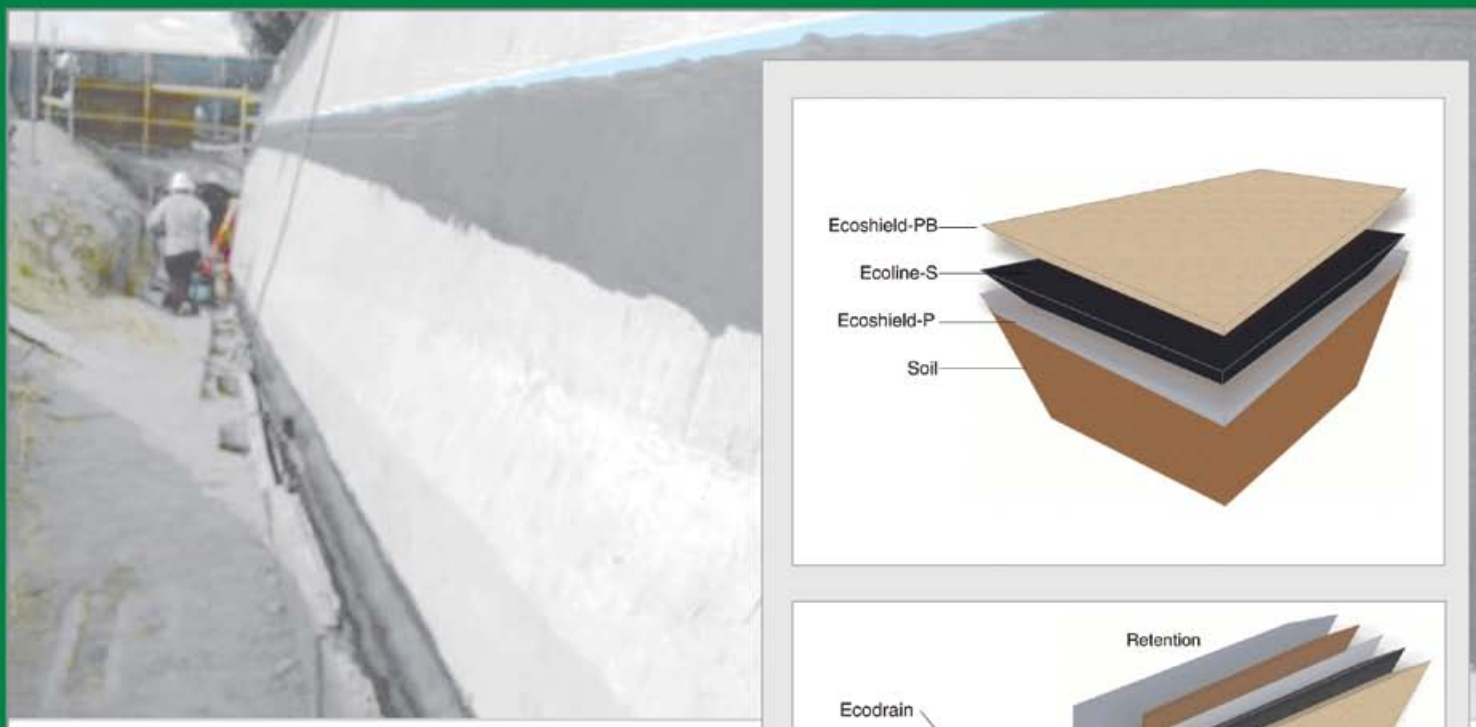

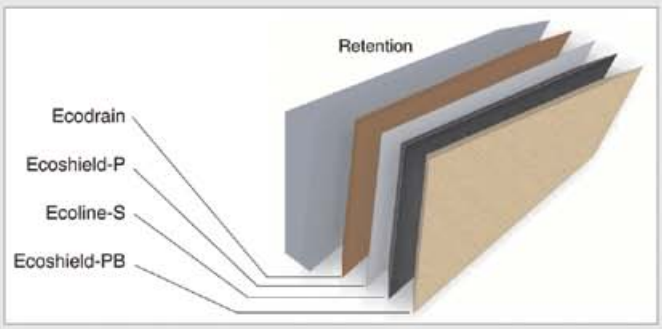

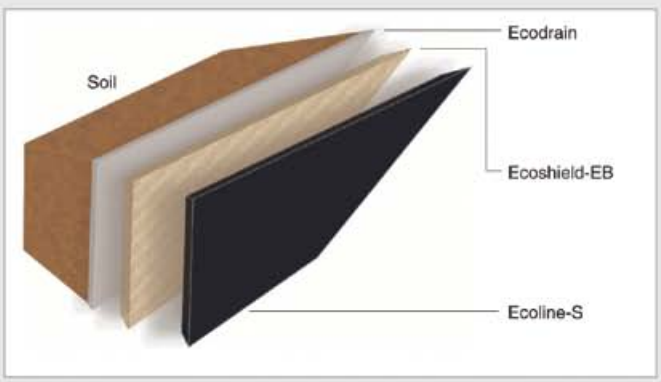

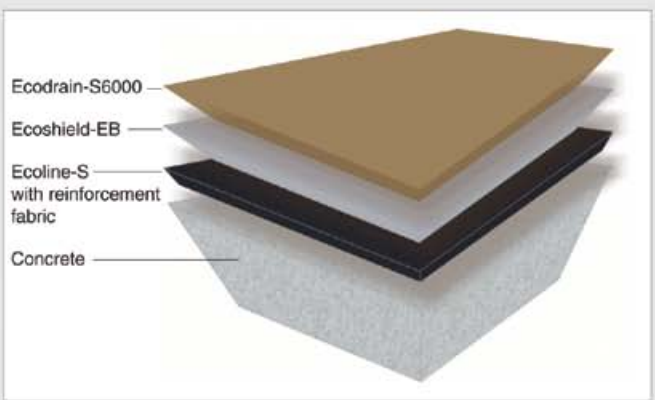

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