VISION House® Orlando 2011

ARXX™ Prime

Manufacturer: ARXX ®
Product: Prime
Category: Insulating Concrete Forms

In residential construction the most important consideration is basic planning and conceptual design. The next most important consideration, in particular when aiming at high levels of building performance, is what materials and methods to employ for the actual construction. In the Hurricane-prone, hot and humid climate of Central Florida that consideration takes on an even higher significance, especially for exterior walls. Tasked with providing a thermal separation between inside and outside, water and moisture vapor management functions, an attachment base for interior and exterior finishes, load bearing structural support, and a requirement to hold the entire building together during a hurricane, the wall systems are asked to do a lot, and to do it well.

Currently in Central Florida, concrete block (CMU) is the default residential building method. This is because CMU is particularly good at structural resistance to strong winds. Water management isn't a strong point, but if water penetrates the wall it will eventually dry. Insulation methods traditionally applied to Florida CMU construction is a kraft-paper radiant barrier applied to furring strips on the interior. This method is inexpensive but not necessarily effective. CMU construction is also fairly labor intensive and often generates a lot of waste. When looking at viable alternatives for the high-performance requirements of the VISION House® Orlando, the design team surveyed multiple options and chose Insulating Concrete Forms (ICF's) by ARXX™.

ICF's come in several configurations. Most are stay-in-place rather than removal forms from poured concrete, consisting of either XPS or EPS insulation. ARXX Prime ICF system is a panel-block system configured with an inner and outer wythe of EPS insulation separated by plastic form ties. The blocks are easily handled and assemble like giant LEGO® blocks. Once set and braced, concrete is poured into the core (for the VISION House it was 6"), completing the assembly. As part of the form ties, ARXX Prime has exposed plastic flanges on the exterior and interior EPS surfaces. These flanges double as screw attachments for exterior fiber-cement cladding and interior drywall providing for a fast and convenient surface finishing. The exterior foam surface is also provided with vertical grooves in the foam creating a rain-screen type detail to aid under-cladding drainage and providing superior moisture management. The ICF wall can be reinforced with steel rebar and internal wire ladder reinforcement. The plastic ties are formed with "seats" for easy placement of the horizontal ladder ties. Structural performance meeting the strictest Miami Dade wind zones is easily achievable.

Thermal performance is perhaps where the ARXX Prime shines the brightest. Typical CMU construction in Central Florida using the interior radiant barrier offers no more than a rated R-4 performance. The ARXX ICF's in the VISION House provide approximately R-22 thermal performance as well as "mass-wall" benefits which help modulate thermal variations. These mass wall benefits are even recognized by the energy code (2009 IECC) where in Climate Zone 2 (which includes central Florida) a mass wall only needs R-4 while a frame wall would require R-13. The end result for the VISION House is outstanding thermal performance including superior air-tightness.

Compared to a building designed with minimal code standards and the exact same configuration, the VISION House walls will save 43 therms of gas in heating energy, and 428 kWh in cooling energy, helping to contribute to over a 50% reduction in total energy use, and result in a HERS index of 46.