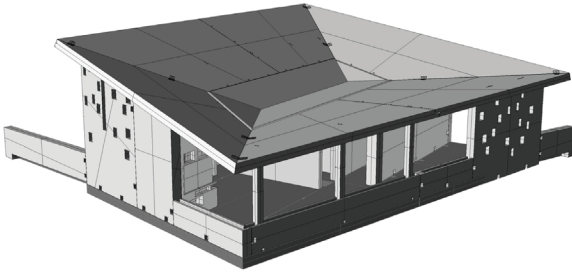


# A.L. PATTERSON, NYCON & NORTHEAST PRECAST UNITE

PRECAST CONCRETE HOUSE UTILIZES FIBER REINFORCEMENT & NEW LIFTING TECHNOLOGY

JULY 28, 2011



Producer and Supplier partner together to build the first precast project for the U.S. Dept. of Energy's Solar Decathlon.

This year, the U.S. Department of Energy presents its fifth Solar Decathlon, a competition that calls for green innovations in the construction of the future. For the first time in history, they will be judging a home constructed of precast concrete.

One of the 20 teams participating in the competition was Team New Jersey, which included students and faculty from The State University of New Jersey (Rutgers) and New Jersey Institute of Technology (NJIT). The team designed the concrete panels to employ a wide variety of special conditions. Based on a beach house design, "eNJoy: A Generation house," utilizes its architecture with solar panels and other integrated systems to function as a completely self-sustaining home.

Northeast Precast of Millville, NJ stepped up to sponsor and build THiN-Wall® panels for this project. "We do precast homes and commercial buildings every day," says John Ruga, President of Northeast Precast, "but this was a unique opportunity to push the envelope and see what could be done with precast." To address some of the new technological challenges of the design, John enlisted the help of his trusted concrete accessory supplier, A.L. Patterson, Inc. and Patterson affiliate

Nycon Corporation. With the experience and knowledge of Patterson's people, specifically Barry Fleck, Skip Francies and Paul Bracegirdle of Nycon, John was able to find the right combination of solutions that would help him reach his goals.

Northeast Precast needed to produce over 30 pieces of THiN-Wall® insulated precast panels, none of which were identical in shape, size or weight. The specifics of the panel needed to be taken into consideration when figuring out which way to lift and handle each piece, not just once but a multitude of times. The house was first erected in late July, 2011 on NJIT campus in Newark, NJ for student and faculty evaluations, but would be moved to The National Mall in Washington D.C. for the 2011 Solar Decathlon. At the conclusion of the competition, it would be disassembled again and transported permanently to an unknown location near the Jersey Shore. Sustaining structural integrity and appearance of the concrete panels through the stresses of this plan added to the challenge that Northeast Precast, Patterson and Nycon faced. They needed to find ways to reinforce, lift and handle these pieces safely.

John brought his concerns to Skip Francies, the President of Patterson's Precast Division, whom is well-known in the industry for his patented lifting devices providing custom solutions for a variety of technical challenges. It was

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Patterson's Sandwich Anchor installed



Then removed when no longer needed

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clear that one of the problems they faced was determining how to lift the THiN-Wall® panels without affecting the thermal performance of the system. This has always been the case with insulated precast wall panels and none of the existing lifting and handling systems could eliminate the thermal bridging. They collaborated on existing options, but Skip created an entirely new lifting system to address these problems. The new system, named the Quik-Lift Zero Series, revolutionizes sandwich panel lifting technology. This patent pending, three-part system is made up of a reusable center lifting plate and two “wings”. The wings are cast into the exterior and interior wythes, using tension reinforcing to lift and support each wythe separately. The lifting plate is bolted to the wings and then the lifting clutch lifts and moves the panel into place. Once the panel is secured, the plate is removed, totally eliminating the thermal bridge.

John, being extremely pleased with the solution offered, explains how the device works on site.

*“The main theory behind it when we reached out to A.L. Patterson was that we told them we wanted a device that would not emit any thermal conductivity between two wythes of the concrete. They came up with the 3-piece lifter that bolted together during the casting process. After the panel is set, you reach in, remove the bolts and the lifter comes right out. It works extremely well. Then what we did was insert a foam piece in place of the lifting device to fill the cavity in. Now, it is totally insulated. You don’t want to go through all this time and effort in building something and then put a short circuit in the system. We’ve never used a lifting device like this because it wasn’t available until it was developed for this project. We want to thank A.L. Patterson for doing that for us.”*

Since the THiN-Wall® panels were constructed of 3-4 inches of poured concrete sandwiching a foam insulated core, there were few options for strengthening the concrete. This was necessary to prevent cracking during manufacture and particularly during lifting and handling. The solution reached between John and Paul Bracegirdle, Executive Vice President of Nycon Corporation, was to add

a blend of two types of Nycon-PVA fibers to the concrete mix. The first fiber is a micro-fiber (Nycon-PVA RSC15)



NYCON-PVA RSC15



NYCON-PVA RF4000

“Nycon-PVA fiber technology can significantly reduce concrete cracking, add flexibility to the panels, reduce handling stress cracks and resist a wide variety of environmental attacks on concrete.”

for crack resistance during production and curing, as well as providing toughness. The second fiber is a macro-fiber (Nycon-PVA-RF4000) for providing increased modulus of rupture and post-crack strength to the panels. Paul, whom holds numerous industry-related patents, showed John how Nycon-PVA fiber technology can significantly reduce concrete cracking during the process. PVA can also add flexibility to the panels, reduce handling stress cracks and resist a wide variety of environmental attacks on concrete. As a result, the precast panels would hold their condition long past the competition.

Quality technical help and innovative solutions are normally not available from suppliers, but they should be. This is where A.L. Patterson, known as the Single Source Supplier to the concrete industry, truly stands alone. The supplier needs to have the right combination of knowledge, experience, coupled with a broad range of great products, a willingness to help and the ability to deliver. “It is that symbiosis of great business and great minds when great things are achieved,” says Barry Fleck. “As a result of our combined efforts, the project was a valuable mesh of industry innovation and achievement.” The project proves that a bond between a producer and their supplier is integral to creating durable, attractive concrete products. So, whether the eNJoy house wins the 2011 Decathlon competition or not, it will forever stand as a monument of great accomplishment and teamwork. ■