

Precast Concrete Industry Performs Life-Cycle Assessment

Building operations in the United States consume significant amounts of energy and materials. According to the U.S. Green Building Council, building operations account for about 40% of all energy use in the United States. Coupled with the public's increasing awareness about sustainability, companies are responding by making claims about the environmental impact of their products.

While these demands have caused companies to provide more-detailed information about their products, the information provided is not always based on research and scientific fact. Realizing the importance of understanding its true environmental impact, the precast concrete industry in Canada and the United States launched a life-cycle assessment (LCA) research program in late 2008. An LCA provides an environmental-impact assessment for the scope selected, most often a product, material, or project. The full research program includes a cradle-to-grave LCA of underground products, and a cradle-to-grave, comparative LCA of commercial buildings. The first phase of the two-phase program was completed in October of 2009.

The main goal of the research program is to better understand precast concrete's environmental life-cycle performance in mid-rise concrete buildings relative to alternative structural and envelope systems and the life-cycle performance of underground infrastructure precast concrete products by applying and following the ISO 14040 series.

Preliminary results of the precast concrete LCA suggest that precast concrete sandwich wall panels provide an extremely energy-efficient envelope system when designed correctly. Energy efficiency is one of the greatest contributors to the overall environmental impact from a building. A more-detailed report is being developed and will be available in the future.

The results are also being used to help identify areas where manufacturers can reduce the environmental impact of precast concrete. To facilitate these improvements, PCI is developing and implementing an environmental improvement program for precast concrete manufacturing facilities.

The program is in development and is anticipated to be launched in January 2010. The initial goals of the program are:

- To educate more precast concrete manufacturers on their environmental impact and get them to track data related to their impact
- To collect more data on industry-wide values related to key performance indicators
- To recognize plants striving to make reductions in their environmental impact

Rather than a checklist-type program, the intention is to have a multistage, or iterative, program that will evolve with the sophistication of the participating plants. The initial rollout of the program will ask participants to report annual data on identified key performance indicators. Plants will be assessed relative to their individual performance and incremental improvement.

The second stage of the plant program will compare individual plant results to others in the industry using the data gathered from the first stage. Once enough data are collected to establish an industry benchmark, reporting of environmental data will be an ongoing practice as part of a plant's certification maintenance.

The precast concrete industry and PCI are committed to better understanding their environmental impact and potential ways that precast concrete can contribute to sustainable design and a better tomorrow. We are also dedicated to continuously improving our operations and minimizing or eliminating any negative factors related to the manufacturing process. For updates on sustainability research and access to other resources, visit www.pci.org/sustainability.