

Lightweight Pink Concrete Heart Necklaces

A reminder of breast cancer awareness

by Luke M. Snell

The ACI Fall 2013 Convention is taking place October 20-24 in Phoenix, AZ. October is also National Breast Cancer Awareness Month throughout the United States. To highlight the convergence of this event and campaign, the ACI Arizona Chapter and the ACI Arizona State University (ASU) Student Chapter are working together to make lightweight pink concrete heart necklaces that will be available at our chapter table. For a small donation, ACI convention attendees can pick up a necklace. Donations collected for the necklaces will be given to the Desert Cancer Foundation, an affiliate of the American Cancer Society, and the Pink Heals Tour, a program that works to empower young women facing cancer.

The ACI Arizona Chapter Convention Committee embraced the idea of making the lightweight pink concrete hearts for several reasons:

- To provide a chance for the ACI ASU Student Chapter and the ACI Arizona Chapter members to work together on a meaningful project;
- To remind the recipients of the pink concrete hearts that breast cancer is a curable disease, if detected early enough; and
- To reinforce the concept that engineers and constructors have the responsibility of solving society's problems by using their technical skills.

Working Together on a Meaningful Concrete Project

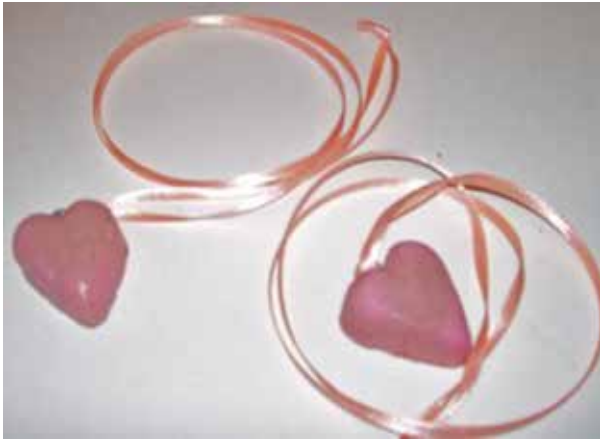
As students learn early in their schooling, concrete's worldwide popularity is largely due to the fact that it is fluid when placed and will assume the shape of the mold it is placed in. They also learn that concrete properties are controlled by the ingredients that are selected by the designer. Most of the concrete that students have already seen is a shade of gray and heavy; thus, students may think of concrete as a universal material that is best hidden from sight.

In addition to boosting awareness of the fight against cancer, our project had the goal of showing students that concrete can be custom-made and used to create truly artful as well as functional products. The concrete heart project created many challenges for the students, including:

- Making the concrete pink—to achieve a pink shade, coloring agents must be added to the concrete mixture. While several companies make coloring agents for



Participants from the ACI ASU Student Chapter helped make the pink concrete hearts



The ACI Arizona Chapter will have lightweight pink concrete heart necklaces available at the ACI Fall 2013 Convention in Phoenix, AZ

concrete, they tend to be earth tones. The students met this challenge by experimenting to find the right combination of coloring agents;

- Achieving uniform color—to accomplish this, the students found that aggregates and cement must be consistent and as white as possible; and
- Creating lightweight concrete—most concretes have a specific gravity of 2.2 to 2.4. The students decided to make concrete that floats, so they needed to come up with a mixture with a specific gravity of less than 1. After they learned that cement has a specific gravity of 3.15, they knew that they needed an extremely lightweight aggregate. Materials that will meet these requirements include vermiculite, perlite, and sawdust from low-density woods. These materials have specific gravities ranging from about 0.1 to 0.2, so when used in a mixture with one-part cement to three-parts aggregate by volume, the resulting concrete will actually float in water. Perlite was selected as the aggregate, because it met the weight requirements and it's white.

Reminder to Recipients of the Pink Lightweight Concrete Hearts

The color pink has been selected in the United States to highlight breast cancer awareness. At awareness events held around the country, pink T-shirts and ribbons are given out to show support for women who have battled breast cancer. Since this disease is curable if caught early enough, the American Cancer Society and the Susan G. Komen Breast Cancer Foundation have developed information for women on how to do self-examinations and what they should do if they discover a lump or change in their breasts. The pink ribbon or T-shirt—and now the pink lightweight concrete heart necklace—are reminders to women that they need to do this exam monthly and that breast cancer does not need to be a death sentence.

The Responsibilities of Engineers and Constructors

Engineers and constructors have a responsibility to society to design and build safe structures, roadways, and bridges. Engineering and construction students may get so caught up in homework assignments and tests that they lose sight of the many responsibilities they will be assuming. Although designing and making lightweight pink concrete heart necklaces will not be typical of the projects these students will experience in their future careers, the project does provide a symbol of how engineers can help to overcome a major problem in our society.

Concrete Cares

The lightweight pink concrete heart necklaces can be looked at from many perspectives. This project shows concrete as an art form, presents a technical challenge that teaches our university students the versatility of concrete, and offers a symbol of hope for families. It is the ACI Arizona Chapter's wish that the attendees of the ACI Fall 2013 Convention in Phoenix will pick up a pink lightweight concrete heart for every female family member. This gift will be a "concrete" reminder that breast cancer can be cured.

ACI convention attendees can also show their support of Concrete Cares, the initiative started by Mike Murray of Decorative Concrete (www.concretecares.com), to increase awareness of cancer research, prevention, and treatment. Attendees will be encouraged to wear pink on Monday, October 21. Concrete Cares T-shirts will be available for a donation.

Selected for reader interest by the editors.



Luke M. Snell, FACI, is a Senior Construction Materials Engineer with Western Technologies, Phoenix, AZ. He has done extensive consulting work on construction and concrete problems throughout the United States, Saudi Arabia, Mongolia, and Algeria. He is the Chair of ACI Committee 120, History of Concrete. He is a member

of several ACI committees, including 214, Evaluation of Results of Tests Used to Determine the Strength of Concrete; E702, Designing Concrete Structures; S801, Student Activities; S802, Teaching Methods and Educational Materials; the Fellows Nomination Committee; the TAC Concrete Terminology Committee; and ACI Subcommittees 318-W, International Workshop Planning, and C601-B, Concrete Quality Technical Manager.