

Wash U - St Louis Audiovisual Presentation, Solar Decathlon 2017

<https://youtu.be/iBi83tvITRY>

Text version:

Dylan Weber Callahan

Architecture and construction management

0:13

When you first walk up to it, it's a little overwhelming. You first see this massive structure. And you kind of wonder, why is this better than some other way, or form of construction?

0:23

Over the last two years, more than 100 WashU students, from architecture, engineering, computer science, and other areas of the university, have all worked with industry partners, for design, fabrication, and now finally the install of the CRETE house.

Ethan Miller

Architecture and construction management

0:38

Concrete is extremely durable, so we have a very resilient house. It's going to be able to stand basically any disaster, even up to tornado force winds.

0:52

It has a high thermal mass, which means its going to hold heat longer. And then it's going to give off that heat at night. It has to do with natural ventilation and giving off heat more sustainably, rather than using traditional HVAC systems.

Dylan

1:05

We were able to build our house, from having site-prep complete, the gravel compacted, all the way to the finish of the gutters, all in five construction days. And to be able to do that in one work week, I think, is a pretty great feat that we're all pretty proud of.

Ethan

1:19

In designing the CRETE house, we put a lot of thought into how we collect water and how we handle water.

1:24

We use water in our radiant heating system. So we have radiant-heated floor, and a radiantly cooled ceiling.

1:31

We have a water collection system using the gutters of the house. The gutters help make a more interesting exterior space, but it also helps collect rain water for a vertical hydroponic garden system.

1:44

Once the CRETE House is up and running, we think that the garden will help feed the inhabitants for most of the year.

Dylan

1:49

For the wall panels, there's a material called Ductal. Our wall panels are a sandwich panel of four inches of structural concrete, five inches of insulation and an inch-and-a-half of this Ductal material. It's ultra-high performance concrete.

2:02

This material is I think six times stronger than typical structural concrete.

Ethan

2:07

We also took into account, in the steel connections, seismic forces. So that this house will not only be able to withstand tornados and hurricanes, but also earthquakes.

Dylan

2:17

Right now, concrete is used typically on larger buildings, larger projects, more industrial commercial projects, but it's not really used in the residential construction industry as much.

2:27

And by using concrete, obviously, for our entire house, in terms of the foundations, the walls, the roof panels, floor panels, the gutter systems – everything – in a way that they all tie together, so uniquely, that we're using this as a catalyst to possibly have more efficient ways to use concrete in the construction industry in the future — at a smaller scale.

