APA
ARCHITECTURAL PRECAST ASSOCIATION

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ARCHITECTURAL precaster

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Arizona State University, ISTB-7 Building

An In-Depth Look at an APA Award Winning Project

ARIZONA STATE UNIVERSITY, ISTB-7 BUILDING
UNLIMITED DESIGNS
APA 2022 DESIGN AND MANUFACTURING AWARD WINNER

Overview

This building on the Arizona State University campus in Tempe, Arizona has many unique design elements. The complex nature of the design by team Grimshaw and Architekton required extremely close collaboration between the Unlimited Designs (UD) team, the general contractor McCarthy and installer MKB Construction.

The GFRC elements created geometric shapes that enclosed the entire building. Each facade had a different shape based on where it was located on the building and how the sun touched it. The geometry of the panels was designed so that as the sun crossed the sky, the panels would minimize the amount of direct sunlight and Arizona heat that would enter through the windows.

Aesthetics

The whole creation of the project was done in reference to Arizona's environment. A light sand color was chosen to match the Arizona ground and the mix design was made with aggregates to compliment the Arizona desert landscape. Each GFRC element was designed for aesthetics but also to divert the sun's rays.

Design

While the panels on the building may all look the same, each facade has similar but slightly different geometric shapes that comprise the entire building. Those slightly different geometric shapes were designed to minimize energy costs in cooling the building due to direct sunlight from the heat of the Arizona sun.

Manufacturing Excellence

In order to ensure consistent color in almost 1,700 pieces, the entire quantity of aggregates was purchased at the same time. The texture was controlled by each individual panel being checked by high and low control samples as it was finished.

The geometry of shapes and blind connections used to attach the overlapping panels was very challenging. The complexity associated with the design and installation of each individual GFRC element was educational for the UD team. It required a high level of collaboration in both the design and manufacturing of the project.

The architects and engineers put a great deal of time into the light studies that were used to aid in developing

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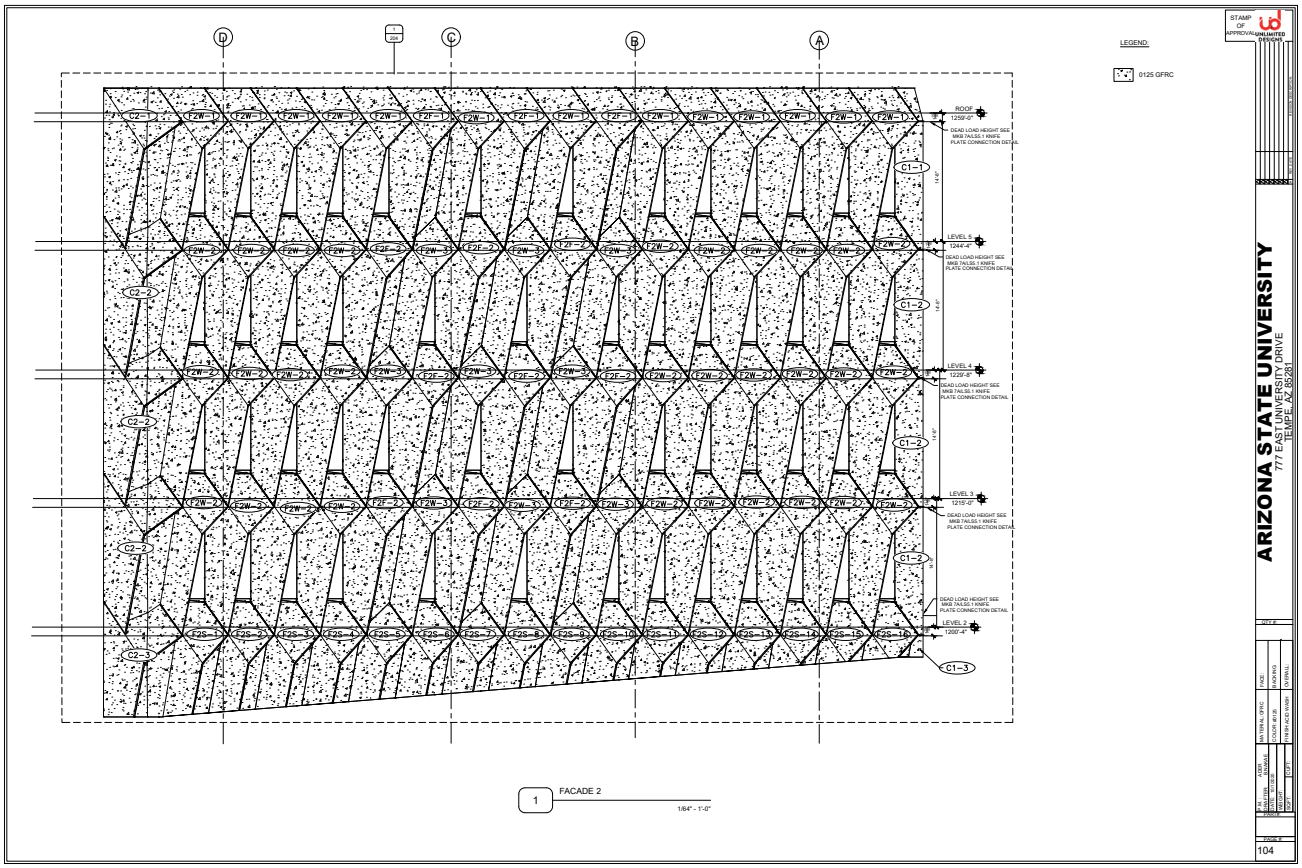
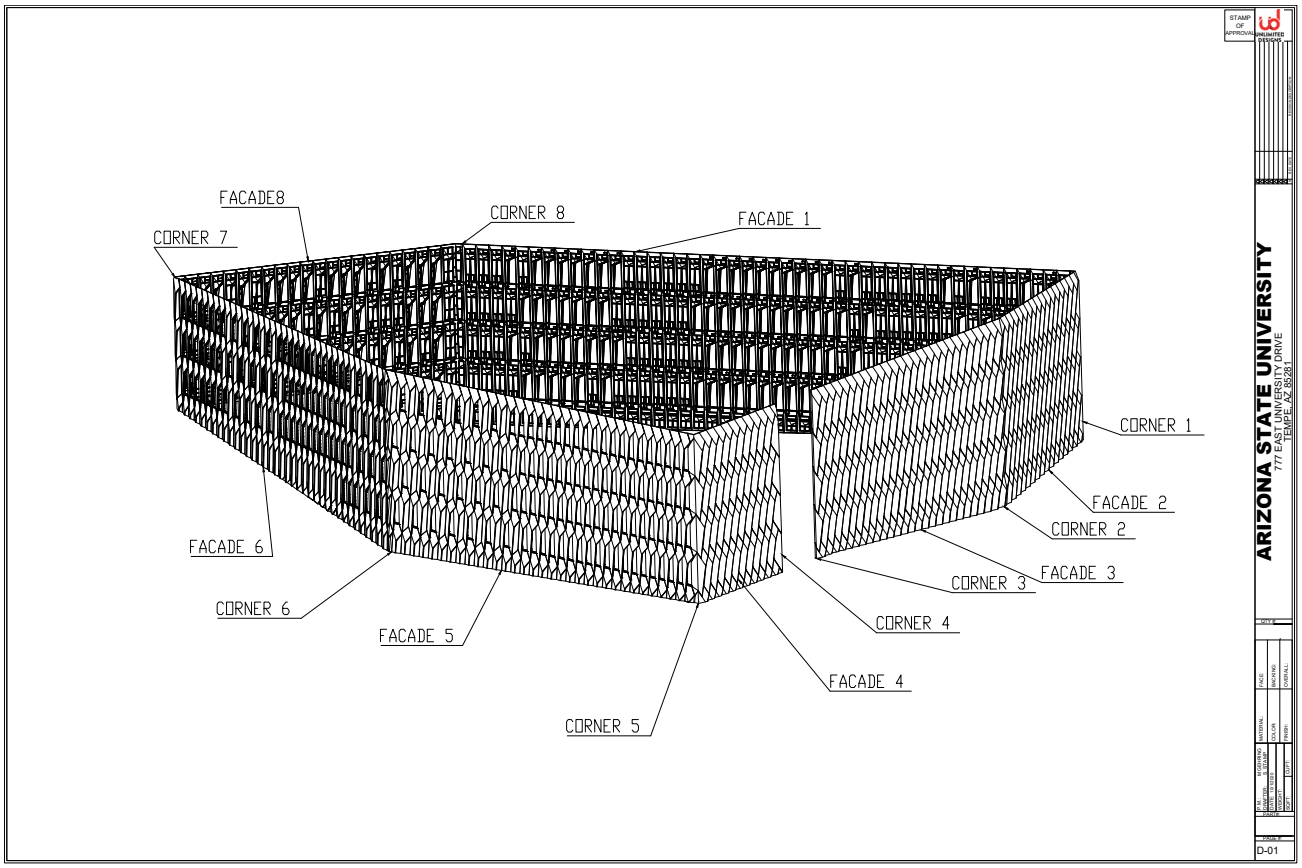

LEGEND:
012S GFRC
ROOF
1259'-0"
LEVEL 4
1244'-4"
LEVEL 3
1215'-0"
LEVEL 2
1200'-4"
DEAD LOAD HEIGHT SEE MKB 7ALSS.1 KNIFE PLATE CONNECTION DETAIL
FACADE 2
1/64" - 1'-0"
ARIZONA STATE UNIVERSITY
777 EAST UNIVERSITY DRIVE
TEMPE, AZ 85281
104


FACADE8
CORNER 7
CORNER 8
FACADE 1
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FACADE 2
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FACADE 3
CORNER 3
CORNER 4
FACADE 4
CORNER 5
FACADE 5
CORNER 6
FACADE 6
ARIZONA STATE UNIVERSITY
777 EAST UNIVERSITY DRIVE
TEMPE, AZ 85281
D-01

BY THE NUMBERS

Unique Molds produced: 21
Total Molds to meet schedule: 33
Pieces produced: 1,696
Square feet: 95,000

the geometry of the building. "We are very proud of the way our team executed on the production of this extremely elaborate project. For the parts to fit accurately, the attention to detail on the back of the part was just as critical. It was a lesson in communication to be sure!" said Jennifer Welding, CEO at Unlimited Designs.

Lessons Learned

Every job creates "lessons learned" and the opportunity to perform better on the next project. On this building, the blind connections required each panel to have an extremely precise location on the facade, which reinforced the commitment the UD team places on the collaboration between manufacturer and installer. With the precision needed to make blind connections work, the UD team recommends that producers pay close attention to the field tolerances of materials and take them into account when designing connections to avoid connection-related problems during installation.

Awards

The jurors deemed this project worthy of two APA Design and Manufacturing Awards in 2022, noting the unique design and innovative use of precast to achieve a beautiful aesthetic and energy efficient building. "We greatly appreciate the recognition for our part in creating this vision the university and architect created" said Matt Gehring, COO at Unlimited Designs.