



AEI International Student Design Competition Competition Program

Addendum 2022

The Challenges

The competition will challenge the student teams to address the design, integration, and construction issues associated with this project. Please keep in mind that the Challenges presented have been created for the sole purpose of the International Student Design Competition. Submissions should address the following challenges:

1. **Resiliency: Natural Disasters.** Being conscious of the geographic location and related weather impacts, this challenge requires teams to design this facility to a higher level of performance beyond code regarding natural disaster resiliency for its occupants. For this challenge, teams are tasked to adjust the building design such that it will serve as a campus shelter in the event of an applicable geographic natural disaster (such as a tornado, earthquake and/or hurricane as examples) causing threatening damage. The building structure and enclosure should be able to resist the loads, movement, and failure prevention associated with local natural disasters as determined by the teams. This challenge requires:
 - The entire building to withstand an EF3 tornado at a performance a level appropriate for the building to serve as a community shelter after the event. Details on the exact performance level should be selected and justified by the team. To serve as a community shelter, the building envelope (walls and roofs) must maintain their integrity during the event, related wind loads and debris impact.
 - Single or multiple segments within the building are to be sized as a safe room for a higher resiliency level (than the rest of the building). This safe room design must meet EF4 tornado requirements per FEMA and ICC 500 to protect individuals working in/occupying the building during an event. These space(s) may be integrated with current spaces or may be constructed as an addition.
 - Other applicable code required considerations.

Teams need to consider all relevant disciplines in their designs, including architecture, engineering, construction, and maintenance. Details on performance levels should be researched and justified by the team based on the type and use of the building, geographic location, and surrounding community. Additional costs for the challenge enhancement must be justified along with the space allocation.

2. **Emergency Planning: Utilities.** Considering the recent ERCOT power grid failure during extreme cold temperatures and the common rolling blackouts during summers, the College would like to pursue energy harvesting and storage strategies to support the new building and/or surrounding buildings in the event of a utility power outage. Teams must provide a plan for operating HVAC, lighting and general-purpose power “off grid” at 100% for 2 days and 20% for 5 days (percentages based on building square footage) until utilities can be restored to have the building serve as a community shelter function for local residents to stay warm during a winter outage and cool during a summer outage. Fire protection systems, communication systems and egress lighting should remain operational for the entire building.



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3. **Building Performance Enhancement.** Innovatively design systems for the Tarrant Community College District Building #2 that exceed the energy performance of the building by at least 50% over ASHRAE 90.1-2019. Teams should consider:
- Thermal Performance: The team should focus on how the thermal envelope can be re-designed to reduce the overall building energy consumption.
 - Daylight Performance. Design the envelope to use daylight as a primary source of light. Ensuring that 80% of all the area on regularly occupied spaces on floors 1-3 have access to adequate daylighting that is controlled for solar glare.
 - Acoustical Performance: Ensure that the sound isolation from exterior noise in all acoustically important spaces is appropriate.
 - Green Roof: Design a Green Roof for the facility.

Building Information

Student Success Center (Building 2), Tarrant Country College District, Fort Worth, Texas
Student Success Center (Building 2) is 3 stories, 90,000SF. The building consists of faculty offices, classrooms, and facilities focused on Student Success. The project is scheduled for completion in 2024.

For the purpose of the AEI International Student Design Competition, the target total building budget will be \$42million. Costs associated with the Challenges listed above should be budgeted separately and included as add alternates.

A document with applicable codes will be provided to registered teams with the other project documents.

Competition Timeline

Student Team Registration begins	Monday, August 16, 2021
Student Team Registration ends	Wednesday, January 12, 2022 1:00pm EST
Deadline for Written Submissions	Monday, February 21, 2022 1:00pm EST
Notify Finalist Teams	Monday, March 7, 2022
Finalist Presentations	Thursday, April 7, 2022 (Austin, Texas)

All teams may continue to work on their projects after the written submission in anticipation of possible selection as a finalist team and in preparation for the finalist presentations. The architectural engineering programs are encouraged to have competing students present their projects to their peers and faculty. It is also encouraged that they receive comments and suggestions from these individuals at multiple instances throughout the project.