2018 Timber Design Competition

The Department of Civil and Environmental Engineering, with support from the Idaho Forest Products Commission (IFPC), are pleased to announce a competition for the IFPC Engineering Design Award for students enrolled in CE 404/504-Timber Design. The goal from the competition is to engage future professionals in developing sustainable structural designs of the Idaho Central Credit Unit Arena on the University of Idaho campus that will be constructed from renewable sources using new and traditional wood materials. The competition will challenge participants to interpret and arrange numerous methods of structural systems with a focus on innovations in wood design.

For thousands of years, wood has been used as a building material. Modern timber products and systems have greatly expanded the potential uses of this historic material. Timber is an ideal green building material: it is well suited for a broad range of structural and aesthetic applications, it offers economical construction and high-performance characteristics; and wood is an economic driver to maintain forests and protect jobs in rural communities.

Proposed architectural layout of main arena area
The Challenge
The competition challenges students to design the Idaho Central Credit Unit Arena. The description of the innovative structure is posted on the arena website as:

“The arena is intended to be designed to showcase massive curvilinear roof that drapes itself over the building. V-shaped timber columns are on prominent display above the entrance, while the underside of the roof features a curving lattice of wooden beams that’s visible from everywhere in the building. Light wood finishes have been used in the few interior areas where the structural elements are hidden, and the building’s exterior will be cladding in metal paneling”.

Criteria for Judging
Criteria for the judging design submissions will include: (1) Timber/wood as the primary structural material; (2) Creative and innovative use of timber/wood as a design solution (3) Efficient use of wood materials and/or constructability of design details.

Competition Details
The competition is for UI students who are enrolled in CE 404/504-Timber Design class during the Fall 2018 semester. Architectural drawings of the arena will be provided to students to help start the structural design process.

Students will work to perform the following:
1. Provide at least three alternatives for the Level-01 floor plan main framing system (10%).
2. Perform structural analyses of the three alternatives using either RISA3D or SAP2000 software (10%).
3. Conduct a comprehensive timber design of the most beneficial alternative using the latest version of the wood design manual-NDS (30%).
4. Prepare detailed calculation report to provide the most economical solutions/sections. (Hint: you need to contact at least one outside source to get the up-to-date labor and materials cost) (25%).
5. Deliver the final design details of the main framing system using AutoCAD-generated drawings (25%).

P.S:
- The winners will be announced and awards will be distributed based on the criteria on shown above.
- Undergraduate students are expected to be involved in the design competition, however the graduate student leading each team will be responsible of the main tasks and mentor the undergraduate students.
- Each team consists of ONE graduate student and FOUR undergraduate students as listed below on page 3.
- Arena architectural plans are attached to this document.
- The instructor will perform a peer review in addition to the feedback from the judges.
- More information about the award ceremony will be announced to you during the semester.
- Please keep the provided arena drawings VERY confidential as the project is still under contracting.
**Deadline:** Students are required to submit their final report electronically as a single PDF file to Dr. Ibrahim by 5 pm on 11/27/2018.  
[aiibrahim@uidaho.edu](mailto:aiibrahim@uidaho.edu)

### Anticipated Project Groups

<table>
<thead>
<tr>
<th>Team No.</th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
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<tbody>
<tr>
<td><strong>Lead</strong></td>
<td>Almakrab Abdullah</td>
<td>Arowojolu Olaniyi</td>
<td>Gdeh Tawfeeq</td>
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<tr>
<td><strong>Members</strong></td>
<td>Alrashdi Ayoub</td>
<td>Bemis Nathan</td>
<td>Corley Austin</td>
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<td>Langan Riley</td>
<td>Graff Joshua</td>
<td>Hodgson Cody</td>
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<td></td>
<td>McCain Joshua</td>
<td>Tompkins Nicole</td>
<td>Noe Walker</td>
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<tr>
<th>Team No.</th>
<th>Group 4</th>
<th>Group 5</th>
<th>Group 6</th>
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<tbody>
<tr>
<td><strong>Lead</strong></td>
<td>Mohamed Mahmoud</td>
<td>Ramirez Kevin</td>
<td>Al Hatailah Hussain</td>
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<tr>
<td><strong>Members</strong></td>
<td>Felton Cooper</td>
<td>Almuhaisen Suliman</td>
<td>Dieckmann Morgen</td>
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<td></td>
<td>Johnson Nathan</td>
<td>Bomber Paul</td>
<td>Wood Chaney</td>
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<td></td>
<td>Lamberton Dylan</td>
<td>Weimer Eric</td>
<td>Aus Connor</td>
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Student Design Awards – IFPC is sponsoring an award to recognize the best use of Idaho wood in structural design.

Award Title: Best Use of Idaho Wood (Idaho Species & Products)
Level: Timber Design Engineering Students

Judges: 2018 Panel of Judges:
- ASCE Idaho Section representative – TBD
- Forest Industry Representative – TBD
- Regional Professional Engineer(s) -- TBD
- Woodworks Representative – TBD

Criteria: Best use of Idaho wood in a structural design that demonstrates a creative solution and knowledgeable application.

Awards: The first-place team will be awarded $600 from IFPC with Plaques for graduate and undergraduate students. The second-place team award consists of $400 cash with Plaques for graduate and undergraduate students. Awards are at discretion of judges.
1. Reference Sheet AX.XX for mounting heights and general information.

2. Reference lighting/electrical for lighting types. Not all lighting is shown on the architectural plan.

3. Concept A: 3/32" = 1'-0".

Concrete shear Walls.

Step edge line at exterior/roof.

12" deep joists to structure above.

Concrete shear walls.

Vera-Stud walls at exterior, TYP.

U.N.O. pre-engineered telescoping bleacher seating.

SLT7 cross laminated timber floor structure; alternatively, can review potential donated products (NLT, GLU-LAM planks, etc.).

Concrete shear walls.

Glulam posts to structure above.

Glulam beams to support walls above.

Glulam beams.

Structural soffit framing.

Alternate framing option: BC glulam purlins with 3x T&G decking.
LEVEL 03 FLOOR PLAN

KPFF 9.29.17

14" DEEP BCI 5000 WOOD I-JOISTS AT 16" ON CENTER WITH 1/2" TYP. AT CONCESSION POD ROOFS

14" DEEP BCI 5000 WOOD I-JOISTS AT 16" ON CENTER WITH 1/2" TYP. AT CONCESSION POD ROOFS

1/2" CIVER BEAM AT CHAPEL FOR FUTURE USE

1/2" CIVER BEAM AT CHAPEL FOR FUTURE USE

GLU-LAM GIRDERS, TYP.

EXTEND A PORTION OF SHEAR WALL UP TO ARENA ROOF OR PROVIDE STEEL DIAGONAL BRACING

14" DEEP BCI 5000 WOOD I-JOISTS AT 16" ON CENTER WITH 1/2" TYP. AT CONCESSION POD ROOFS