2027 CFSEI STUDENT COMPETITION

Learning Objectives

- Gain exposure to designing with cold-formed steel (CFS)
- Communicate designs through technical drawings and reports
- Utilize CFS to address real-world societal problems
- Foster excitement about CFS design

Problem Statement

For decades, a small wood-framed ice shanty served anglers and outdoor enthusiasts on the frozen waters of Lake Winnebago, Wisconsin. The structure became a familiar landmark during the annual sturgeon spearing season and winter recreation events. Unfortunately, the aging wood structure was recently destroyed by a fire, leaving the community without a gathering shelter on the ice.

To replace this loss, the community is seeking an innovative, durable, and transportable replacement that highlights the advantages of cold-formed steel construction. The new ice shanty must provide a safe, weather-resistant shelter while demonstrating the efficiency, sustainability, and resilience of cold-formed steel framing systems.

Student teams are challenged to design a modern ice shanty for three occupants using cold-formed steel that can be transported to and from the lake on a trailer and withstand Wisconsin's demanding winter environment.

Design Considerations & Challenges

- All designs must use cold-formed steel framing as the primary structural system. This material is chosen for its durability and fire resistance. Students can use industry standard stud profiles, proprietary products such as studs and clips, or they can design custom shapes or clips of their own.
- Design to include shell (walls, roof, floor), one door, one floor opening and lateral system (min).
- The exterior finish should be noncombustible and weather resistant suitable for exposure to snow, ice, and wind.
- The completed structure must fit on an open flat-bed trailer (8’x10’) with a maximum allowable transported weight of 3000 lb. Transportation load analysis is not required.
- Attachment to ice is not required.
- Students should use ASCE/IBC code to determine design criteria and loads. Building is classified as Risk Category I (commercial structure)

Mentors

CFSEI will provide each participating team with an industry mentor to support student learning throughout the competition. Mentors can provide guidance on cold-formed steel design, applicable standards, constructability, and project development. Teams must submit an Intent to Participate through the CFSEI website by November 1, 2026 to be assigned a mentor. Mentors serve in an advisory capacity; all design work and submission materials must be completed by the student team.

Deliverables

1) Submit 'Intent to Participate' on CFSEI website. Deadline for mentor assignment: November 1st, 2026.
2) Competition Submission. Send to info@cfsei.org no later than January 31st, 2027.
    a. A design narrative indicating design criteria and loads used for design.
    b. Submit fully dimensioned 2D shop drawings in PDF format to include.
        i. Floor/Roof plans showing members and connections.
        ii. Wall sections and/or opening elevations showing members and connections.
        iii. Connection details
    c. Submit calculation package in PDF format showing complete design.
    Calculations should illustrate load path for both gravity and lateral systems. Design software such as RISA/SAP/RSG, etc. may be used. One hand calculation (min) must be done utilizing the information provided in CFSEI tech notes, SFIA/SSMA manuals and AISI excerpts. Access to CFS Designer software will be provided as soon as possible.

Student Membership

Students are encouraged to obtain free complimentary CFSEI membership to gain access to a wide range of benefits uniquely tailored for cold-formed steel engineers. To learn more about these benefits, please visit https://www.cfsei.org/membership

Reference Documents

- CFSEI students only section
  https://www.cfsei.org/students-only
- Introduction to Cold-Formed Steel Standards:
  https://www.cfsei.org/assets/docs/technotes/tn-beginners/TechNote%20-%20B004-20-Introduction-to-framing-standards-WEBFINAL.pdf
- AISI Standards
  https://www.cfsei.org/free-aisi-standards
- CFSEI Tech Notes
  https://www.cfsei.org/technical-notes
- Design Guides
  https://www.cfsei.org/-design-guides
- Other References
  https://www.steelframing.org/
  https://ssma.com/

Judging Criteria

- Technical correctness
- Constructability
- Presentation
- Attention to detail

Awards

1st place: $2,000 USD, award plaque, 2027 CFSEI Expo Registration and 2027 CFSEI Expo Stipend
2nd place: $1,500 USD, award plaque and 2027 CFSEI Expo Registration
3rd place: $1,000 USD, award plaque and 2027 CFSEI Expo Registration

Notes:

- Applicants are typically University students
- Winner will have the option to present their project at the CFSEI Expo in Milwaukee
- We encourage applicants to apply for the stipend program if they'd like to attend the Expo.
- Awards are intended to be granted for 1st, 2nd, and 3rd place, but all three are not required to be given if submissions do not meet an acceptable standard.