

TOWERS

2024 Div B & C

EVENT DESCRIPTION

Load testing of pre-built wooden structure designed to specific dimensions with material limitations. Tower with the highest Structural Efficiency scored AND no rules violations wins.

BUILD SUMMARY

- Designs are to use wood and bonding adhesive only
- Tower must accommodate the Load Assembly (Load Block, Eyebolt & Chain) for applying a Load
- Div B height = 50cm minimum; Div C height = 60cm minimum
- Tower must span a 20 cm x 20 cm opening on the Test Base
- Maximum load applied is limited to 15 kg
- Bonus awarded by designing a tower with no contact within the 29 cm circle
- Students are expected to build and test several structures throughout the season
- Results should be documented in a Design Log using the Scientific Process
 - Div C can earn a score multiplier

COMPETITION SUMMARY

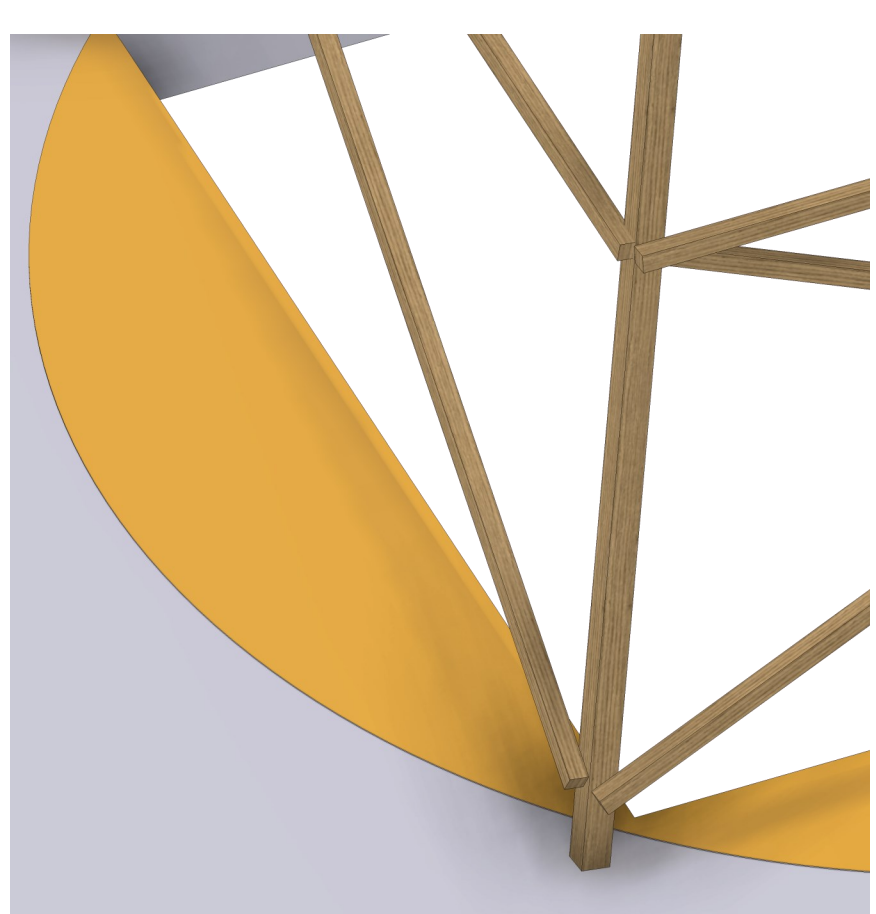
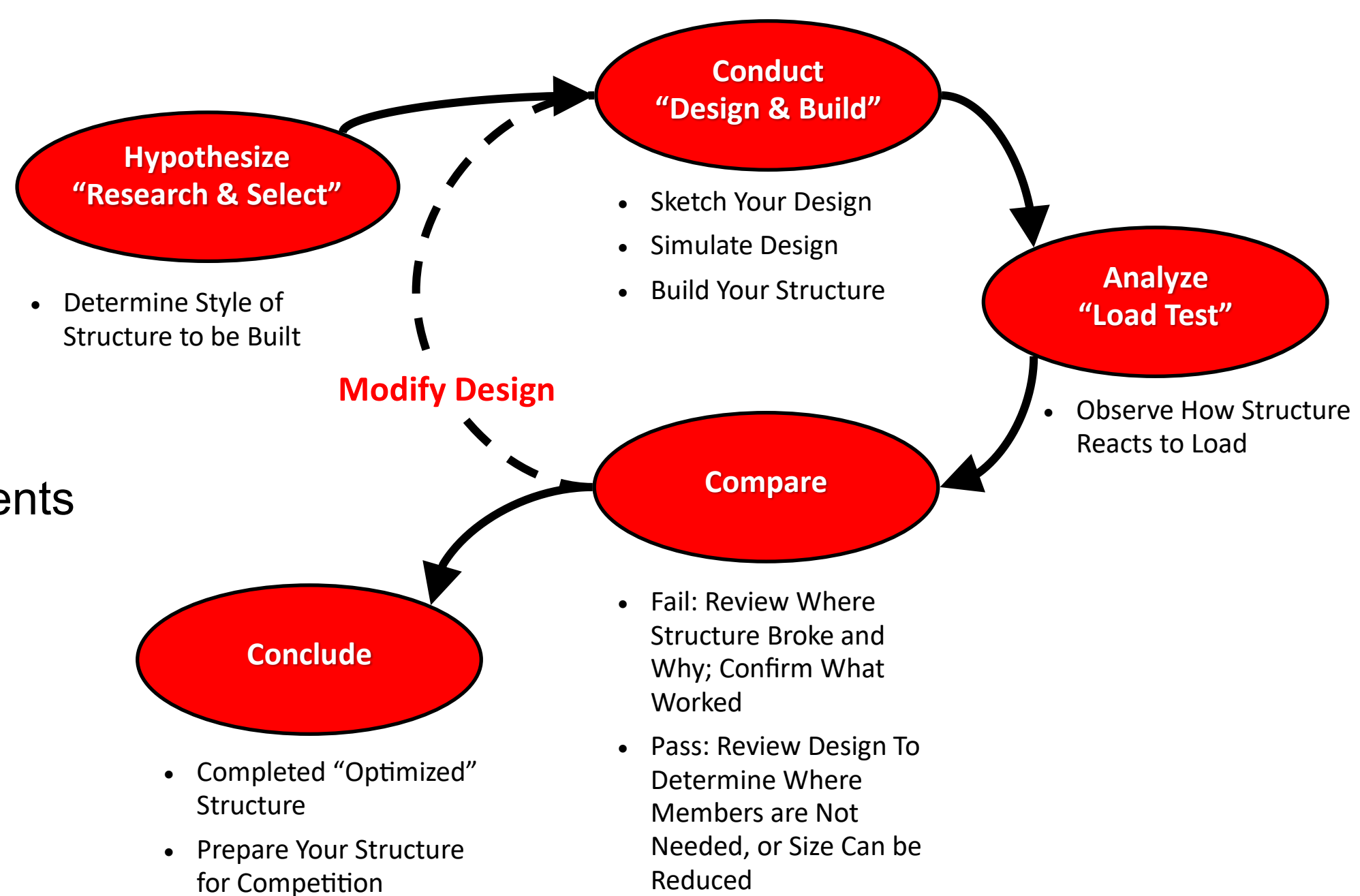
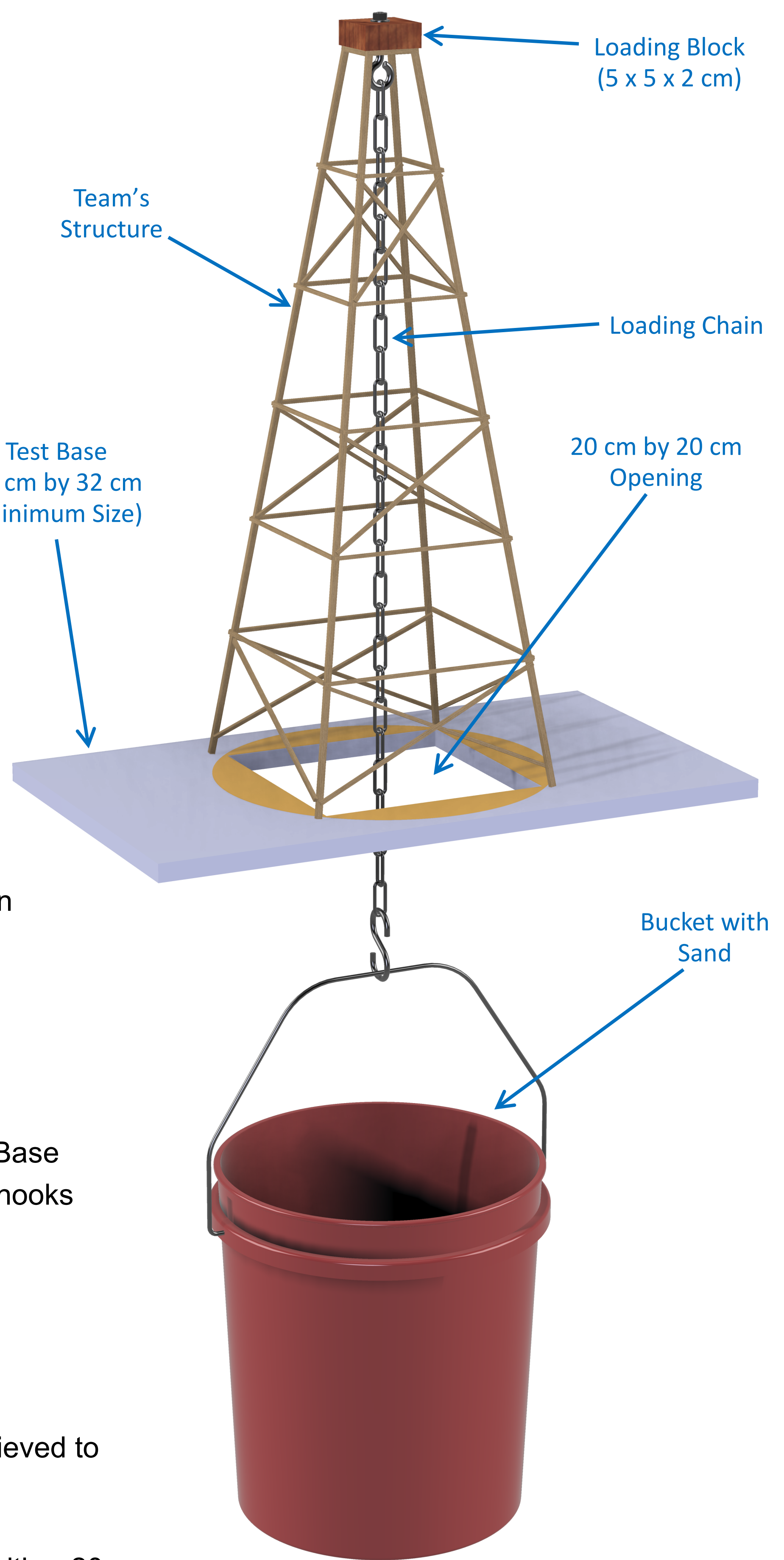
- No impound. Entire test must be less than 6 minutes
- Students will measure structure mass and height with Event Supervisor
- Load testing starts when the Students place the Tower with Load Block on Test Base
 - An empty Bucket will be suspended from the Load Block with a chain and S-hooks
 - Students will pour sand into the Bucket to load the structure until:
 - Structure failure
 - or Structure holds the entire 15 kg load
 - or the 6 minute time is expired
- Load Held (Load Assembly, bucket, and sand) is measured
- Minimum load of 1.5 kg (or empty bucket suspended without sand) must be achieved to initiate a valid test.

TEST APPARATUS

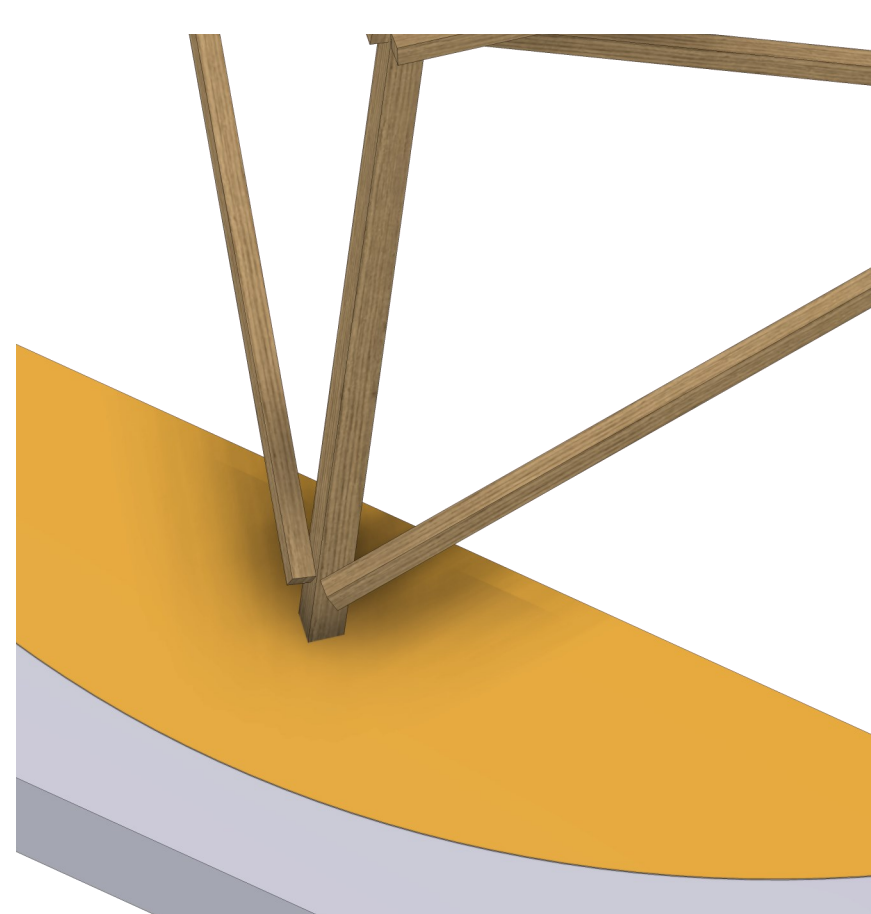
- Minimum 55 cm long x 32 cm wide sturdy, clean, smooth, and leveled tabletop with a 20 cm x 20 cm opening in the middle.
- 29 cm diameter circle will be drawn to Bonus Zone (See images below)
- Load is applied with a suspended bucket with clean, dry, free-flowing sand.
- Sand can be added manually scooped/poured, or poured by a hopper type delivery system.

SCORING SUMMARY

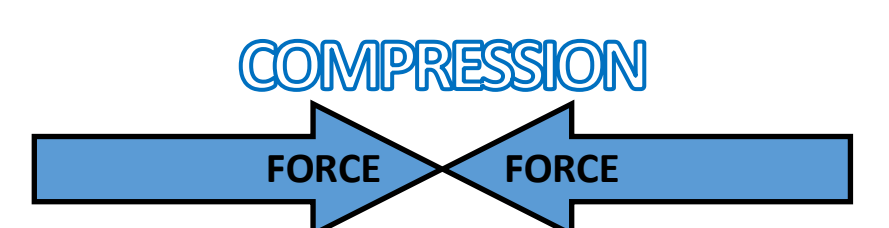
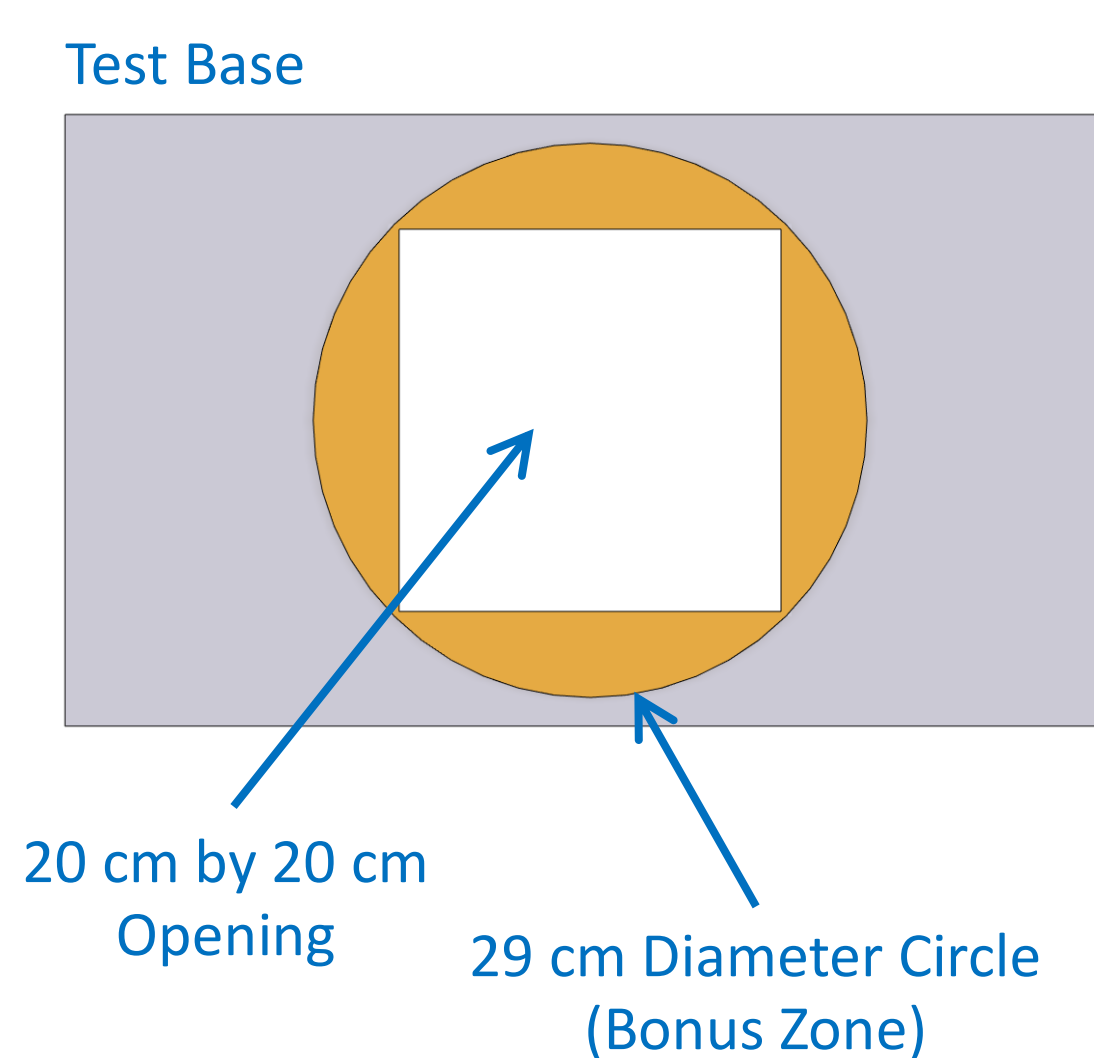
- Test scores will be ranked from highest to lowest in separate categories:
 - Tier-1 : Towers that Meets ALL Construction and Competition Requirements
 - Tier-2 : Tower that holds any load AND has any violation
 - Tier-3 : Unable to load
- Structural Efficiency (ratio) = Load Held (g) / Tower Mass (g)
 - Bonus of 5000g added to Load Held if Tower base does not contact within Bonus Zone AND Tower holds the Full Load
 - Div C Only : Score is increased if a compliant Design Log is submitted
 - Score times 1.25 multiplier



Eligible for Bonus
No Contact within 29 cm Circle



Not Eligible for Bonus
Contact within 29 cm Circle



Exploring the World of Science