

HS Structural Design and Engineering



Below is an informal checklist to assist participants in preparation for competing in this event.

REQUIREMENTS FOR CHECK-IN

- Completed model structure in box
(Fabricated according to the design specification)
- Team Verification form
- Analysis and Assessment form
- Three (3) view orthographic drawing of pre-built structure

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Team ID# _____

Team Verification Form

As the advisor for the team of students representing the school indicated below, I certify that the students have used only the specified list and quantity of materials, as designated by TSA, in the construction of their entry for the Structural Design and Engineering event. I also certify that only the two (2) team members noted have worked on the entry they are submitting for testing and evaluation.

Date: _____

Team member names (printed, with signatures):

Advisor's name (printed, with signatures):

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Team ID# _____

Analysis and Assessment Form

Complete and submit this form (signed by the chapter advisor) with the Structural Design and Engineering entry, as confirmation that a structure was designed, built, and tested prior to and in preparation for participation in conference competition.

1) Structure weight prior to testing _____

2) Predicted ultimate load carrying capacity: $F_{u,p}$ _____

3) Use the equation to calculate the error in prediction for the ultimate load carrying capacity:

$$E = \frac{F_u - F_{u,p}}{F_u} \quad E \text{ _____}$$

where

E = Error

$F_{u,p}$ = Predicted Ultimate Load

F_u = Ultimate load attained in testing

4) Structural efficiency: N_s _____

Use the equation to calculate structural efficiency:

$$N_s = \frac{F_u}{M}$$

where

F_u = Ultimate load (failure weight) attained in testing

M = Dead weight of structure as measured in testing

5) Predicted failure mode: FM _____

6) Where or how was the structure predicted to fail? _____

7) What are the four major types of forces that act on a structure under stress?

8) What is the static load of a structure? _____

9) What part of a testing device should be considered live load? _____

10) What effect would a shorter length test block have during stress testing?

Chapter Advisor Printed Name

Chapter Advisor Signature

Date