

Science Olympiad Tower Building Template Guide

Div C

2025 Season

Based on rules as of 6/1/2024

General reference information for building a 2025 Div C Tower to span a 20 cm by 20 cm opening with only 3 points of contact on the Test Base.

Layout (or schematic) in this Template is provided for reference only, where the schematic illustrates only one side of a 3-sided structure, designed with 9 layers and a default configuration for its cross-members.

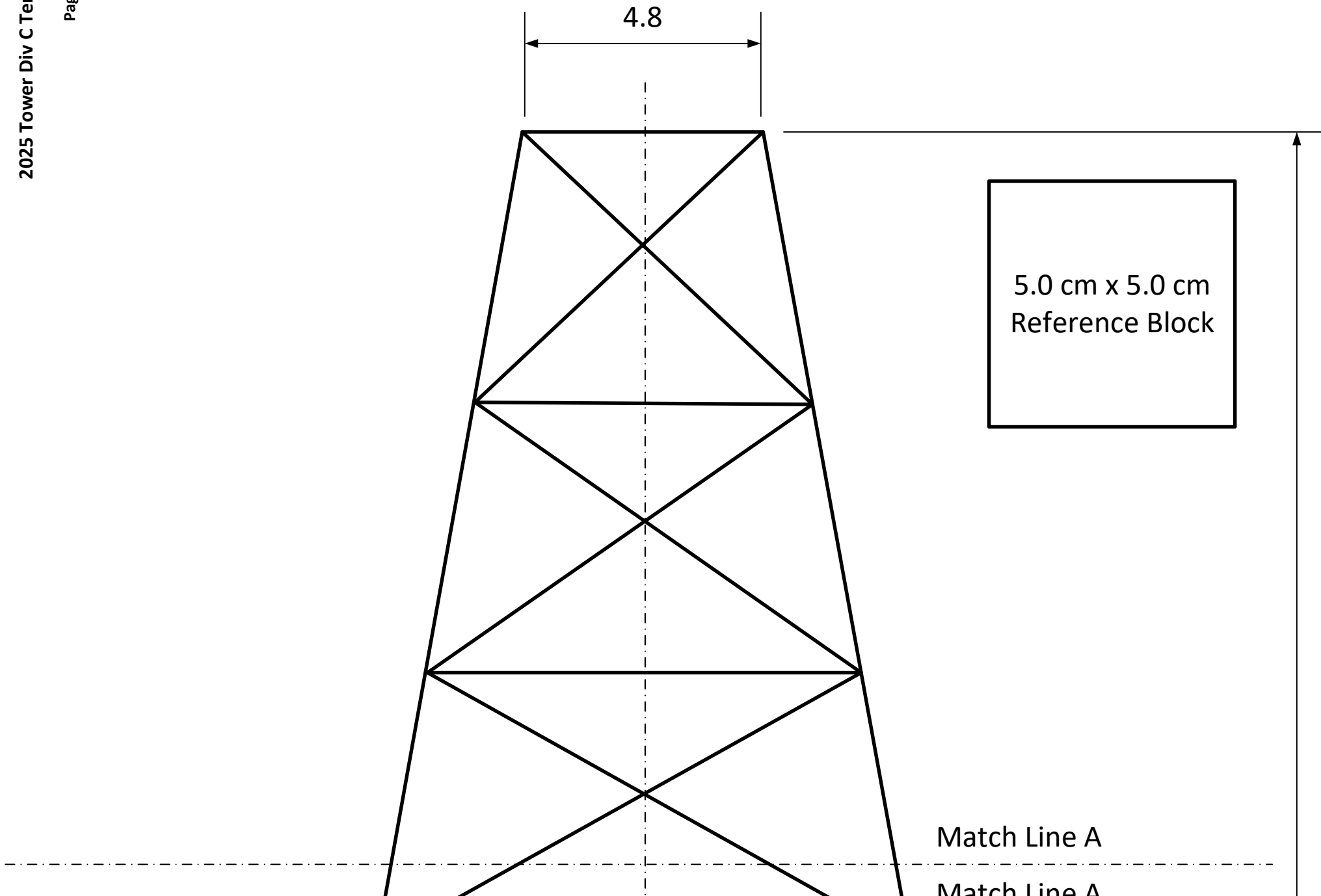
Students must determine whether the example schematic is optimal for their Tower, and must also determine:

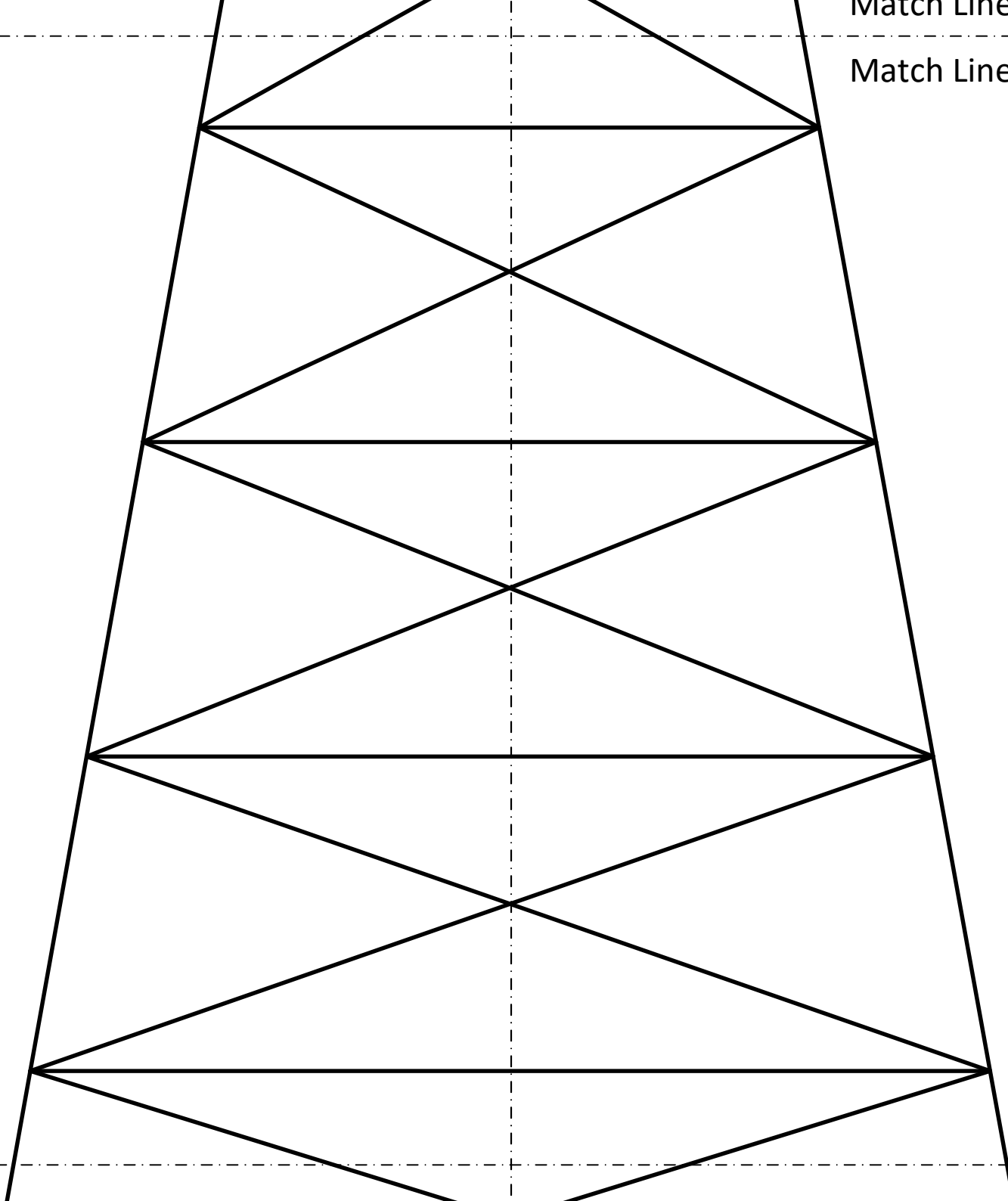
1. Selection of wood (type, dimensional cross-section, density) for the long-vertical members and cross-support members.
2. Whether the number of layers is optimal to manage flex or bending of members (re: Euler's "Oiler's" Critical Load).
3. Whether cross support member design is optimal (More? Fewer? Design type?).
4. Orientation of the 3-sided structure onto the Test Base, and if its orientation is optimal.
5. Whether each side of the Tower will be the same configuration.
6. Determine a technique for solid bonding of each side to each other to create a 3-sided structure.
7. Determine whether additional aids or tooling is needed during construction to stabilize the structure and minimize deforming (twisting).
8. Whether to pursue Bonus with design trades for expanding the base dimensions to attempt the Bonus (i.e. Bonus added to Load value **IF** Tower has its base legs touch outside the 29cm circle throughout test, **AND** Tower holds the full load).

Additional illustrations/guides are provided as reference that indicate:

1. Test Apparatus Test Base:
 - Representative 20cm x 20cm cut-out opening, and its center lines and quadrants.
 - 120° reference vectors as an example of an equilateral base for the Tower
2. Example 3-sided Tower Base:
 - Equilateral base (60° internal angles) as an example cut-out of a 3-sided Tower base

NOTE: Print out template (use 100% scaling in PDF print menu) and verify the reference square measure 5 cm in both directions.





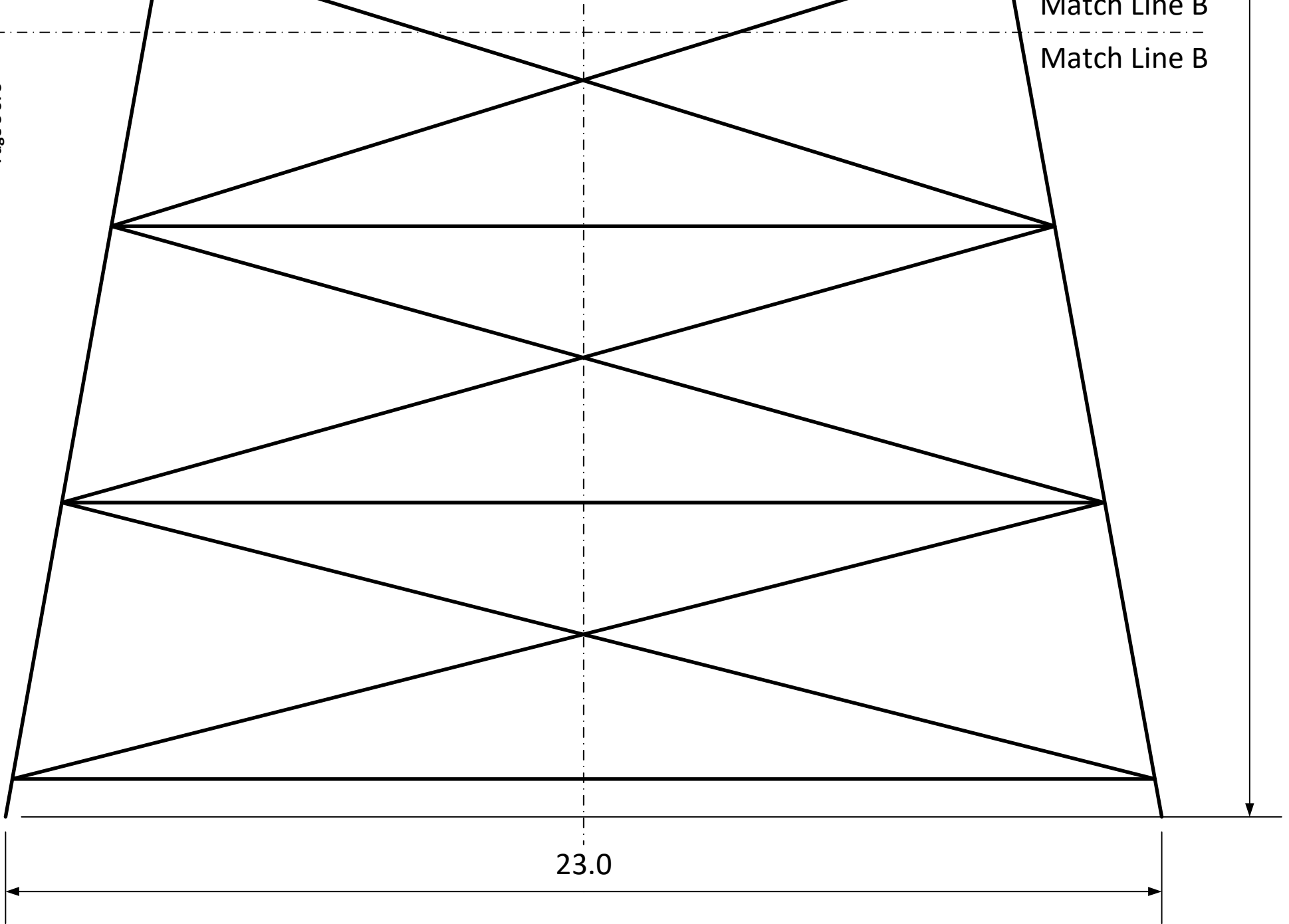
Match Line A

50.2

Match Line B

Match Line B

Match Line B
Match Line B



3.b. Structure design requirements for Tower

- i. Must span a 20 cm x 20 cm opening on a Test Base (5.a.),
- ii. May only have 3 points of contact with the Test Base (5.a) and each tower leg must be in its own quadrant, not shared with any other leg
- iii. must be placed on the Test Base surface such that the loading chain is suspended within 2.5 cm of the center of the opening in the Test Base.

Quadrant 2

29 cm Bonus Circle

20 cm x 20 cm Test Base
Opening

Quadrant 1

Quadrant 3

5 cm dia. loading chain
limit centered on 20 cm
x 20 cm opening

Match Line C

x 20 cm opening

Match Line C

Tower Base

Quadrant 4

NOTE! Only a portion of the 55.0 cm
long x 32.0 cm wide Test Base is
shown