StructIT

ABOUT

- Design and build a two-storey structure that can withstand maximum Centric Load.

DETAILS

Date: 13th July 2018.

Time: Test (04:30pm to 06:30pm)

Round (12:30am to 02:00pm)

Fees of Event: - For IEI Member: 30/- per head.

For Non-IEI Member: 50/- per head.

Location: for Test GF-26

For Round GF-26, FF-17

RULES

BUILDING IN GENERAL:

- The participants need to prepare a two-storey building on 13th July 2018 in MOS LAB and it will be tested against Axial loading.
- The building's each floor area must lies inside the square of 150mm x 150mm. (Penalty: Participants will be disqualified if this criterion is not satisfied)
- The clear height of the building must be 450 mm with an allowance of +/- 10mm.
- The total vertical distance of the top of the structure from the base plate must be less than 500 mm (as shown in figure).
- The building must essentially contain ground floor + one floor of horizontal levels.
- All levels must have a floor and roof made of Popsicle sticks itself resting on the beams.

• Boundary of 50mm height should be made on the first floor of the building.

• A maximum of four columns must be present on all four corners to connect two floors (i.e. a total of 8 columns can be used).

• Penalty Criteria for above-mentioned rules: Penalty of 5 points (refer Scoring section) will be added for each dimension lying within 5 mm beyond the allowance limit. Further extension in dimension values will lead to direct disqualification.

• The dead load of the building must be less than 1.5 kg. (Penalty: Participants will be disqualified if this criterion is not satisfied)

STRUCTURAL ELEMENTS SPECIFICATION

COLUMN

• A maximum of four columns are essential on the corners of two connected floors.

• The maximum cross-sectional dimension of column must not be greater than 12mm x 10mm make sure that no more than four Popsicle sticks should be overlapped longitudinally (only for the thickness of column member).

BEAM

• Each floor surface should rest on beams. Beams would be further connected to columns.

• The cross-sectional dimensions of a beam must be 150mm x 12mm x 10mm (L x B x D) with an allowance of +/-2mm on each side.

• Make sure that not more than four Popsicle sticks should be overlapped longitudinally to make a beam member (only for the depth of beam member).

ROOF AND FLOOR

• All levels must have a floor made of Popsicle sticks itself resting on the beams.

• Floor dimension must be less than 150mm x 150mm (L x B) and should have thickness of maximum 2 Popsicle sticks.

BASE PLATE

- The structure must be attached to Base Plate after incorporating the earthquake resisting mechanism.
- The Base Plate must be made with wooden slab.
- Thickness of Base Plate must lie between 6mm to 8mm.
- The base area of Base Plate must be 350mm x 350mm with an allowance of +/- 5mm.
- Centre of base place should coincide with Centre of building (when viewed from top view).
- The building can be connected to Base Plate by screws (bolt and nut).
- A maximum of 4 screws are allowed to attach building structure. Screws should not be used anywhere else.

Note: The Base Plate will be directly fixed on the testing setup so any discrepancies in Base Plate dimensions will directly lead to disqualification.

BOUNDARY

- Boundary should start from beam of 1st floor and should have height of 50mm.
- Boundary should be present on all 4 faces of the building and should cover entire width of face as shown in figure.
- Boundary should be of 1 popsicle stick thickness (i.e. 2mm).

EARTHQUAKE RESISTING MECHANISM

- Participants are free to use cross bracing technique, Base Isolation technique, Tuned mass damper or any other innovative earthquake load resisting mechanism.
- It will be very crucial for participants to fix the mechanism and then go for construction of building.
- Mechanism should lie within the area of building (i.e. 150mm*150mm)
- A total of 100 credits are given to Participants for designing earthquake resisting mechanism.
- Use of more than 100 credits will lead to disqualification.

Cross Bracing (On one face of a floor)	15 credits
Single Bracing (On one face of a floor)	10 credits
Any other type of Bracing (On one face of a floor)	15 credits
Base Isolation (As a whole)	40 credits
Tuned Mass Damper	40 credits
Any Other Technique	40 credits

BRACING

- Above credits are given for bracing of a single face of a floor, for subsequent faces credits will get added. (example- if participant wish to provide cross bracing in 5 faces credits counted will be 15*5=75).
- Popsicle Sticks should not be longitudinally overlapped for bracing (i.e. thickness should be of 1 popsicle stick only).
- As per Architecture requirement, any type of bracing should not be done in at least 1 face of upper floor of building (1st floor of building).
- Combination of any mechanisms can be used.
- Violation of any criteria of earthquake resistant Mechanism can lead to direct disqualification.
- Please go through the testing and judging criteria carefully before deciding on the mechanism.

MATERIAL CONSTRAINTS

- Popsicle sticks (maximum length 120 mm, width 12 mm and thickness 2 mm) and Fevicol MR White glue must be used to construct the structure. The Popsicle sticks can be cut or trimmed to any shape or size.

• Adhesive must only be used to join Popsicle sticks together. Adhesives can't be connected on the free surface of a part made of Popsicle sticks to enhance strength.

• Wooden plank can only be used to make the Base Plate of the structure. And 4 screws can be used to attach the superstructure with Base Plate.

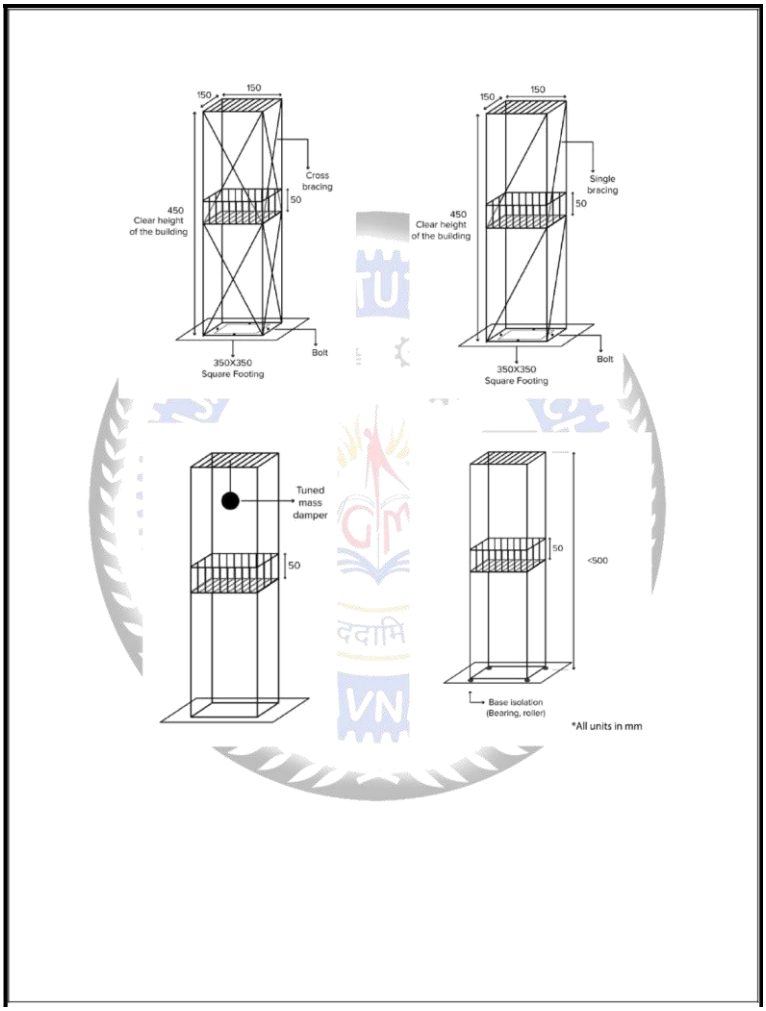
• Any other material can only be used to incorporate earthquake resistant technique except for bracing (bracing should be made up of popsicle stick).

TESTING CRITERIA

• The structure will be weighed first and all the dimension will be noted down.

• A deadweight of 500 gm will be added on the first floor and the top of building for testing. This procedure will repeat again with 100 gm weight and checked out the Load carrying capacity.

• Testing on the Model will be carried out on 14th July 2018 in the MOS Lab.



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