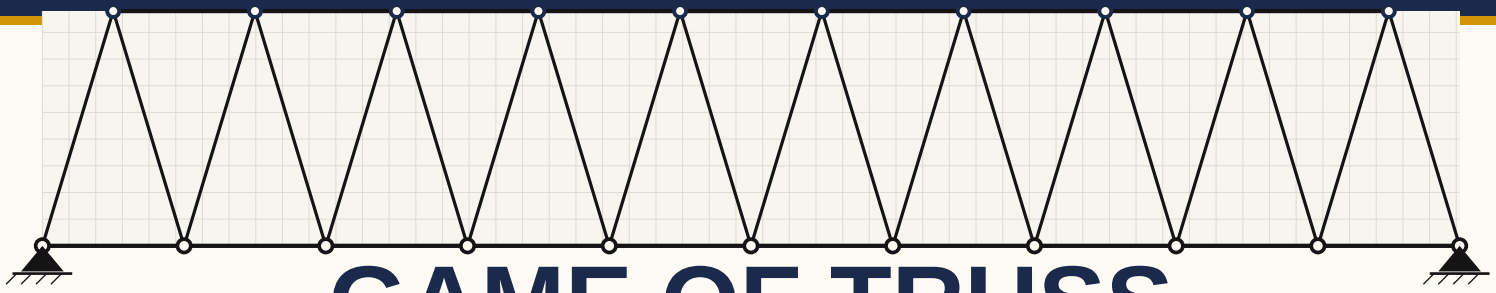


GAME OF TRUSS

Bridge Building Competition — DAY II | AVLOKAN 2026

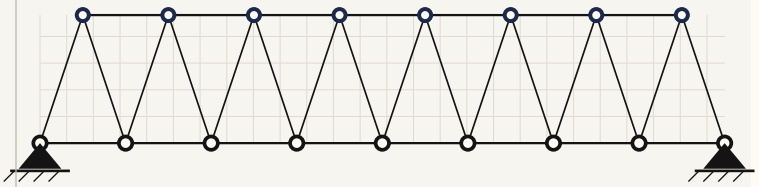
"Build Light. Build Strong. Let the Load Decide."

ICE CREAM STICKS	TEAMS	PRIZES	DAY II
Only material	2 – 3 Members	To Be Announced	AVLOKAN 2026

WHAT IS GAME OF TRUSS?

Game of Truss is the signature structural engineering event of AVLOKAN 2026. Participants design and construct model bridges using only ice cream sticks and Fevicol adhesive, applying real truss bridge principles. Each bridge is tested by hanging calibrated weights at the centre midspan. The bridge with the highest load-to-self-weight ratio wins.

WARREN TRUSS — RECOMMENDED DESIGN



Alternating diagonals · No verticals · All-triangle panels · Maximum efficiency

Length	Width	Height	Material	Load Point	Scoring
85 cm max	15 cm max	12 cm max	Ice Cream Sticks + Fevicol	Centre Midspan	Efficiency Ratio

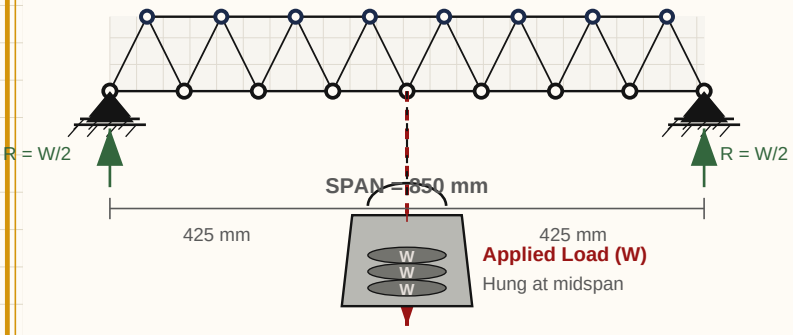
ABOUT THE EVENT & BRIDGE SPECIFICATIONS

Game of Truss is the signature structural engineering event of AVLOKAN 2026. Participants design and build model bridges using only ice cream sticks and Fevicol adhesive, replicating the principles of real-world truss bridge design. The competition tests structural intuition, material efficiency, teamwork, and creative construction. A judge panel evaluates each bridge on load-bearing efficiency, structural creativity, aesthetic quality, and technical presentation. Bridges are tested by hanging a metal bucket loaded with calibrated weights at the centre midspan — the bridge that carries the maximum load relative to its own weight wins. The event draws inspiration from similar competitions held at IITs and NITs across the country, including IIT Dhanbad.

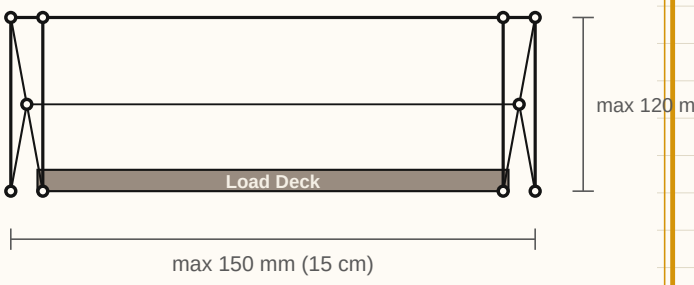
BRIDGE SPECIFICATIONS — DIMENSIONAL CONSTRAINTS

Parameter	Specification	Notes
Overall Length	Minimum 700 mm | Maximum 850 mm	Measured between outer faces of end joints
Clear Span	Minimum 650 mm | Maximum 800 mm	Distance between inner support contact points
Width (max)	150 mm (15 cm)	Measured at widest cross-section point
Height (max)	120 mm (12 cm)	Measured from deck level to topmost member
Deck Thickness	No restriction	Must support load hook or bracket at centre
Member Dimensions	Ice cream stick: ~114 x 10 x 2 mm (stand	No custom-cut shorter than 20 mm allowed

BRIDGE DIMENSION DIAGRAM — SIDE VIEW WITH LOADING



CROSS-SECTION VIEW (Front)

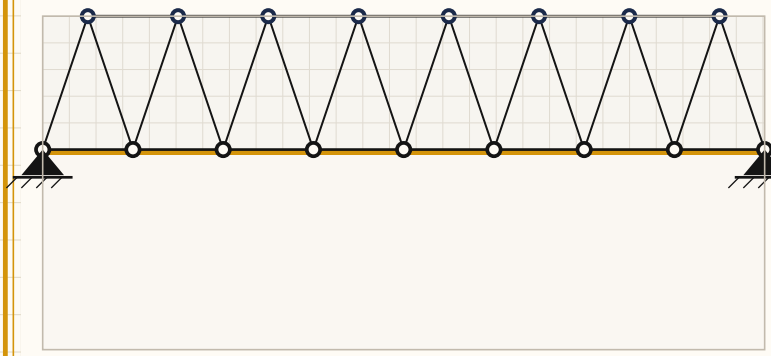


REQUIRED BRIDGE TYPE: Warren Truss (recommended) | Other truss types accepted — see Page 3

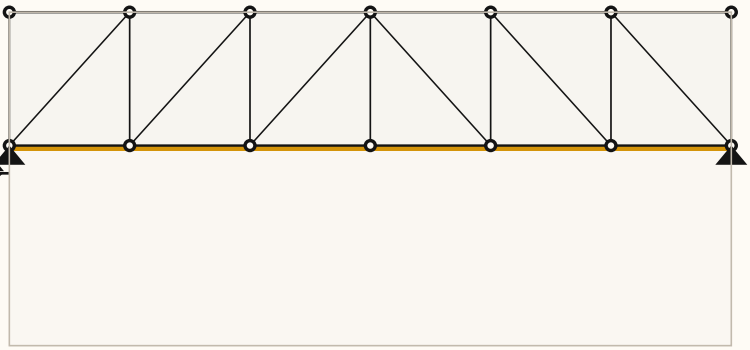
Warren Truss: Triangular panels with alternating diagonal members, no verticals — optimal material efficiency for ice-cream-stick bridges.

TRUSS TYPES — REFERENCE GUIDE FOR PARTICIPANTS

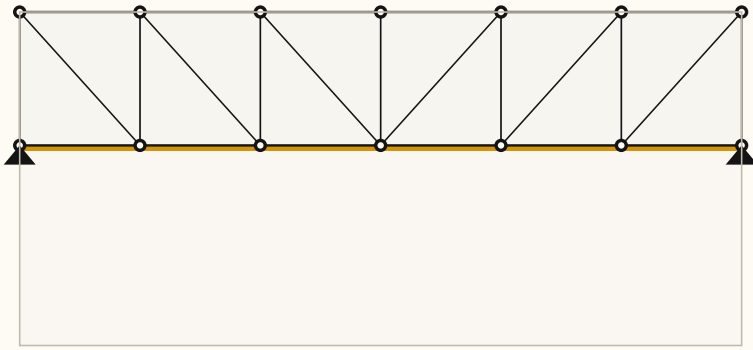
The following four truss configurations are accepted for the Game of Truss competition. Participants may choose any design or combine elements. Warren Truss is recommended for optimal load-to-weight efficiency with ice cream sticks. Study the force flow in each type before finalising your design.

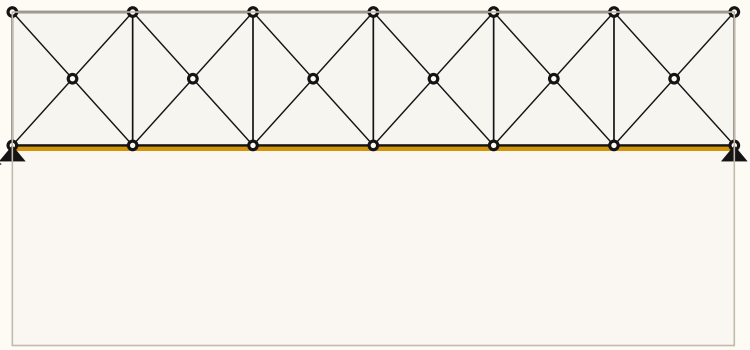


Alternating diagonal members, no verticals. All triangular panels.
Best load-to-weight ratio for stick bridges. Simple, efficient, elegant.



Vertical members + diagonals in tension under load. Developed 1844.
Diagonals in tension — suitable when diagonals are weaker than verticals.





STRUCTURAL PRINCIPLE:

All truss bridges work by converting bending forces into axial tension and compression in individual members. Triangulated geometry ensures stability. In ice-cream

Euler's formula for critical buckling load in compression members: P_cr = (pi^2 x E x I) / (L^2)

MATERIALS, CONSTRUCTION & GENERAL RULES

ALLOWED MATERIALS AT A GLANCE

✓ **Ice cream sticks**
Standard 114 x 10 x 2 mm craft sticks, any quantity

✓ **Fevicol / PVA glue**
White glue only — applied at joints and laminations

✗ **Staples / pins / wire**
Metal fasteners strictly prohibited

✗ **Cardboard / plastic**
No non-stick material reinforcement

✗ **Super glue / epoxy**
Only PVA-type adhesive permitted

ALLOWED MATERIALS

Ice Cream Sticks
Standard craft sticks only — approx. 114 x 10 x 2 mm. Any quantity.

Adhesive
Fevicol SH (white glue) or equivalent PVA glue only.

String / Thread
Only for temporary holding during drying — must be removed before testing.

NOT ALLOWED

- Metal staples, pins, nails, screws, or wire
- Cardboard, foam, plastic, or paper reinforcement
- Super glue (cyanoacrylate), epoxy, or any resin adhesive
- Pre-fabricated brackets, hinges, or commercially manufactured components

SECTION 1 — ELIGIBILITY & REGISTRATION

1.1	Open to all undergraduate engineering students currently enrolled in a recognised university or institute. Interdisciplinary teams are welcome.
1.2	Teams must comprise 2 to 3 members. All team members must be from the same institution. Solo participation is NOT permitted.
1.3	Each team must register on the AVLOKAN 2026 portal at least 48 hours before Day II. Walk-in registrations are not accepted.
1.4	A maximum of 3 teams per institution may participate in the Game of Truss event.
1.5	Valid college ID cards are mandatory for ALL members and must be presented at the entry desk on Day II.

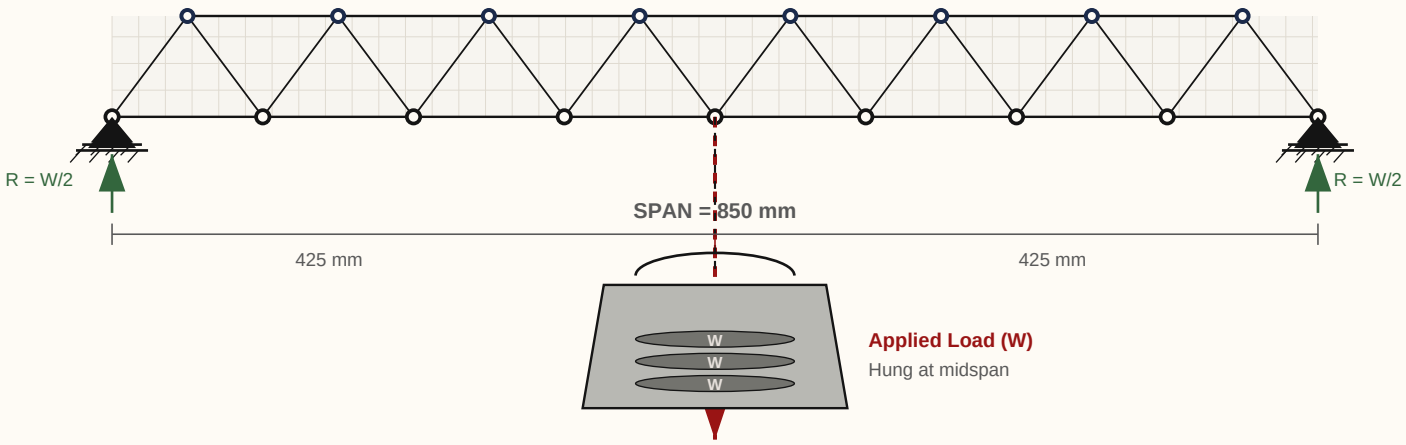
SECTION 2 — CONSTRUCTION RULES

2.1	The bridge must be constructed entirely off-site (at home or hostel). On-site construction or modification on the day of testing is strictly prohibited.
2.2	The bridge must be constructed using only ice cream sticks and Fevicol/PVA adhesive. No other materials are permitted.
2.3	All joints must be glued. String, thread, or any temporary fastener used during construction MUST be completely removed before submission.
2.4	Bridges may be painted, varnished, or decorated for the aesthetics score — however, no structural coating that adds rigidity (e.g., resin, plaster) is permitted.
2.5	The bridge must be self-standing when placed on the testing rig. It must not be taped, nailed, or fastened to the support surface.
2.6	Teams may inspect the testing rig (span and support details) during the pre-registration briefing. No measurements or on-site adjustments after submission.

SECTION 3 — SUBMISSION & INSPECTION

3.1	Bridges must be submitted to the inspection desk between 08:30 and 09:00 on Day II. No submissions accepted after 09:00 hrs.
3.2	Each team must submit a Bridge Data Sheet (provided on Day II morning) stating: team name, bridge weight (self-reported), truss type used, and estimated load capacity.
3.3	Judges will inspect each bridge for material compliance before testing. Non-compliant bridges will be disqualified without testing.
3.4	Once submitted, the bridge may not be touched, repaired, or modified by participants. Only judges and event staff may handle submitted bridges.

TESTING PROTOCOL — LOADING PROCEDURE



TESTING PROCEDURE — STEP BY STEP

STEP 1 WEIGH THE BRIDGE	Before testing, each bridge is placed on a calibrated digital weighing scale by the judge. The weight (in grams) is recorded on the scoring sheet as Bridge Self-Weight (Wb). Participants may not be present during weighing — value is revealed after all bridges are tested.
STEP 2 PLACEMENT ON RIG	The bridge is placed on the standardised testing rig with a span of 800 mm. Both ends rest on smooth cylindrical steel rods (dia 10 mm). The bridge is NOT clamped or fixed — it rests freely under self-weight. If the bridge does not sit stably, it fails automatically.
STEP 3 LOAD HOOK ATTACHMENT	A standardised S-hook is attached to the centre midspan of the bridge deck at the designated loading point. A calibrated metal bucket (tare weight: 500 g) is hung from the hook. Teams must indicate their loading point clearly on the bridge deck.
STEP 4 INCREMENTAL LOADING	Calibrated weights (250 g increments for the first 2 kg, then 500 g increments) are added to the bucket by judges. A 15-second hold is observed after each addition. Loading continues until visible failure, collapse, joint separation, or 5 mm mid-span deflection.
STEP 5 FAILURE DETERMINATION	Failure is defined as: (a) complete collapse, (b) audible crack with permanent deformation, (c) joint separation > 2 mm, or (d) mid-span deflection exceeding 10 mm under sustained load. The load at the LAST successfully held increment is recorded as Maximum Load (Wl).
STEP 6 SCORE CALCULATION	Structural Efficiency = Wl / Wb (load carried divided by bridge self-weight). Higher ratio = better structural performance. This score feeds into the final weighted formula.

IMPORTANT — TESTING FAIRNESS

All bridges will be tested in a random order drawn publicly before testing begins. Judges' decisions on failure determination are final. Video recording of the testing

SCORING RUBRIC & EVALUATION CRITERIA

FINAL SCORE FORMULA

Final Score = (S1 x 0.60) + (S2 x 0.20) + (S3 x 0.12) + (S4 x 0.08)

Where: S1 = Structural Efficiency Score | S2 = Creativity & Innovation | S3 = Aesthetics | S4 = Presentation

Structural Efficiency = Wl / Wb (Maximum Load Carried / Bridge Self-Weight) — Normalised to 100-point scale

DETAILED SCORING BREAKDOWN (Total: 100 Points per Bridge)

#	Criterion	Wt%	Evaluation Guidelines
S1	**Structural Efficiency — Load**	**60%**	Efficiency = Wl/Wb. Score = (Team Efficiency / Max Efficiency in event) x 60. Example: Bridge carries 8 kg, weighs 200 g → Efficiency = 40. If highest in event is 50 → Score = (40/50)x60 = 48.
S2	**Structural Creativity & Engine**	**20%**	Jury evaluates originality of truss design, quality of joint engineering, creative use of material arrangement, and structural logic. A team using a novel non-standard configuration with good reasoning scores higher.
S3	**Aesthetics & Craftsmanship**	**12%**	Visual finish, neatness of construction, symmetry, alignment, surface treatment (paint/varnish), and overall presentation quality of the physical bridge model.
S4	**Technical Presentation**	**8%**	2-minute verbal pitch before testing: team explains design decisions, structural rationale, expected load capacity, and construction process. Judges assess clarity, confidence, and depth.

WORKED EXAMPLE — EFFICIENCY SCORE CALCULATION

Bridge	Weight (Wb)	Max Load (Wl)	Efficiency	Reference	S1 Score
Bridge A	185 g	7.2 kg	7200/185 = 38.9	Best in event = 42.1	(38.9/42.1) x 60 = 55.4
Bridge B	210 g	9.4 kg	9400/210 = 44.8	Best in event = 44.8	**(44.8/44.8) x 60 = 60.0 ← WINNER**
Bridge C	155 g	5.6 kg	5600/155 = 36.1	Best in event = 44.8	(36.1/44.8) x 60 = 48.3

TIE-BREAKER: If two bridges have equal final score → (1) Higher structural efficiency score wins. (2) If still tied → lighter bridge wins. (3) If still tied

All scores are compiled by two independent judges and averaged. Score sheets are shared with teams after results announcement.

AWARDS, RECOGNITION & EVENT SCHEDULE

AWARDS & RECOGNITION

Position	Award Title	Perks & Recognition
WINNER	Most Efficient Bridge	Trophy + Certificate of Excellence + Industry Referral Letter
1st Runner-Up	2nd Highest Efficiency	Trophy + Certificate of Achievement
2nd Runner-	3rd Highest Efficiency	Trophy + Certificate of Merit
Best Aestheti	Most Beautiful Bridge	Memento + Special Jury Commendation
Best Presenta	Best Technical Pitch	Memento + Special Recognition Certificate
All Participan	Participation Certificate	Issued by Dept. of Civil Engineering, B.I.T. Sindri

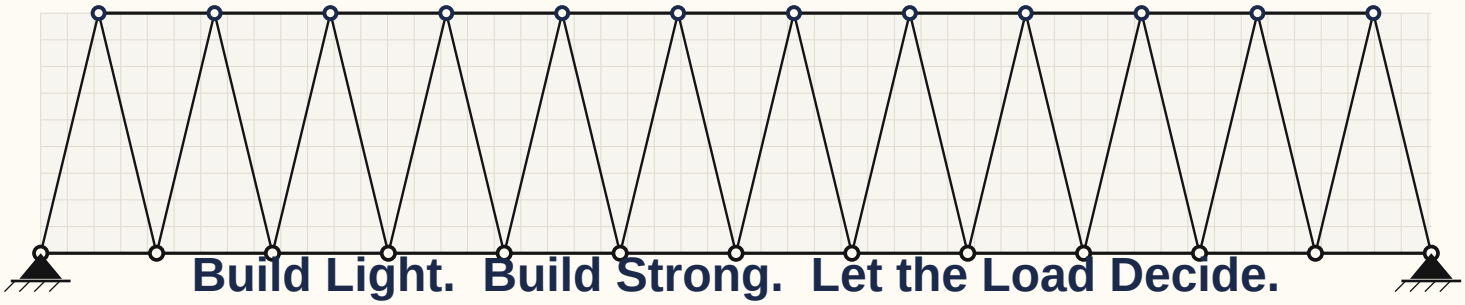
Note: Prize money details will be announced closer to the event date. The organising committee reserves the right to revise the prize structure.

DAY II SCHEDULE — GAME OF TRUSS

Time	Activity	Notes
08:30 – 09:00	Bridge Submission & Registration	Inspection desk open. All bridges submitted. Team Data Sheets filled.
09:00 – 09:30	Material & Dimension Inspection	Judges inspect all bridges for rule compliance. Non-compliant bridges disqualified.
09:30 – 09:45	Weighing — Bridge Self-Weights	All bridges weighed. Weights recorded in sealed sheet (not disclosed yet).
09:45 – 10:00	Technical Presentations (2 min/team)	Each team delivers pitch before testing begins.
10:00	**TESTING BEGINS**	**Random order drawn. Loading rig prepared. Calibrated weights ready.**
10:00 – 12:30	Incremental Load Testing	All bridges tested sequentially. Progressive loading. Results recorded.
12:30 – 13:15	Score Compilation & Verification	Two-judge verification. Efficiency scores calculated. Final scores compiled.
13:15	**RESULTS ANNOUNCEMENT**	**Winners declared. Certificates and prizes distributed. Group photography.**

CODE OF CONDUCT:

1. No participant may touch, adjust, or repair their bridge after submission. Violation = disqualification.
2. No interference with other teams' bridges or the testing apparatus.
3. Judges' decisions on failure detection and scoring are final and binding.
4. Unsportsmanlike behaviour will result in immediate disqualification of the entire team.



Build Light. Build Strong. Let the Load Decide.

DESIGN TIPS FROM STRUCTURAL ENGINEERS

- Triangulate everything — every panel must be a rigid triangle.
- Maximize truss depth at midspan for bending resistance.
- Keep compression members short — they buckle first.
- Glue joint area > stick cross-section area = joint won't fail first.
- Symmetric design distributes load evenly — asymmetry causes twist.
- Use laminated sticks (2–3 layers) for bottom chord under tension.
- Gusset plates made of layered sticks dramatically improve joint strength.
- Dry-fit your entire bridge before gluing — check alignment.
- Let glue cure fully (24 hrs minimum) before handling or testing.
- Lighter bridge = higher efficiency ratio — remove redundant material.

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FREQUENTLY ASKED QUESTIONS

Q: Can we use more than one layer of sticks?
A: Yes — laminating or stacking sticks is allowed as long as only Fevicol is the adhesive.

Q: What if our bridge width exceeds 15 cm at one point?
A: The bridge will be disqualified. Measure carefully before submission.

Q: Can we paint the bridge?
A: Yes. Paint or varnish for aesthetics is allowed. No structural coatings (resin/plaster).

Q: What is the load bucket tare weight?
A: 500 grams. This is added to all incremental weights in the final load calculation.