

CONCEPT

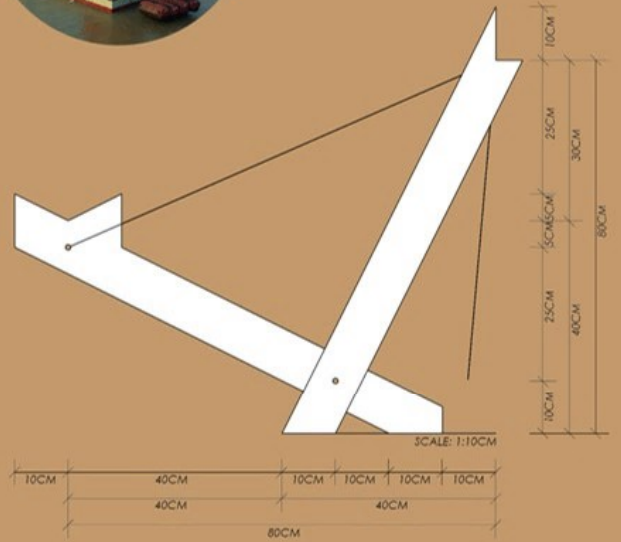
WITH THE PROBLEM OF ALLOWING LOAD TO BE CANTILEVERED 40CM FROM THE BASE AND AT 40CM HIGH WITHOUT FOUNDATION OR BELOW-GROUND WORK AS WELL AS HAVING THE EFFICIENCY MEASURED BY WEIGHT, A FLOATING CRANE BECAME THE INSPIRATION AS IT ALSO USES CANTILEVERED CONCEPTS WHILE BEING JUST AT THE SURFACE OF THE SEA.

WITH THE CONSTRAINTS OF USING EASY-TO-PROCURE MATERIALS (OR DIY MATERIALS), A CARDBOARD AND STRING WAS CHOSEN AS IT IS LIGHT-WEIGHT AND WORKABLE.

THE SHAPE WAS FORMED AS A COMPROMISE FROM HAVING ISOMETRIC FORCES FOR BALANCED DISTRIBUTION OF LOAD AS WELL AS FITTING THE STRUCTURE INSIDE A 40CM X 40CM BASE CONSTRAINT.

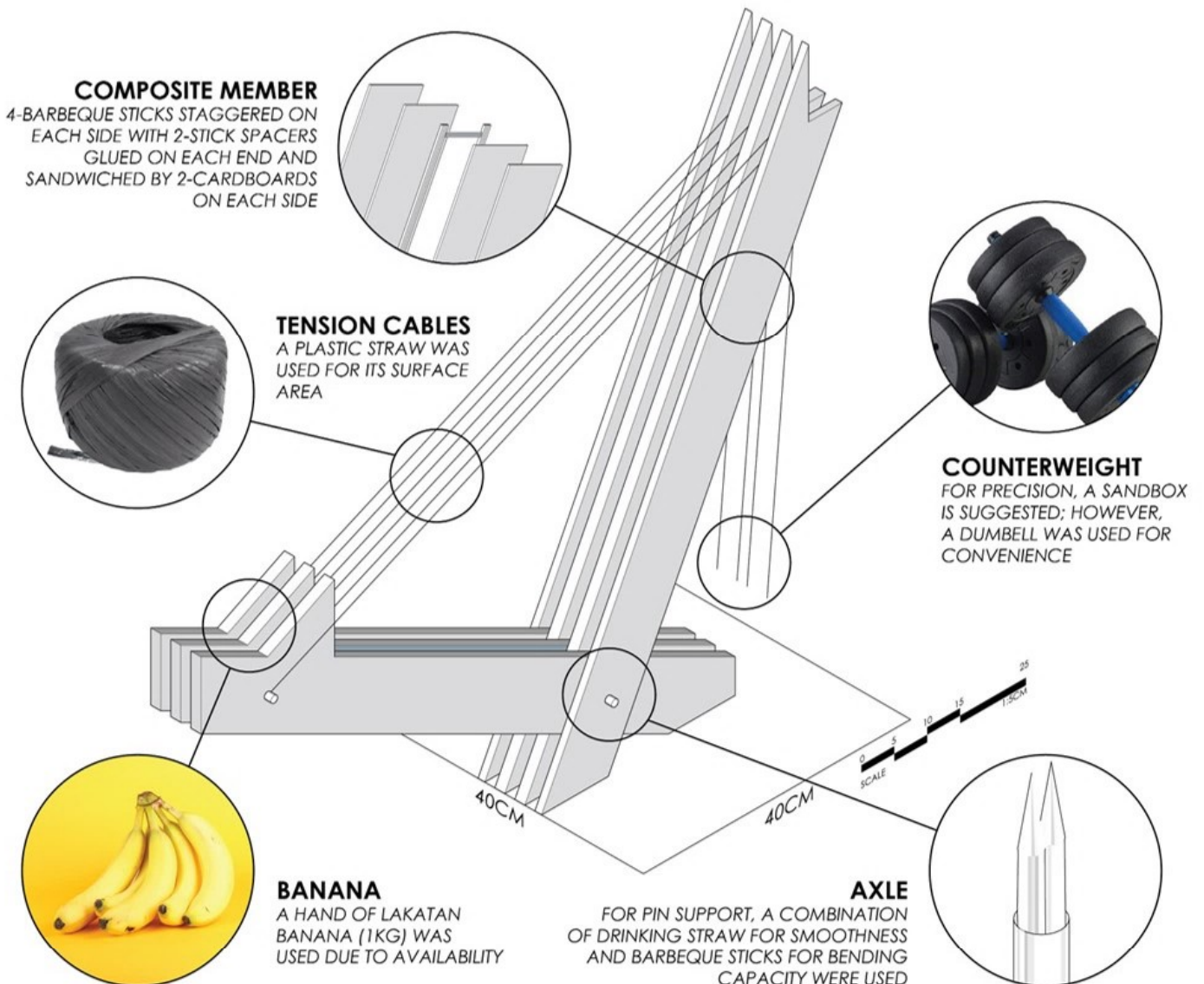
WITH THE SLENDERNESS AND THE TENDENCY TO BUCKLING, THE STAND WILL INCORPORATE BARBEQUE STICKS INSIDE THE CARDBOARD MEMBERS, SIMILAR TO REINFORCED CONCRETE, TO ENSURE THE STRUCTURAL FORM BE KEPT INTACT.

FOR EASY WORKABILITY AND ALLOW PORTABILITY OF THE STAND, THE COUNTERWEIGHT IS LEFT BLANK TO ALLOW VARYING WEIGHTS ACCORDING TO THE EXPECTED LOAD AS WELL AS USING PIN SUPPORTS TO ALLOW MOVEMENT OF THE PROPOSED FORM.



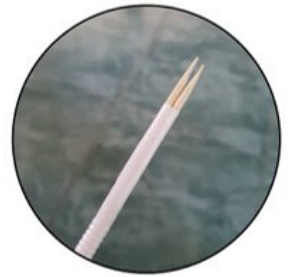
BANANA STAND

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AXLE SPOT VIEW



SKELETON SPOT VIEW



PORTABLE FORM



DEFORMATION

THE STAND STARTED HAVING DEFORMATIONS CARRYING 5.95KG LOAD. IT FORMED IN THE BASE OF THE STAND WHEREIN AN UNREINFORCED AREA OF THE CARDBOARD BUCKLED OUTWARDS REDUCING LATERAL BALANCE OF THE STAND AS AN EFFECT OF IMPERFECTION IN MATERIAL OR BUILDING METHOD.



COLLAPSE

THE STAND COLLAPSED CARRYING 6.60KG LOAD, WITH THE IMBALANCED MODEL AND THE LENGTHY CANTILEVER DISTANCE, THE STAND SLIPPED OUT OF BALANCE TOWARDS THE CANTILEVERED SIDE. WHILE THE COUNTERWEIGHT IS NOT YET CLOSE TO THE LOAD, IT WAS THE EFFECT OF HAVING A LENGTHY CANTILEVER THAT MADE THE WEIGHT IT IS CARRYING MORE CREDIT COMPARED THE ONE CLOSER TO THE CENTER OF MASS.



WEAKNESSES

THE MODEL IS NOT SUITABLE FOR BANANAS CONSIDERING THE HIGHLY INEFFICIENT OUTCOME AS WELL AS THE EXCESSIVE LOAD CAPACITY AND DEAD LOAD. COUNTERWEIGHT INCREASES THE DEAD LOAD FURTHER WHILE CARDBOARD EASILY BUCKLES WITHOUT PROPER REINFORCEMENT.

SUGGESTIONS

TO INCREASE EFFICIENCY, LIGHTER AND SMALLER FORM IS SUGGESTED USING POPSICLE STICKS AND THREAD AS WELL AS CANTILEVER ON THE OPPOSITE DIRECTION TO REDUCE DEAD LOAD BUT HAVE AN INCREASED RESISTING TORQUE ON THE BANANA.

WEIGHTS

STAND	2.15KG
HANDLE	1.10KG
BANANA	1.00KG

COUNTERWEIGHT	10.70KG
DEFORMATION AT	5.95KG
COLLAPSE AT	6.60KG

EFFICIENCY

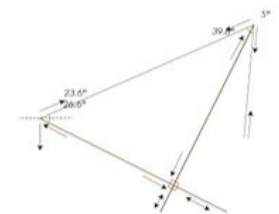
$$E = \frac{\text{BANANA}}{\text{PROTOTYPE}} \times 100\%$$

$$\text{PROTOTYPE} = \text{STAND} + \text{HANDLE}$$

$$E = \frac{1\text{KG}}{(2.15\text{KG} + 1.10\text{KG})} \times 100\%$$

31%

FREE BODY DIAGRAM



TORQUE REQUIRED TO COLLAPSE
(WITH A 10.7KG COUNTERWEIGHT)

$$6.60\text{KG} \times 0.40\text{M} \times 9.81\text{M/S}^2$$

25.90 N M