

DESIGN II

THE S.W.I.N.G. PROJECT

SEMESTER II
DSATM - SOA
2017



ARCHITECTURE



WITH THE SUPPORT OF OUR PRINCIPAL DR. B R LAKSHMIKANTHA, AND THE DIRECTIONS OF DIRECTOR, PROF. GADDAM RAMESH, THE STUDENTS OF SOA-DSATM UNDERTOOK THIS PROJECT.

Ar. Arun Swaminathan, Ar. Govind Rao, Ar. Rhythema Rawat and Mr. Arun Desai (paper engineer) along with core faculty Ar. Praseetha G, Ar. Mamtha N, Ar. Anusha, Ar. Rashmika Singh and Ar. Pooja B guided the students and lead the project.

On the 26th of April, 2017 **THE SWING PROJECT** was presented by the students of sem II as a part of their design curriculum. They displayed a total of 13 swings.

The task was to design and build a swing to the scale 1:1 purely out of mount board. The project covered the following features:

- It has to take the minimum weight of a 35kg person
- Light weight structure made of mount board
- Catering to a specific height and width dimensions
- Use of innovative members
- Design the swing seat
- Joinery details between different components

The work was done in teams of four and the whole project was made over a single weekend.



DR. B R LAKSHMIKANTHA



PROF. GADDAM RAMESH



AR. ARUN SWAMINATHAN



AR. RYTHEMA RAWAT



SWING 1

The swing that took the most weight –

A construction of triangular prisms in a hexagonal form which was light in weight yet carried more 180kg of weight easily.

It was a great achievement for the students who put in a lot of hard work to make this project successful.



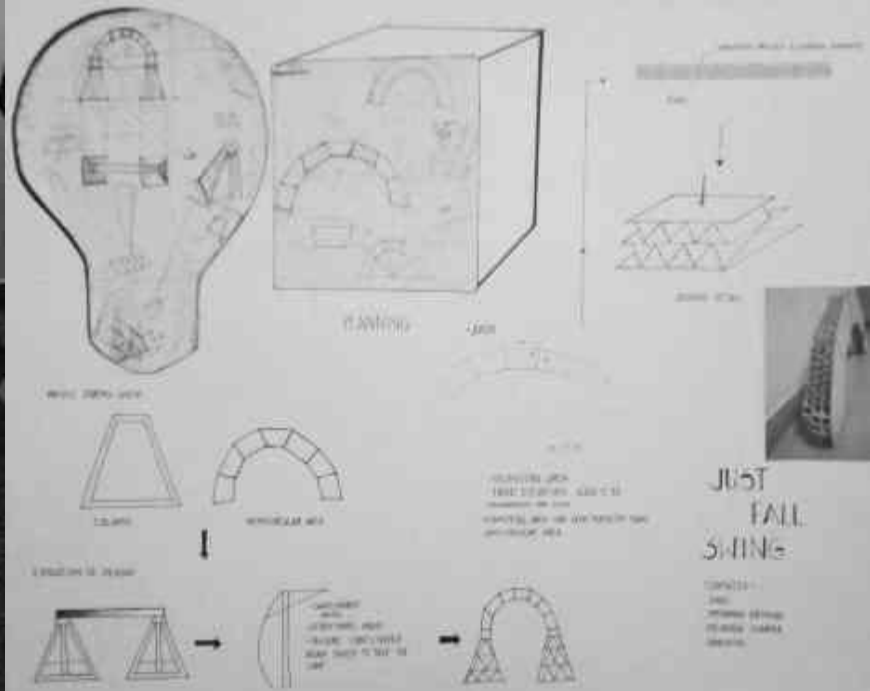


SWING 2

Arched swing –

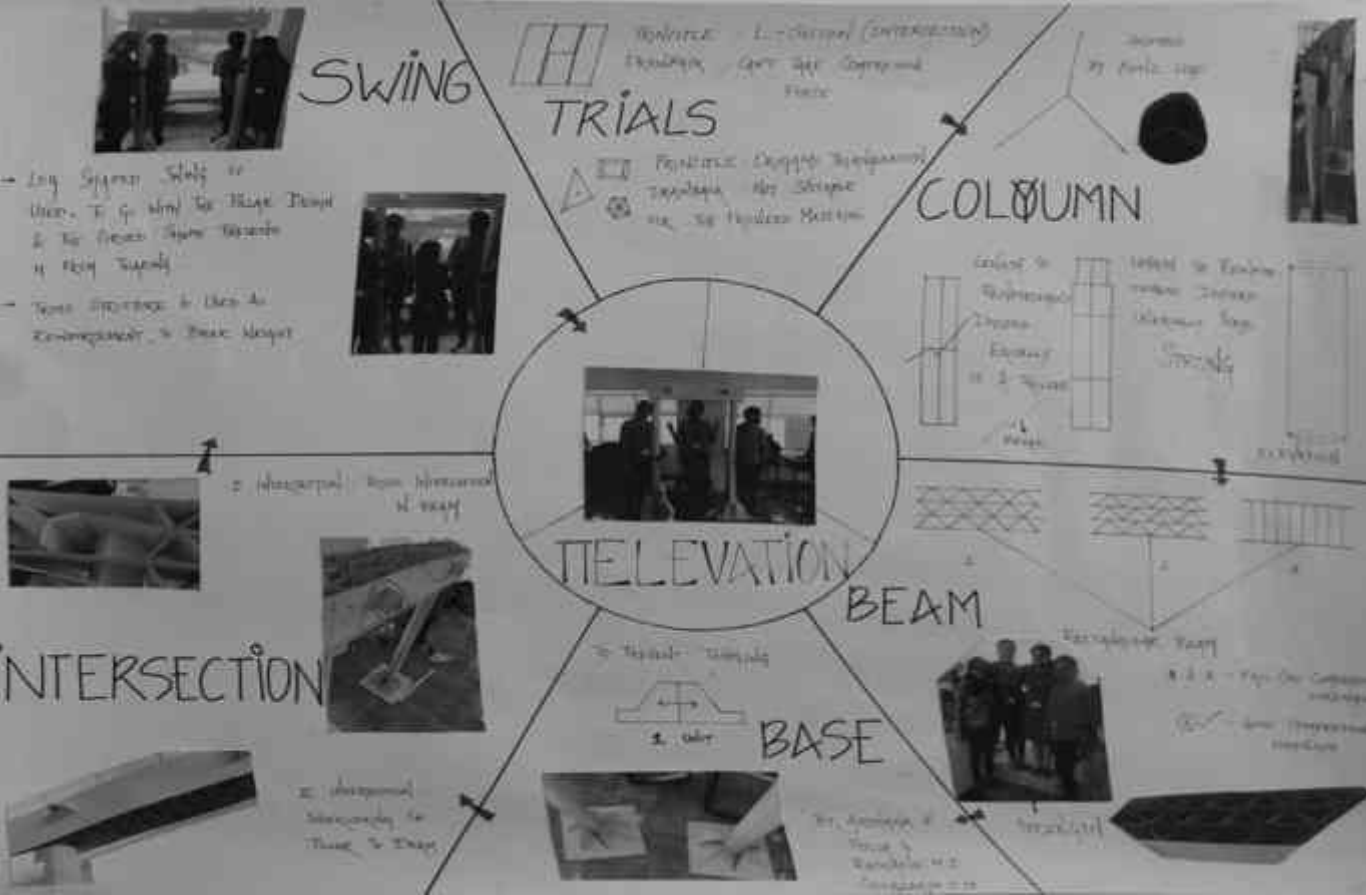
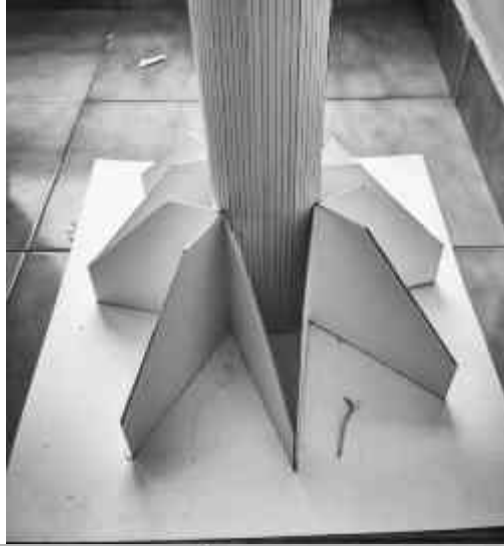
Experimentation at its peak with truss elements and curved structures.

Out of the box design which proves arches are no less.



SWING 3

Different base support and use of curved pillars instead of rectangular or triangular made it one of a kind.





CONCEPT-1
WHEEL
+
TRIANGLE
CONCEPT-2

CONCEPT-3
COLUMN

BEAM

THE MAKING

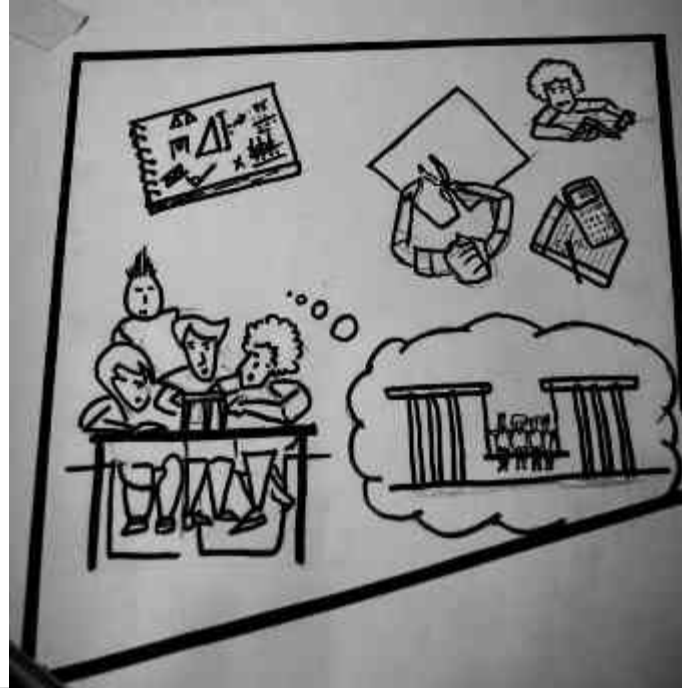
SWING 4

Students out did themselves with different designs and came up with unique structures.

SWING 5

Smart thinking –

The students went another step further and re-enforced their structure with double columns and used cantilever beams.



CONCEPT

- WE HAVE A VERY INTERESTING CONCEPT THAT INSPIRED US, MISSILE.
- A SWING IS SUSPENDED FROM THE ABOVE, USED TO MOVE TO AND FRO.
- THE MATERIAL THAT HAS BEEN USED IS MOUNT BOARD.
- A MISSILE IS A POWERFUL, STRONG OBJECT WHICH IS FIRGLIBLY PROPELLED AT A TARGET.



- OUR SWING IS STRONG AND STABLE AND IS ABLE TO TAKE THE WEIGHT OF A NORMAL AVERAGE HUMAN BEING.
- IT IS MANUFACTURED FOR USING AT PLACES LIKE PARKS OR ANY MATHEMATICAL SCHOOL BECAUSE OF ITS GEOMETRICAL SHAPE.
- OUR ALL THE UNITS, MAY IT BE COLUMN, BEAM, INTERIOR EVERYTHING IS OF TRIANGULAR SHAPE.
- WE HAVE TAKEN TRIANGLES BECAUSE IT IS CONSIDERED STRONGEST OF ALL GEOMETRICAL SHAPES.
- WE HAVE TAKEN MUCH INTEREST IN ITS STRENGTH BY USING AN AESTHETIC.

Balancoire In Making

FOR COLUMNS

- THREE TRIANGLES OF DIFFERENT SIZES ARE TAKEN AND INTERLOCKED TO FORM A STRONG & SUPPORT.





SWING 6

Strong beams which were heavy at the base and usage of a contrasting thin beam which seemed weak but carrying more than expected.



PICCOLO SWING MAX WEIGHT 60 KG.

WE HAD A LOT OF IDEAS ABOUT THE SWING, BUT THE BEST IDEAS WERE THE MOST SIMPLE. WE WANTED TO MAKE A SWING THAT WAS EASY TO BUILD AND USE. WE WANTED TO MAKE A SWING THAT WAS EASY TO BUILD AND USE. WE WANTED TO MAKE A SWING THAT WAS EASY TO BUILD AND USE.

REVISIT: THE FIRST DESIGN AT HOME, A SIMPLE SWING SET, BUT THE SECOND DESIGN WAS BETTER. WE WANTED TO MAKE A SWING THAT WAS EASY TO BUILD AND USE. WE WANTED TO MAKE A SWING THAT WAS EASY TO BUILD AND USE.

HOW TO BUILD A FUNCTIONING SWING SET

STEP 1: CUT THE BEAMS AND DRILL THE HOLES. STEP 2: ASSEMBLE THE SWING SET. STEP 3: TEST THE SWING SET.

FINAL PRODUCT

THE SWING SET IS MADE OF THICK BEAMS AND A THIN BEAM. THE THIN BEAM IS MADE OF A WEAK MATERIAL, BUT IT CAN HOLD MORE THAN EXPECTED.

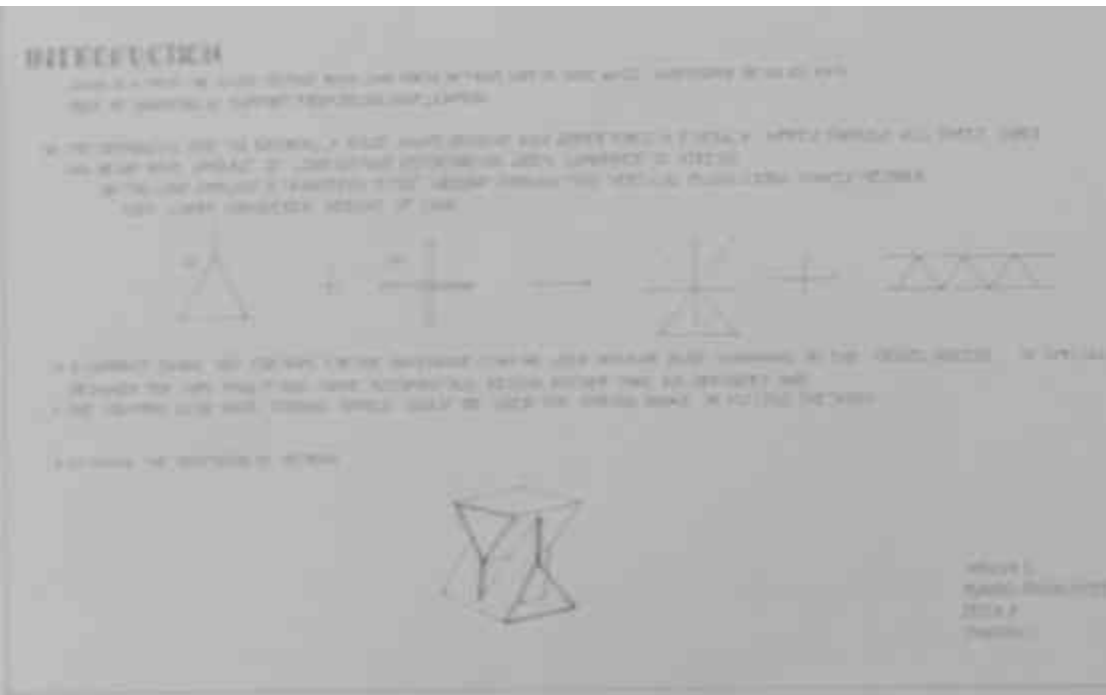
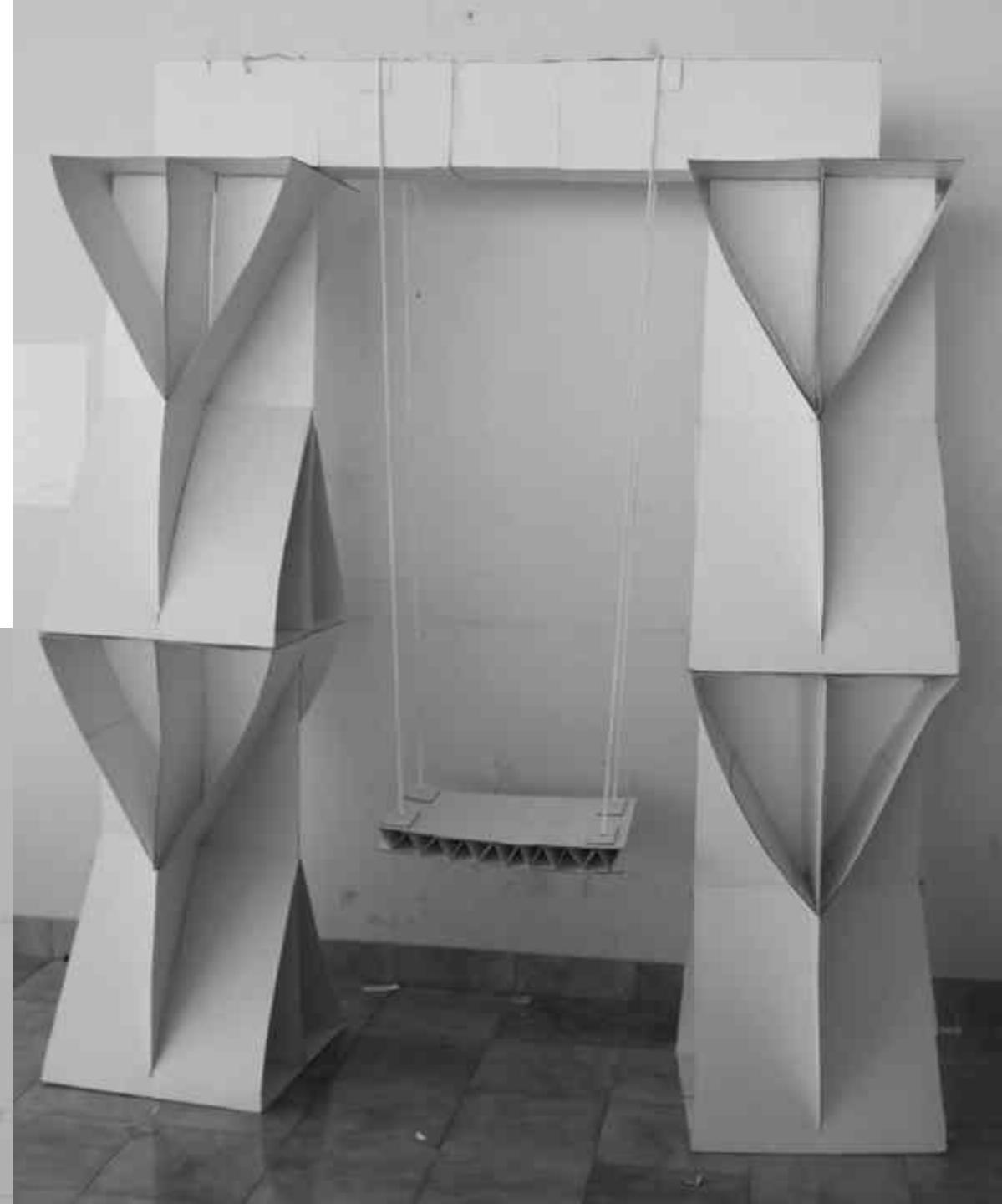
ANGUSHKA. S ALSON X. DSOUZA ROSHAN S. HRISHIKESH



SWING 7

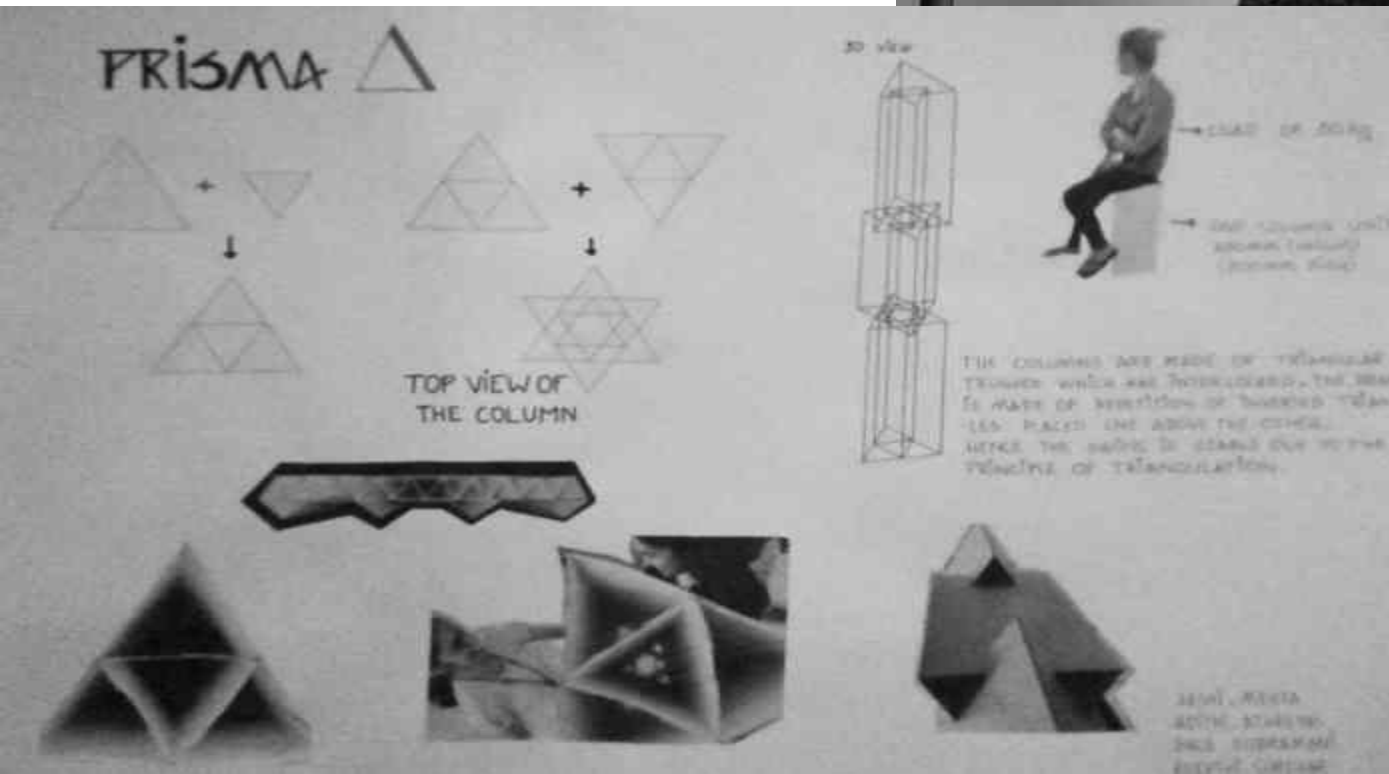
Unique member designs exhibited –

The triangular forms intersecting each other at the centre in different sides presents a beautiful design and innovative method of thinking. This truly depicts that art can be found in simple structures.



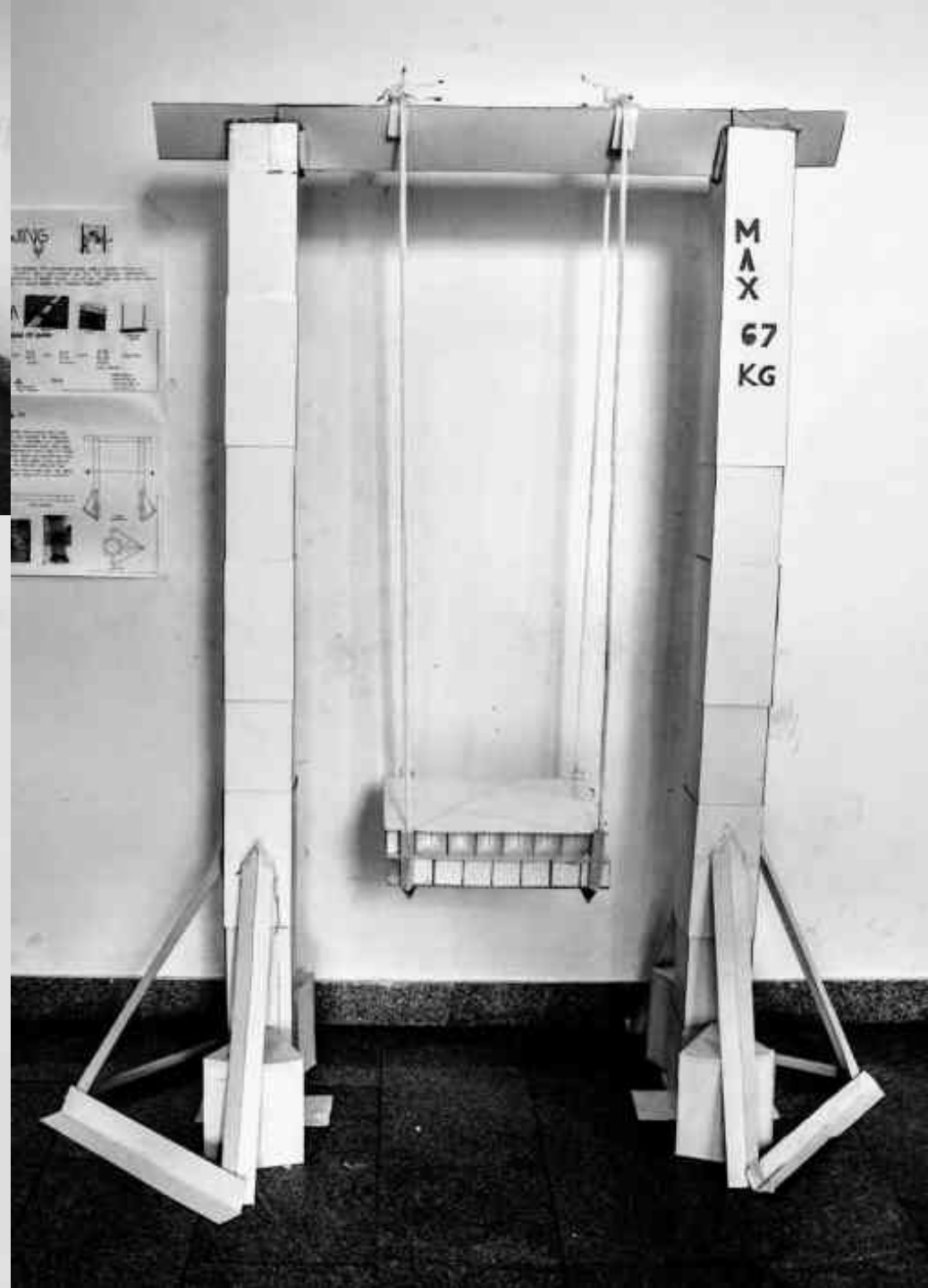
SWING 8

Another display of truss usage where triangular elements were used innovatively. The whole structure from beam to base was made out of triangular prisms, hence named – **PRISMA!**



SWING 9

Strong composition and clean presentation which was a proud representation of their makers.



CONSTRUCTION OF SWING

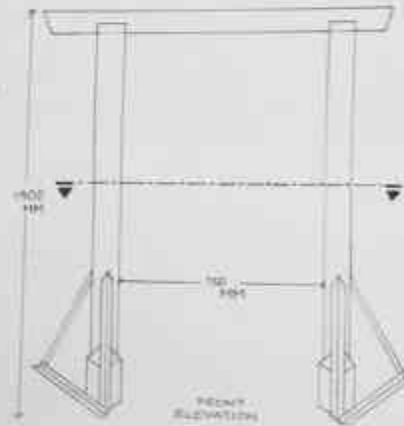
FIRSTLY FOR THE CONSTRUCTION, WE NEED TO HAVE DIFFERENT PARTS READY, WHICH ARE THE PRIMARY PARTS LIKE BEAMS, COLUMNS ETC. THE COLUMN WAS ACHIEVED BY COMBINING FOUR EQUAL LENGTHS OF 100x40x50 TO REACH THE HEIGHT OF 1.6 METRES. EACH INDIVIDUAL PART WAS BEING GIVEN MEMBERS TO THE DIAGONALS FOR BETTER STRENGTH. THESE PARTS WERE THEN JOINED TO FORM ONE COLUMN. FOR THE BEAM, A TRIANGULATED PIECE (THICK OF 200x50) WITH SIDES OF 100x500 WAS USED. THEN ANOTHER SIMILAR BEAM WAS CREATED AND THAT WAS SPLIT INTO TWO AND INSERTED ONTO BOTH ENDS OF THE MAIN BEAM. IN THE CENTER ZONE OF THIS BEAM WAS A SERIES OF TRIANGLES GIVEN FOR BETTER STRUCTURE. THEN THERE WAS A GROOVE CREATED ON THE TOP OF THE COLUMN IN SUCH A WAY THAT THE BEAM WAS FIT INTO THE BEAM COLUMN AT ITS POINTED EDGE. THIS WHOLE SET WAS PROPERLY GLUED SO THAT MOUNT BOARD STAYED STRONG.



FRONT ELEVATION OF BEAM



PLAN OF BEAM



FRONT ELEVATION



SECTION

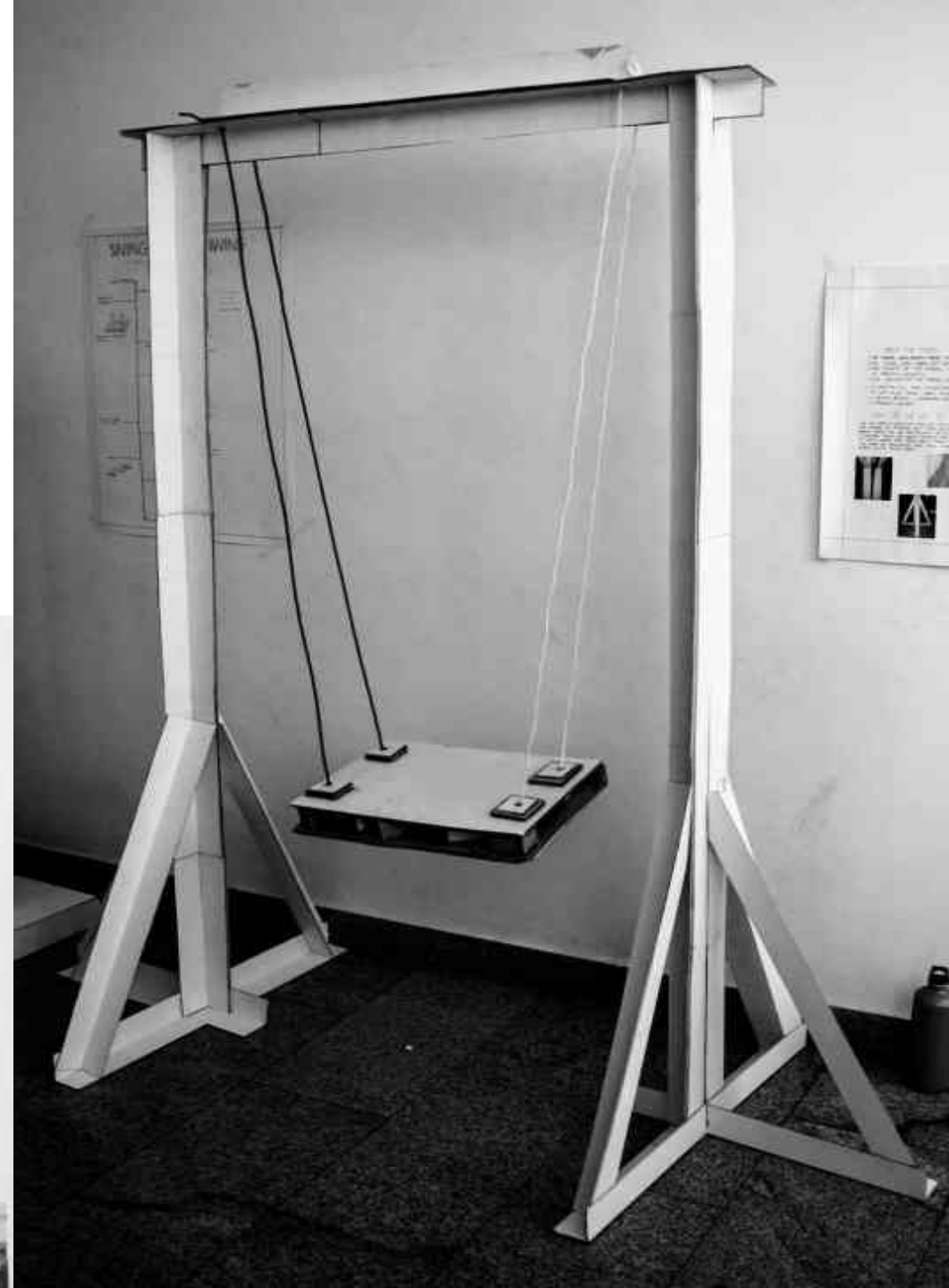


SWING 10

The most efficient and light weight design -

Weight carrying capacity up to 98kg.

The complete structure was made using T-sections, from the beam to the base the thin T-sections stood against everyone's expectation and bore through.



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ABOUT THE MODEL

- THE MODEL HAS BEEN MADE OF PLANT BOARDS
- THE MODEL WAS MADE OUT OF 'L' AND 'T' ANGLES
- THE HEIGHT OF THE MODEL IS APPROXIMATELY THE LENGTH OF 'T' BEAMS LENGTH
- THE WEIGHT OF THE MODEL IS APPROXIMATELY 1 TONS

AIRY

BY USING T-SECTIONS THAT WERE GIVEN A GAP OF 10 CM BETWEEN THEM THE MODEL WAS MADE VERY AIRY AND LIGHT. WEIGHT IS 1000 KG.

ACCIDENTS AND INJURIES

THE MAIN PROBLEM WAS THAT SOME CHILDREN WERE TRYING TO CLIMB ON THE MODEL AND WERE FALLING. TO PREVENT THIS WE MADE THE MODEL VERY STABLE AND WE MADE IT WITH A DESIGN CALLED 'X' WHICH HELPS TO BRING THE MODEL TO A FULL LENGTH WITHOUT COLLAPSING ON THE SWING BAR.

HOW DID WE GET TO THE MODEL

WE HAD BEEN THINKING OF CREATING THE MODEL OUT OF THICKER BOARDS BUT THEN WE THOUGHT ABOUT THE WEIGHT OF IT AND DECIDED TO MAKE IT LIGHTER. WE USED T-SECTIONS AND MADE IT WITH 'X' ANGLES. THEN WE MADE MODELS FOR THEM BOTH TO SEE WHICH ONE WAS BETTER AND REALIZED THAT IT WAS EQUALLY EFFICIENT TO MAKE IT THINNER AND WILL LAST FOR LONGER AND BEING LIGHTER AND WITH THIS IDEA.





The students worked day and night through the weekend.

They enjoyed throughout the project and conquered all the barriers that came in their way. When their models failed they didn't lose hope but started again. No matter how many injuries or obstacles they persevered and at the end presented brilliant works for all to see.





During this, the students learnt about the basics of bending moment, slenderness ratio and dynamic load. They got a hands on feel of the structural limitations of a design and while over coming these limitations, they came up with models that took double the prescribed weight and got an intuitive sense of structures.



LATER ON,

Great architect Shahrukh Mistry visited our college for a talk show – **LET'S TALK MISTRY**. He saw each and every swing and appreciated the hard work of all the teachers and the students.





THANK YOU