TAYLOR'S

ARCHITECTURAL DESIGN I [ARC60208]

Project 2 - Structure and Body: Materials, Anthropometric and Ergonomic Exploration

KAZE

[The breeze that brings your story to our structure]

Studies and Test Model images

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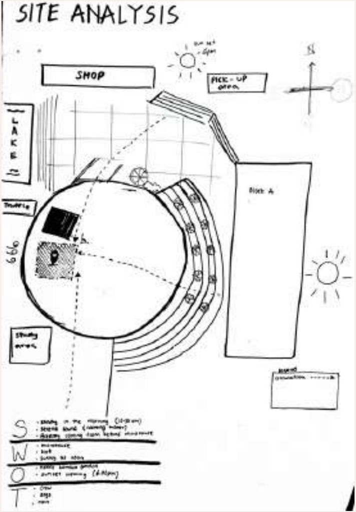
By:
Group 1 [March 2022] Sem 1

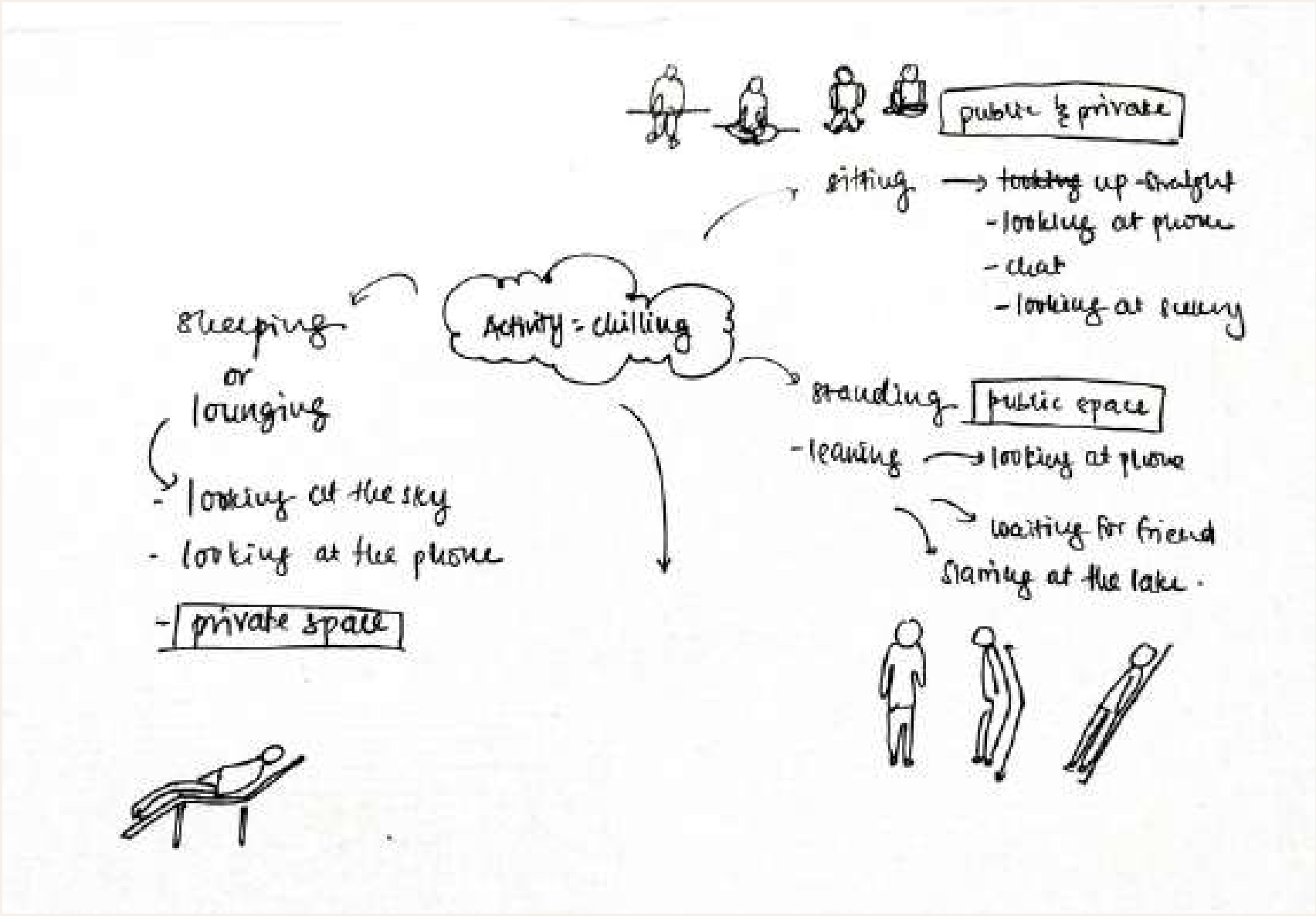
Leader:
Low Chu En

STUDIES

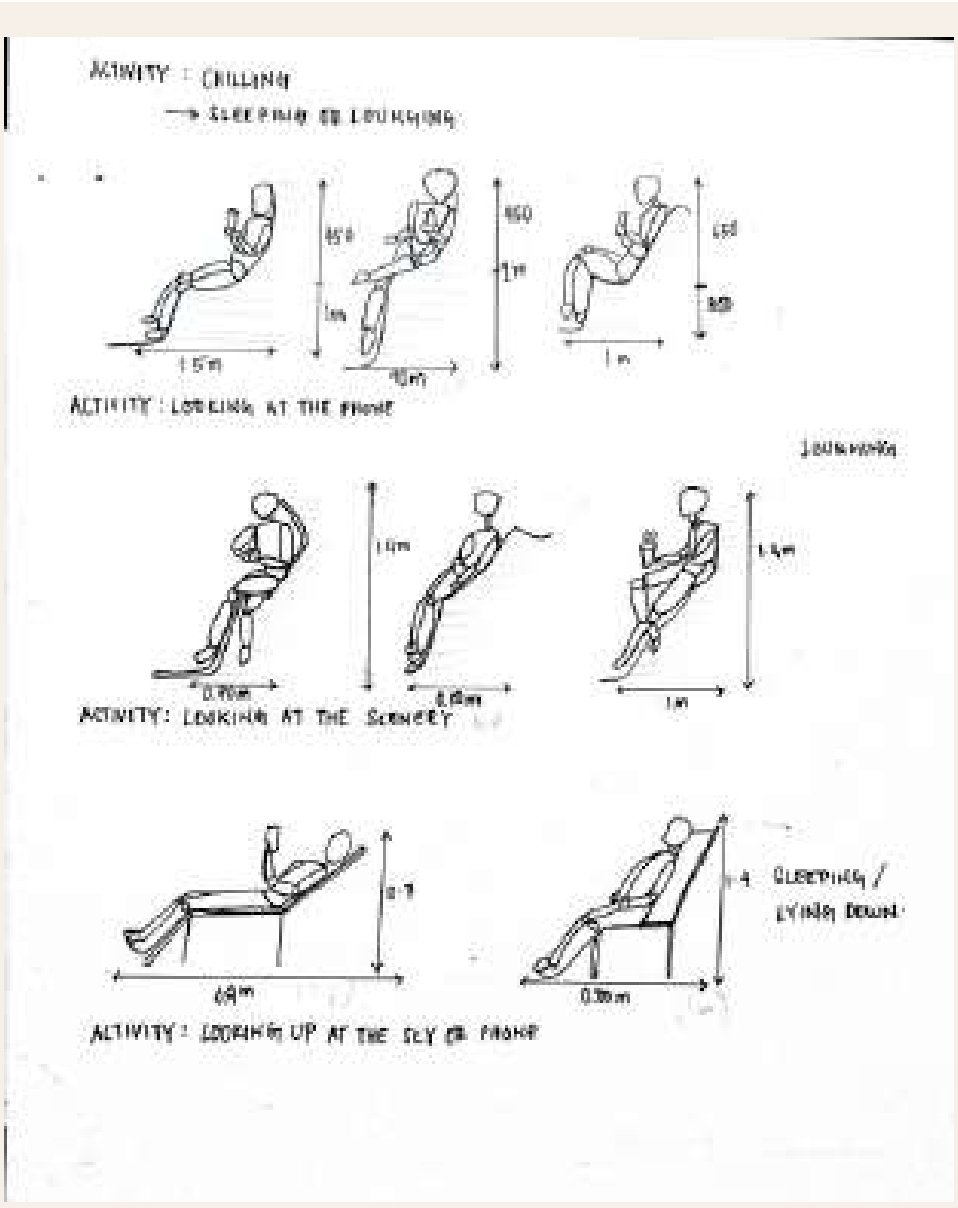

SITE ANALYSIS
SHOP
PICK-UP AREA
N
LAKE
Study area
S
W
O
T

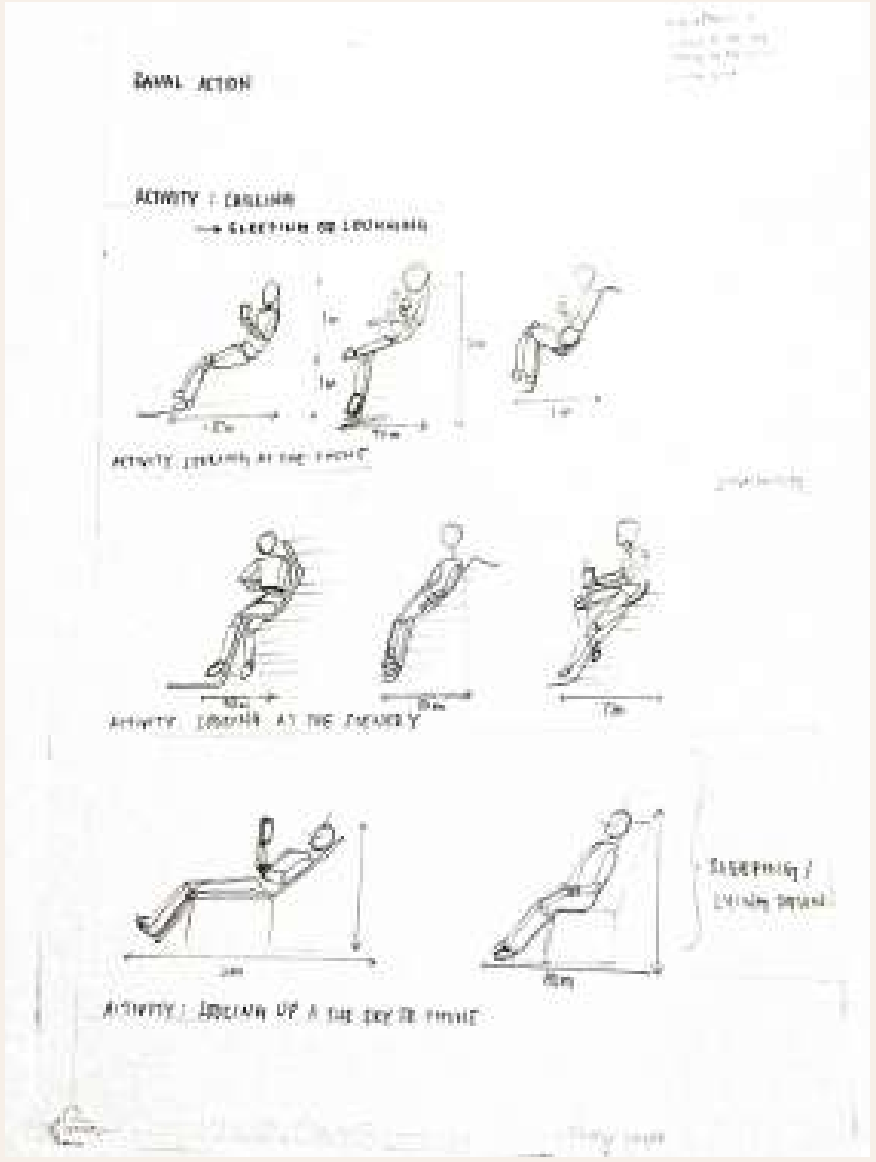

Roger → 161
Nikhil → 176
Olivia → 160
Hois → 168
Jiekay → 171
Brendon → 177
Yong Hang → 168
Wan Qi → 161

STUDIES

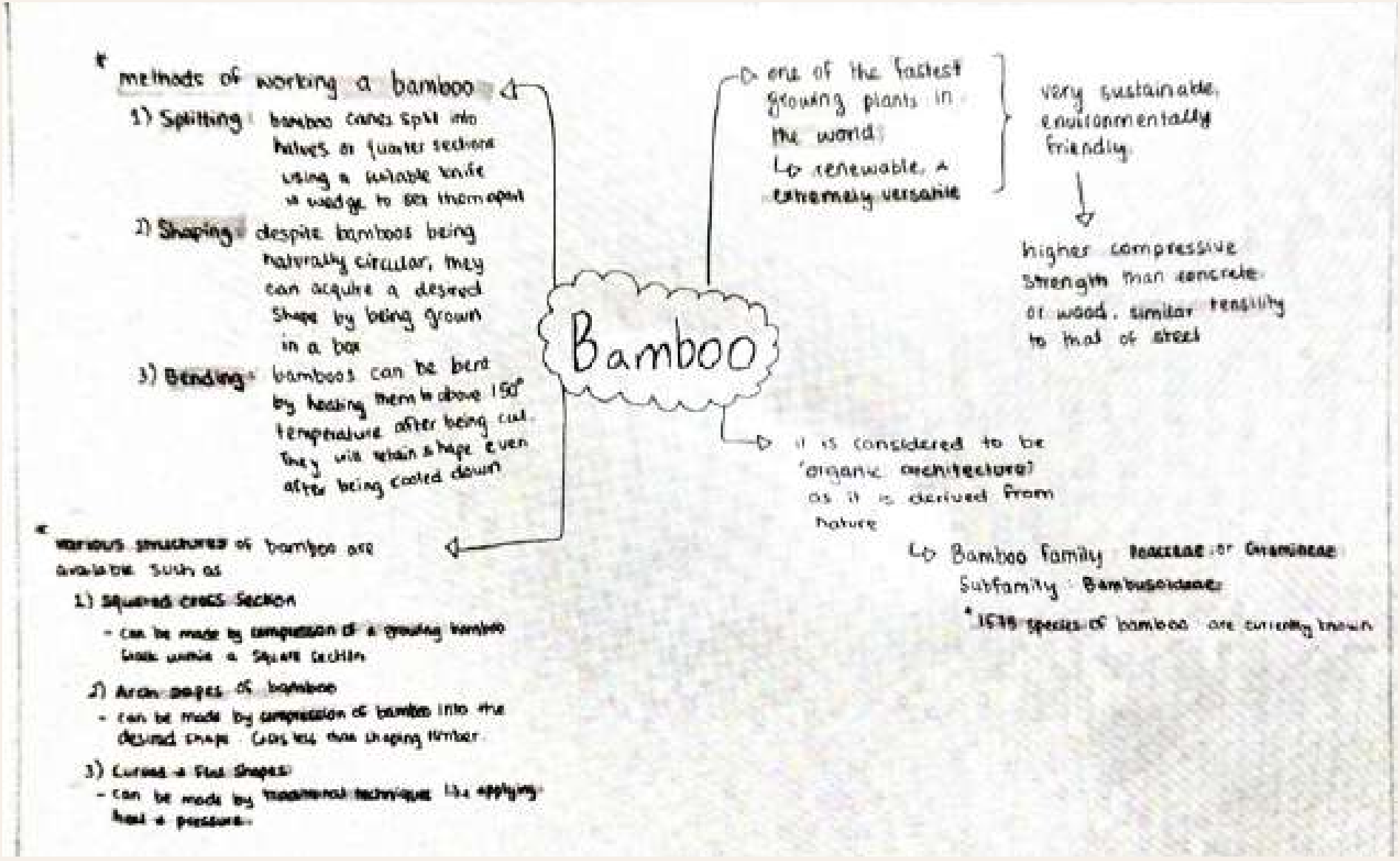

public & private
sitting → looking up - straight
- looking at phone
- chat
- looking at scenery
Activity - chilling
sleeping or lounging
- looking at the sky
- looking at the phone
- private space
standing - public space
- leaning → looking at phone
→ waiting for friend
staring at the lake.

STUDIES


ACTIVITY : CHILLING
→ SLEEPING OR LOUNGING
1.5m
1m
1m
1m
ACTIVITY : LOOKING AT THE PHONE
LOUNGING
1.1m
1.4m
1m
ACTIVITY: LOOKING AT THE SCENERY
0.7
0.9m
0.3m
SLEEPING / LYING DOWN
ACTIVITY : LOOKING UP AT THE SKY OR PHONE


BASIC ACTION
ACTIVITY : CHILLING
→ SLEEPING OR LOUNGING
1m
1m
ACTIVITY : LOOKING AT THE PHONE
ACTIVITY : LOOKING AT THE SCENERY
SLEEPING / LYING DOWN
ACTIVITY : LOOKING UP AT THE SKY OR PHONE

STUDIES


Bamboo
methods of working a bamboo
1) Splitting: bamboo canes split into halves or quarter sections using a suitable knife or wedge to get them open
2) Shaping: despite bamboos being naturally circular, they can acquire a desired shape by being grown in a box
3) Bending: bamboos can be bent by heating them to above 150° temperature after being cut. they will retain shape even after being cooled down
one of the fastest growing plants in the world
renewable, & extremely versatile
very sustainable, environmentally friendly
higher compressive strength than concrete or wood. similar tensility to that of steel
it is considered to be 'organic architecture' as it is derived from nature
Bamboo family Poaceae or Gramineae
Subfamily: Bambusoideae
1538 species of bamboo are currently known
various structures of bamboo are available. such as
1) Squared cross Section
- can be made by compression of a growing bamboo into within a square section
2) Arch shapes of bamboo
- can be made by compression of bamboo into the desired shape. (cost less than shaping timber
3) Curved & Flat Shapes
- can be made by treatment techniques like applying heat & pressure.

STUDIES

BAMBOO CHARACTERISTICS

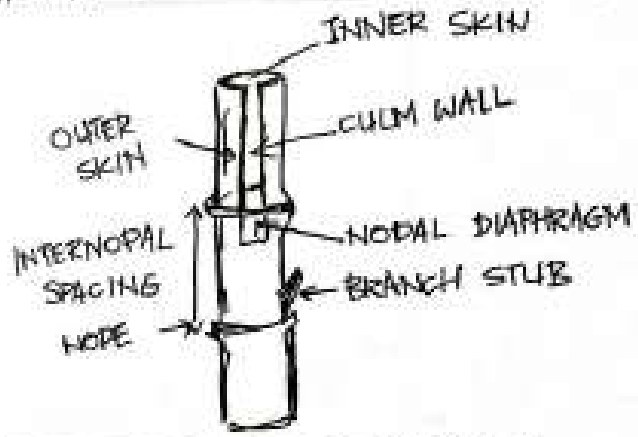
THERE ARE MORE THAN 1000 SPECIES OF BAMBOO IN TOTAL, BROKEN INTO, BROKEN INTO 2 "TRIBES":

i) HERBACEOUS ii) WOODY

HERBACEOUS
- VERY SMALL DIAMETER
- RESEMBLE GRASSES

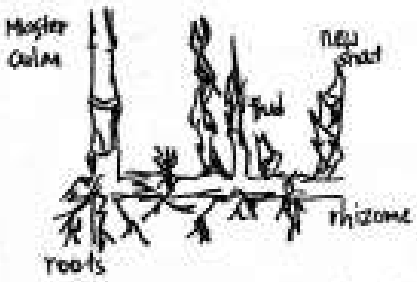
WOODY
- LARGE DIAMETER
- USE FOR CONSTRUCTION

STRUCTURE OF A BAMBOO CULM



WOODY BAMBOO

RUNNING BAMBOO



- SEND THEIR SHOOTS AS FAR OUT 30m FROM AN EXISTING CULM

CLUMPING BAMBOO

- SPROUT THEIR SHOOTS CLOSE TO THE BASE OF EXISTING CULM

WOODY DIAMETERS VARY FROM 10MM TO 200MM.
WALL THICKNESS FROM < 10% OF THE EXTERNAL DIAMETER TO COMPLETELY SOLID

SUITABLE STRUCTURAL SPECIES

- GROW LOCALLY IN ABUNDANCE
- STRONGER THAN OTHER LOCAL SPECIES
- LARGE DIAMETER (80MM - 200MM)
- GROW RELATIVELY STRAIGHT
- MATURE QUICKLY (3 - 5 YEARS)
- LESS SUSCEPTIBLE TO SPLITTING

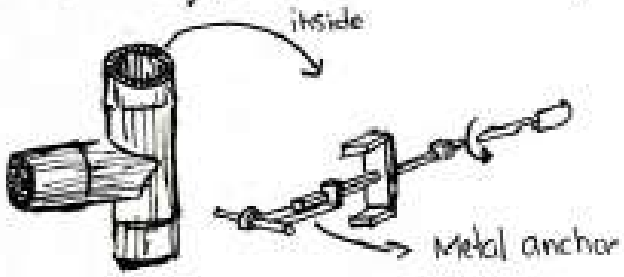
(*) LIST OF COMMONLY USED STRUCTURAL BAMBOO SPECIES

GIGANTOCHLOA SCORTECHINII (BULUH SEMANTAN)

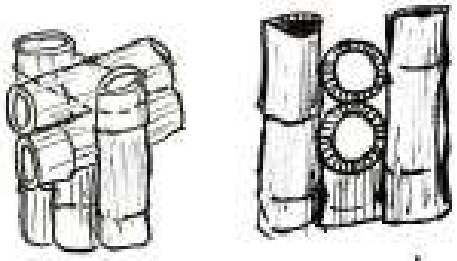
GIGANTOCHLOA WRAYI (BULUH BETI)

STUDIES

(a) Bamboo joint with metal anchor.
This technique is used in various positions

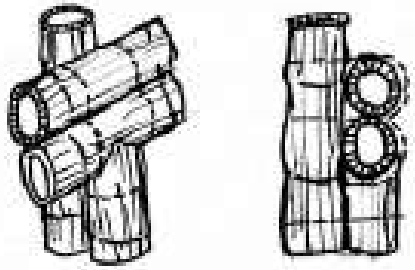


(b) Central double rafter



↳ It was a wide range of applications. in the construction of bridges and structures for rural facilities.

(c) Lateral double rafter



↳ Each of the rafters is secured independently at the side support and each other It is often used in the construction of bridges and structures for rural facilities.

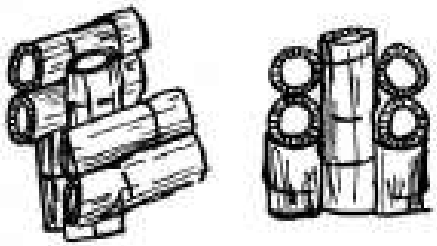
(d) Double and quadruple bamboo rafter support

(a) Beams formed by 4 or 6 members.

↳ The top row is separated from the bottom with bamboo or wood slats so that the upper bamboos do not slide over the lower.

STUDIES

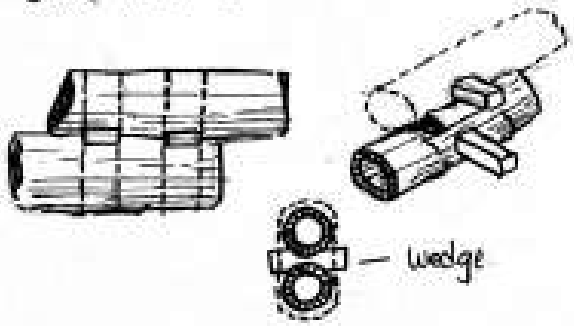
ⓓ Lateral double rafles



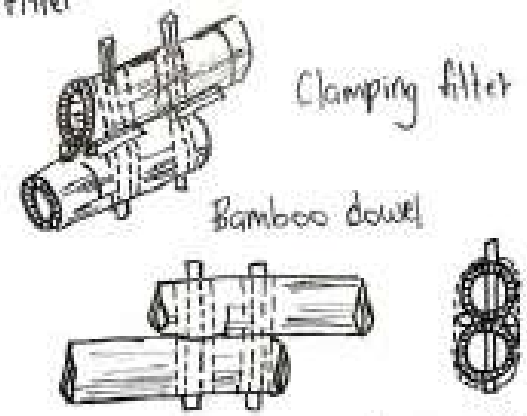
C. Is often used as a central support for bridge structures or sheds

③ Joining and fixation of bamboo poles

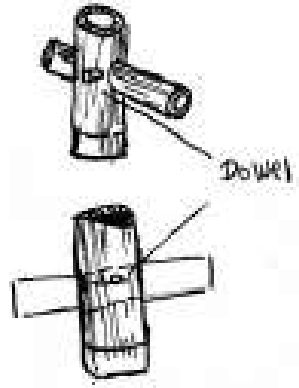
ⓐ Joint with double wooden wedge.



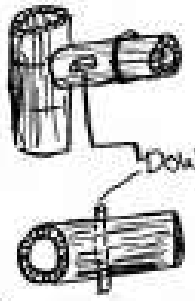
ⓑ Joint with dowels and clamping fitter



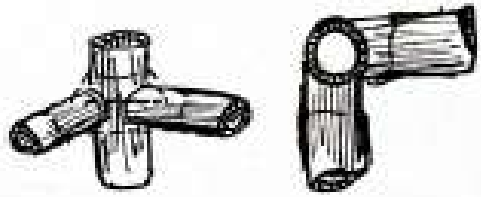
ⓒ Cross joint with dowel.



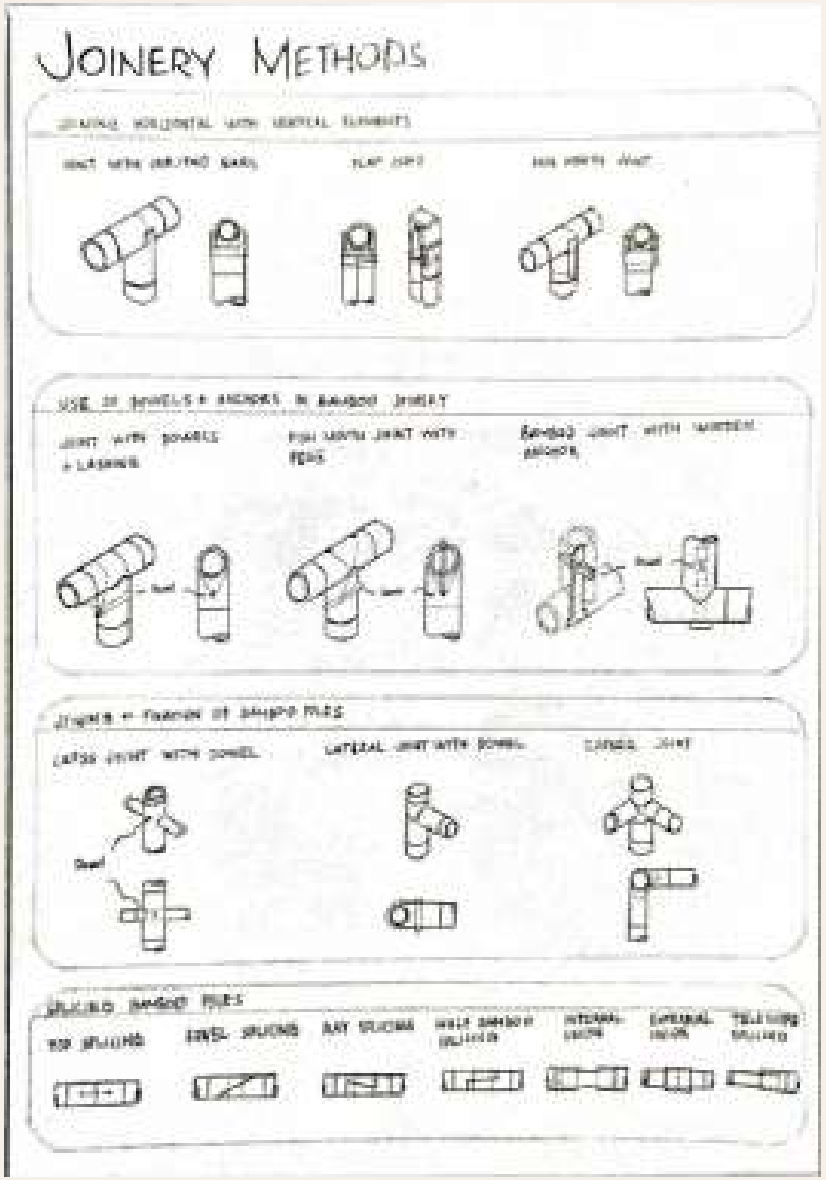
ⓓ Lateral joint with dowel

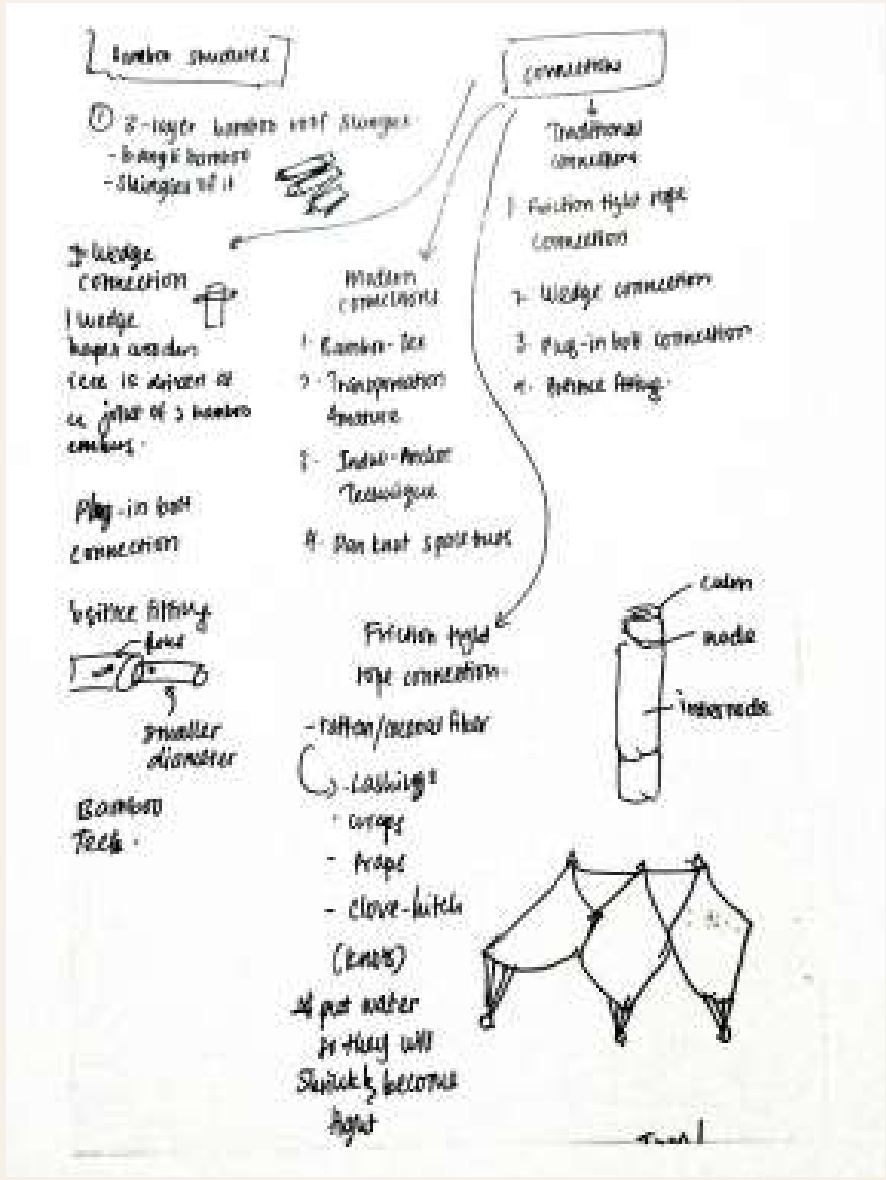


ⓔ Corner joint

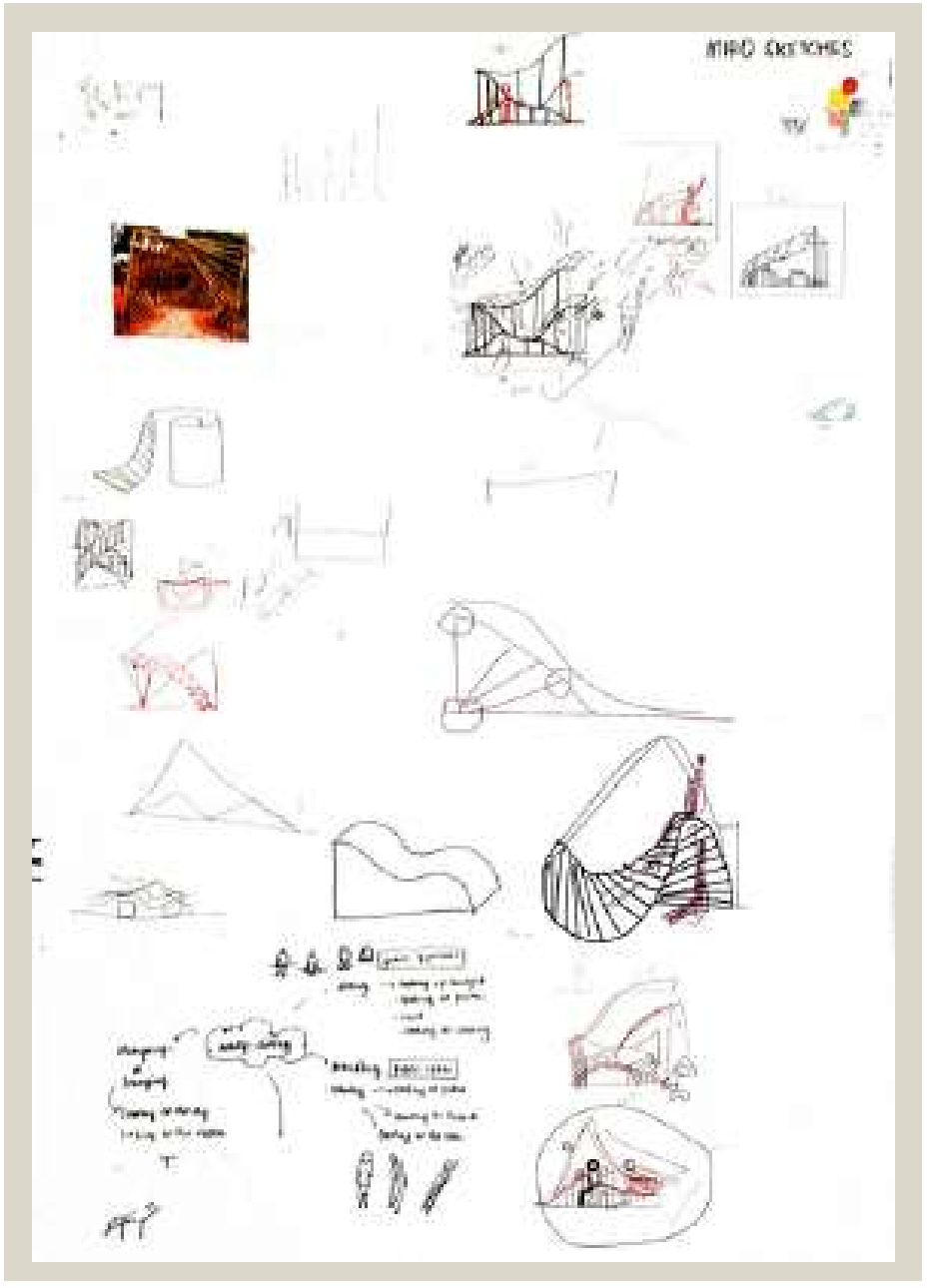


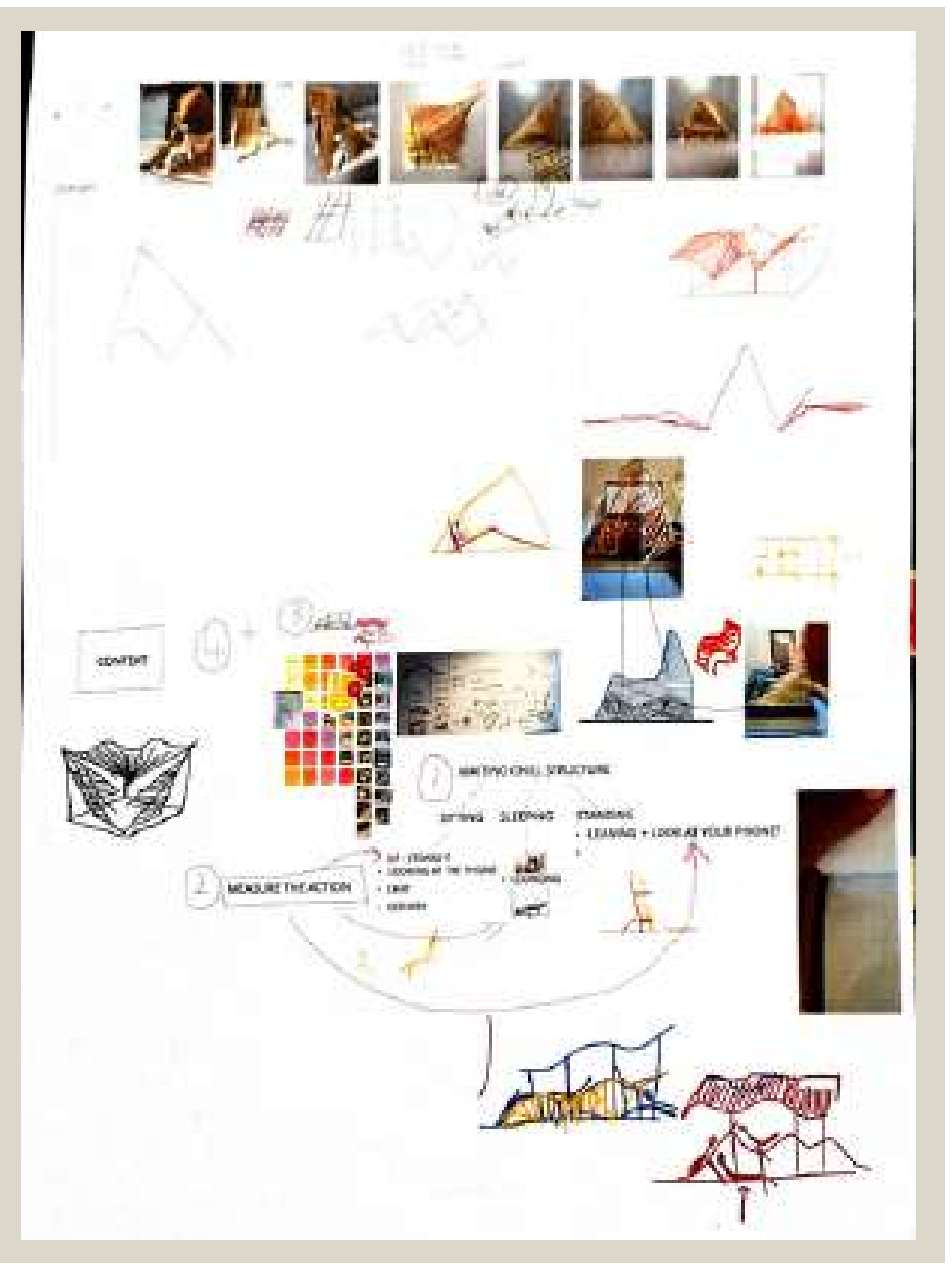
STUDIES


JOINERY METHODS

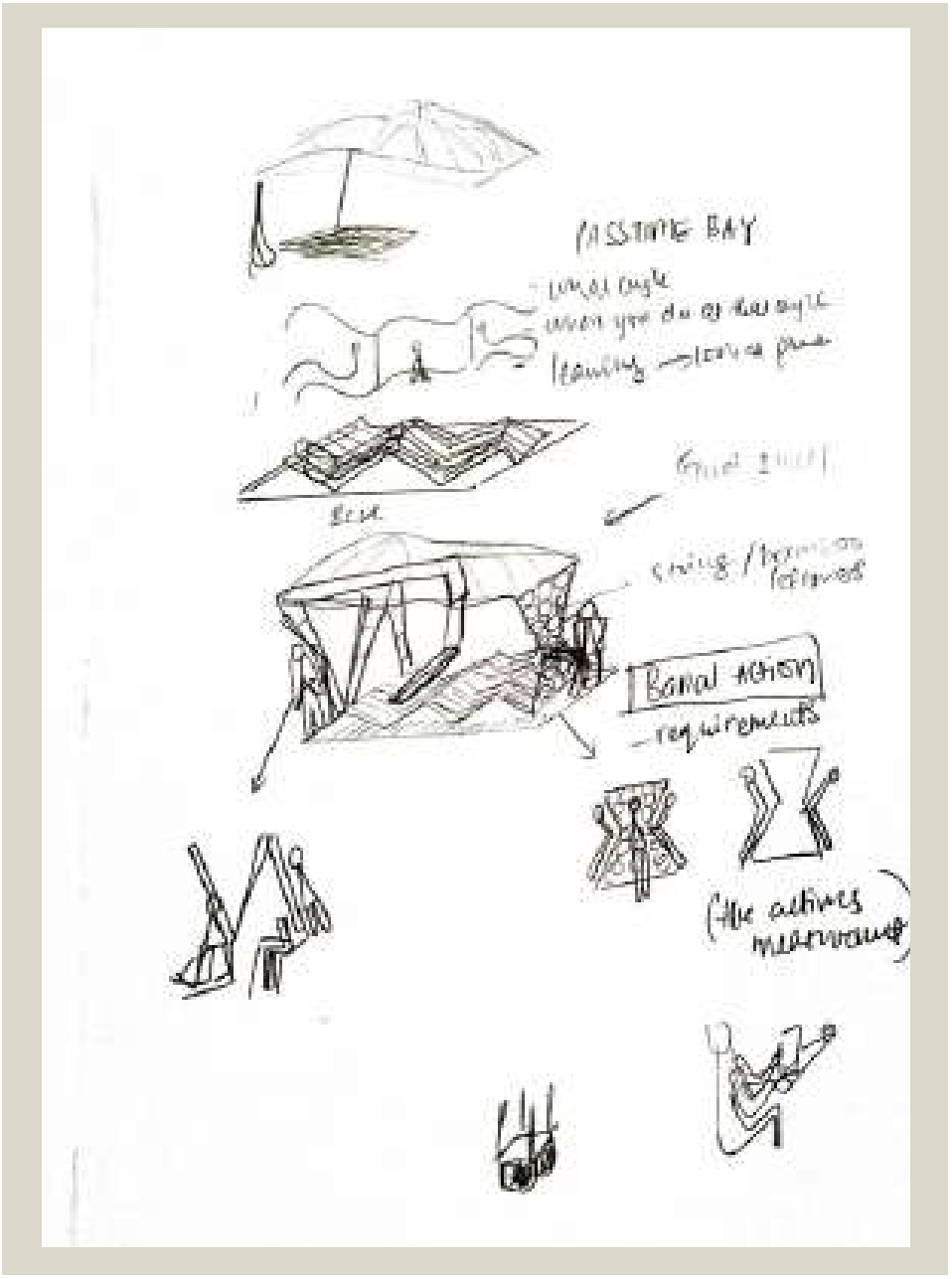

Bamboo structures
Connections
① 2-layer bamboo roof shingles
- Bungil bamboo
- Shingles of it
Traditional connections
1. Friction tight rope connection
2. Wedge connections
3. Plug-in bolt connection
4. Bamboo fitting
2. Wedge connection
Wooden connections
1. Bamboo-Tie
2. Transformation Structure
3. Indoor-Outdoor Terminology
4. Plan Layout spatial Layout
Wedge keeps wooden core in shape of a joint of 2 bamboo culms.
Plug-in bolt connection
Bamboo fitting
Bamboo Tools
smaller diameter
Friction tight rope connection
- rattan/coconut fiber
- Lashings
- wraps
- Rope
- clove-hitch
(knots)
culm
node
internode
At past water it they will shrink & become tight

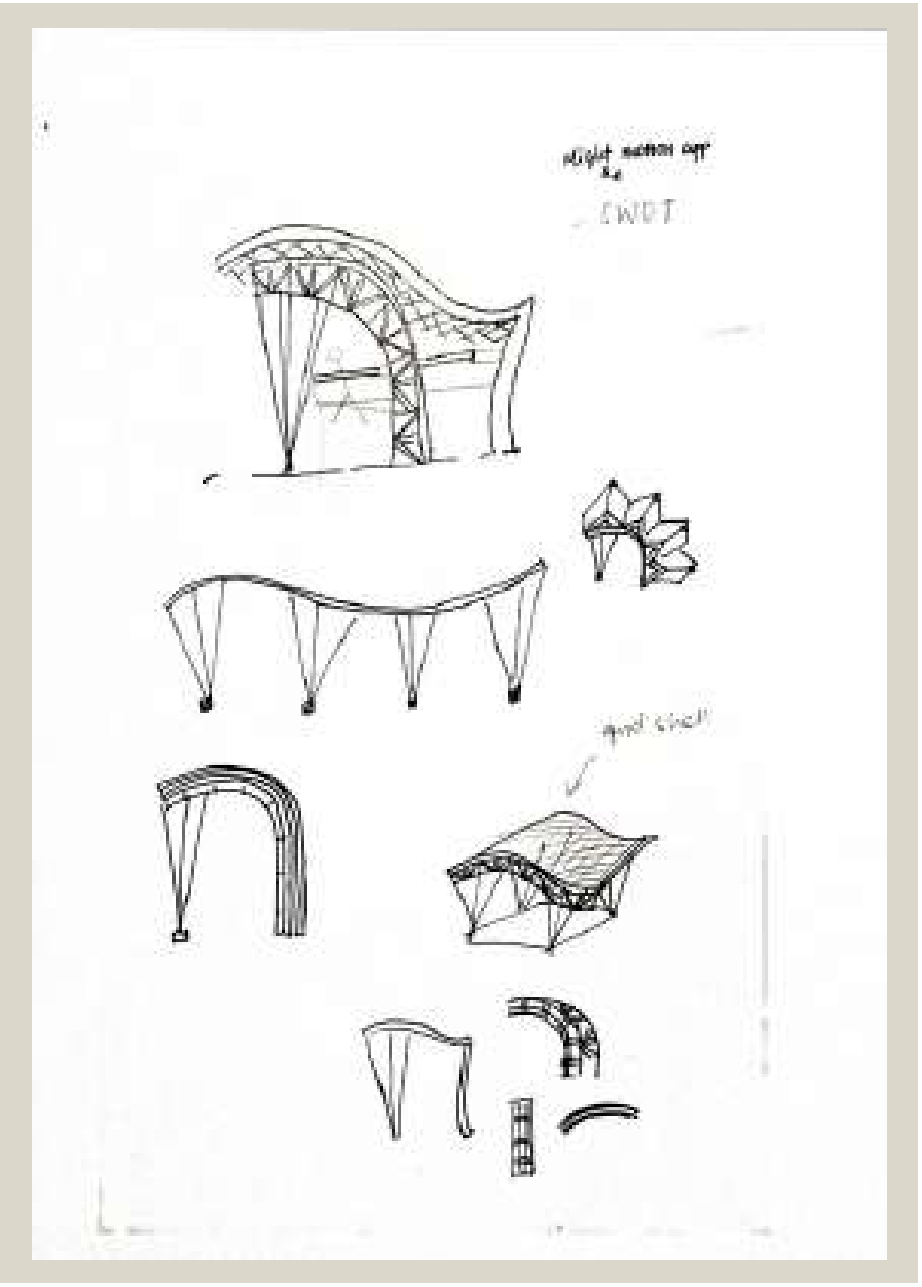
SKETCHES DONE ON MIRO BOARD



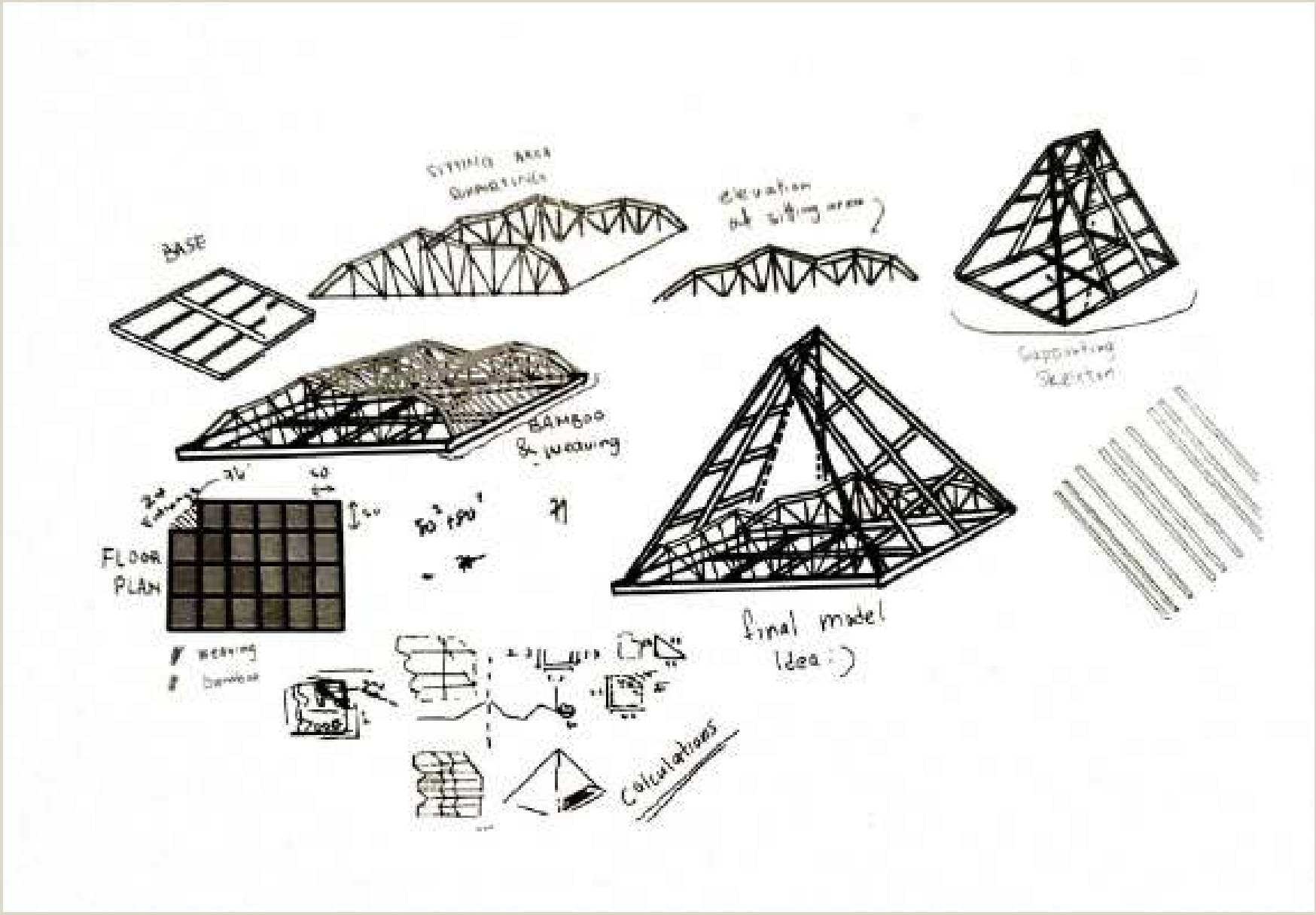


SKETCHES

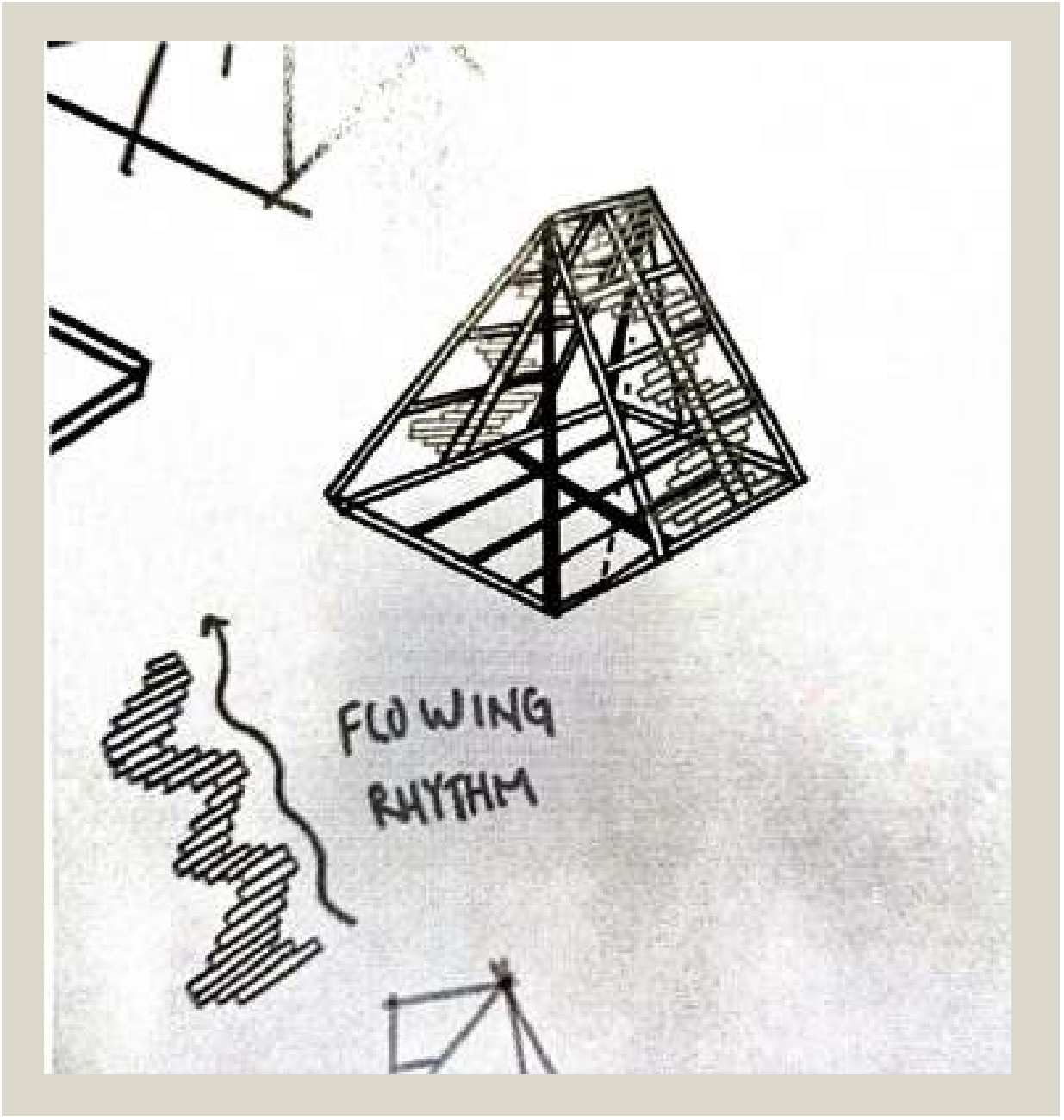

PASSIVE BAY
Banal action
requirements
(the actives maintained)



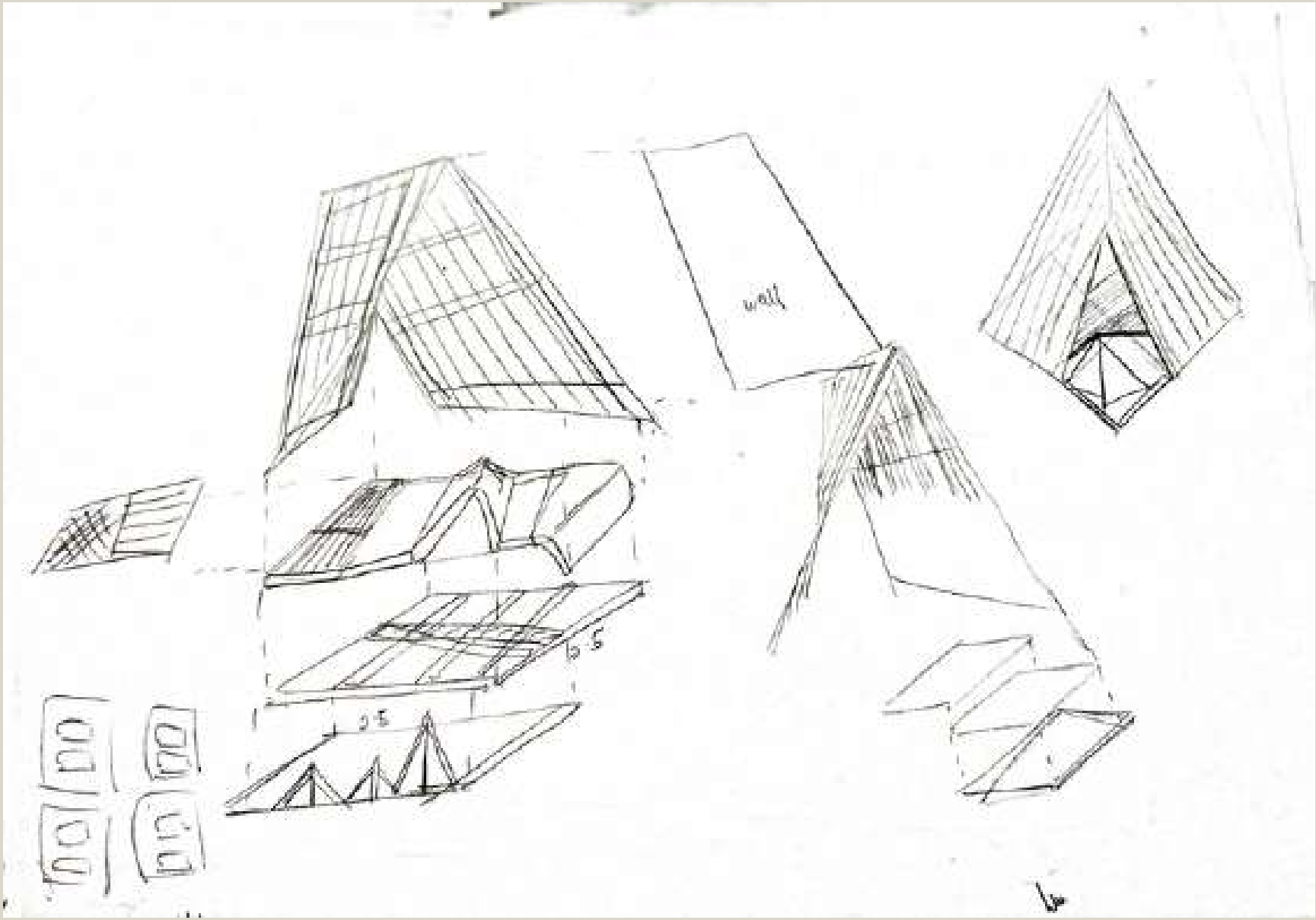
SKETCHES



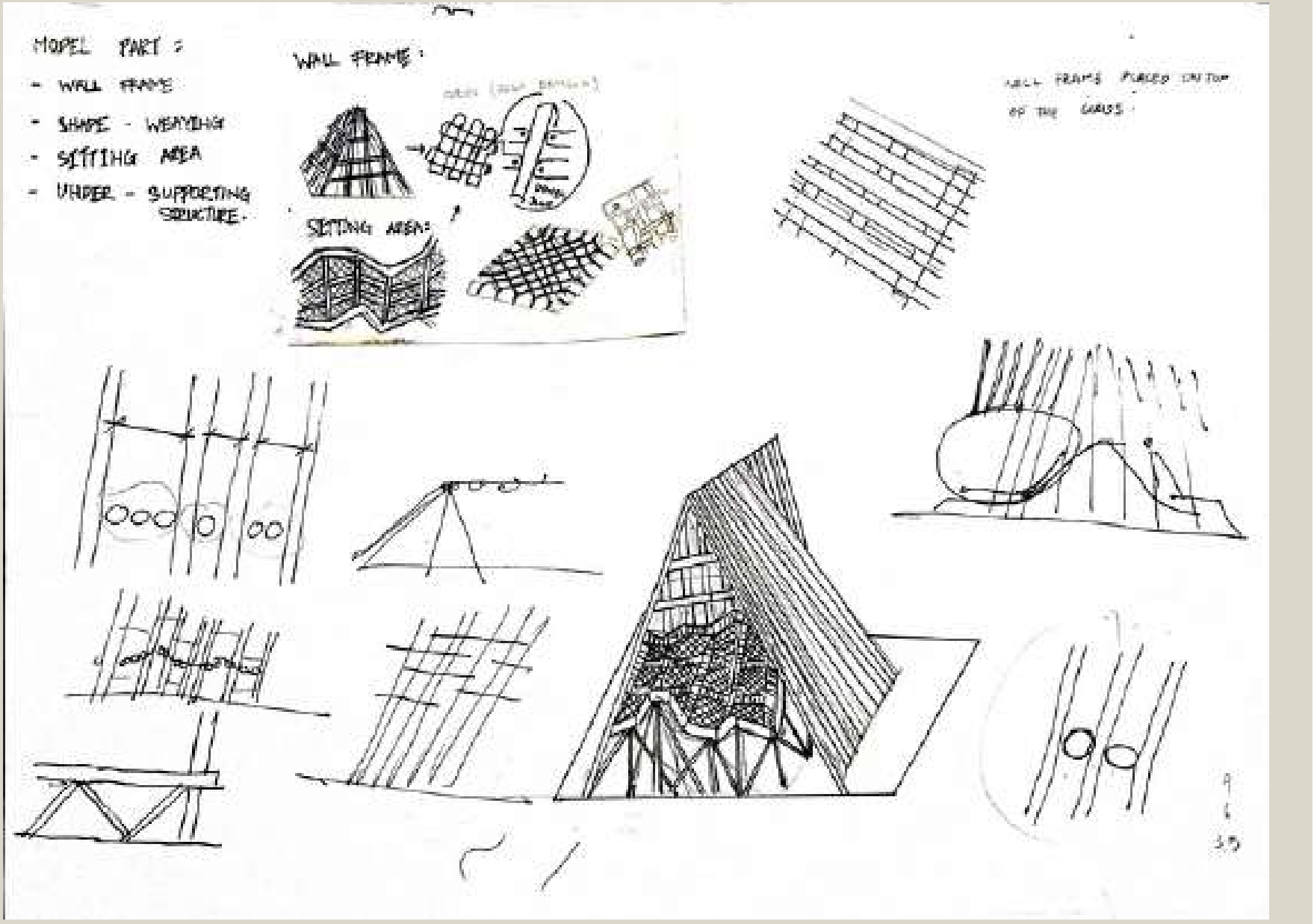
SKETCHES



SKETCHES

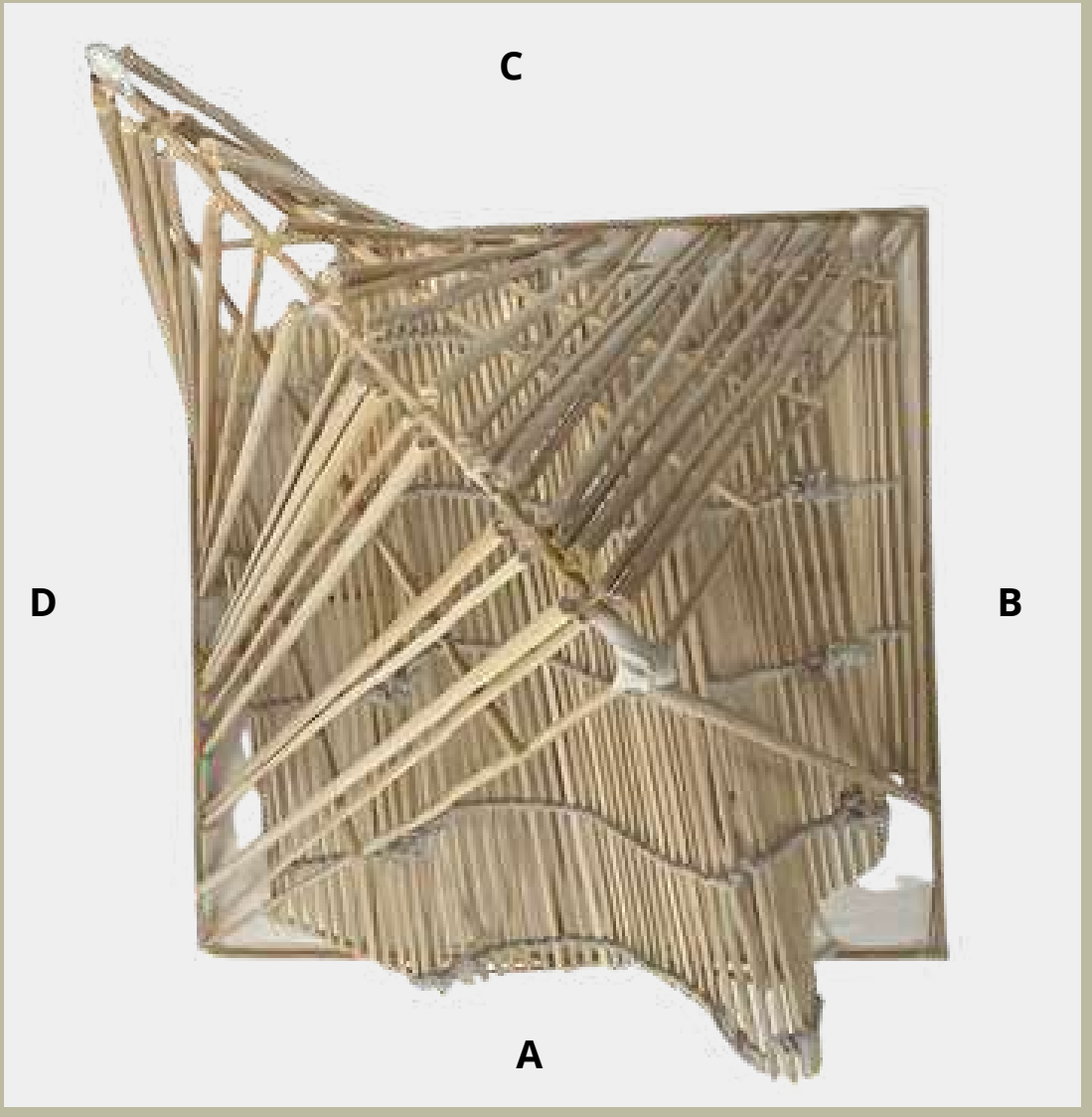


SKETCHES


MODEL PART :
- WALL FRAME
- SHAPE - WEAVING
- SITTING AREA
- UNDER - SUPPORTING STRUCTURE
WALL FRAME :
SITTING AREA :
WALL FRAMS PLACED ON TOP OF THE GABUS

TEST MODELS

TOP VIEW



TEST MODELS

FRONT VIEW - A

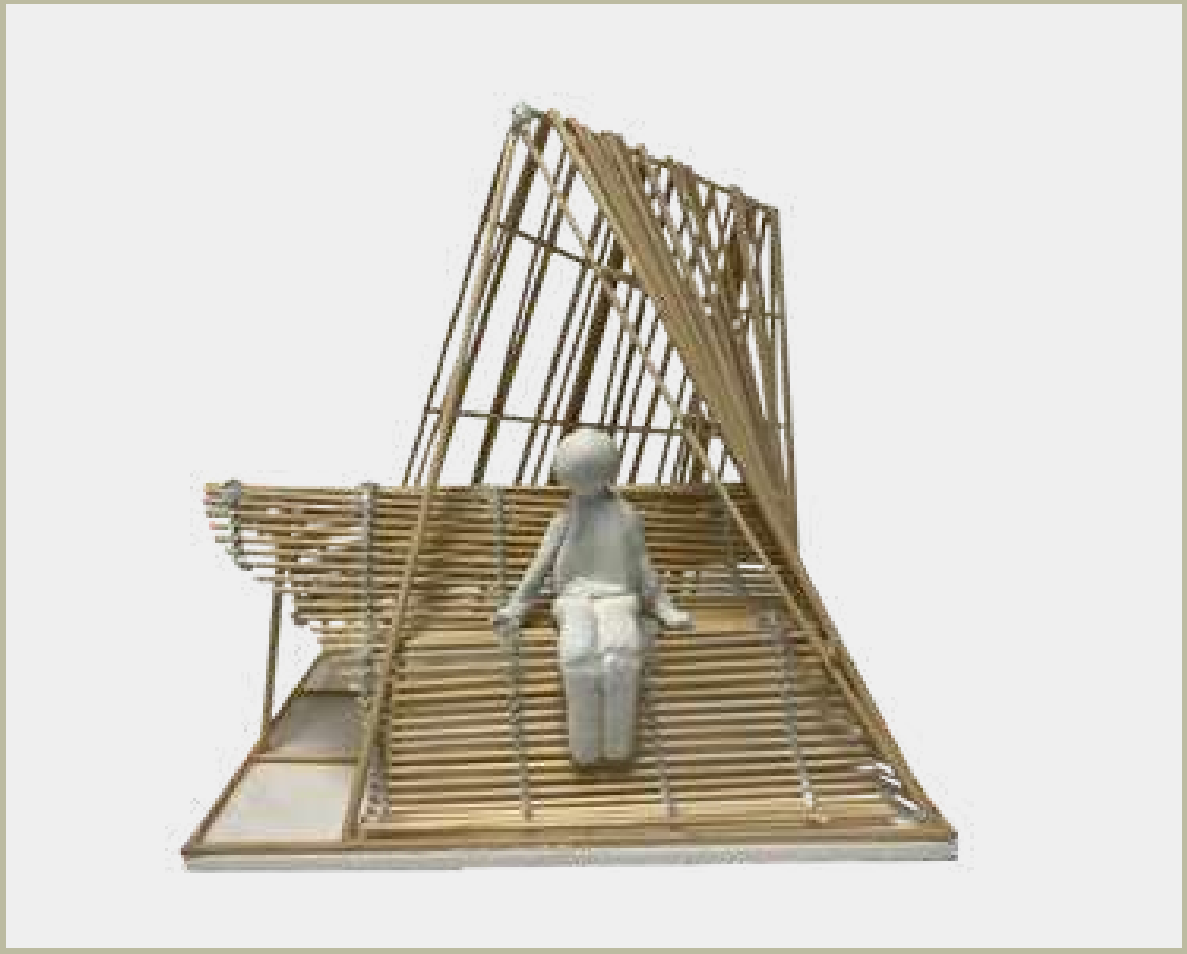
LEANING + SITTING

SITTING

LYING BACK

TEST MODELS

ELEVATION VIEW - B



SITTING

TEST MODELS

LYING DOWN FLAT

TEST MODELS

PERSPECTIVE VIEW

TEST MODELS

PERSPECTIVE VIEW