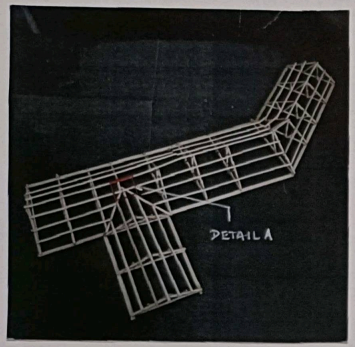
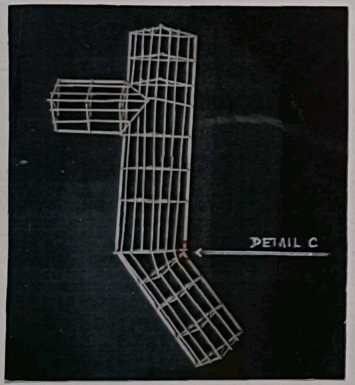
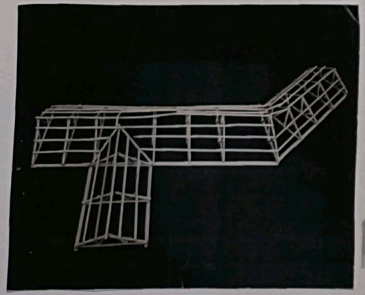
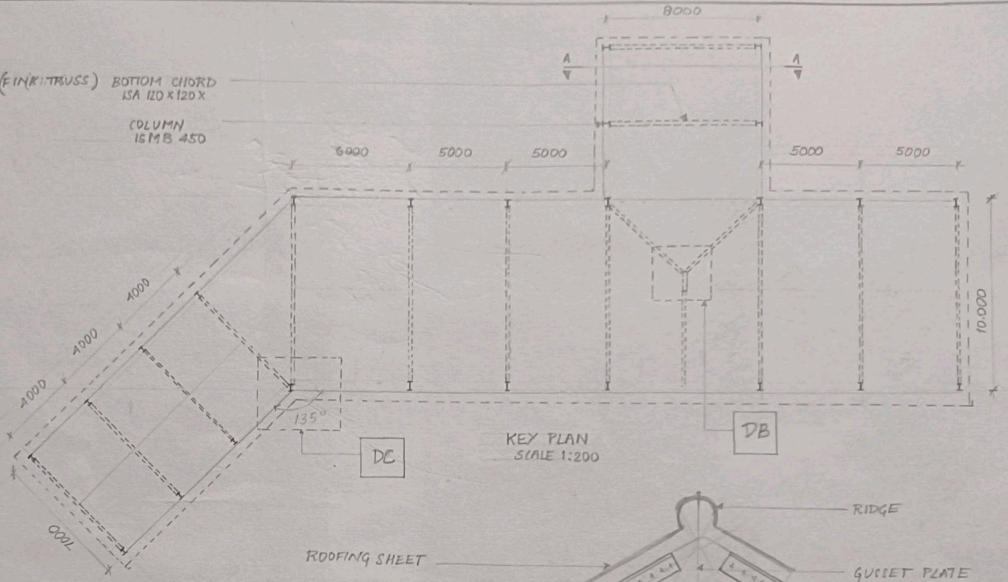
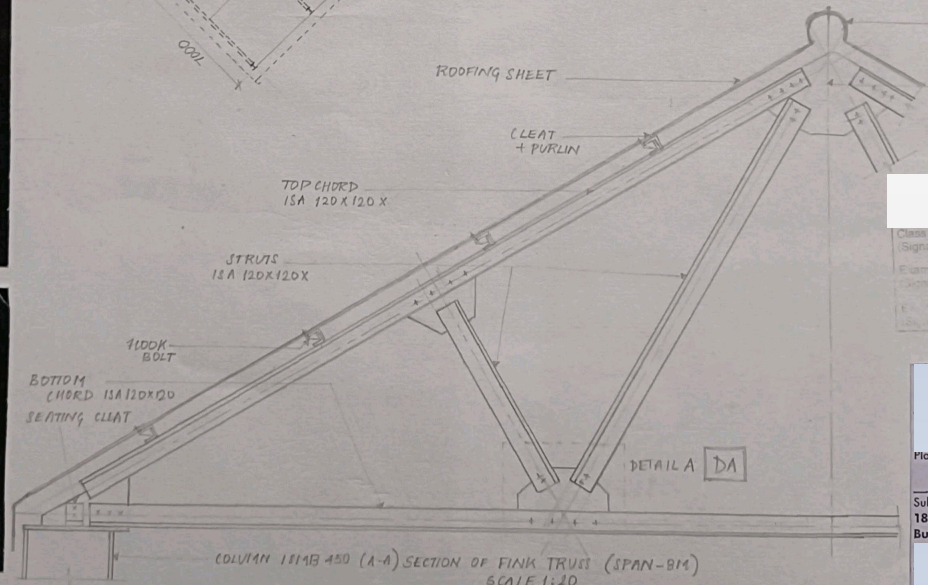






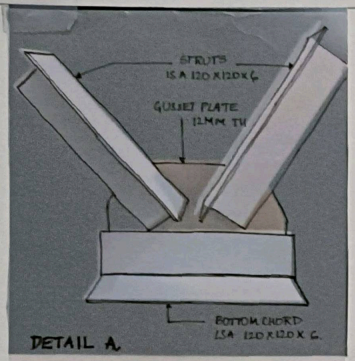
(FINK) TRUSS) BOTTOM CHORD
ISA 120 X 120 X
COLUMN
ISMB 450



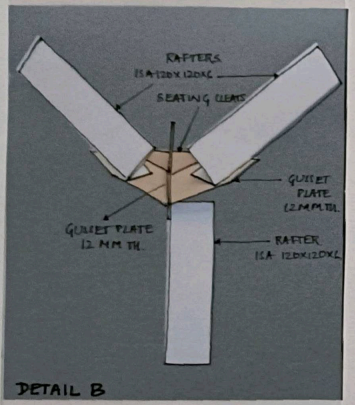


Class Teacher:
(Signature with date)
Examiner 1:
(Signature with date)
10/01

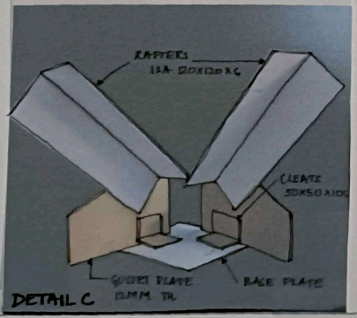
Plate Title:
STEEL TRUSSES
Subject Code and Name: 18ARC5.2
18ARC5.2 Materials and Methods in Building Construction - V



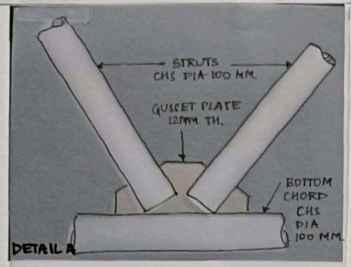
DETAIL A



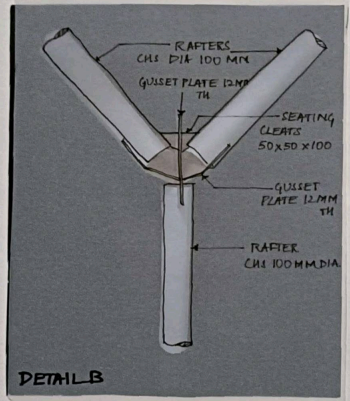
DETAIL B



DETAIL C



DETAIL A



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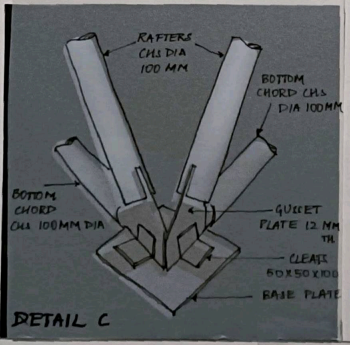
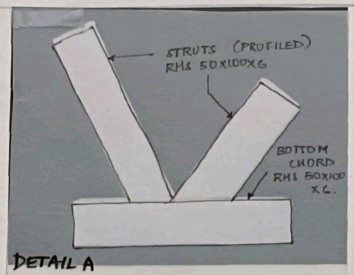
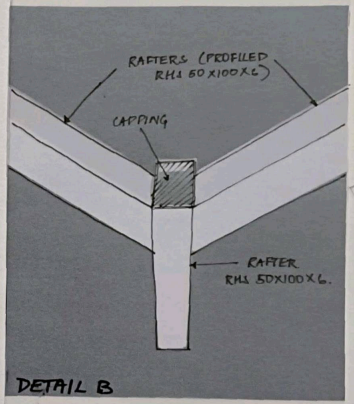


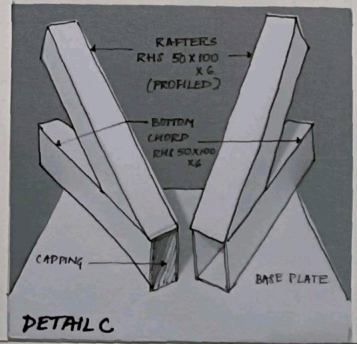
DETAIL C



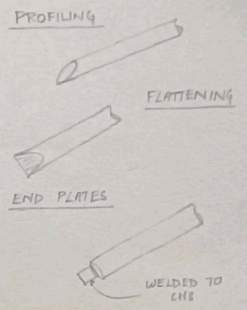
DETAIL A



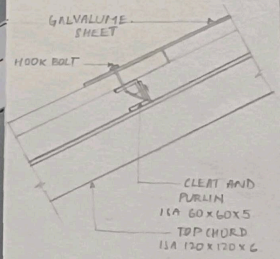
DETAIL B



DETAIL C



(1:10) ROOFING SHEET DETAIL



GUTTER DETAIL (1:20)

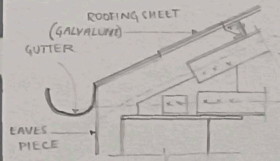
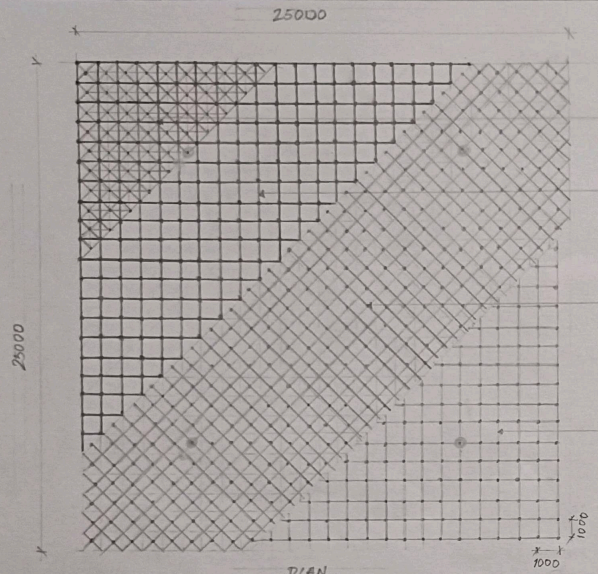


Plate Title:

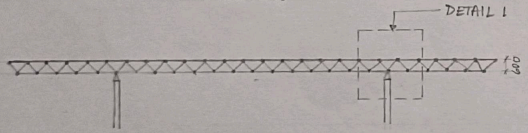
STEEL TRUSSES

Subject Code and Name:

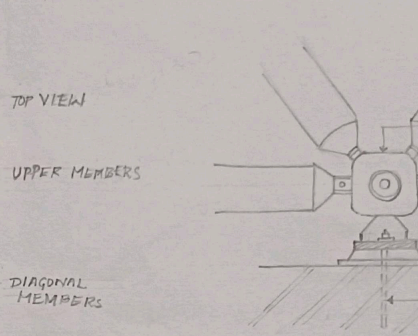
18ARC5.2 Materials and Methods in Building Construction - V

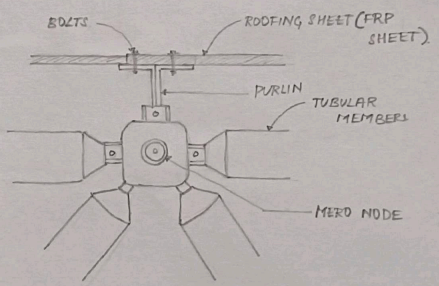


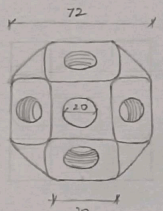
PLAN
SCALE 1:200



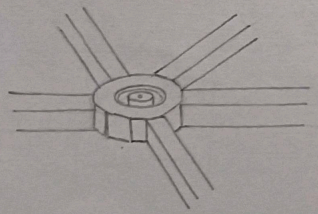
ELEVATION
SCALE 1:200



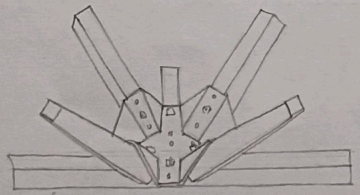




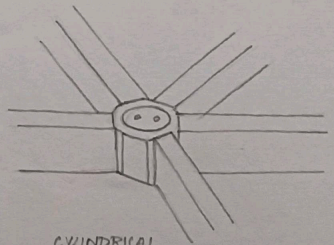
MERO NODE
DIMENSIONS



DISK NODE SYSTEM



UNI-STRUT SYSTEM



CYLINDRICAL
NODE SYSTEM

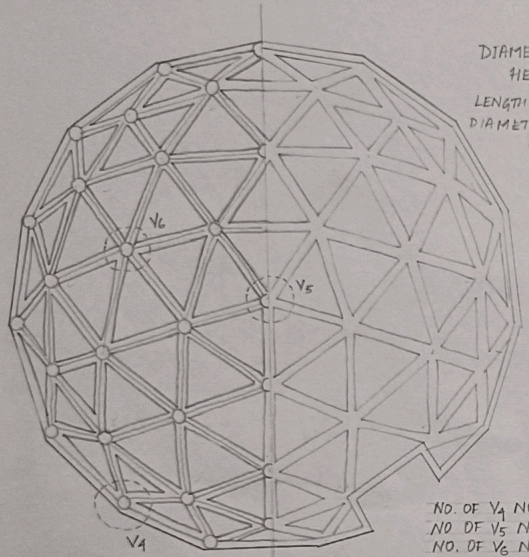
(Signature with date)

10/01

SPACE FRAMES

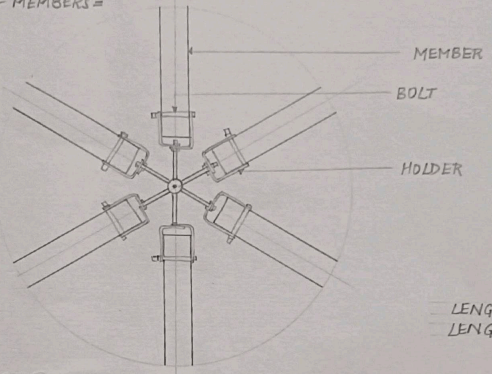
Subject Code and Name:
18ARC5.2 Materials and Methods in Building Construction - V

DIAMETER = 4.9M
HEIGHT = 1.6M
LENGTH OF MEMBERS = 875MM AND 1000MM
DIAMETERS OF MEMBERS =

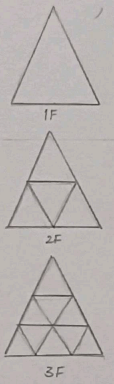


GEODESIC DOME
(PLAN)

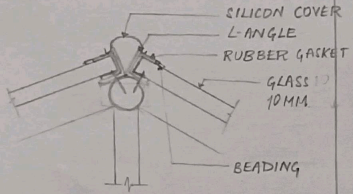
NO. OF V_1 NODES = 15
NO. OF V_5 NODES = 6
NO. OF V_6 NODES = 24



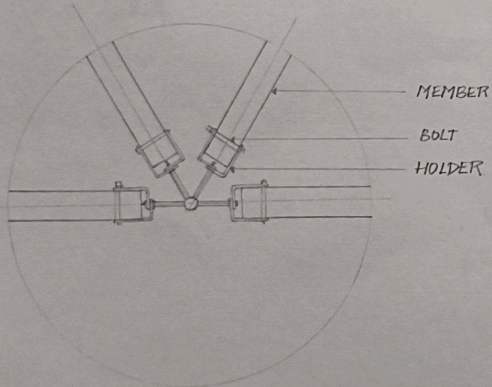
6 - MEMBER NODE



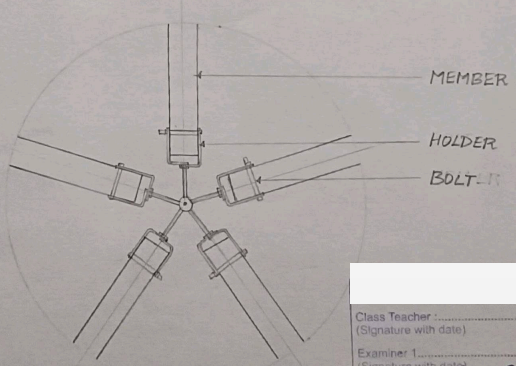
LENGTH OF STANDARD MEMBERS = 1000MM
LENGTH OF SMALLER MEMBERS = 875 MM



GLAZING DETAIL



4 - MEMBER NODE



5 - MEMBER NODE

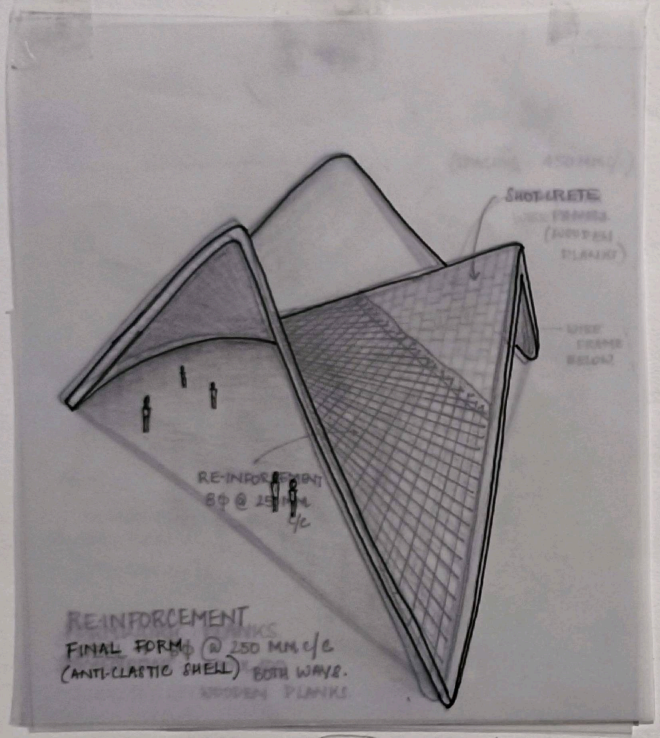
Class Teacher : .....
(Signature with date)

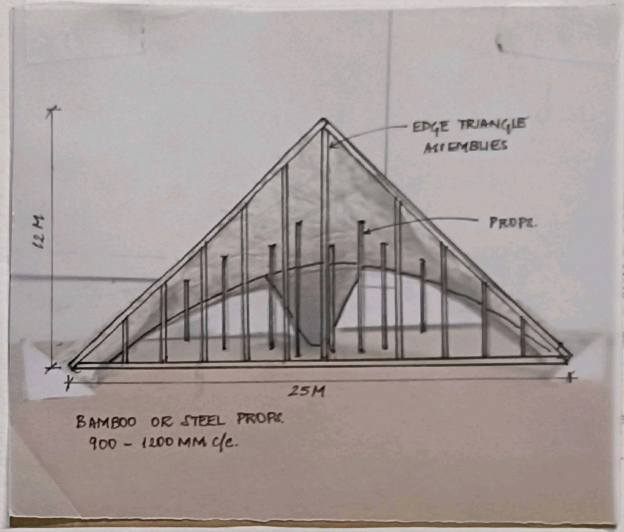
Examiner 1 .....
(Signature with date)

Examiner 2 .....
(Signature with date)

Plate Title:
GEODESIC DOMES

Subject Code and Name:
18ARC5.2 Materials and Methods in Building Construction - V





ELEVATION

ADVANTAGES

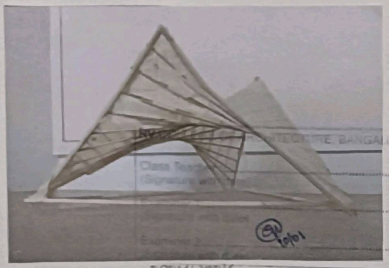
1. EFFICIENT MATERIAL USE
2. LARGE SPANS
3. ORGANIC FORMS

DISADVANTAGES

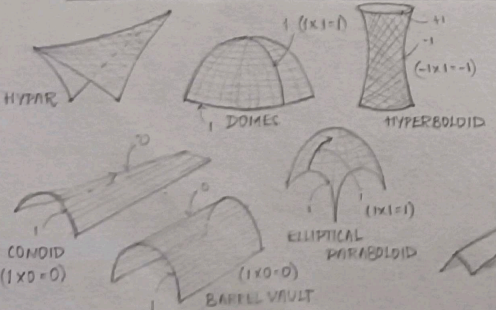
1. EXPENSIVE FORMWORK
2. SKILLED LABOUR
3. SLOWER CONSTRUCTION
4. MAINTENANCE IS EXPENSIVE - DUE TO CONTINUOUS RUN-OFF.
5. SERVICES HAVE TO BE DETAILED.
6. ACOUSTICS NEED ATTENTION.

SHELLS AND FOLDED PLATES:

- SHELLS ARE THIN, CURVED PLATE STRUCTURES SHAPED TO TRANSMIT APPLIED FORCES BY COMPRESSIVE, TENSILE AND SHEAR STRESSES.
- FOLDED PLATES ARE ASSEMBLIES OF FLAT PLATES/SLABS INCLINED IN DIFFERENT DIRECTIONS AND JOINED ON THEIR LONGITUDINAL EDGE.



FORMWORK

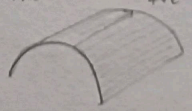


APPLICATIONS:

- STADIUMS, PAVILIONS
- PODIUMS
- CHURCHES
- AUDITORIUMS
- AIRPORTS
- TERMINALS.

SYNCLASTIC

SHELLS WITH POSITIVE CURVATURE AND CENTRES ARE ON SAME SIDE OF SURFACE.



ANTI-CLASTIC

SHELLS WITH NEGATIVE CURVATURE AND CENTRES OF THESE CURVATURES ARE LOCATED ON OPP SIDES OF SURFACE.

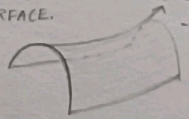


Plate Title:

SHELLS AND FOLDED PLATES

Subject Code and Name:

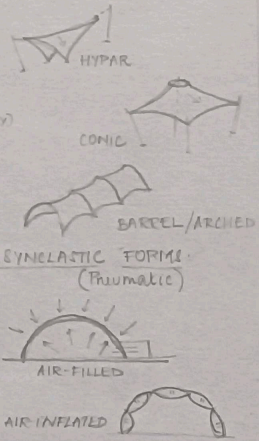
18ARC5.2 Materials and Methods in Building Construction - V

TENSILE STRUCTURES:

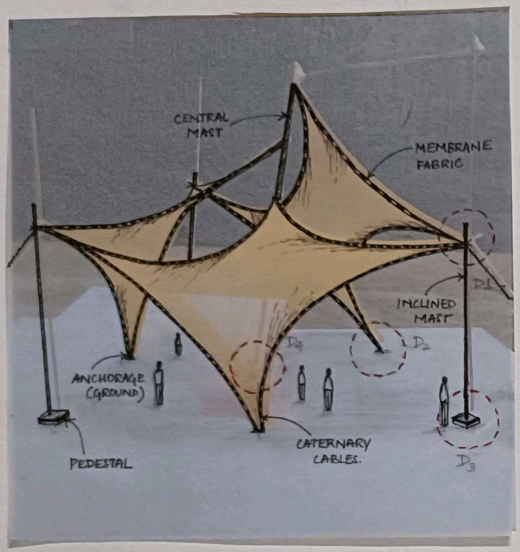
A TENSILE STRUCTURE IS A STRUCTURE WITH ELEMENTS CARRYING ONLY TENSION AND NO COMPRESSION OR BENDING.
IT CAN SPAN LARGE DISTANCES
EXTERIOR - SHELL IS A FABRIC MATERIAL SPREAD OVER A FRAMEWORK.

COMPONENTS:
1. MEMBRANE 2. CABLES
3. RIGID ELEMENTS
4. HARDWARE.

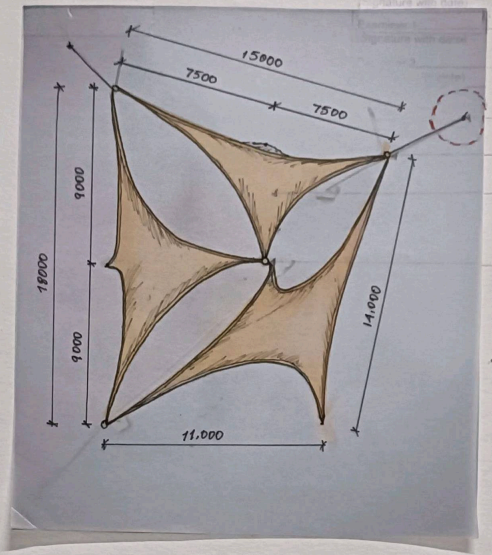
ANTI-CLASTIC FORMS:



SYNCLASTIC FORMS: (Pneumatic)

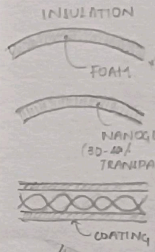


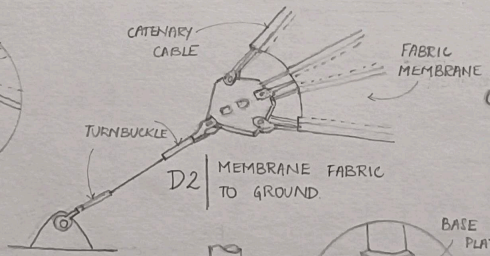
ELEVATION



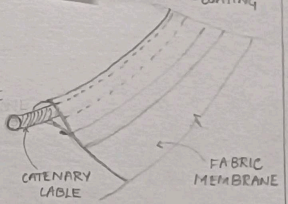
KEY PLAN

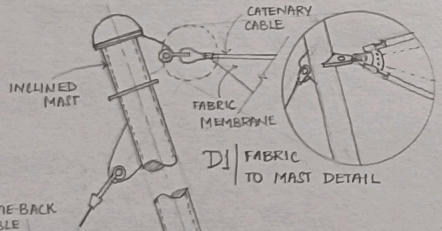
ANCHORAGE (GROUND)
INCLINED MAST
MEMBRANE FABRIC
CENTRAL MAST.



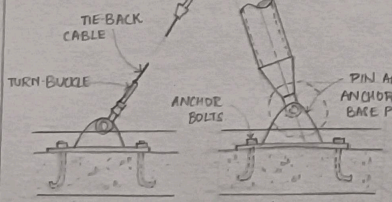


D2 | MEMBRANE FABRIC TO GROUND



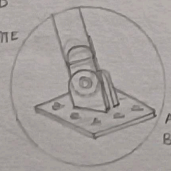


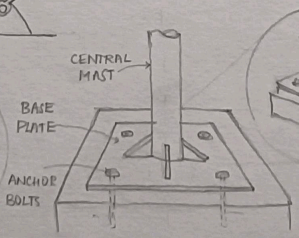
D1 | FABRIC TO MAST DETAIL

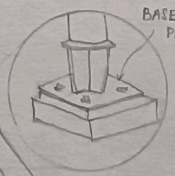


D5 | GROUND ANCHORAGE

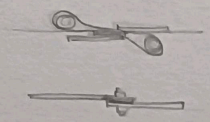
D3 | INCLINED MAST TO GROUND





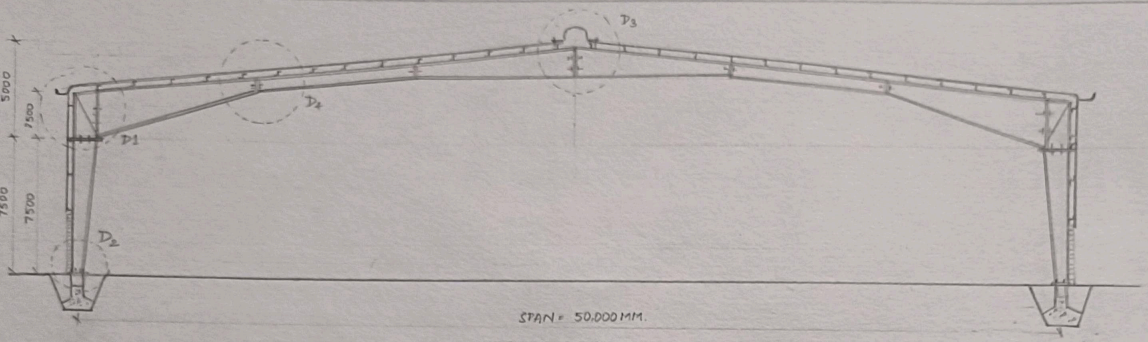


D4 | FIXED COLUMN BASE



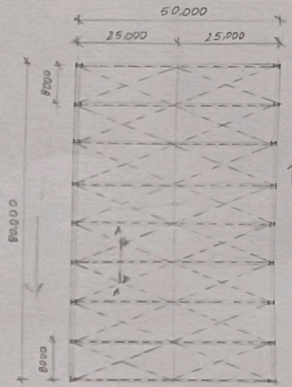
FABRIC TO FABRIC JOINING
- HOT WELDING
- GLUEING
- TAPE
- SEWING - BOLTING

Plate Title:
TENSILE STRUCTURES
Subject Code and Name:
18ARC5.2 Materials and Methods in Building Construction - V
Good

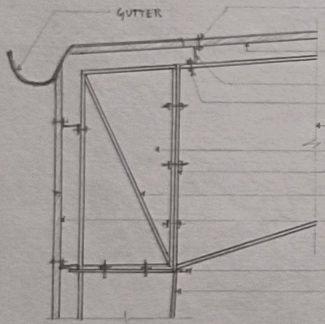


SPAN = 50.000 MM.

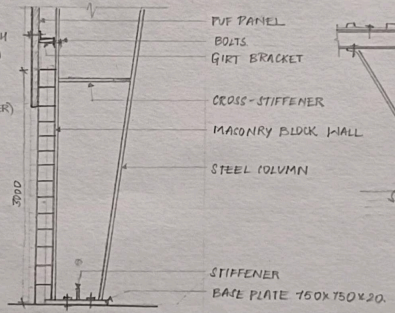
SECTION OF PORTAL FRAME
SCALE 1:200



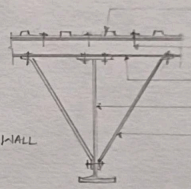
KEY PLAN
1:1000



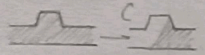
DETAIL 1
1:50



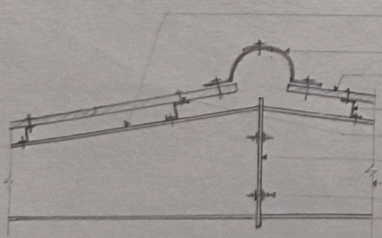
DETAIL 2
1:50



SECTION A-A
1:50



SANDWICH PANELS
(PUF - Polyurethane)



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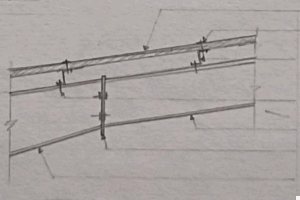
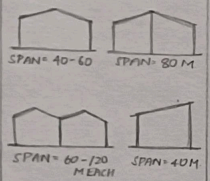


DETAIL 4
1:50

PRE ENGINEERED BUILDINGS

TYPOLOGIES:



Class Teacher :.....
(Signature with date)

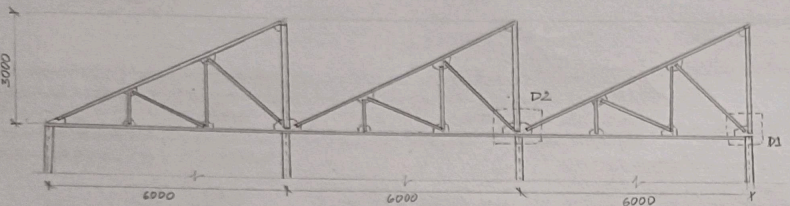
Examiner 1.....
(Signature with date)

Examiner 2.....
(Signature with date)

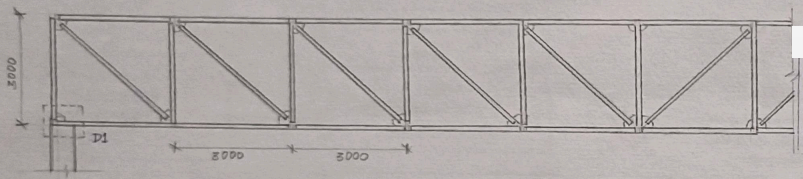
Plate Title:

PRE-ENGINEERED BUILDINGS

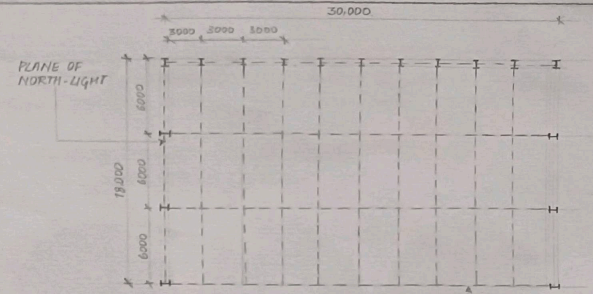
Subject Code and Name:
18ARC5.2 Materials and Methods in Building Construction - V



NORTH-LIGHT TRUSS (ELEVATION)
SCALE 1: 100



LATTICE GIRDER (ELEVATION)
SCALE 1: 100

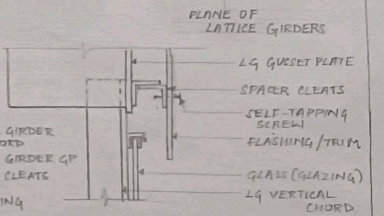


KEY PLAN
1:300

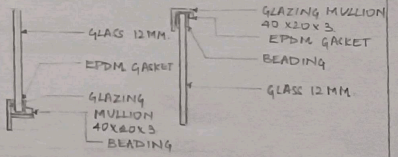
Class Teacher : .....
(Signature with date)

Examiner 1 .....
(Signature with date)

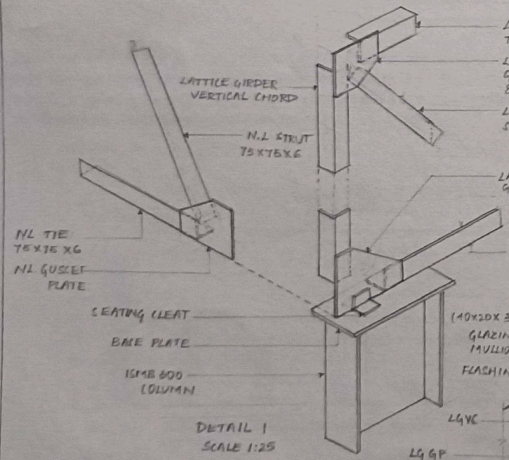
Examiner 2 .....
(Signature with date)



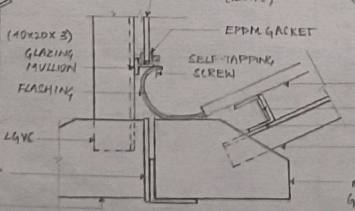
FLASHING DETAIL
1:10



GLAZING DETAILS
1:5



DETAIL 1
SCALE 1:25



DETAIL 2
SCALE 1:10

SECTION

Plate Title:

NORTH-LIGHT TRUSSES.

Subject Code and Name:
18ARC5.2 Materials and Methods in Building Construction - V

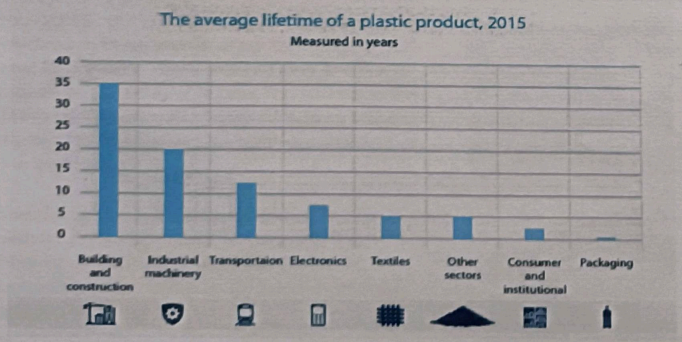
REUSE OF PLASTIC WASTE IN BUILDING CONSTRUCTION

Plastic waste (PW) has become extremely threatening to the environment due to their high quantities generated, which poses serious harm to both the environment and its inhabitants.
The **low biodegradability** of plastic poses a huge limitation on its **recyclability** and disposal into the environment.

BENEFITS OF USING WASTE PLASTIC

- Depleting deposits of raw materials used for construction purposes, this acts as a good alternative
- Solid waste management
- Sustainability trend of a circular economy

The use of PW for construction applications creates a pathway to use these wastes for long term applications compared to short term ones such as recycling into new products which will end up as waste within a short period of time and generates revenue.



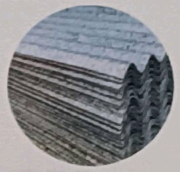
Applications:

Using plastic as a filler in concrete can make the concrete more durable and resistant to water and other environmental factors. This can help to extend the life of the building and reduce the need for repairs and maintenance.

Building Products manufactured using waste plastic


Waste plastic used as filler in concrete


Recycled plastic bricks


Recycled roofing sheet


Recycled plastic as door panels


Plastic lumber


Recycled plastic pavements

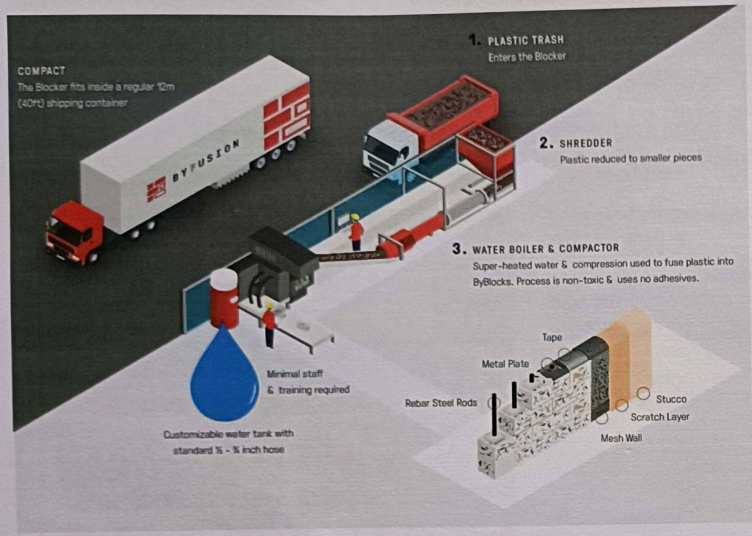
Application Methods

SORTING
Mostly done using methods such as
- Electrostatics
- Floatation
- Fluorescence
- Infrared
- Spectroscopy

RECYCLING
- Mechanical
  - Grinding
  - Shredding
- Chemical
- Thermal

MELTING INTO SLURRY

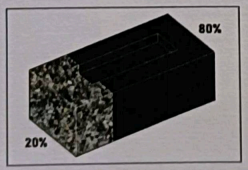
MOULDING



CASE STUDY

The owner and managing director of **Rhino Machines**, a project consultancy firm, presents Rhino bricks, made from foundry dust and waste plastic. Rhino bricks are 2.5 times stronger and 25 per cent lighter. They are also reasonably priced at Rs 10 per piece. **These unique bricks are made using 75% foundry dust and 25% plastic**. Conventional clay bricks can sustain between 3.5-7 kg per cm square, while Rhino bricks can sustain about 14-15 kg per cm square because of the compressive strength of the ingredients.

The plastic waste is shredded and then mixed with waste foundry sand. Then comes the heating and mixing part, which creates a pulp-like mixture that is finally compressed and shaped into bricks.



The potential revenue generation as a result of using PW for different construction applications can be achieved in the following ways:

- Reduction in waste management expenditure
- The monetary value added to these materials will create an extra source of revenue for stakeholders interested in recycling waste materials and manufacturers of plastics
- The use of PW as insulation material will improve the energy efficiency of buildings, thereby reducing the overall costs associated with running buildings.

Recycled Plastic Floor Tile, 20-25 Mm

रिसाइकल्ड प्लास्टिक फ्लोर टाइल, 20 से 25 mm

₹ 75/ Square Feet Get Latest Price

Finish	Mosaic
Shape	Rectangular
Thickness	20-25 mm
Material	Plastic

Recycled Plastic Roofing Sheet

₹ 30/ Square Feet Get Latest Price

Feature	Wear-Resisting, Waterproof , Heat Resistant, Fine Finish, Termite Proof
Brand	Nasa
Material	Recycled Plastic
Thickness(mm)	Available in 4, 6, 8, 10, 12, 16, 18, 20, 25 mm
Heat Resistant	60 Deg C

Limitations to the application of plastic wastes:

a) **Harvesting:** Plastic wastes are **contaminated** with various types of plastics and other materials when collected from various streams in which it is generated. So they require **sorting** according to the grade.

b) **Varying composition**: Due to difference in grades and types of plastic which might result in a **non-isotropic** (different physical properties) performance when used for construction purposes in contrast with other construction materials and complex composition of some types of plastics.

c) **Low surface energy**: plastics are generally **poor in mechanical bonding** when used for applications such as those where the PW is incorporated into a composite. This poor bonding can lead to a reduction of the overall mechanical performance of the resulting composite.

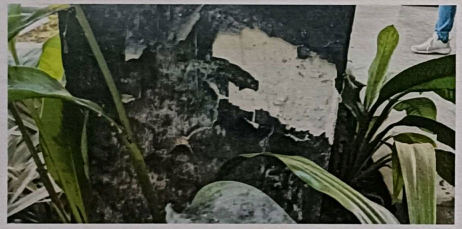
e) **Economical constraints**: Recycling some types of plastic requires **advanced technology** which is expensive.

f) **Lack of standards:** Currently there is no standard that supports the use of PW for **construction applications.**

WATERPROOFING

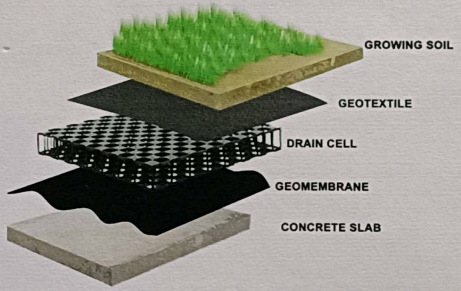
Waterproofing is the process of making an object or structure waterproof or water-resistant so that it remains relatively unaffected by water or resisting the ingress of water under specified conditions.

PROBLEM

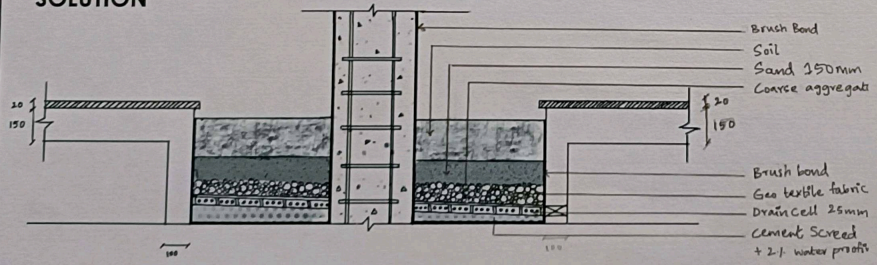


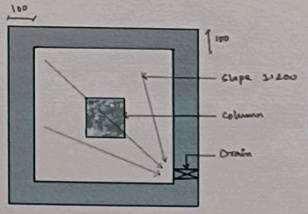
Paint and plaster is getting peeled off of a column in a planter box.

Due to the accumulation of water in the planter box, the water seeps into the pores of the RCC Column and damages the exterior of the column.



SOLUTION



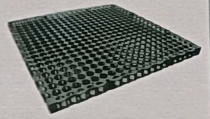


MATERIALS USED

- Fosroc Brushbond - Fosroc Brushbond (M) is a flexible cementitous. waterproofing system formulated to waterproof fill and. seals pores and voids of all masonry and concrete

- Screed + 2% Waterproofing Compound - 1:200 Slope
  Prevents roots from penetrating the slab.

- Drain Cells - Drain cell provides a drainage cavity and, when used in a landscaped roof, it provides additional protection layer for the waterproofing membrane. Drain cell modules are easily interlocked in the same plane or at right angles to one another.



- Gravel Course - Acts as a filter medium
- Sand
- Growing Medium

WATER-PROOFING
Subject Code and Name:
18ARC5.2 Materials and Methods in Building Construction - V