BAMBOO CONSTRUCTION

AUROVILLE
• Bamboo has been in wide usage since ancient times as a low-cost material for houses, bridges etc.
• Recently started appearing in designer homes as flooring, walling and paneling material
• Is viewed as a material preferred only by the poor or for temporary constructions
• Bamboo has good engineering properties and it is a feasible substitute for other materials for housing and construction sector.
• Bamboo has high tensile strength, very good strength to weight ratio. It can be easily worked upon by simple tools.
• It can resist forces created by high velocity wind and earthquake.
• Bamboo and components made of bamboo are environment friendly, energy efficient and cost effective.
Bamboo sizes are generally specified by minimum diameter, wall thickness, and length.

- **Column** – 80-100mm dia
- **Wall thickness** – 10-12mm dia
- **Bamboo strips for infill panels** – 18-20mm wide, 8-10mm thick
Friction-tight rope connections

- For tight connections green bamboo strips are used, the fibres are watered before tying around the bamboo.
- While drying, the fibres shorten and the connection becomes stronger.
- Nowadays also industrial materials are used:
  - iron wire (zinc coated)
  - plastic tapes/ropes
Plugin/bolt connections

- Constructions with secondary interlocking elements are often used in context with rope connections.
- In this case the bolts have to transfer tractive and compressive forces.
- In wooden connections this is done by different kinds of profiles.

Types Of Structural Connectors used with bamboo:
Positive fitting connections
• Wooden connections with slit and tenons, like they are traditionally used for carpenter-like constructions in Germany, are rare.
• There are three reasons:
  • - bamboo is round
  • - bamboo is hollow
  • - bamboo splits
Lashing ties:
• The common type of connection at a joint is lashing.
• The ties are also of organic material and therefore provide optimal compatibility between the elements of the construction system.
• Cords and ropes are made of bamboo bark, bast, coconut – or sagopalmbires. Nowadays also plastic cords are used.
• **Plugin connections:** Carpenterlike connections with mortise and tenon are seldom used in bamboo structures.
• On the other hand plugin elements like bolts or consoles you find very often.
• Additional lashing or wedging keeps things in place.
Induo-anchor technique

- For big bamboo diameters, the Induo-anchor can transfer nearly 100% of the maximum load of the cane cross section.
- Induo-anchor consists of a cast iron core with connection teeth on its sides. It can easily be shed with a bamboo cane.
- Concrete or artificial resin can be used for that.
Pan-knot spacetruss

- Pan-spacetruss consist only of two elements - the Pan-ballknot and the cane with sheded threadrod.
- That means more economic statics, drawings and production.
- Furthermore they can be dismantled and reused.
Cane bundles:

- Cane bundles must be used for bigger loads.
- When using them for construction a possible connection can be achieved by projeting steel tips out of a wood cylinder (see interlocking connection), so that these tips can be welded to a plate or any other central component, to fix the relative position of the canes.
Thank you