

TRAINING NOTES

Carpenters basic training kit for basic construction.

The carpenter's basic training kit is a simple kit designed to help the training of carpenters in the construction of basic shelters. It is designed to demonstrate the following principles, which are relevant to transitional and temporary shelters as well as jointing in katcha houses.





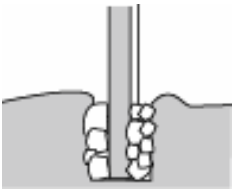
- Walls should have Foundations
- The tops of wall plates should be connected
- The importance of diagonal bracing
- The importance of solid jointing

Kit contents

The kit consists of the following components:

- 1 x box to carry the materials
- 1 x wooden pad with two holes cut into it (a base to shake to simulate earthquakes)
- 3 x ½"x ½" x 6" wooden sticks
- 1 x ½"x ½" corner joint non- connected (consisting of two jointed and nailed sticks and one non nailed stick)
- 1 x ½"x ½" corner joint connected (consisting of two jointed and nailed sticks, attached to one upright stick and two diagonal braces)
- 1 x wall plate model with diagonals and strapping
- 1 corner joint – fixed with 1 bolt
- 1 x corner joint of two pieces of cut / jointed wood held together with two bolts
- 1 x diagonal bracing frame with two push fit diagonal braces

1. Basic pad foundations for wooden poles

| | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |
| <p>1.1 Balance the piece of wood upright on wooden platform</p> <p>1.2 Shake the platform</p> | <p>The wooden pole will fall over</p> |
|  |  |
| <p>1.3 Now put the piece of wood in one of the holes in the wooden platform</p> <p>1.4 Shake the wooden platform</p> | <p>The wooden pole will not fall over</p> |
| <p>Explanation:</p> <p>The piece of wood represents a vertical pole from a wooden framed house. The hole represents a foundation. Strong foundations reduce risk of collapse from earthquakes.</p>  <p>For basic foundations: bury upright wooden poles a minimum of 1 foot 6 inches. (450mm) deep, and be fixed in solid soil.</p> | |
| <p>Look for a foundation like this in the village. Discuss what is good and bad about it.</p> | |

2. Basic wooden strip foundations



2.1 Balance the piece of wood upright on the corner joint on the wooden platform
2.2 Shake the platform



The vertical wooden pole will fall over



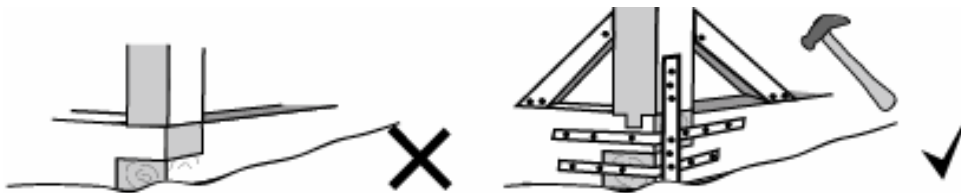
2.3 Put the pre-made corner joint on the wooden platform
2.4 Shake the wooden platform



The corner joint will not collapse

Explanation:

The joint represents the corner of a wooden strip foundation. Correctly jointing the corner will help to prevent the wall and the roof from collapsing in an earthquake.



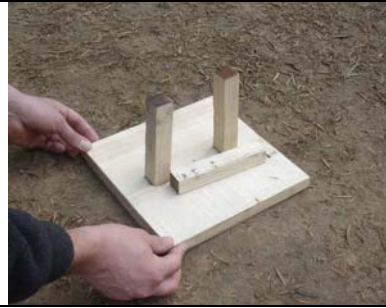
- SECURELY connect upright poles to a solid wooden frame on the ground. Do this using reinforcement bar, wooden planks or metal straps. This ties the bottoms of the uprights together.

Look for a foundation like this in the village. Discuss what is good and bad about it.

3. Connection of roof beams to wall plate



- 3.1 Put two vertical columns in the holes
- 3.2 Balance a beam along the top
- 3.3 Shake the platform



The wooden pole will fall off. If this was supporting a roof, the roof would have collapsed



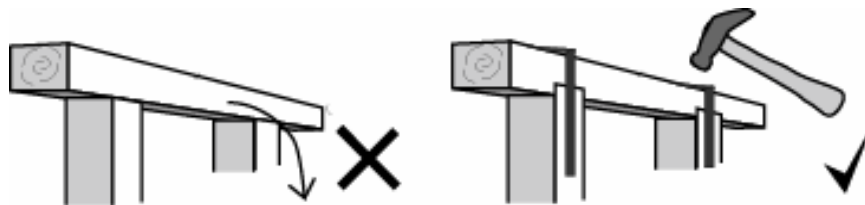
- 3.4 Put the pre formed wall section in the two holes
- 3.5 Shake the platform



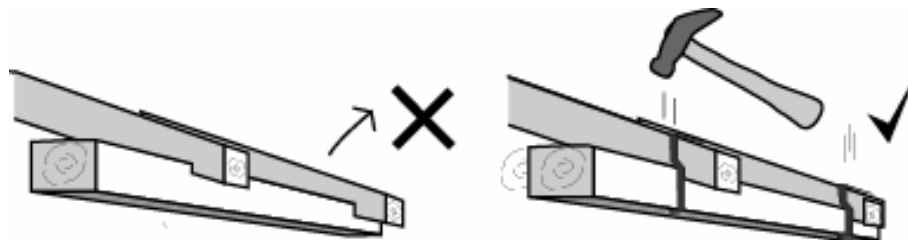
The wooden pole does not fall off. Note that it is connected with nails and with metal straps. It is also connected with diagonals.

Explanation

This model demonstrates how wooden beams and roofs must be securely connected to walls.







- Securely connect wood beams at top of walls to uprights

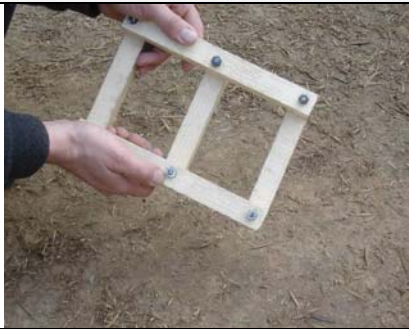


- Roofs should be firmly connected to the walls using at least two nails per joint and metal bands

Look for a beam like this in the village. They are common on katcha roofs. Discuss what is good and bad about it.

| 4. Basic jointing | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------|--|
|  | |  | |
| 4.1 Pick up the two pieces of wood connected by one bolt 4.2 Twist the joint | | The joint twists | |
|  | |  | |
| 4.3 Pick up the piece of wood with a cut joint and held together by two bolts | | The joint is solid | |
| Explanation: Each joint should be fixed by at least two nails. Ideally joints should be cut for additional strength. There are many methods of jointing timber | | | |
| Look for joints like this in the village. Discuss how they can be improved. Discuss the different ways in which timber can be joined. | | | |

5. Diagonal bracing



5.1 Hold top and bottom sides of frame
5.2 Push top and bottom sides apart

The whole frame will flex.

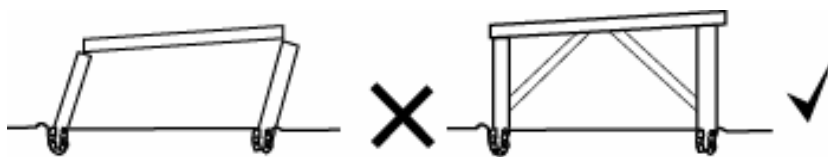


5.3 insert cut diagonals into frame
5.4 hold top and bottom sides of the frame
5.5 push top and bottom sides apart

The frame will **not** flex.

Explanation:

Diagonals should be used in walls and in frames.



- Walls should be braced diagonally to prevent collapse.
- Use triangles for strength

Look for un-braced walls in the village. Discuss how they can be strengthened.