

Durability

Thatch roof

Treatment



- Soak the thatch leaves in a solution of Copper Sulphate 4% + Sodium Dichromate 4% + Boric Acid 2% + Water 90% for 12 hours and then drain the water and shade dry the leaves for 2-3 days and then sun dry it for 1-2 days
- This treatment increases the cost by 20 % but increases the longevity by 2-3 times.
- The materials shall be freshly harvested ones for best results but the died leaves may also be used
- With thatch roof the angle of the slope shall be 30'-40'
- In case of rotting leaves shall be immediately replaced by new ones.

CGI Sheetings

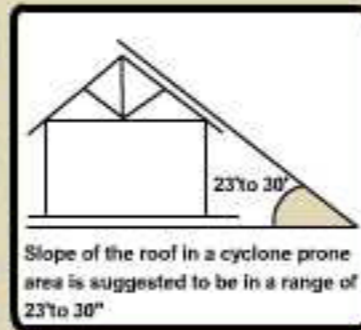
- The minimum thickness of the CI Sheets should be 0.35 mm, anything less than this is not recommended.
- While fixing the CI Sheets it should be carefully handled and skilfully fixed without damaging the sheets.
- In coastal regions the CI sheets corrode very quickly, it is recommended that the sheets are coated with anti corrosive paints after the first oxidation stage for durability

IMPORTANT

- Make regular checks, especially around ridge and corners.
- Replace weakened members, repair loose members.
- Purlins should be increased near eaves, ridge and corners.

Improved Roofing Structure

Resistance to Wind



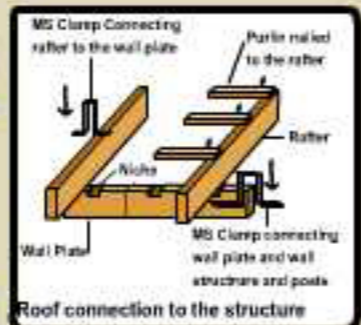
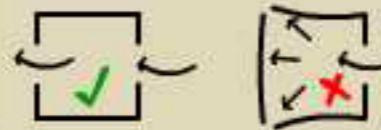
In a cyclone prone and heavy wind zone it suggested that the roof slope is maintained between 23' to 30', too high or too low slope may create greater risk of lift. In any case the raise shall not be less than 1:4 slope



In a cyclone prone zone a four way slope (Hip Roof) performs better than a two way slope (Gable Roof) because of its shape. Other preferred shapes of the roof are: pyramidal, and circular dome roof. A small opening a top of the roof structure reduce the risk of lifting to a great extent



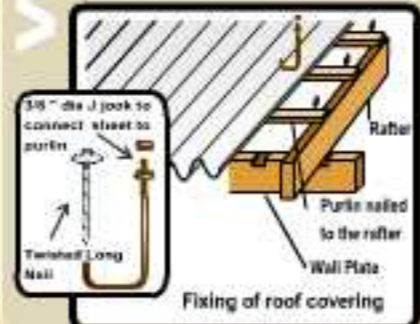
There should provisions for adequate cross ventilation in the roof structure. A fully enclosed roof structure will have more risk of getting lifted with the wind flow



Strong connection between the roof and the vertical member is very important. the connections can be made of metal Straps, bolts with washer or with the extension bars of the RCC Columns, simple nails should not be avoided. Rafters shall be places at recommended distance

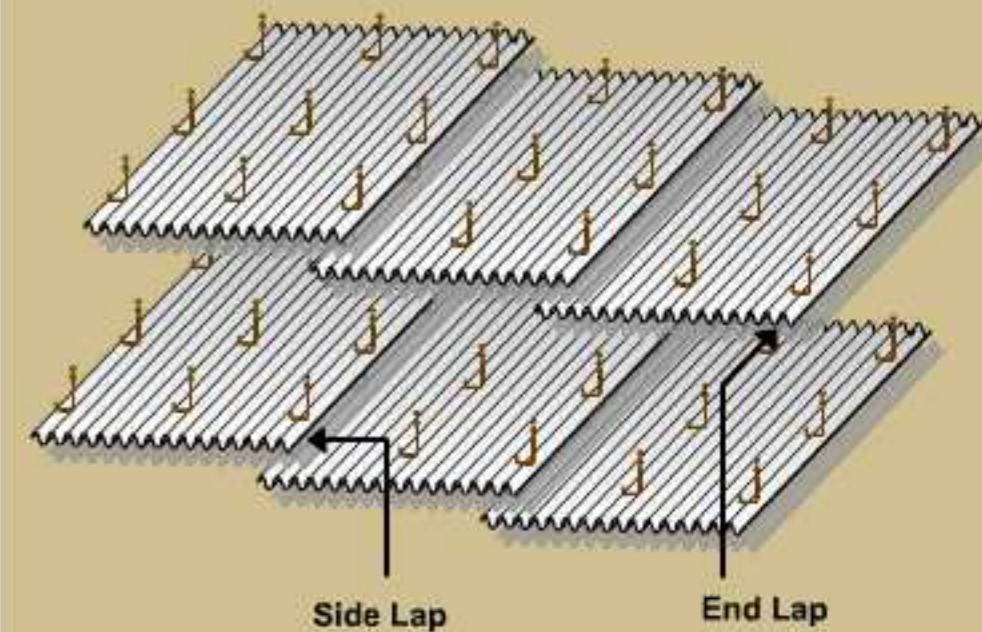


Some typical connectors of the roof structure. These can be easily custom made as per required sizes with the locally available materials



CGI Sheet Screwed at recommended distance. Use of J Bolts to tie down the sheets. GI wires as wind tie may also be used for tying down of roof covers. Locally made long twisted nails are also used for fixing roof sheets. Another popular design is the use of long bamboo sections as tie down over the roof cover.

Overlapping of CGI Sheets



- The minimum sidelap of two CGI Sheets shall be 225mm or atleast two ridges of corrugation
- The end laps shall me 150mm to 200 mm

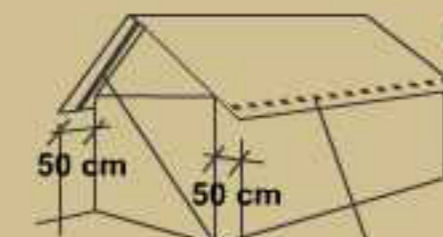
Spacing of Purlin

The centre to centre distance between two purlin will depend upon the thickness of the CI Sheet

| Thickness of CI Sheet in mm | Maximum spacing in meter |
|-----------------------------|--------------------------|
| 0.63 | 1.6 |
| 0.54 | 1.4 |
| 0.48 | 1.2 |
| 0.35 | 1.0 |

Purlin shall coincidethe centre line of each lap

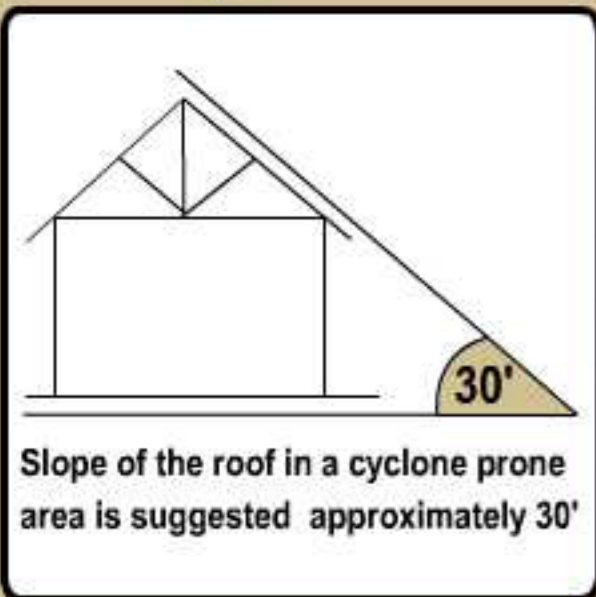
Roof Overhangs



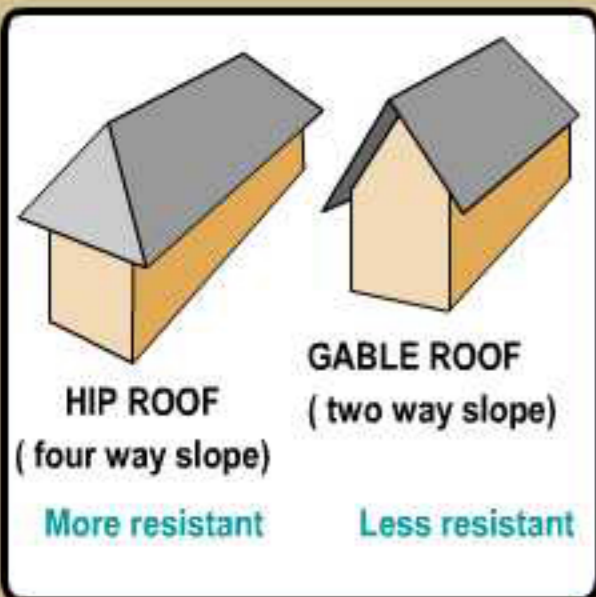
- The extended over hang of a pitched roof should not exceed 50 cm at both gable and eave end

- An extra batten between the edge of the external wall and edge of the overhanged roofing sheet is very important to reduce the weakness at these critical places

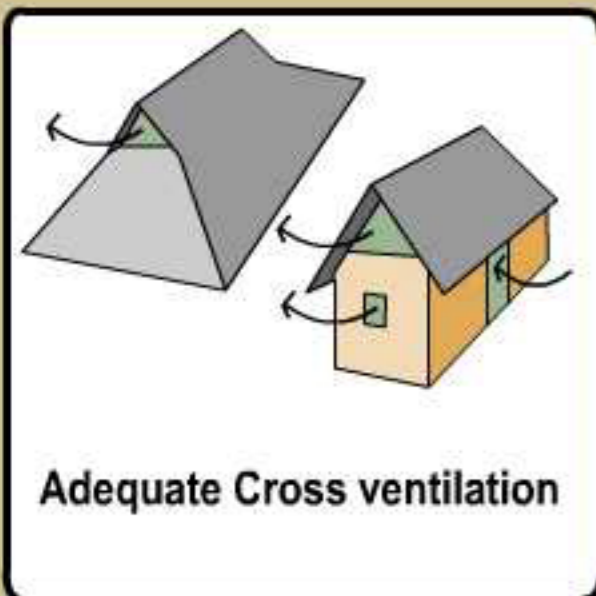
Improved Roofing Structure



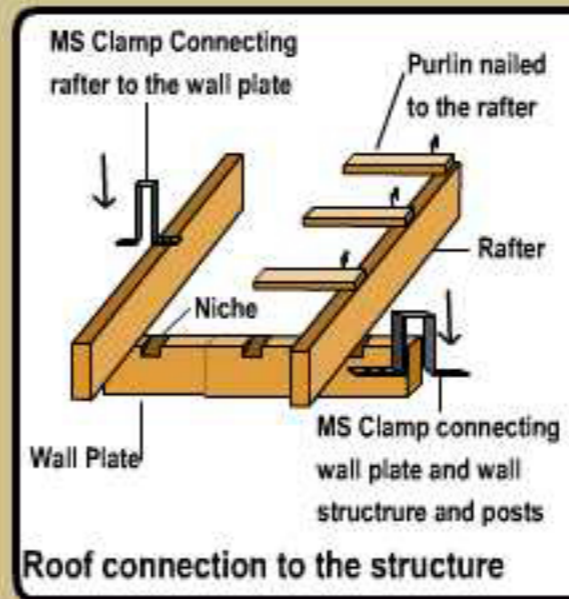
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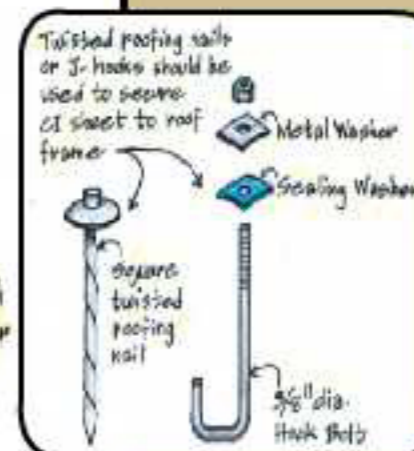
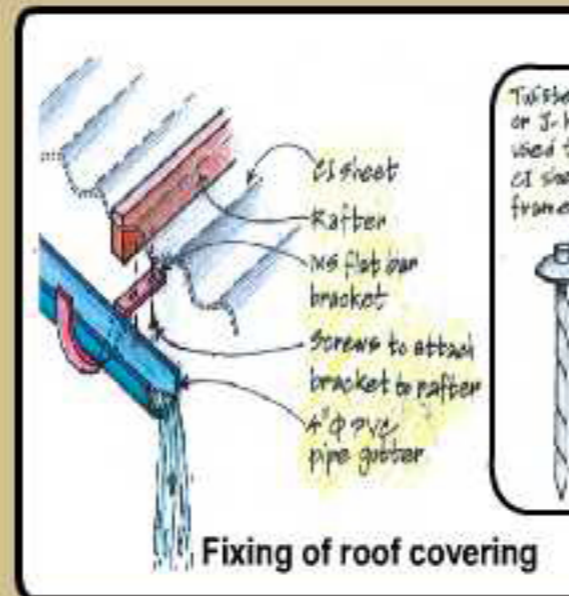
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CGI Sheet Screwed at recommended distance Use of J Bolts to tie down the sheets GI wires as wind tie may also be used for tying down of roof covers Locally long twisted nails are also used for fixing roof sheets Another popular design locally is the use of long bamboo sections as tie down over the roof cover.

The rain water splashing on the ground from the roof top damages the lower structure at that level, it is important to take extra care to protect this portion of the structure from splashing water as getting damaged.



Use a roof gutter to drain away the rain water



Do a regular care and maintenance of the roof structure, check for loose ends and leakages

Important

Roof cavity should have sufficient pitch for storing house hold goods

Every sheet to be fixed to purlins with hook bolts or twisted nails.

Wind ties made of GI wires to tie down the roof sheets to the structure, Bamboo laid over sheets may also be used

Adequate connections should be made with nylon rope or good quality galvanized wire (instead of jute rope).

After a cyclone warning is received, a rope net properly anchored to ground should preferably hold down all lighter roofs.

The shielding of the building shall be equal at all the side, as the cyclonic wind may strike from any direction not considering the orientation of the house

Rainwater gutters prevent creation of furrows around plinth by rain falling down from roof eaves, also prevent rainwater splashing on walls.

Fluttering and vibration of the roof members during may be reduced by having cross bracing between the members

IMPROVED ROOFING



The Roof is the most important feature of the shelter which protects and covers everything inside it from external climatic conditions, therefore it is important that the roof is strong and well built. the basic chatacter of a roof in cyclone prone are shall be durable, wind resistant and water resistant

BUILD BACK BETTER