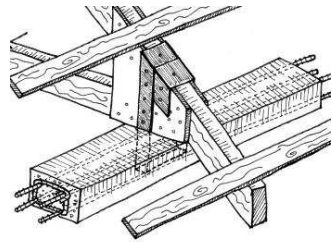
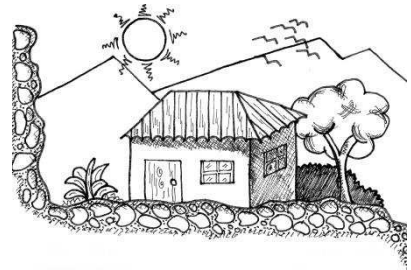


# KEEP YOUR FAMILY SAFER FROM EARTHQUAKES AND TYPHOONS BY MAKING SURE YOUR HOUSE FOLLOWS THESE 6 BASIC PRINCIPLES

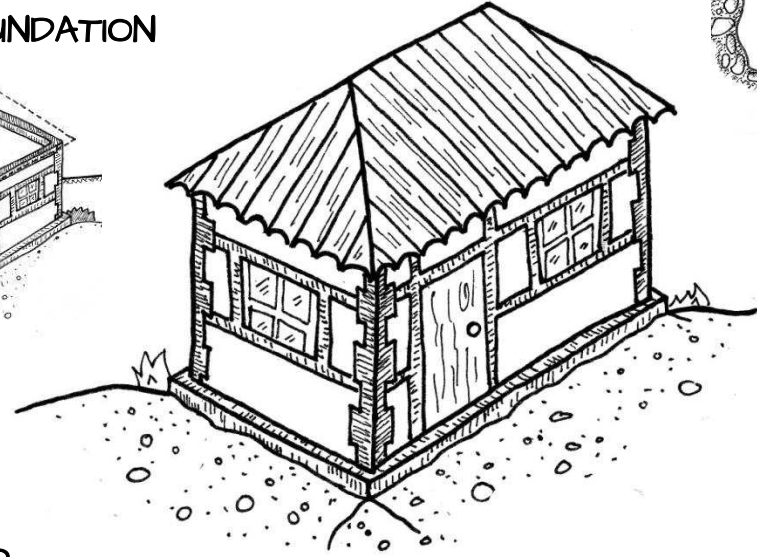
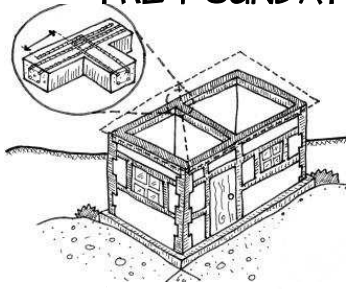
6. STURDY ROOF FIRMLY CONNECTED TO THE WALLS



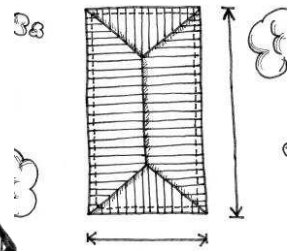
1. SAFE LOCATION



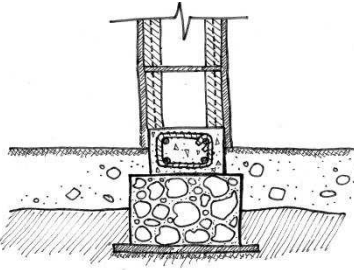
5. WELL BRACED WALLS FIRMLY CONNECTED TO THE FOUNDATION



2. SMALL and SIMPLE LAYOUT



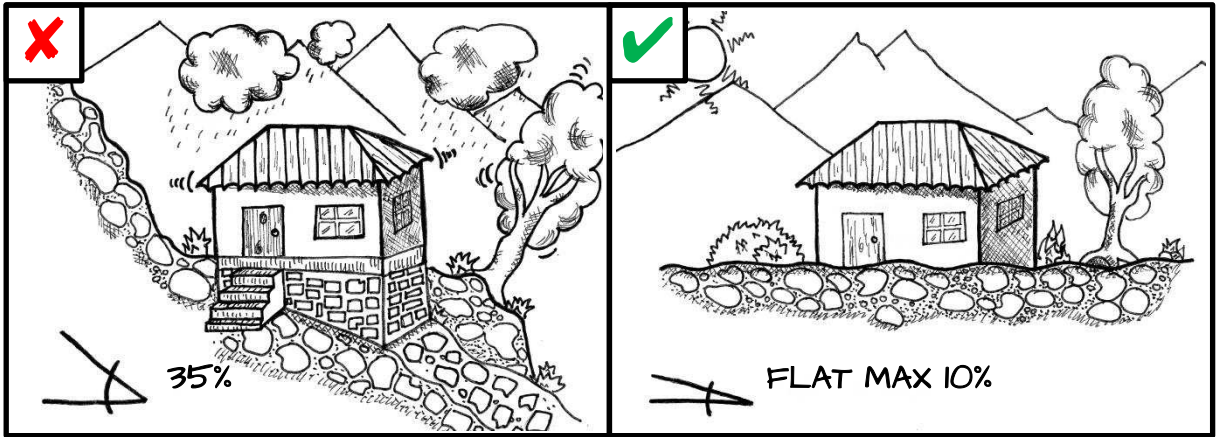
4. SOLID FOUNDATION



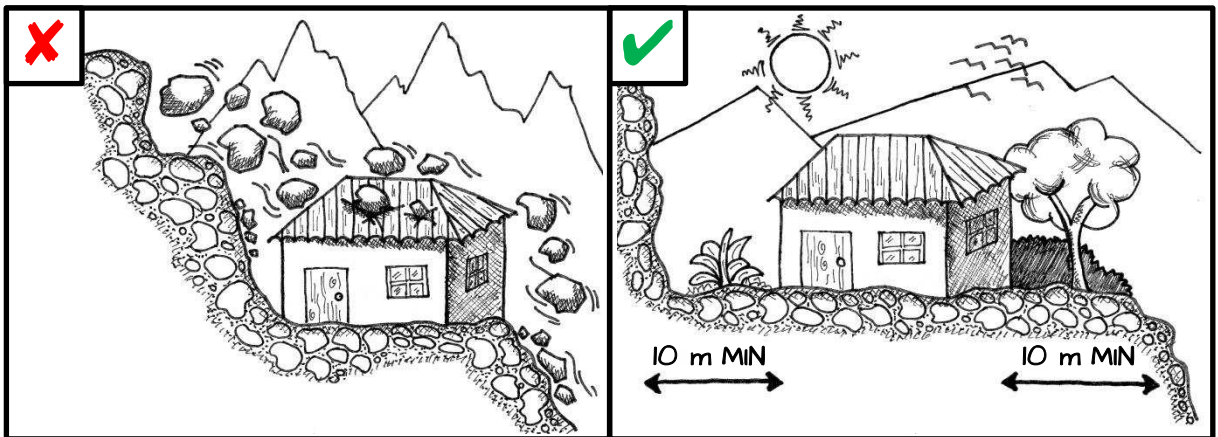
3. GOOD QUALITY MATERIALS



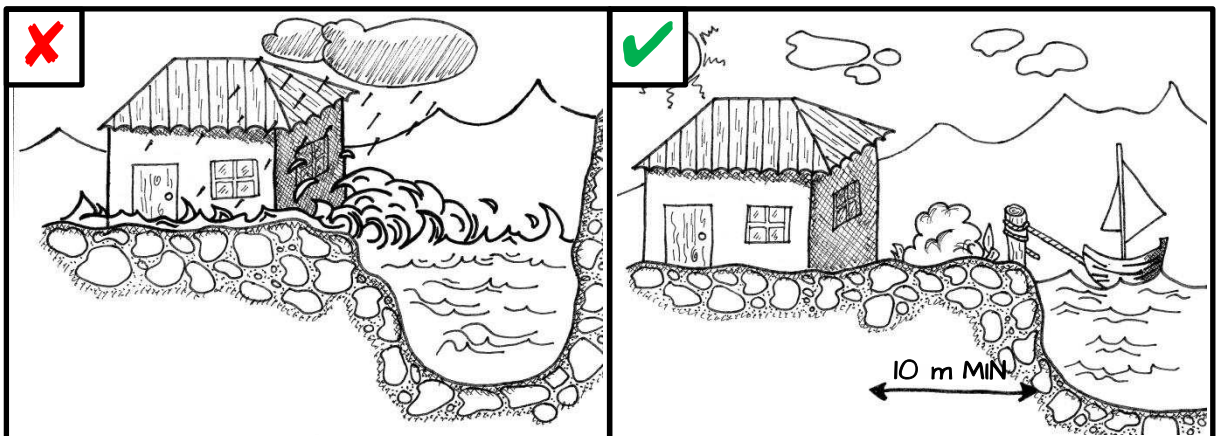
# I. HOW TO CHOOSE A SAFE LOCATION



1.1 Choose a site with a slope of less than 35%.



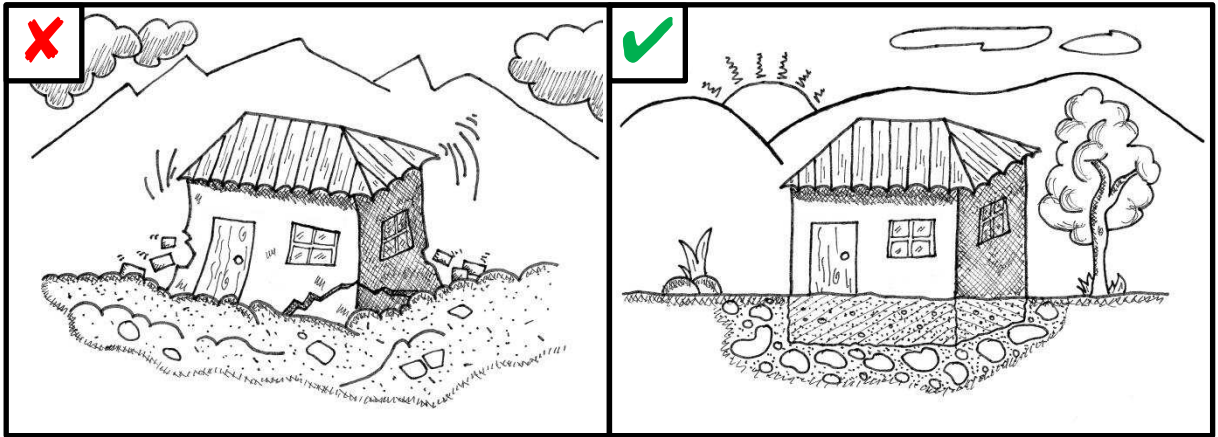
1.2 Choose a site that is at least 10 meters away from landslide prone areas or unstable slopes.



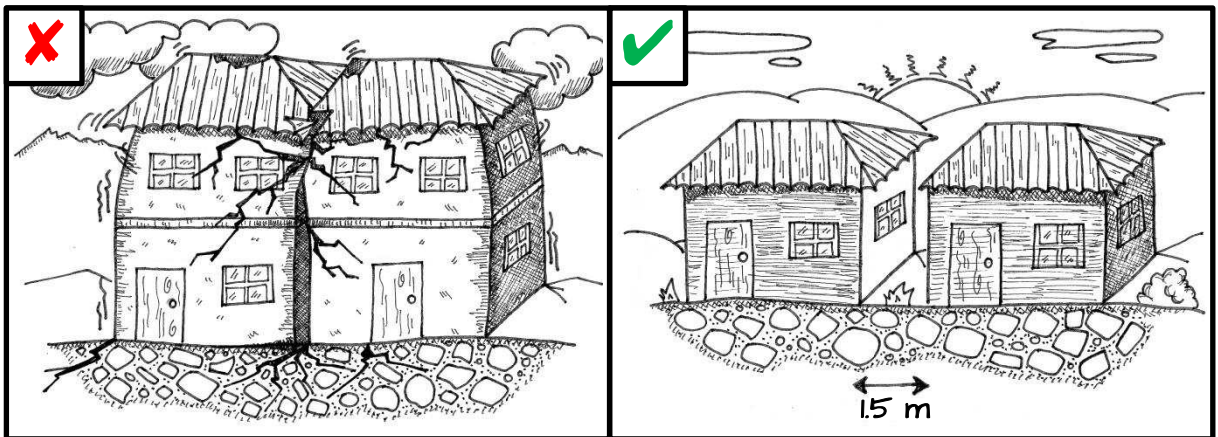
1.3 Choose a site that is at least 10 meters away from rivers, ravines and flood prone areas.

# I. HOW TO CHOOSE A SAFE LOCATION

(continue)

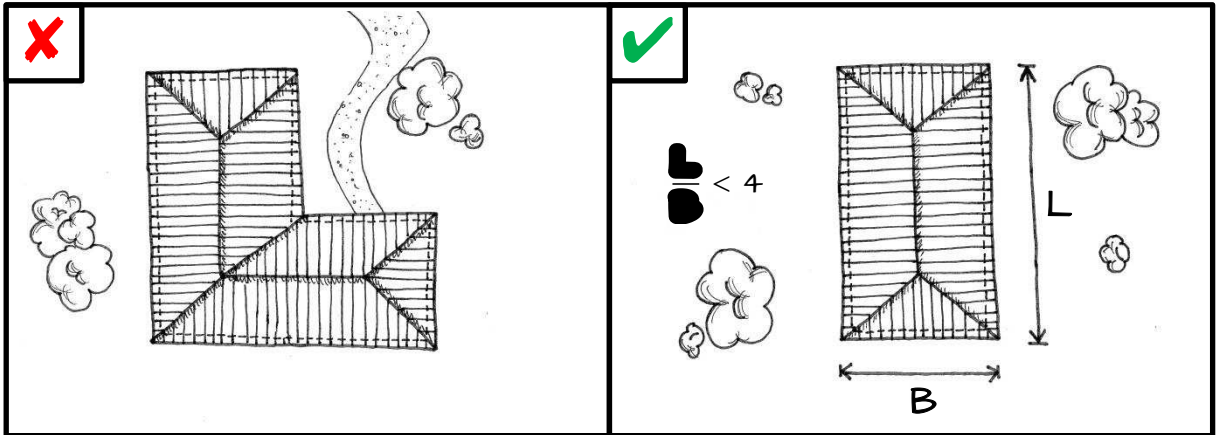


1.4 Choose a site that has stable and well-consolidated ground.

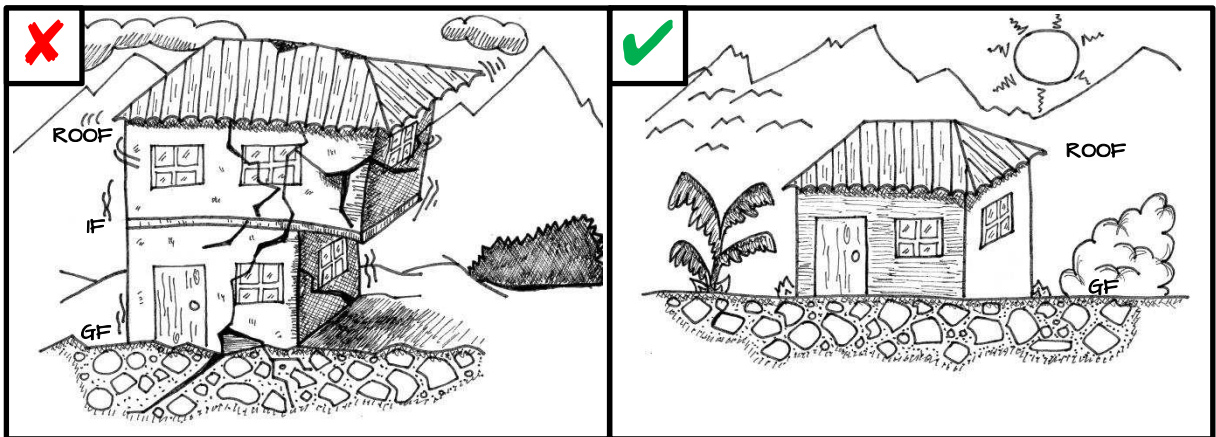


1.5 Choose a site that is a safe distance of 1.5 m from other houses, this also helps in the case of fires.

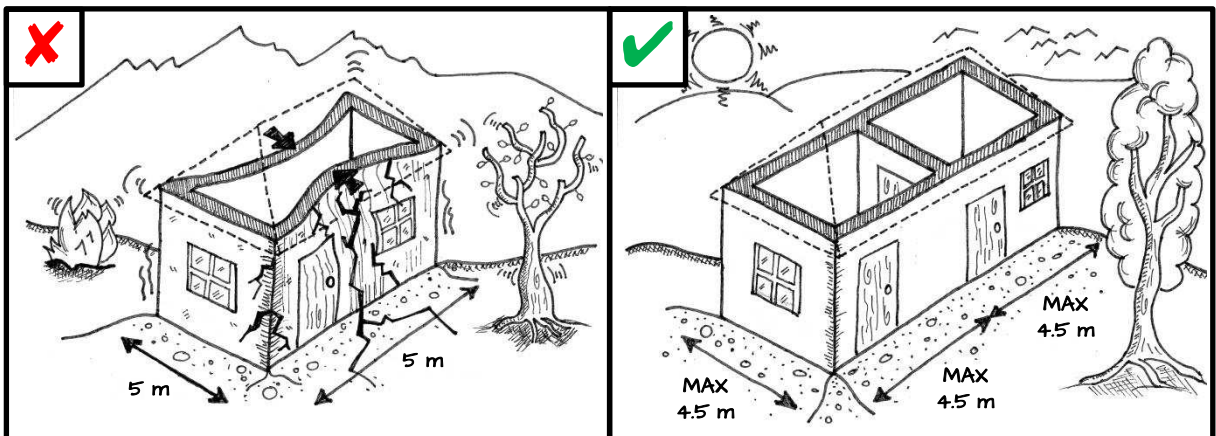
## 2. HOW TO DESIGN A SMALL AND SIMPLE LAYOUT



2.1 Give the home a simple shape, such as a square or a rectangle that's not too long or too narrow.

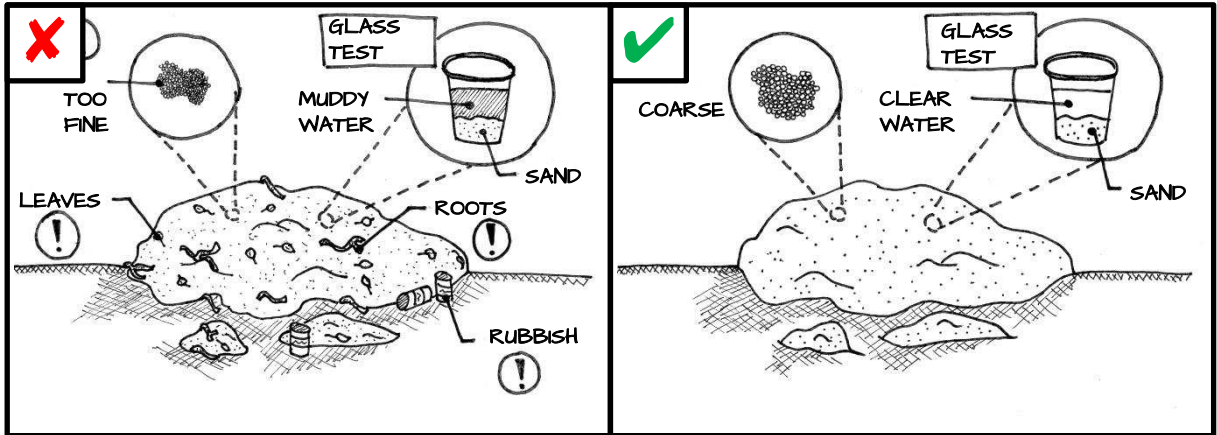


2.2 Give the home a single floor. If it must have two floors, make the second floor no bigger than the first.

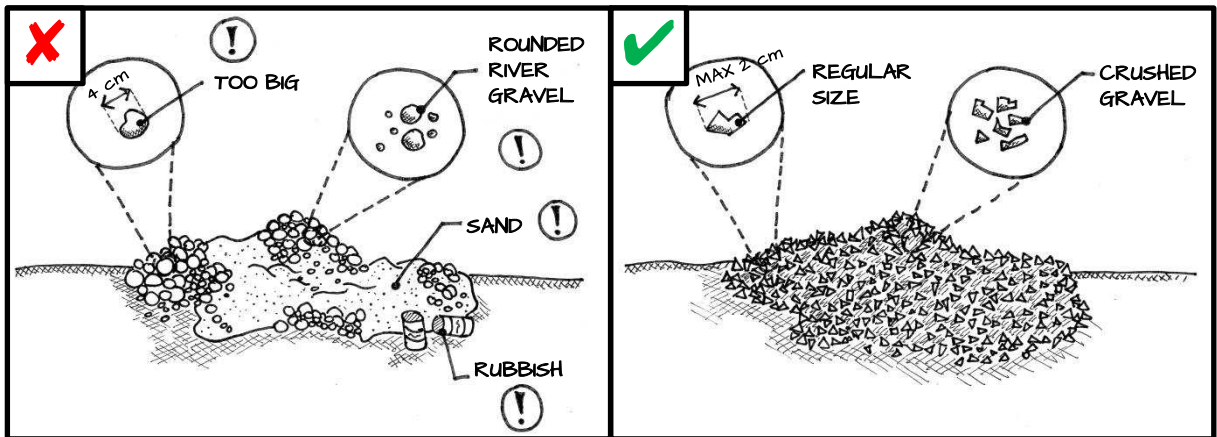


2.3 For MASONRY homes, make unsupported walls no more than 4.5 meters long. For TIMBER FRAME homes, make unsupported walls no more than 3.5 meters long.

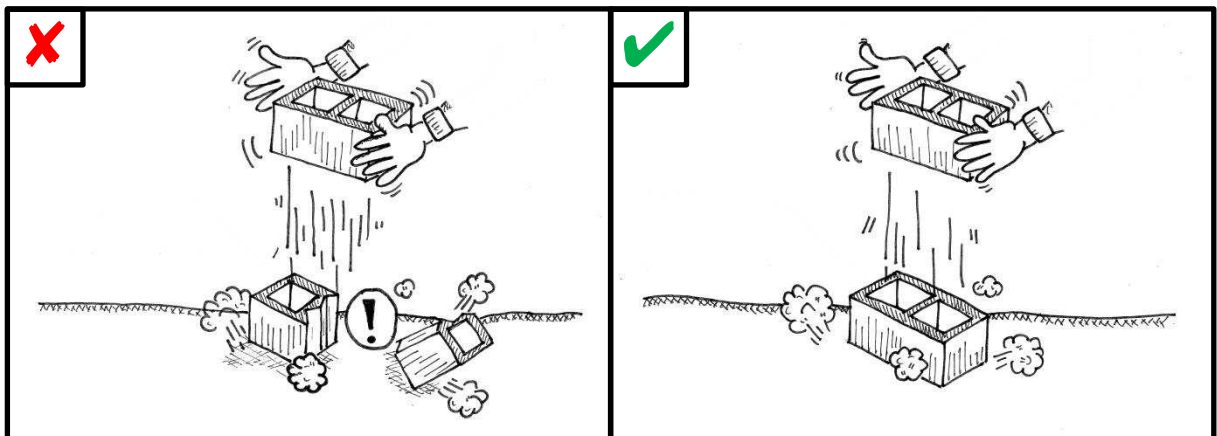
# 3. HOW TO CHOOSE GOOD QUALITY MATERIALS



3.1 Choose dust-and-dirt-free coarse river sand.

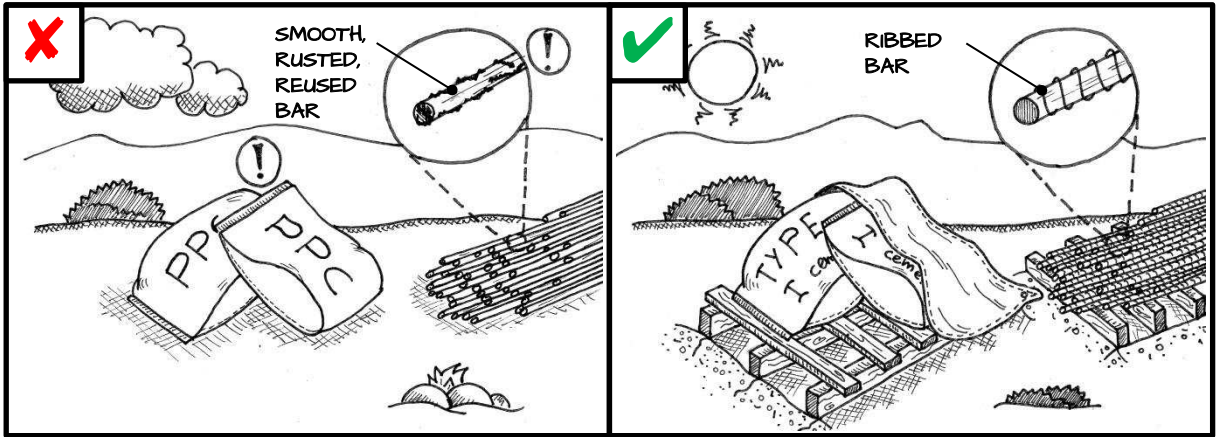


3.2 Choose crushed, dust-and-dirt-free gravel that is no larger than 2 centimeters.

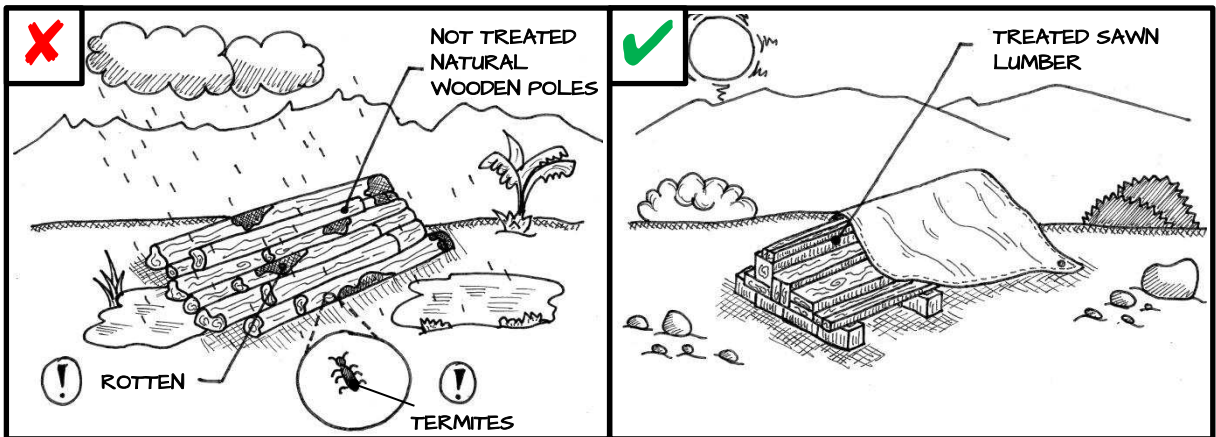


3.3 Choose blocks that don't break when you drop them on hard ground from head height.

# 3. HOW TO CHOOSE GOOD QUALITY MATERIALS (continue)

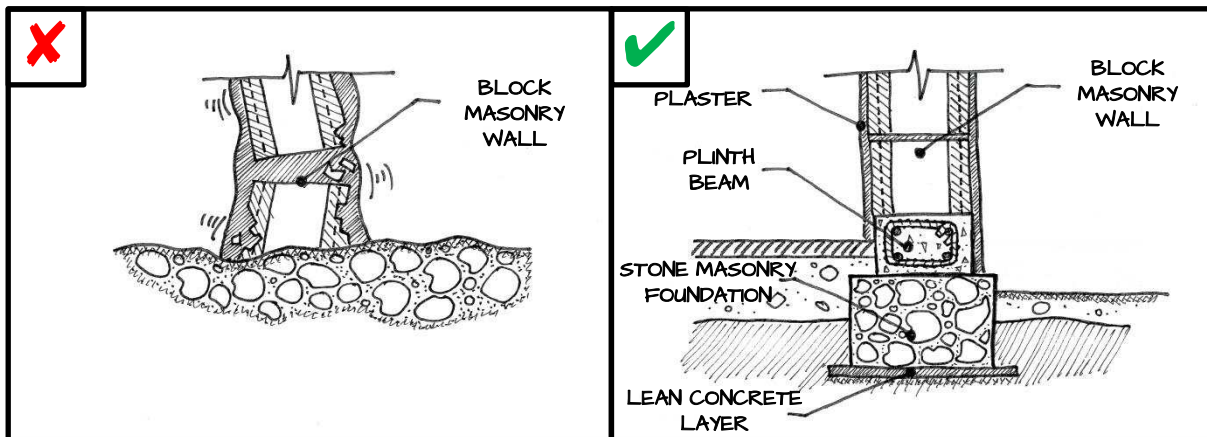


3.4 Use type I cement and new, straight ribbed steel reinforcement bars free of rust.

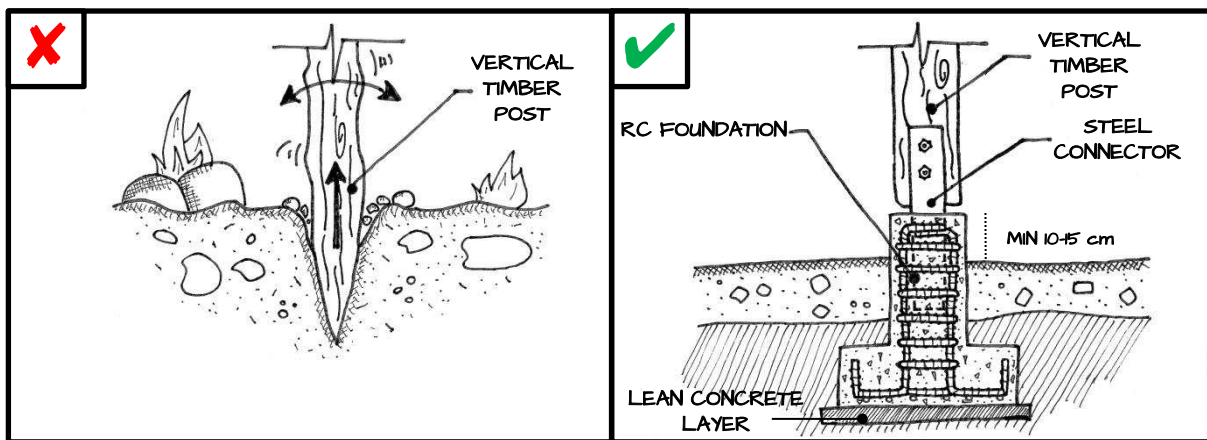


3.5 Use pre-treated sawn lumber planks, if not, treat them with wood preservative.

# 4. HOW TO BUILD A STRONG FOUNDATION

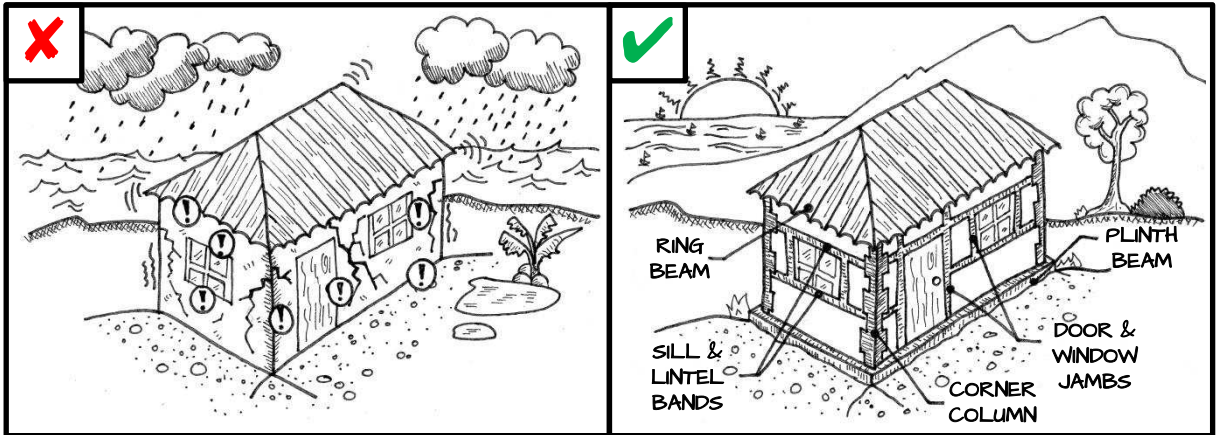


4.1 For MASONRY homes, use a stone masonry foundation with a continuous reinforced concrete plinth beam.

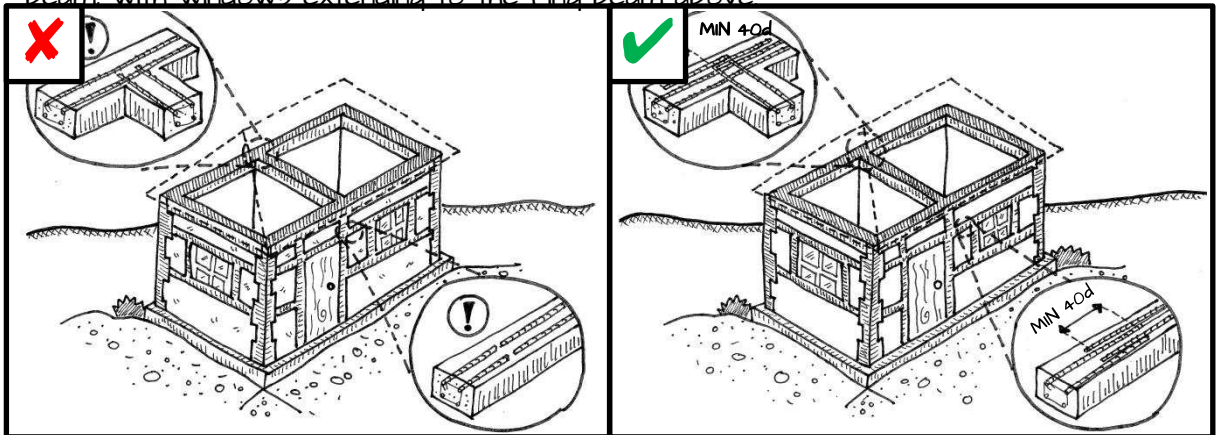


4.2 For TIMBER FRAME homes, add isolated reinforced concrete footings under each post or add a continuous reinforced concrete plinth beam.

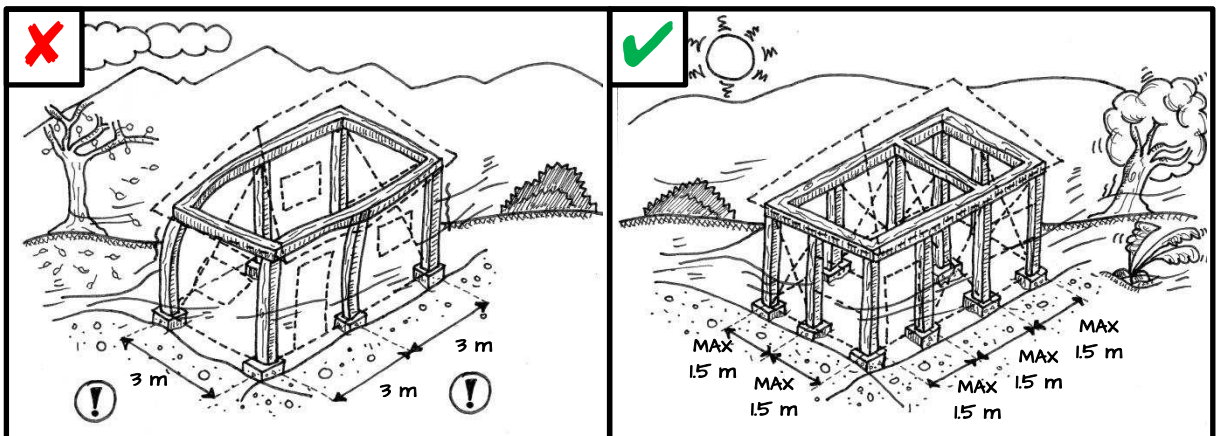
# 5. HOW TO BUILD WELL BRACED WALLS FIRMLY CONNECTED TO THE FOUNDATION



5.1 For MASONRY homes, add vertical RC ties at corners, intersections and around openings and hook them into the foundation. Add horizontal RC plinth, sill, and ring beam with windows extending to the ring beam above.



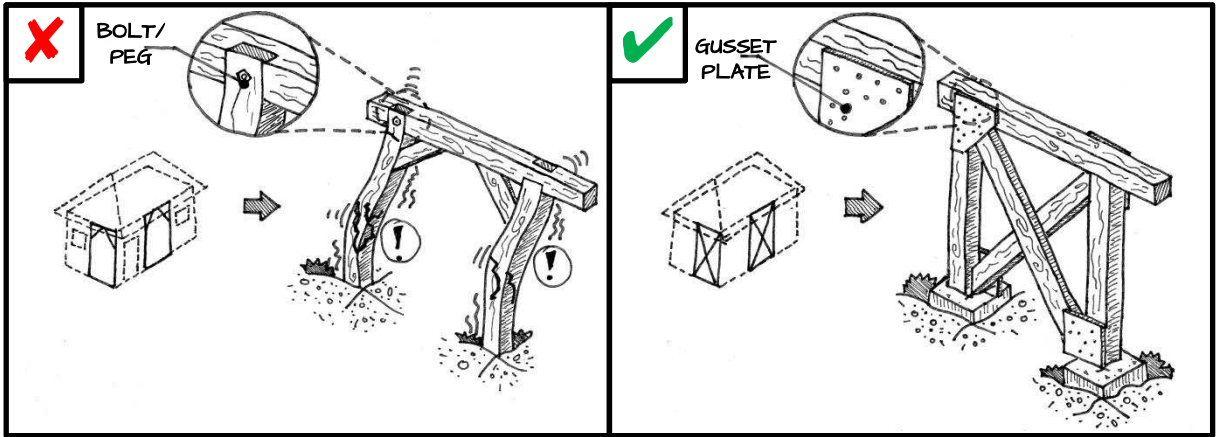
5.2 Overlap any steel reinforcement intersections or bar ends by at least 40 times the bar's diameter.



5.3 For TIMBER FRAME homes, place vertical posts no more than 1.5 meters apart in all exterior and interior walls.

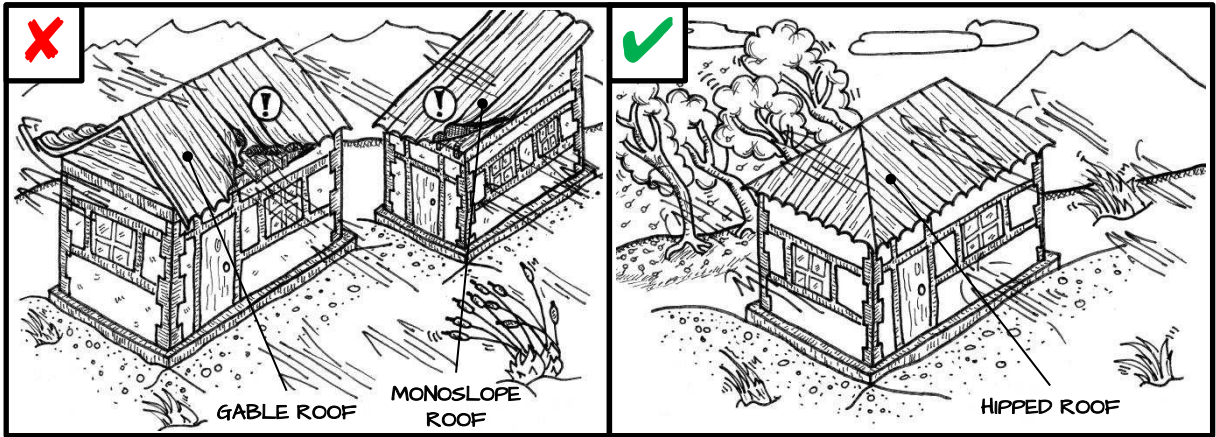


# 5. HOW TO BUILD WELL BRACED WALLS FIRMLY CONNECTED TO THE FOUNDATION (continue)

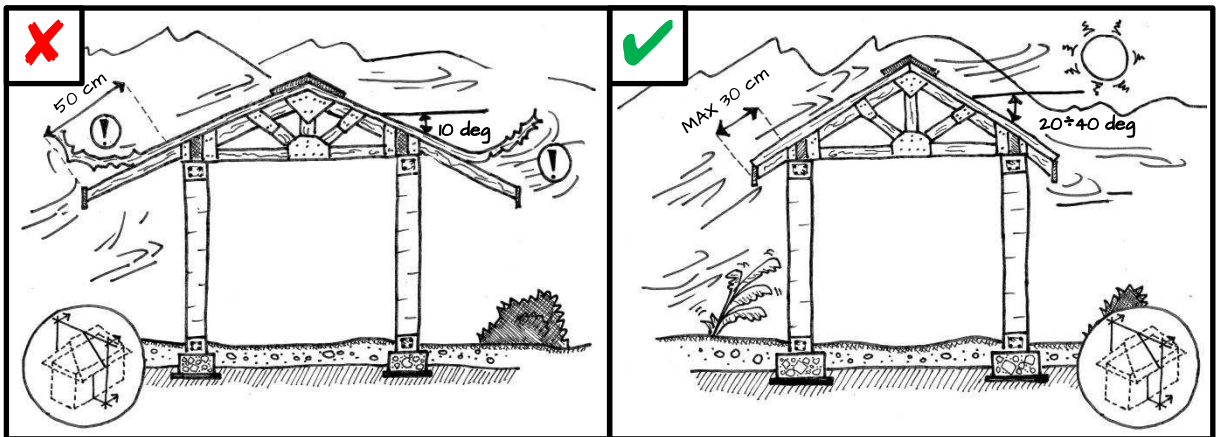


5.4 For TIMBER FRAME homes, firmly attach cross bracing between vertical posts in all exterior and interior walls.

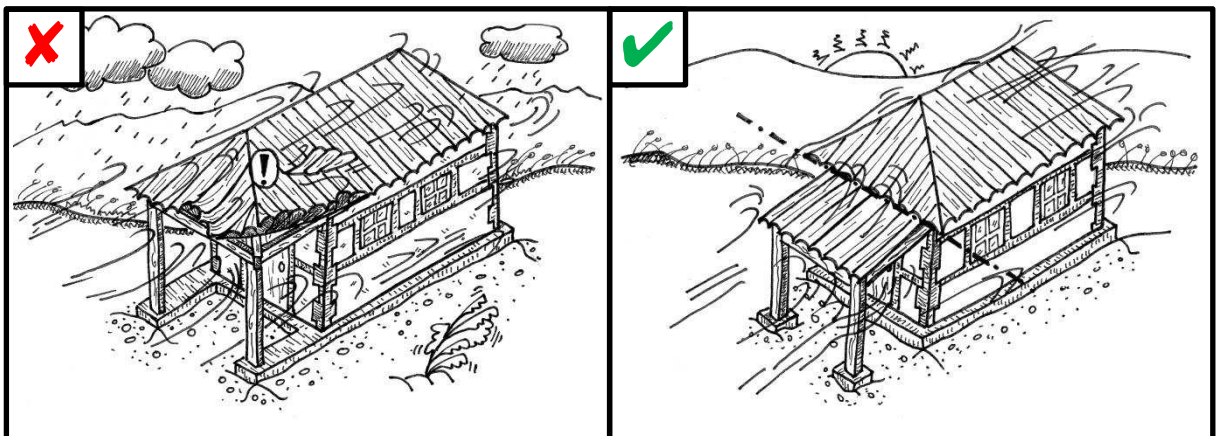
# 6. HOW TO BUILD A STURDY ROOF FIRMLY CONNECTED TO THE WALLS



6.1 Choose a hipped roof design.



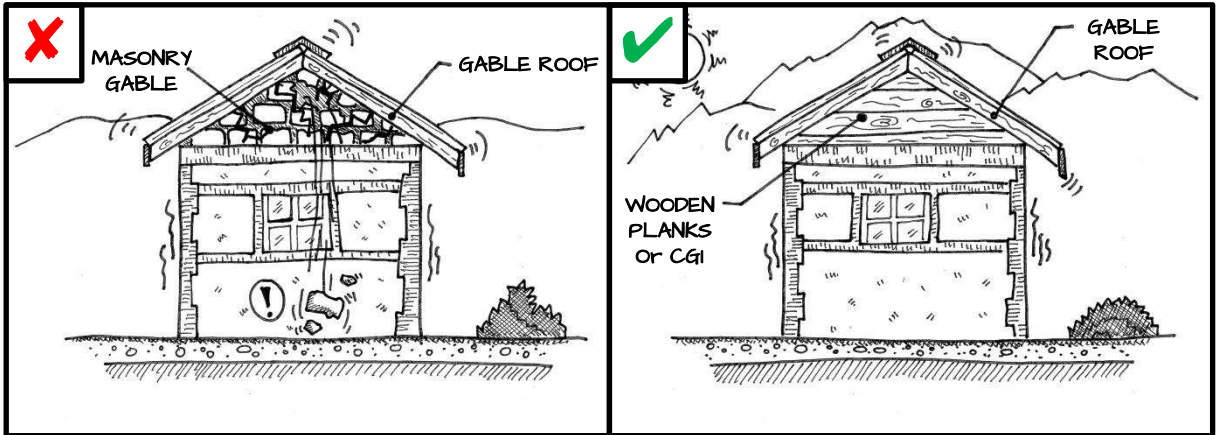
6.2 Design the roof to have a slope of more than 20 deg and less than 40 deg and an overhang of less than 30 centimeters.



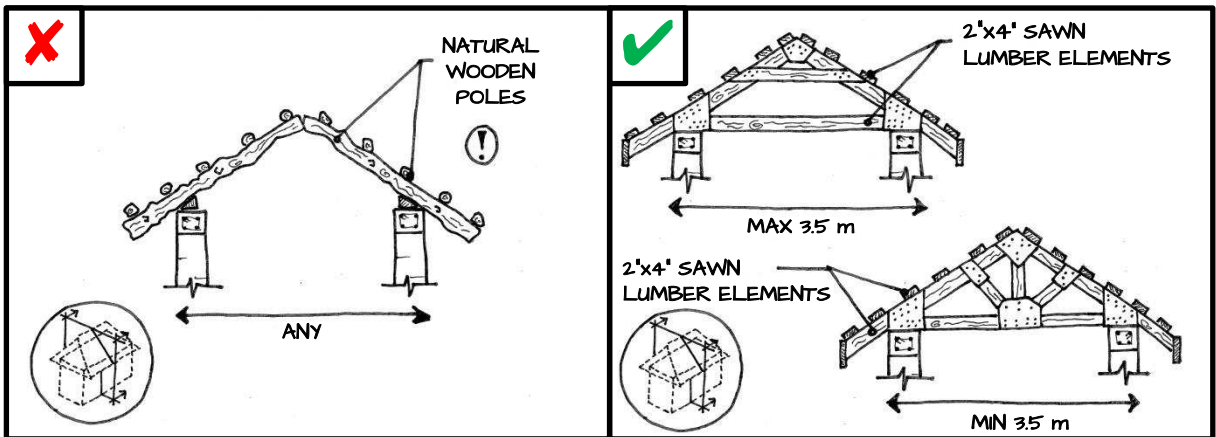
6.3 Design the veranda roof to be separate from the home's main roof.

# 6. HOW TO BUILD A STURDY ROOF FIRMLY CONNECTED TO THE WALLS

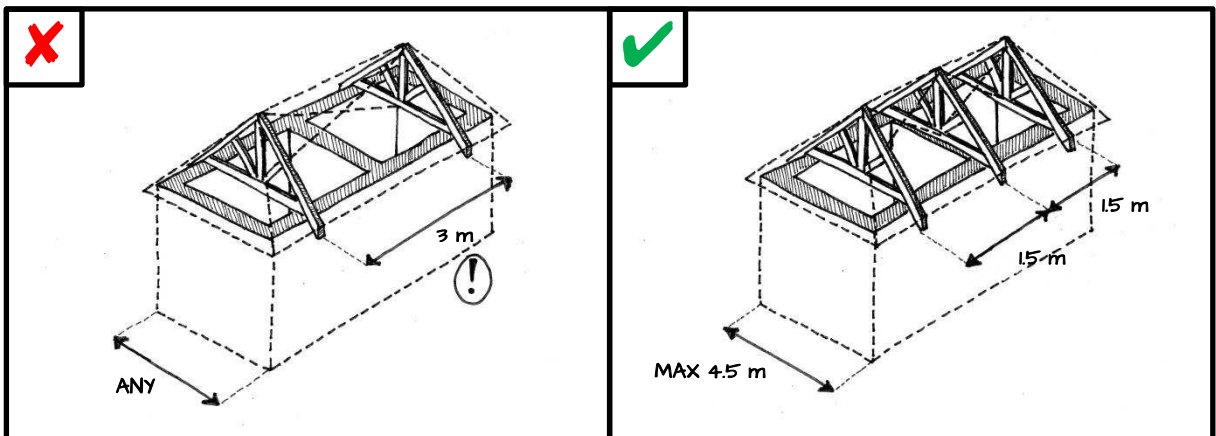
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6.4 If the roof has to have two slopes, make the gable from light-weight material like wood or CGI sheeting.



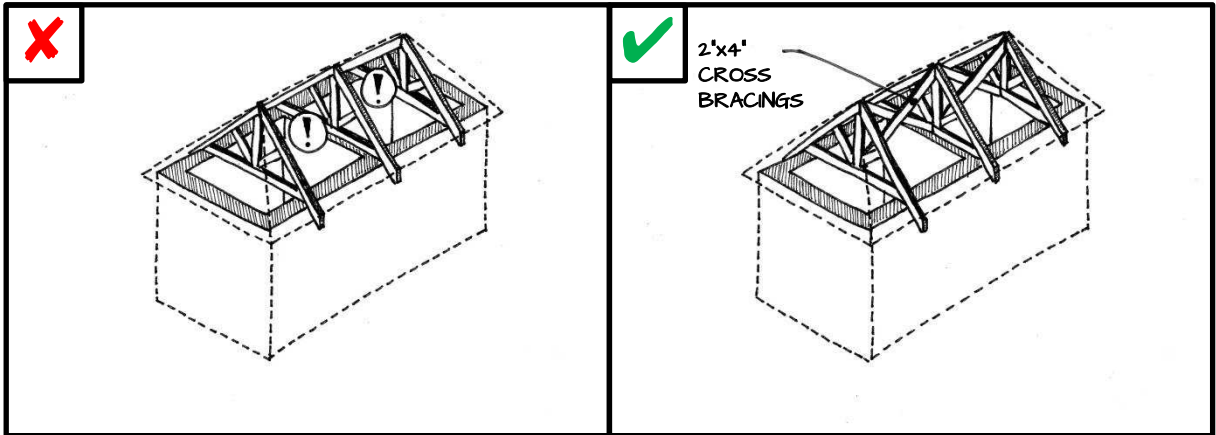
6.5 Build trusses out of 2"x4" sawn lumber.



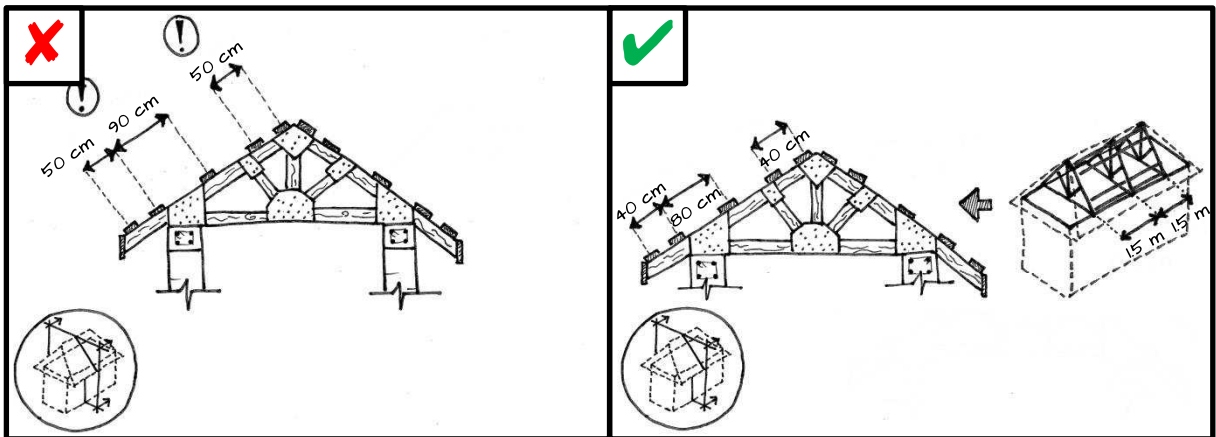
6.6 Place trusses no more than 1.5 meters apart.

# 6. HOW TO BUILD A STURDY ROOF FIRMLY CONNECTED TO THE WALLS

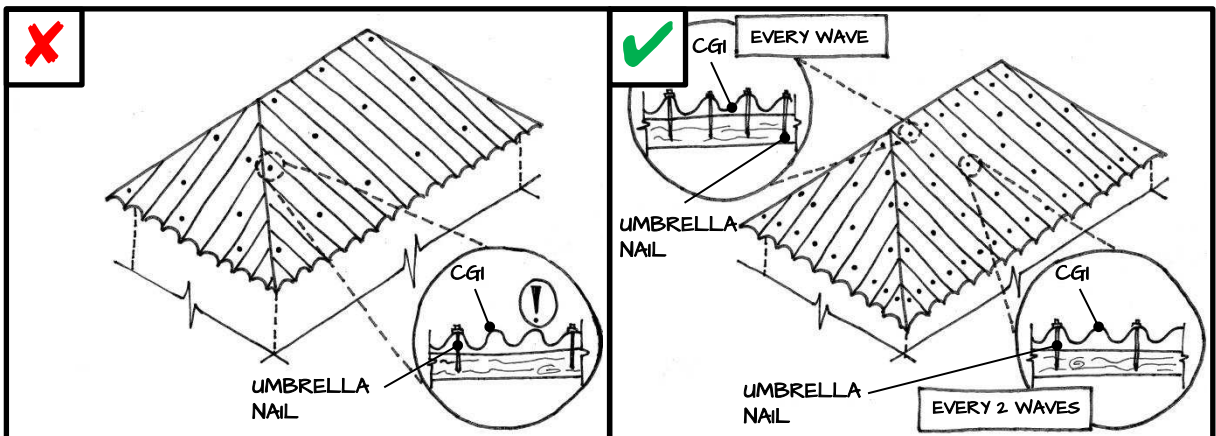
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6.7 Add 2"x4" sawn lumber cross bracing between trusses.



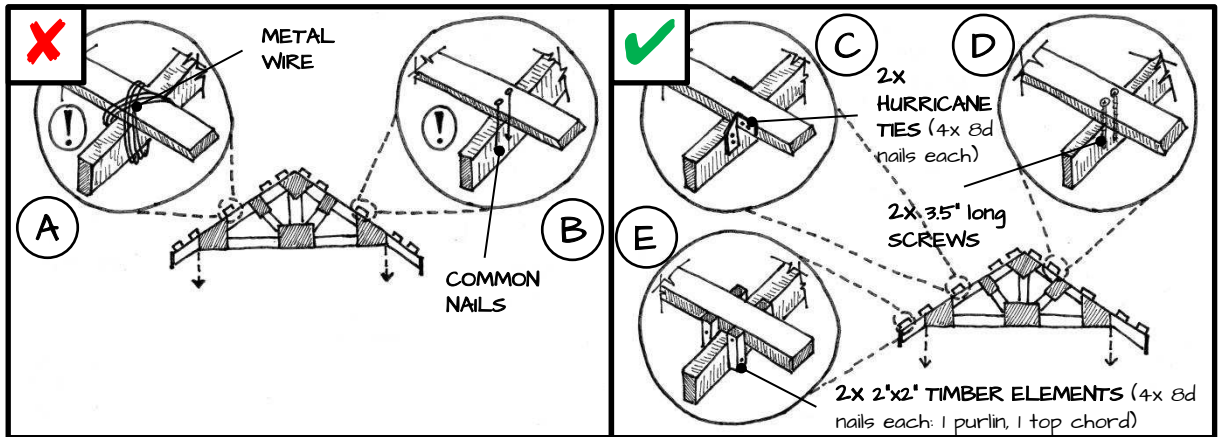
6.8 Place purlins no more than 80 centimeters apart, and no more than 40 centimeters apart underneath the overhangs.



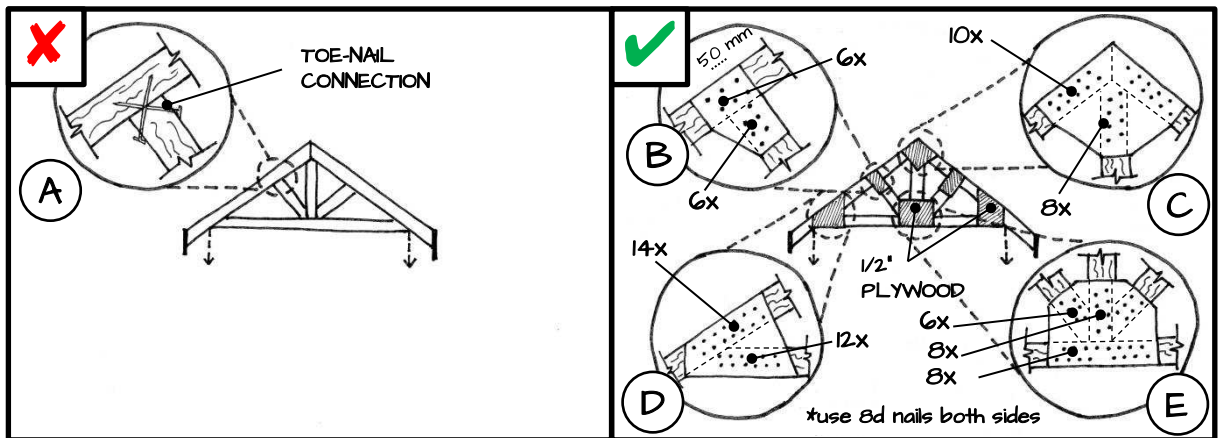
6.9 Nail CGI sheeting down every two waves along each purlin and every single wave along the top, sides and edges of the roof.

# 6. HOW TO BUILD A STURDY ROOF FIRMLY CONNECTED TO THE WALLS

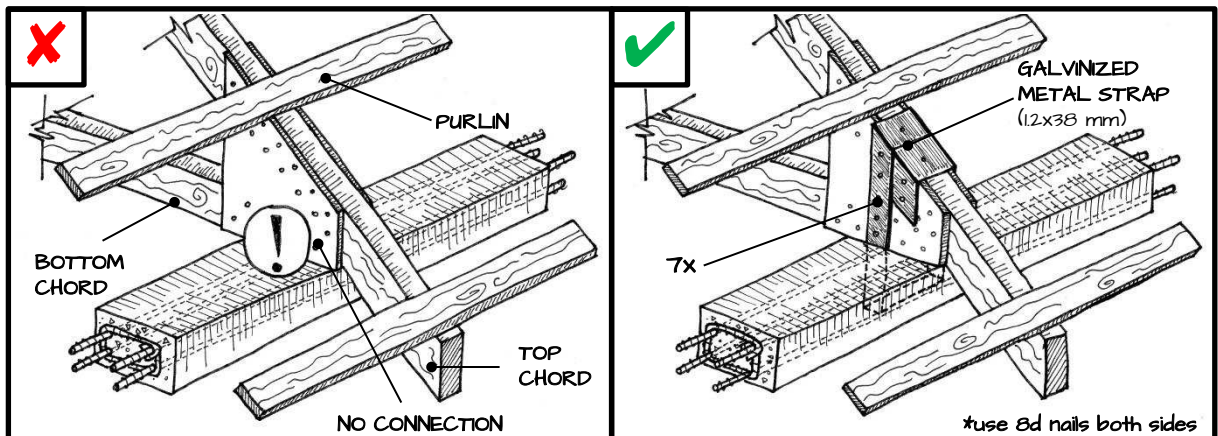
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6.10 Firmly attach purlins with 2"x2" wooden elements, manufactured metal hurricane tie (like Simpson H3) or screws.



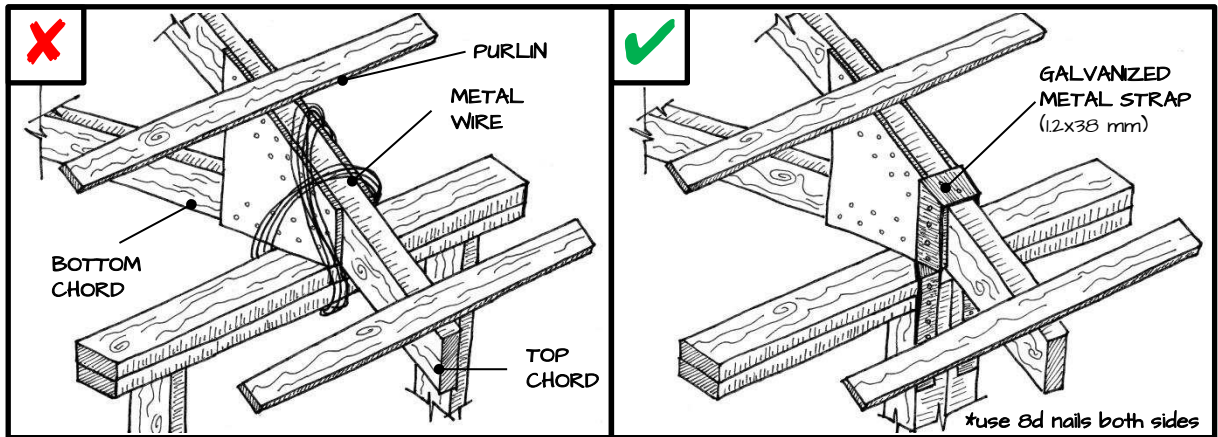
6.11 Connect the different truss elements with plywood gussets or metal plate on each side of the connection.



6.12 For MASONRY homes, firmly connect trusses to the ring beam with galvanized metal straps embedded under the stirrups.

# 6. HOW TO BUILD A STURDY ROOF FIRMLY CONNECTED TO THE WALLS

(continue)



6.13 For TIMBER FRAME homes, firmly connect trusses to the top plate with nailed galvanized metal straps. Position trusses directly over the vertical timber posts.

