

# TOPIC: TROPICAL DESIGNS FOR LOW COST HOUSING AREAS

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## INTRODUCTION

Buildings are designed around the world to meet certain requirements after the architect has taken site and environmental conditions into his consideration.

Guyana is subject to the conditions that are characteristic of the Tropical Zone, they are: steady trade winds and seasonal rainfall but without the excessively high hurricane and typhoon winds that prevail in typical temperate zone countries.



# ELEMENTS FOR TROPICAL BUILDING DESIGN

1. Orientation
2. Layout
3. Internal Plan
4. External Walls and Roof
5. Windows
6. Color
7. Shading Devices



# ORIENTATION

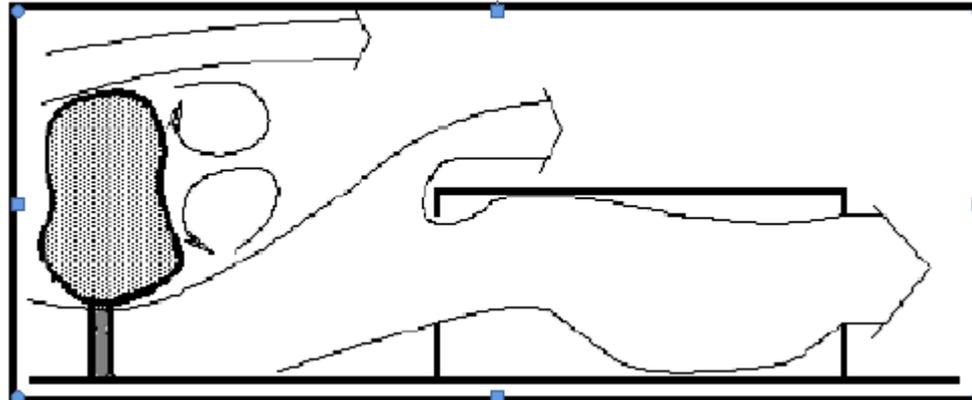
To ensure that a building has the ability to be cooled naturally, free air movement must occur throughout the entirety of the building. This ability is determined by the building's orientation (i.e. with regards to the prevailing winds and the size and location of the window openings) and this is more important for those days when there are light or no breezes.

It is preferred to have habitable rooms oriented East / West.



# LAYOUT

The building should be design to allow air movement through and around the building.

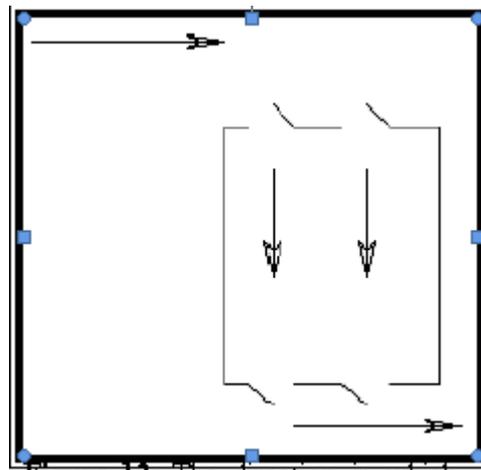


Wind may enter the building directly and in the case of a barrier such as a tree may cause acceleration of air underneath it with a wider band of moving air beyond.



# INTERNAL PLAN

The internal plan should provide for cross ventilation such as single banked rooms. This is achieved by the type and location of windows and internal walls throughout the building to allow air to enter and exit freely.



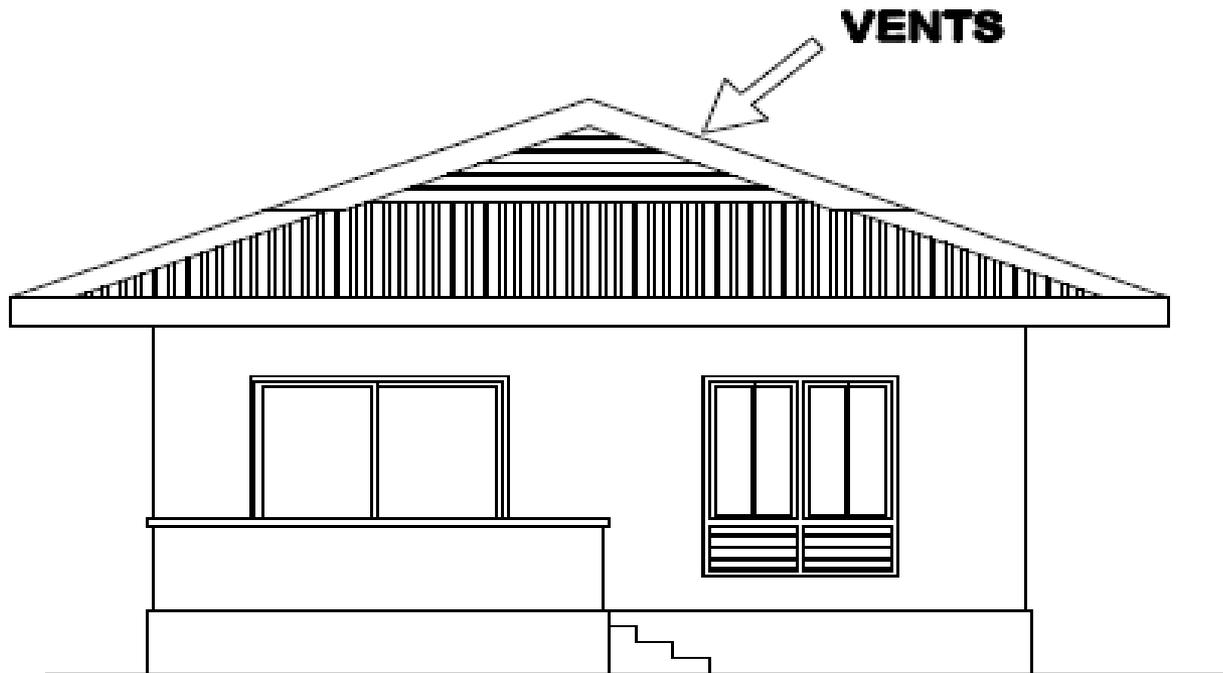
# EXTERNAL WALLS AND ROOFS

External walls should be thin and insulated and where surfaces are not shaded there should be light coloured(close to white as possible) and/ reflective.

Roofs should be design to allow hot air rising with the ability to escape. Should a ceiling be used in a building the ceiling should take the shape or profile of the roof. The roof should have a steep slope, large over hangs and should allow for ventilation at the top or at the gable. One such example of roof is the Dutch hip design where the roof provides shade to all external walls and at the same time allow for the extraction of hot air.



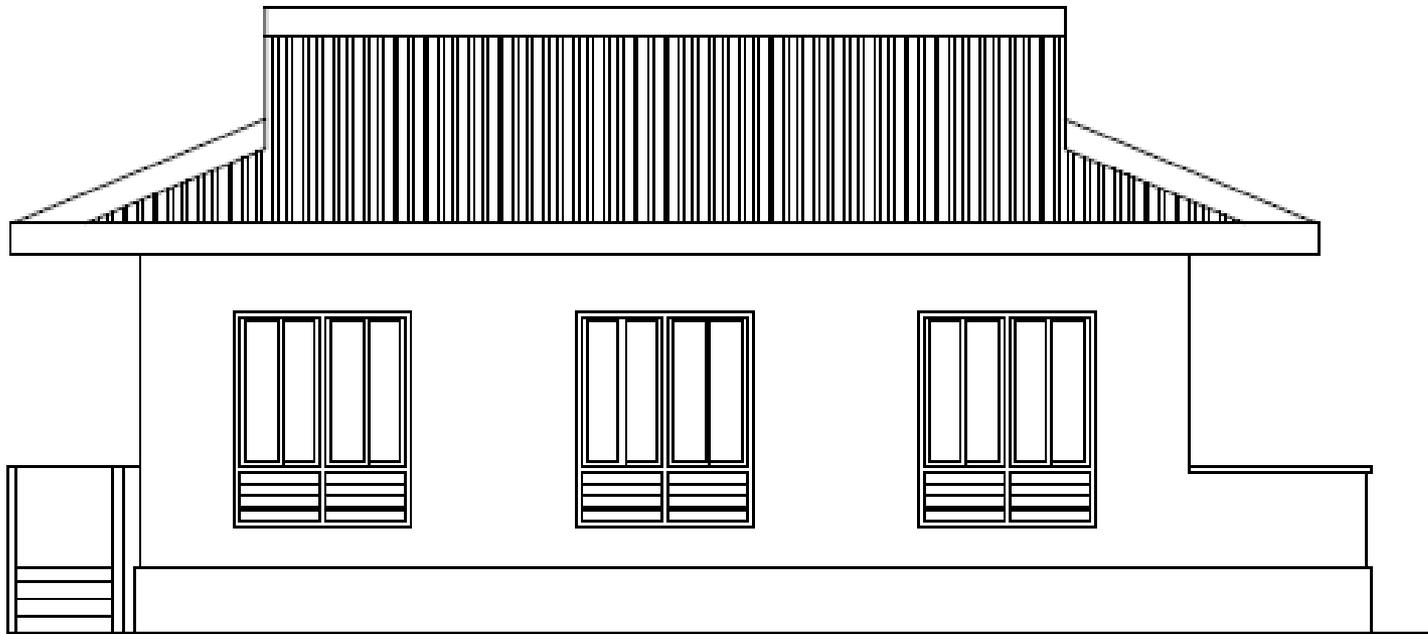
# DUTCH HIP ROOF



**FRONT ELEVATION OF THE DUTCH HIP ROOF**



# DUTCH HIP ROOF



**SIDE ELEVATION OF THE DUTCH HIP ROOF**



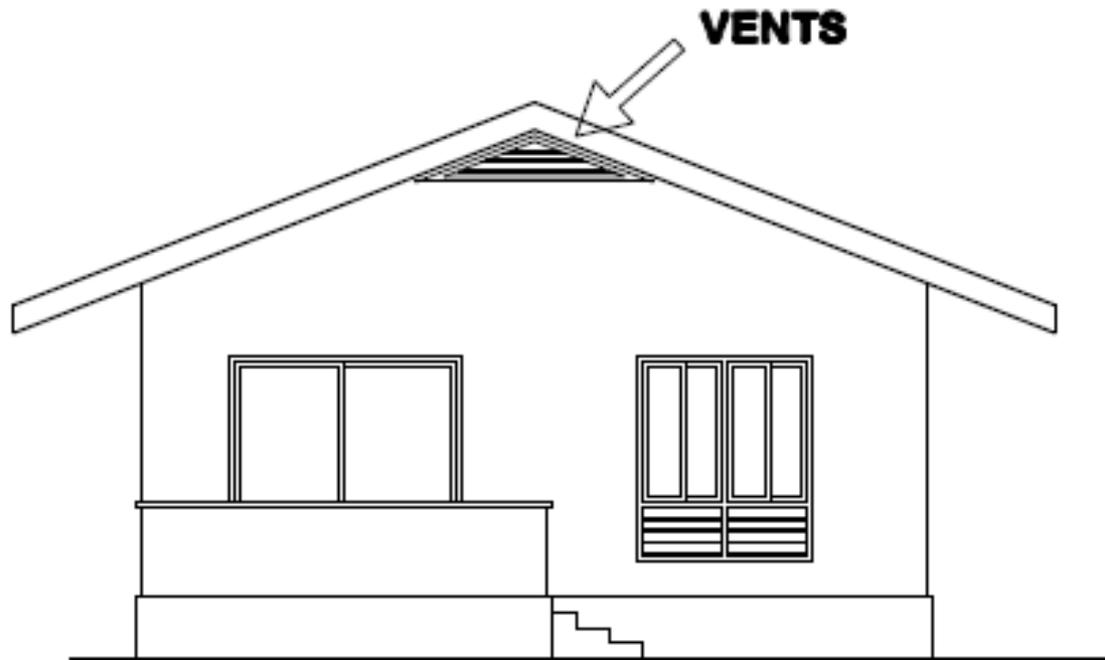
# ROOFS

Other roofs that are commonly used are the gable roofs. This roof would be best used if the building is oriented in a east to west direction because the over hang provides shade to the larger wall area. However these roofs should cater for ventilation at the gable.

The broken pitch roof or policeman cap roof is also a good example which also for ventilation at the apex of the roof however this roof should be oriented towards the leeward direction.

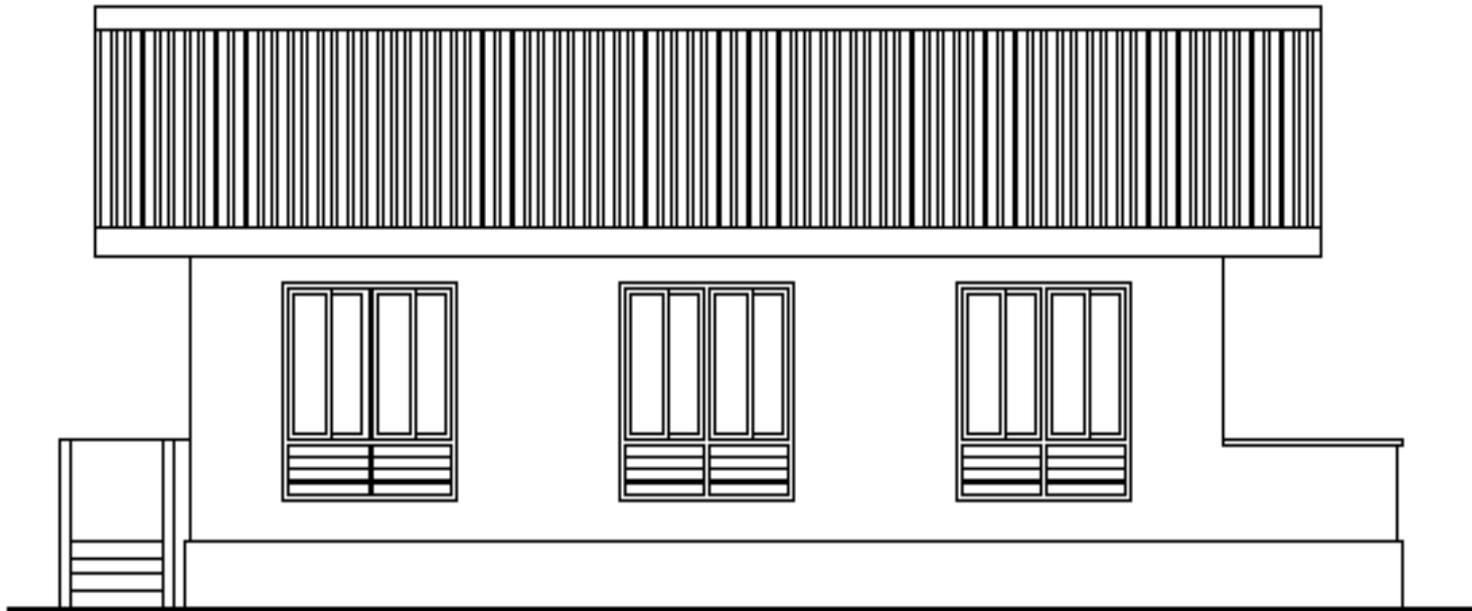


# VENTED GABLE ROOF



**FRONT ELEVATION OF THE GABLE  
ROOF**





**SIDE ELEVATION OF THE GABLE  
ROOF**



# BROKEN PITCH OR POLICEMAN CAP





# WINDOWS

Windows should allow for maximum ventilation through the entire opening. Example of window that reaches such criteria are the casement, pivot hung, awning, louvers and jalousie. It would be ideal for openings to be from the ground to the height of the wall.



# PIVOT HUNG WINDOWS WITH WOODEN LOUVERS TO THE BOTTOM



# LOUVERED WINDOW WITH FIXED JELOUSIE



# BUILDING HAVING PIVOT HUNG AND CASEMENT WINDOW



# COLOUR

Ceilings should be white in order to reflect maximum light from windows and spread it as evenly as possible throughout the room. White or light grey window walls will reduce the contrast between the light window aperture and the surrounding wall as seen inside, thus minimizing glare.



# SHADING DEVICES

Where it is not possible for a roof to provide shade to the external wall, shading device should be used.

It is best to have horizontal shading devices on walls that run north to south and vertical devices on walls running east to west. This is due to the movement of the sun from a east to west direction. These shading devices should allow for ventilation if possible. Example of shading device can be Canopies and Jelousie.



# EXAMPLE OF A CANOPIES WITH WOODEN JELOUSIE



# CONCLUSION

When designing for the tropics your building should allow for easy ventilation, adequate lighting and extraction of heat. Should buildings be design using the criteria listed, its occupants should be at comfort.

