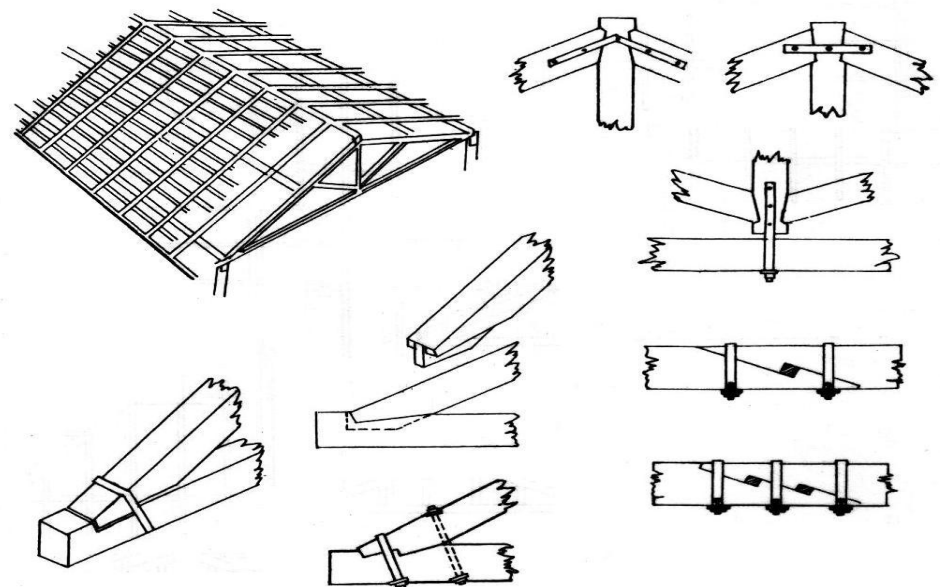
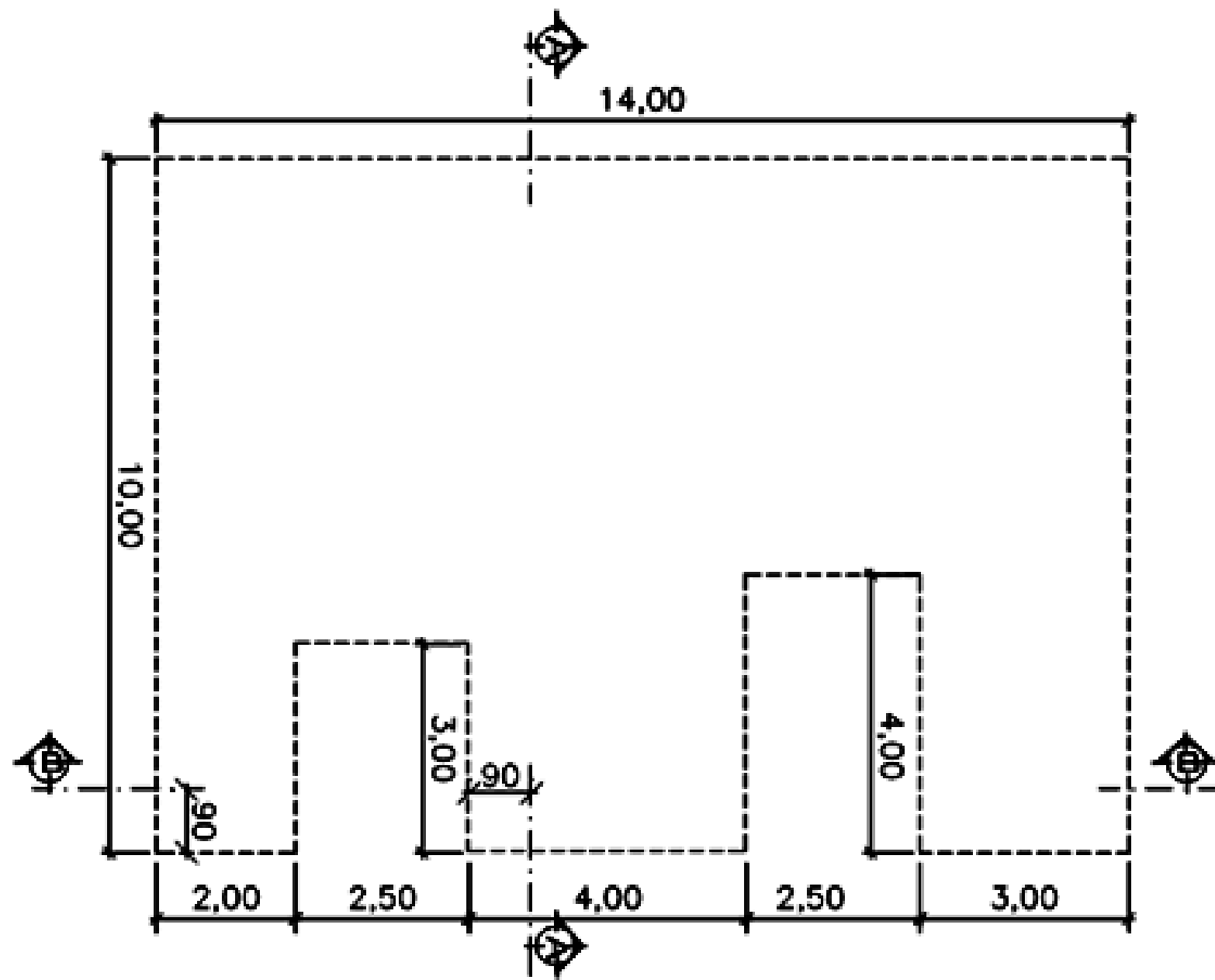
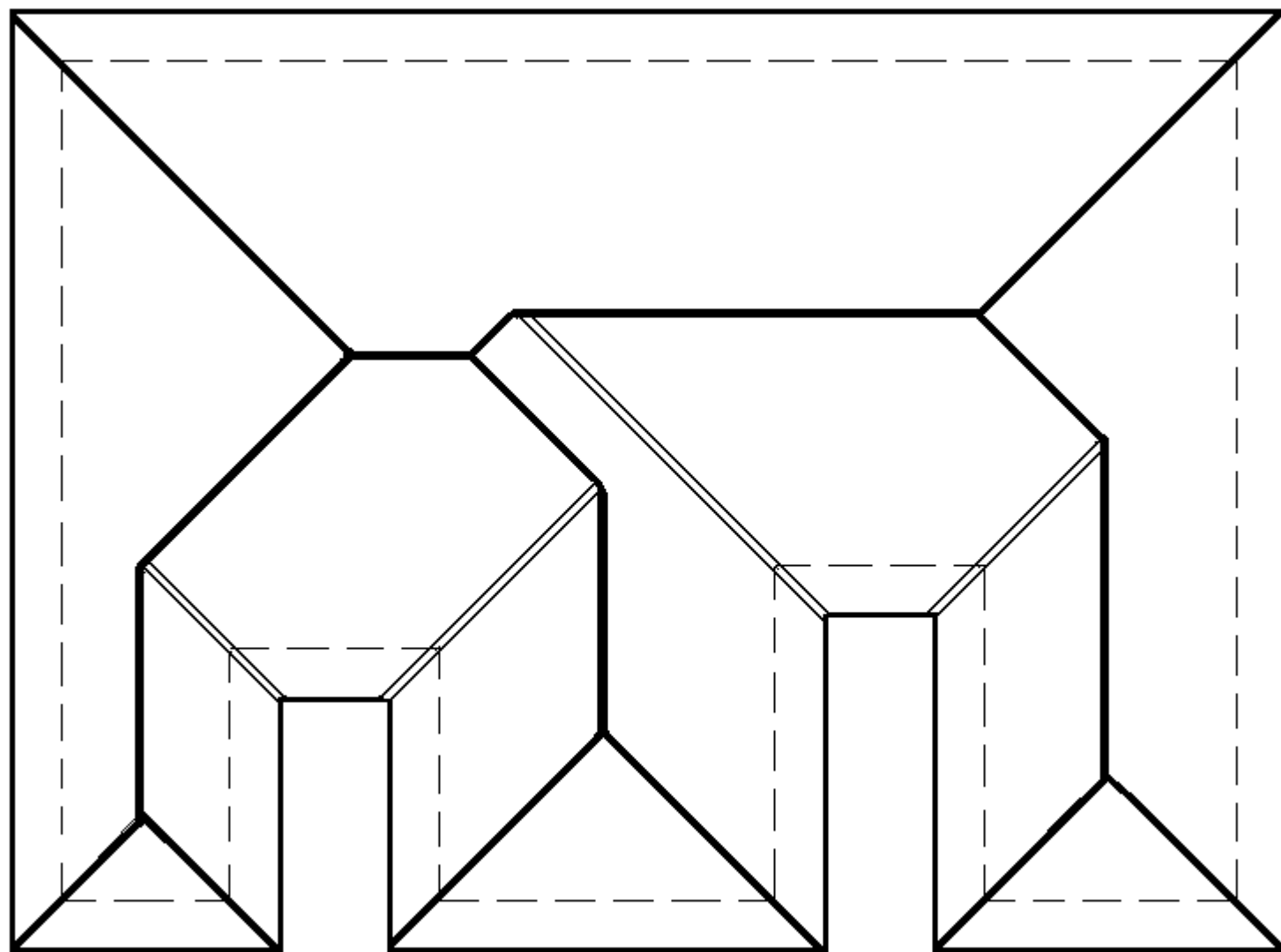


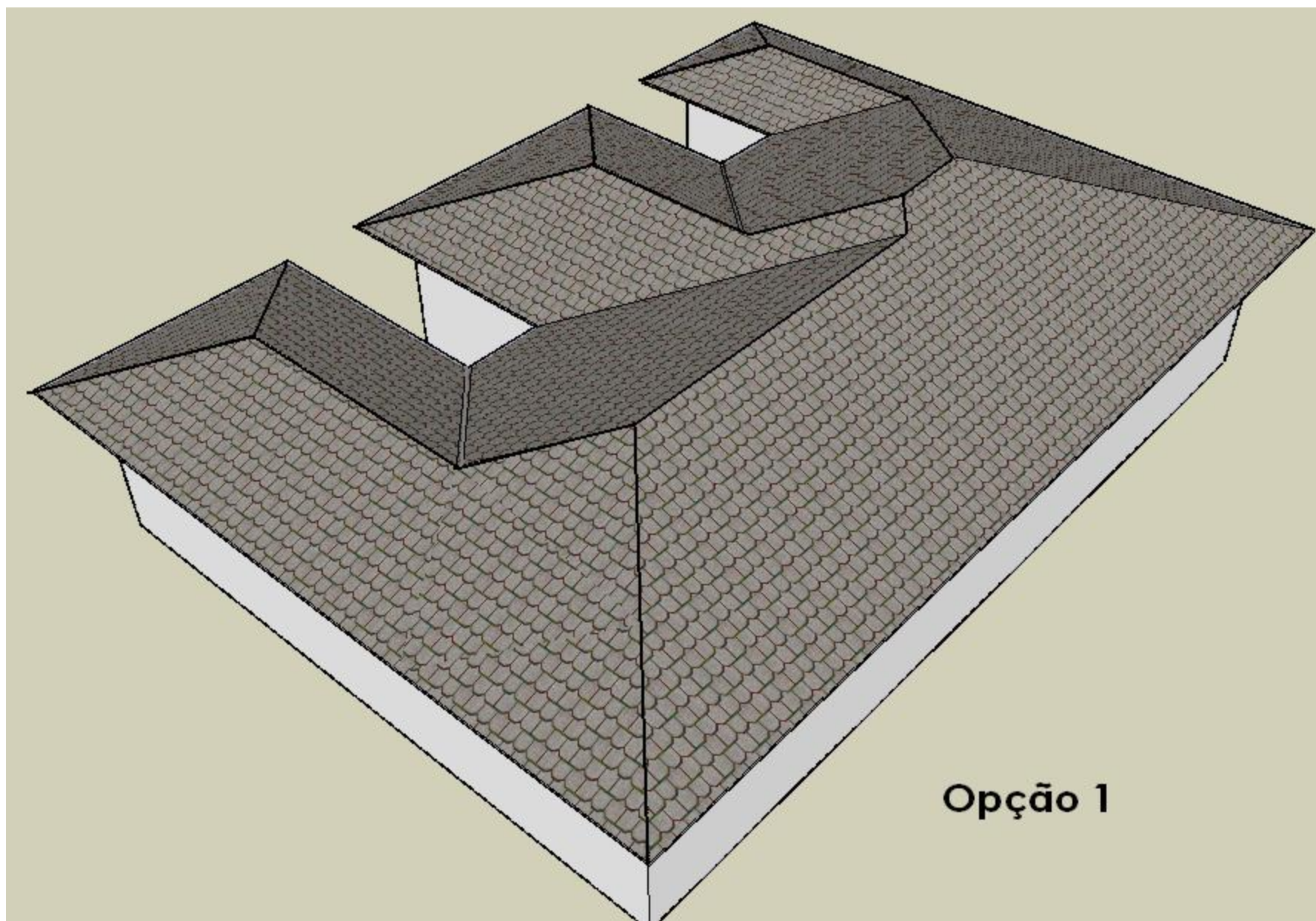
# TELHADOS ESTRUTURA DE MADEIRA

Prof. Carlos Barbosa  
Goiânia/ set 2010

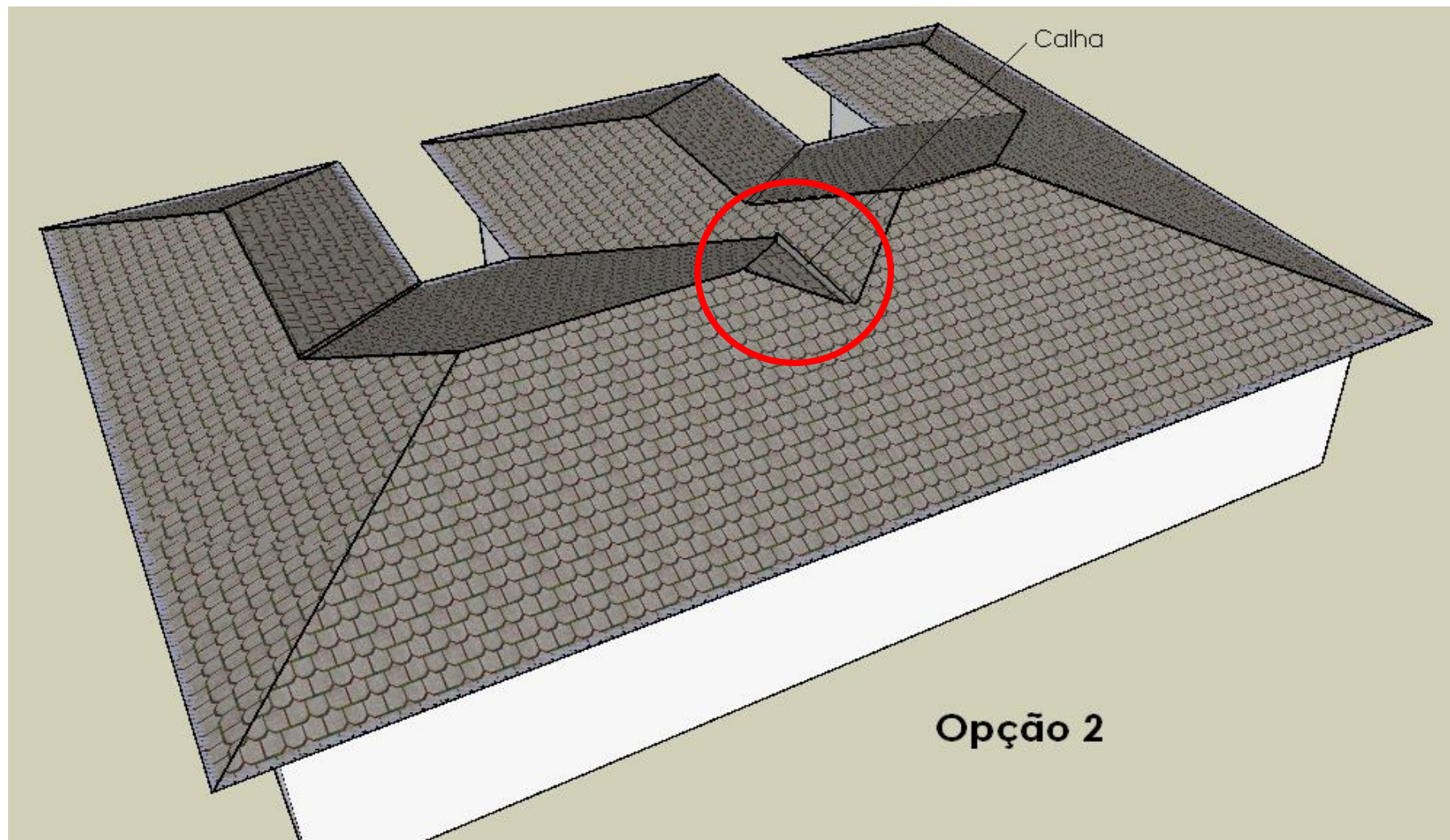


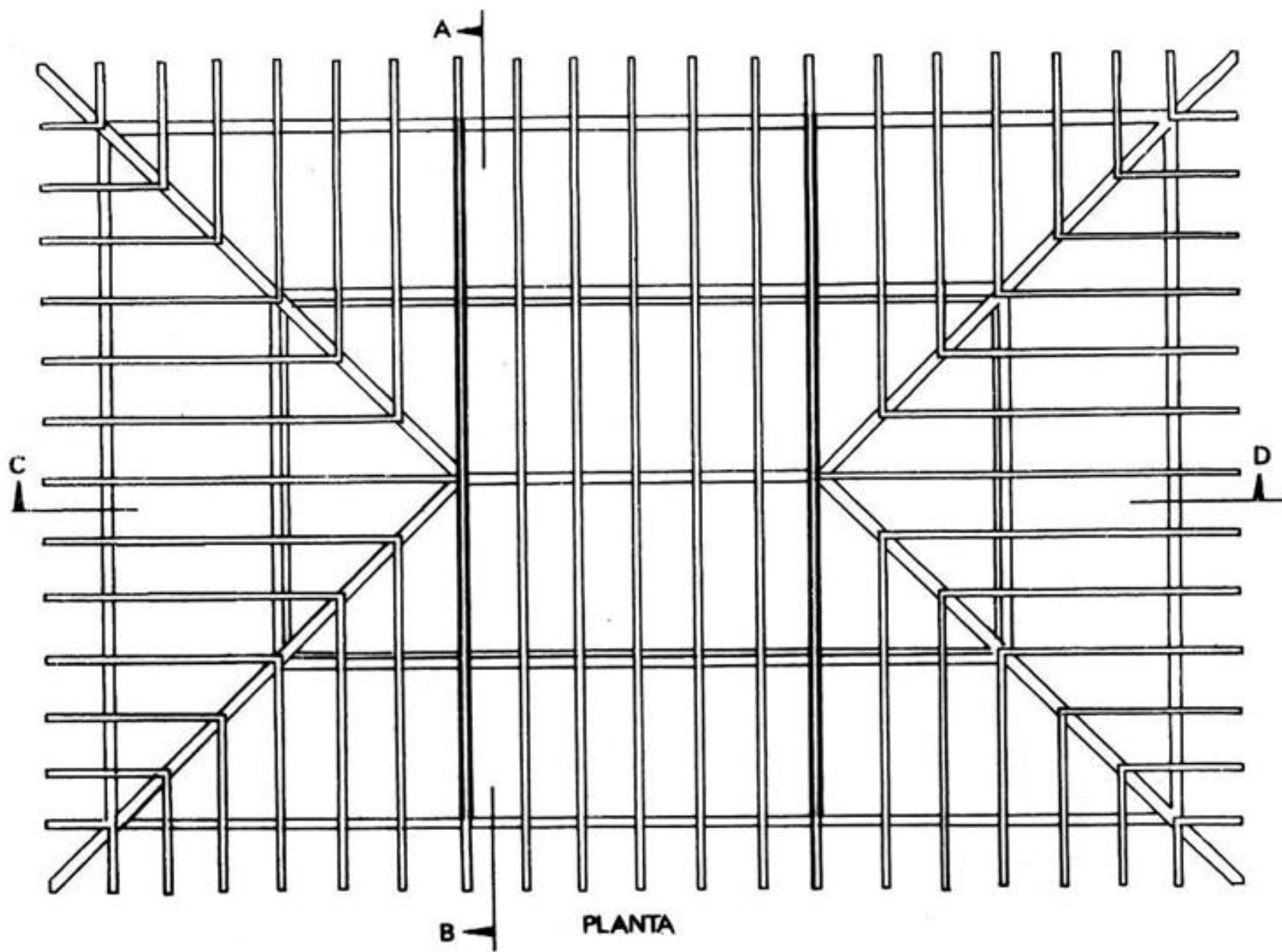


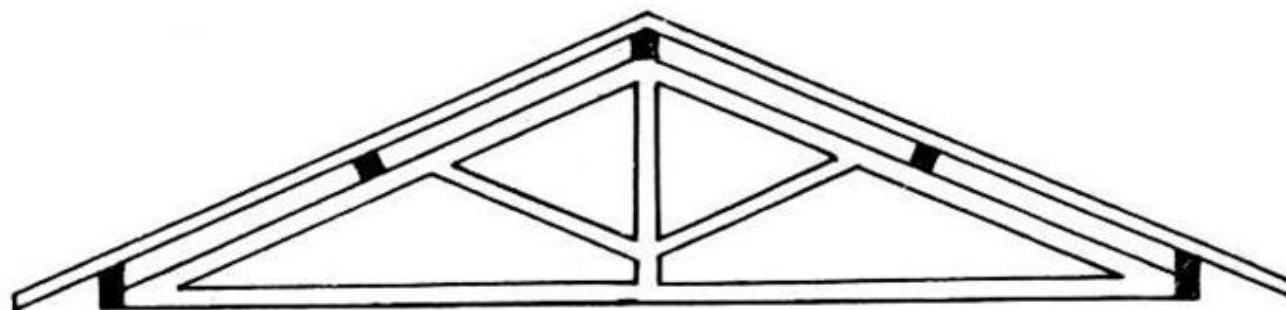




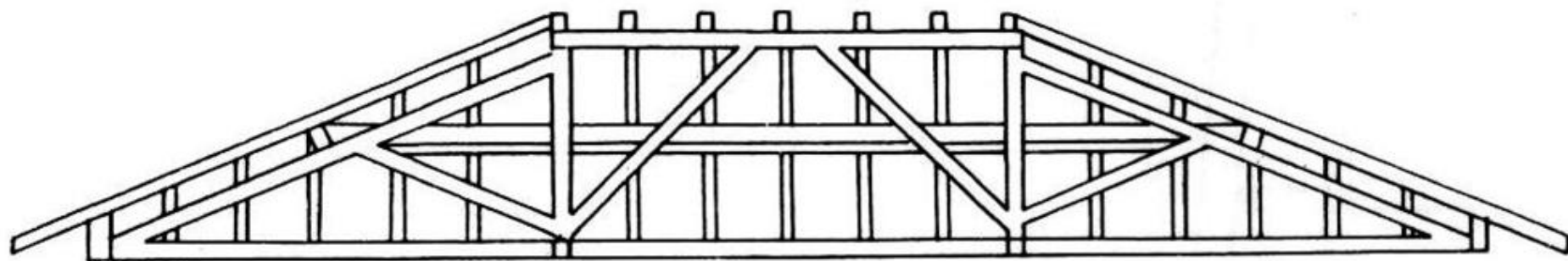




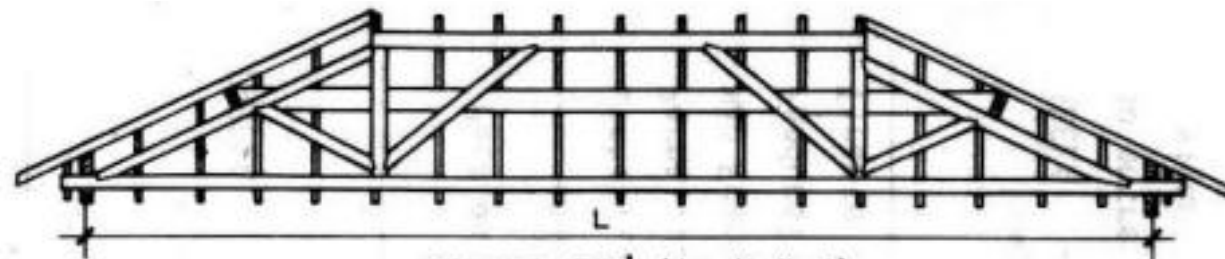




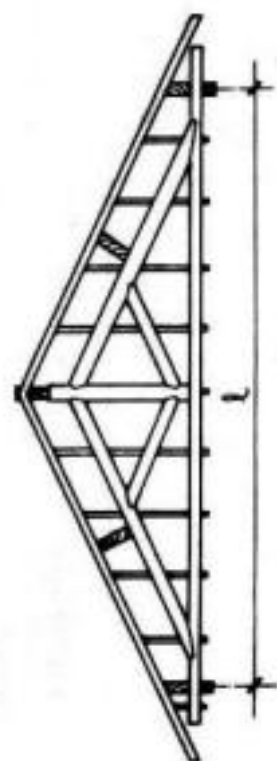
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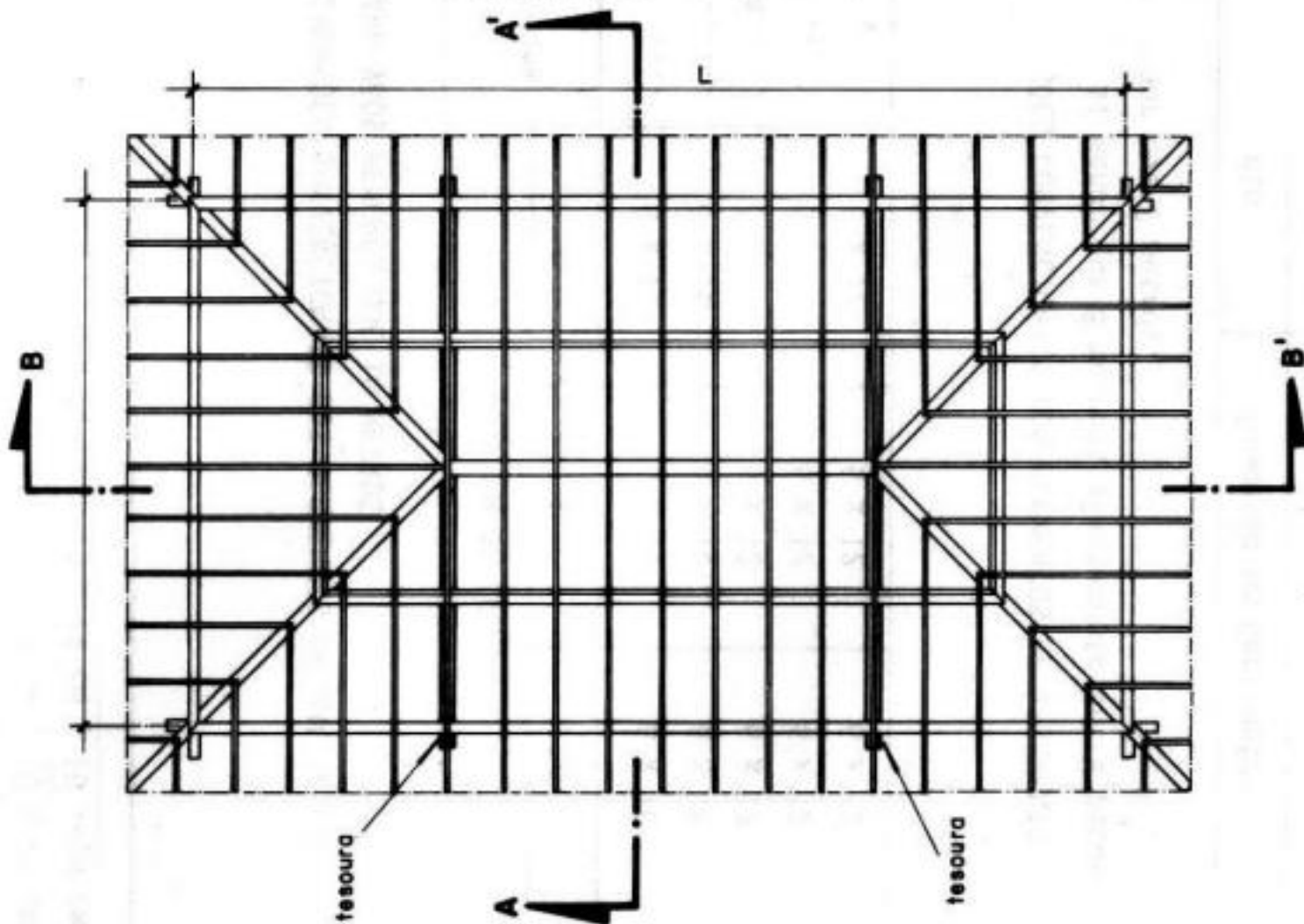
CORTE CD



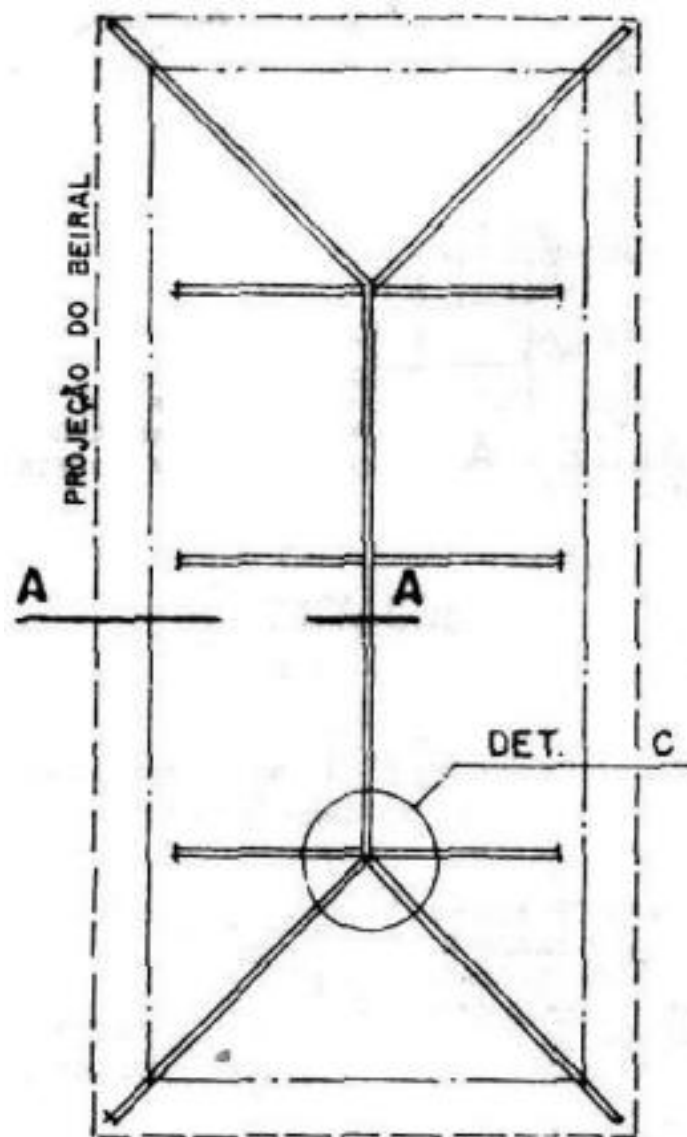
CORTE BB' (longitudinal)



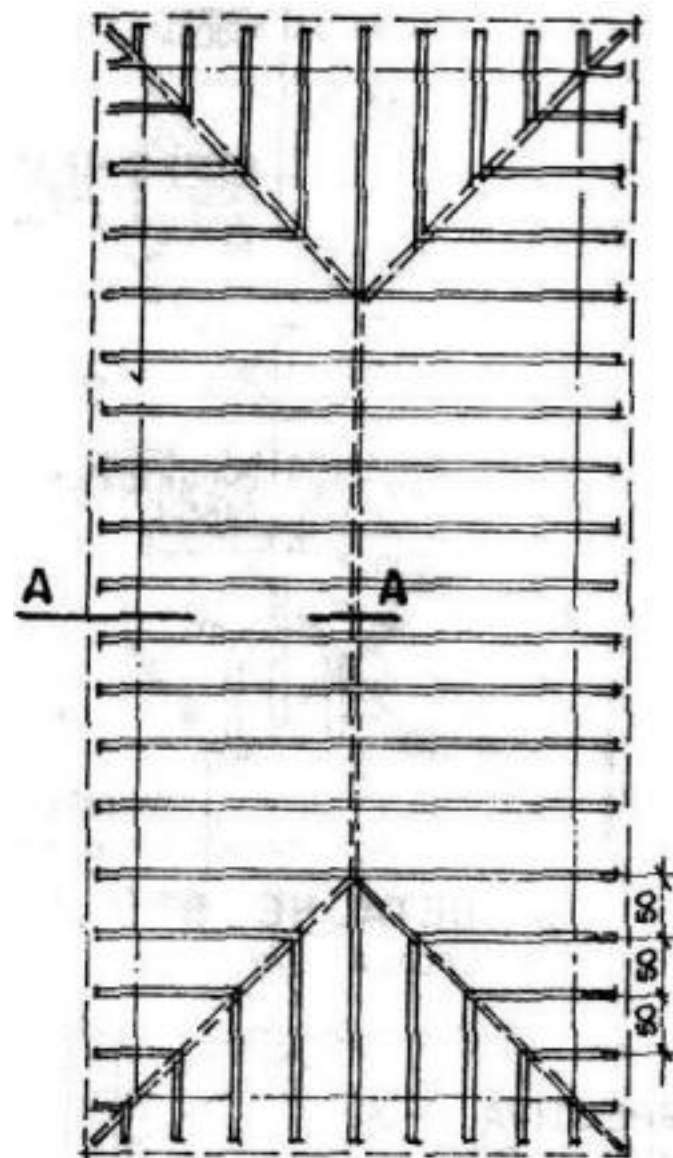
CORTE AA' (transversal)



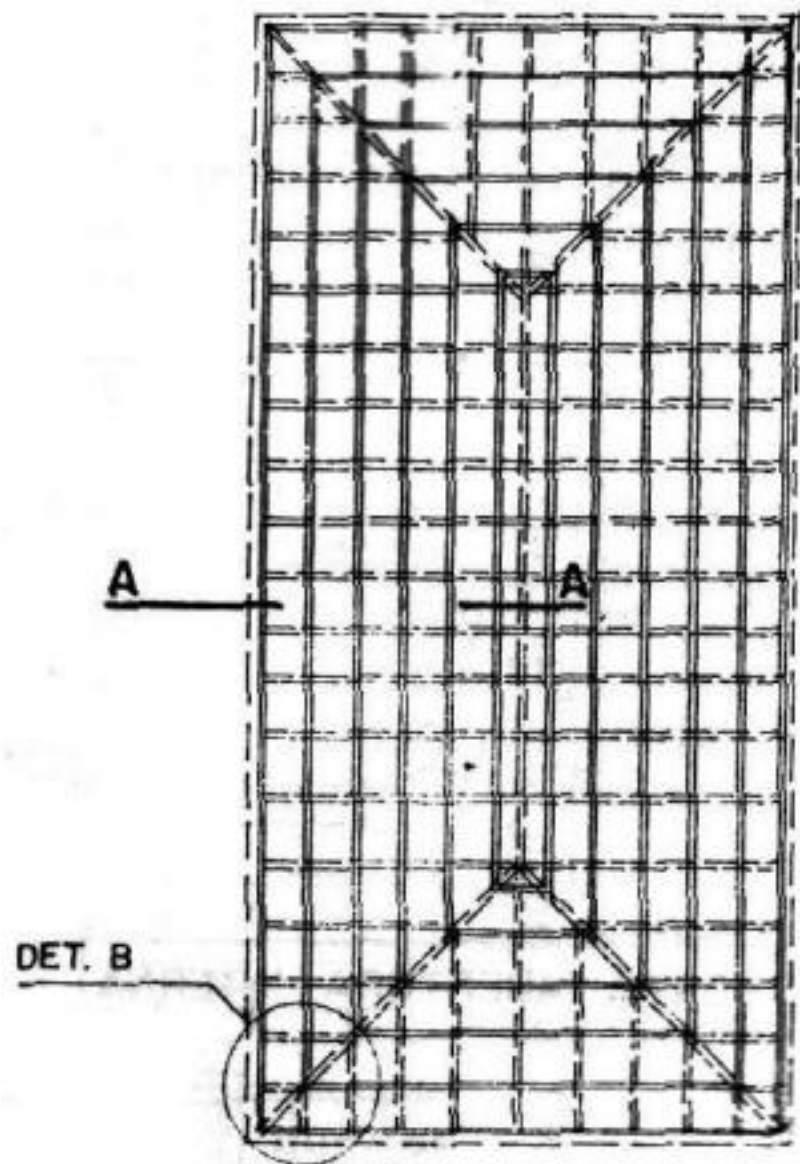




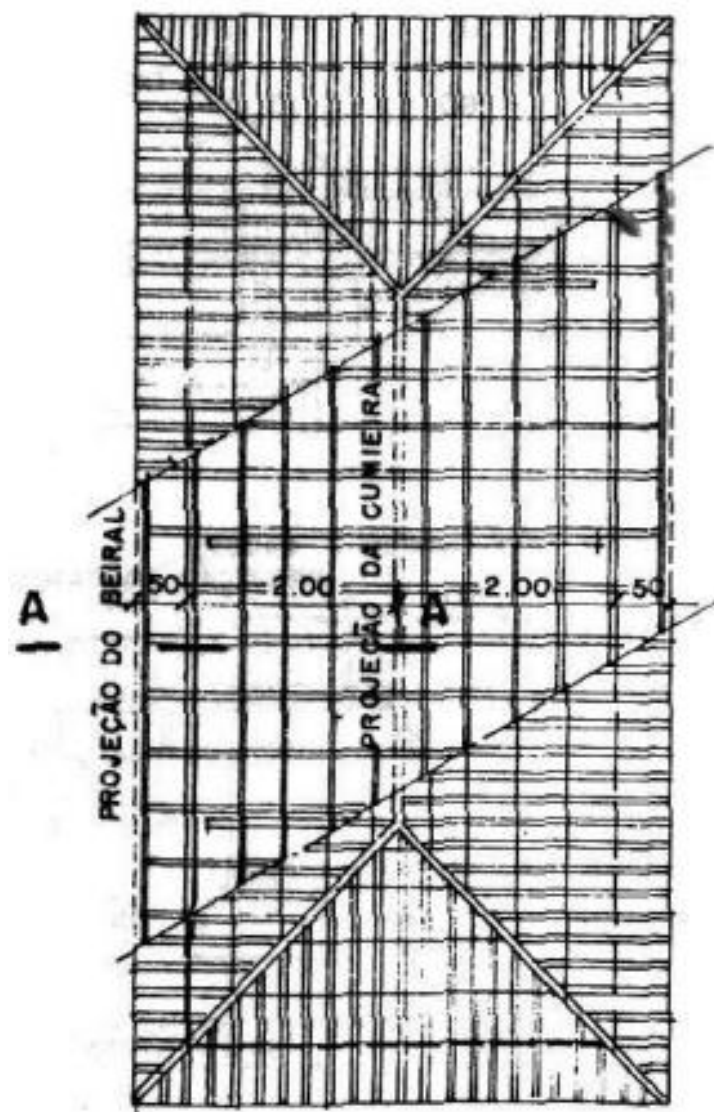
1 PLANTA BAIXA (TESOURAS)  
ESCALA 1/100



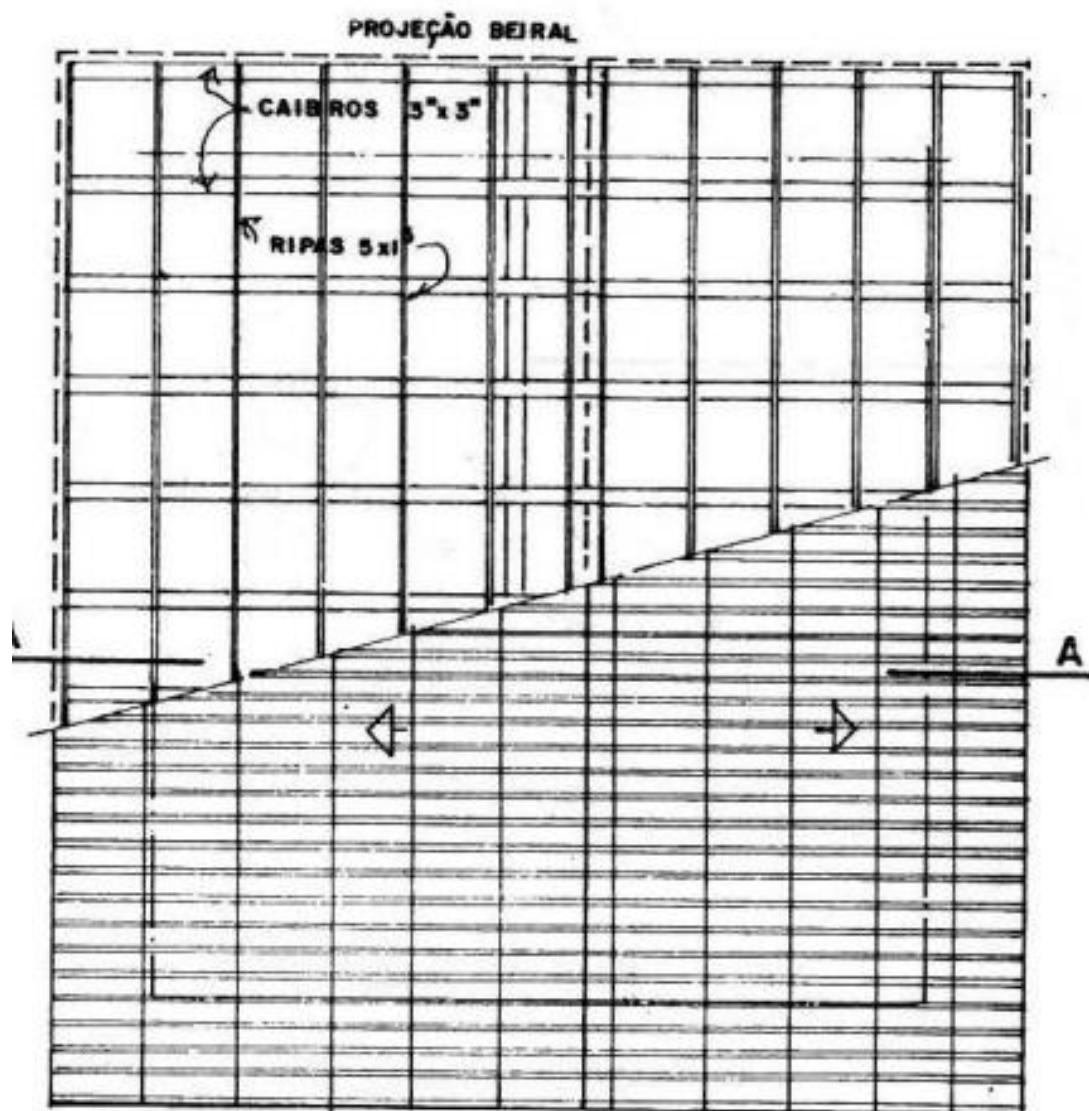
2 PLANTA BAIXA (CAIBROS)  
ESCALA 1/100



**3 PLANTA BAIXA (RIPAS)**  
ESCALA 1/100



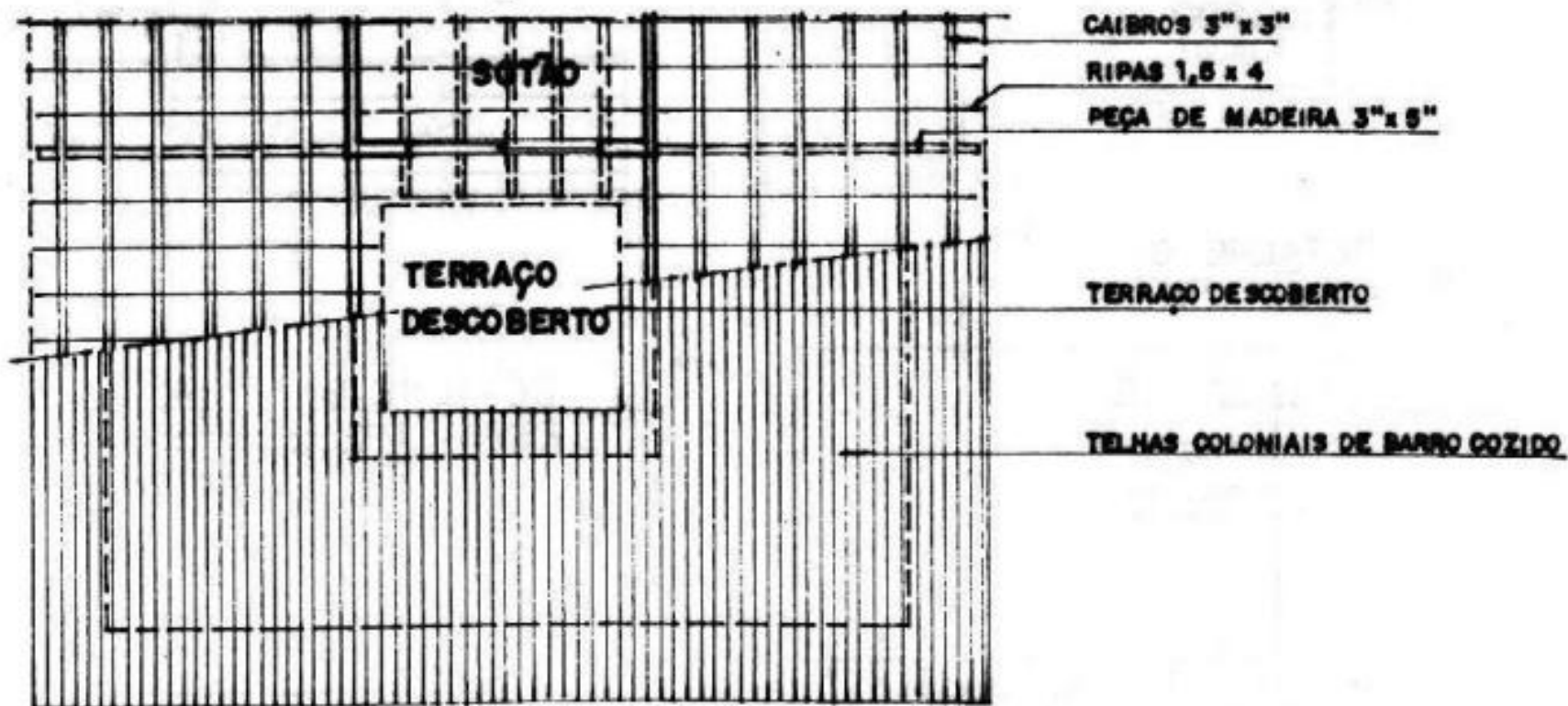
**4 PLANTA BAIXA (TELHAS)**  
ESCALA 1/100



1 PLANTA BAIXA DO TELHADO  
ESCALA 1/50

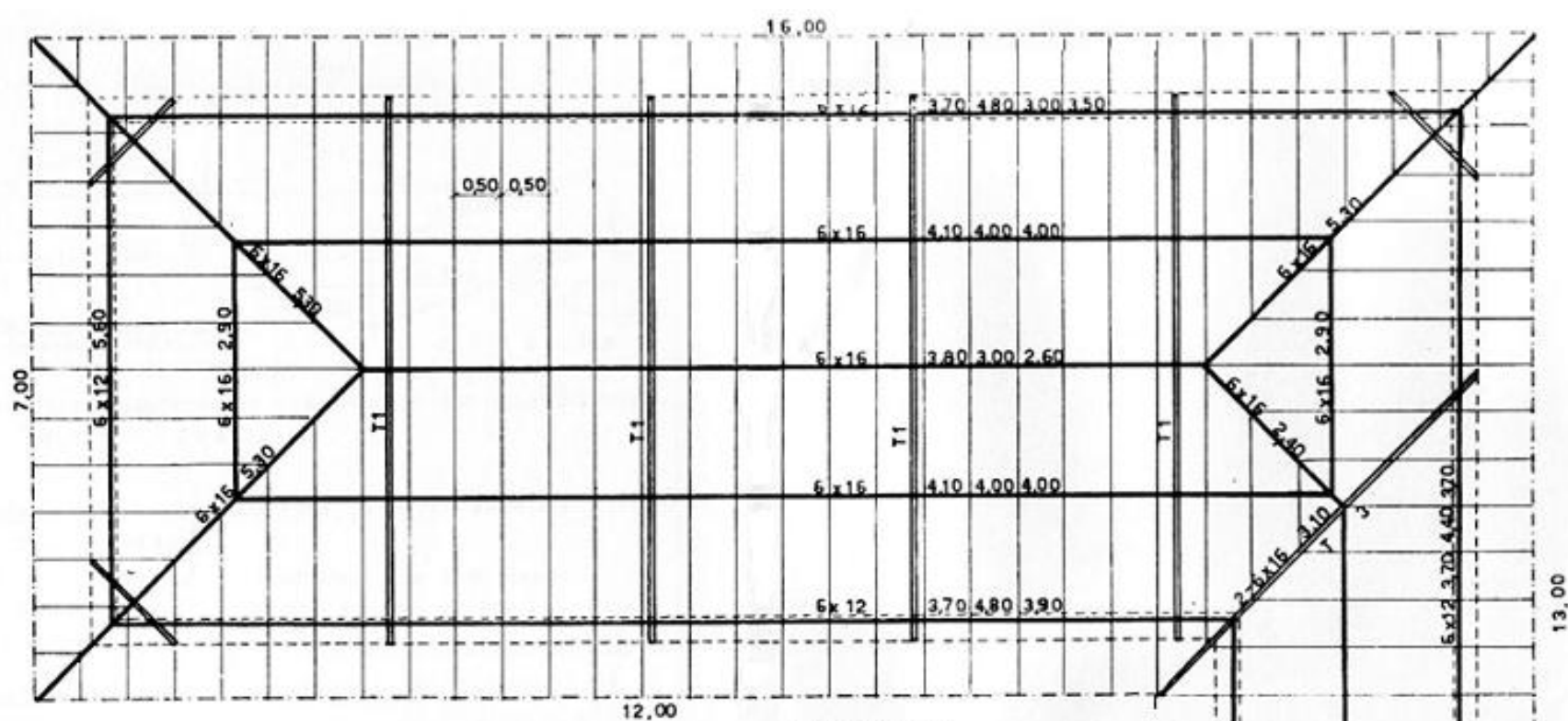
2 **CORTE A.A**  
ESCALA 1/100

A |

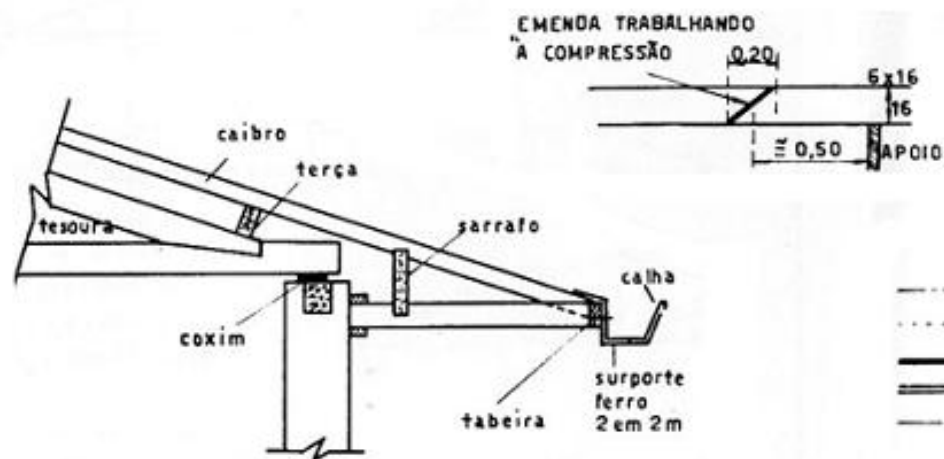


1 **PLANTA BAIXA**  
ESCALA 1/100

A |



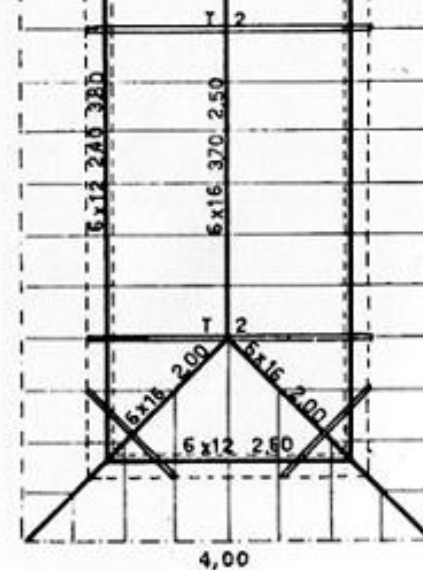
ESCALA 1:50



DETALHE DO BEIRAL (sem escala)

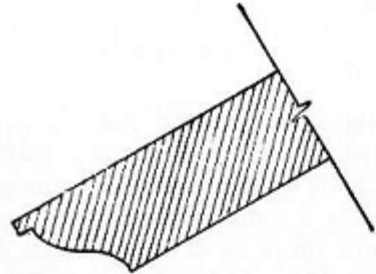
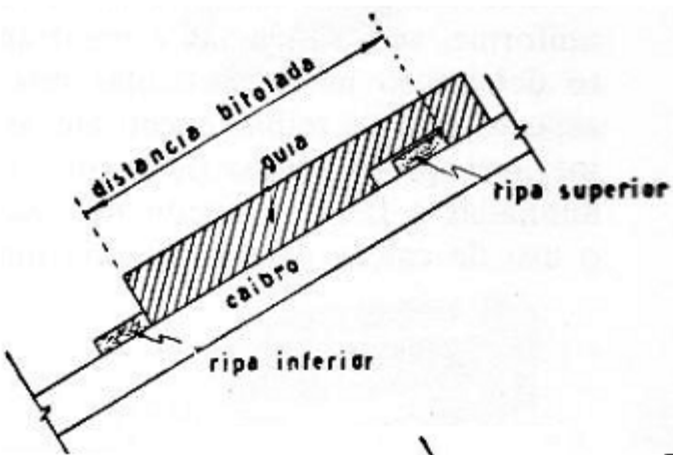
LEGENDA

- beiral
- contorno parede
- terças
- canton e tesouras
- caibros

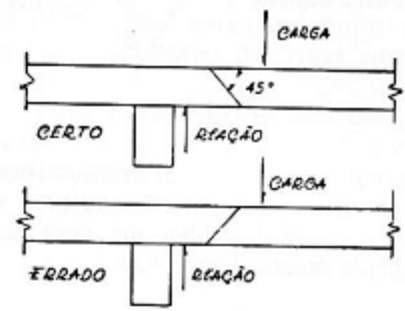
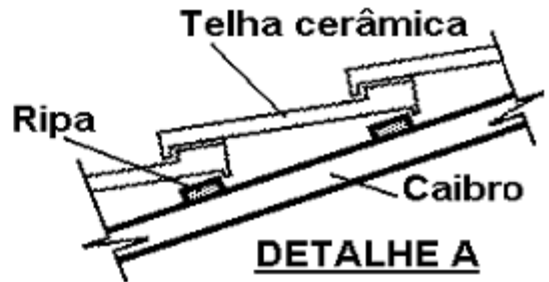
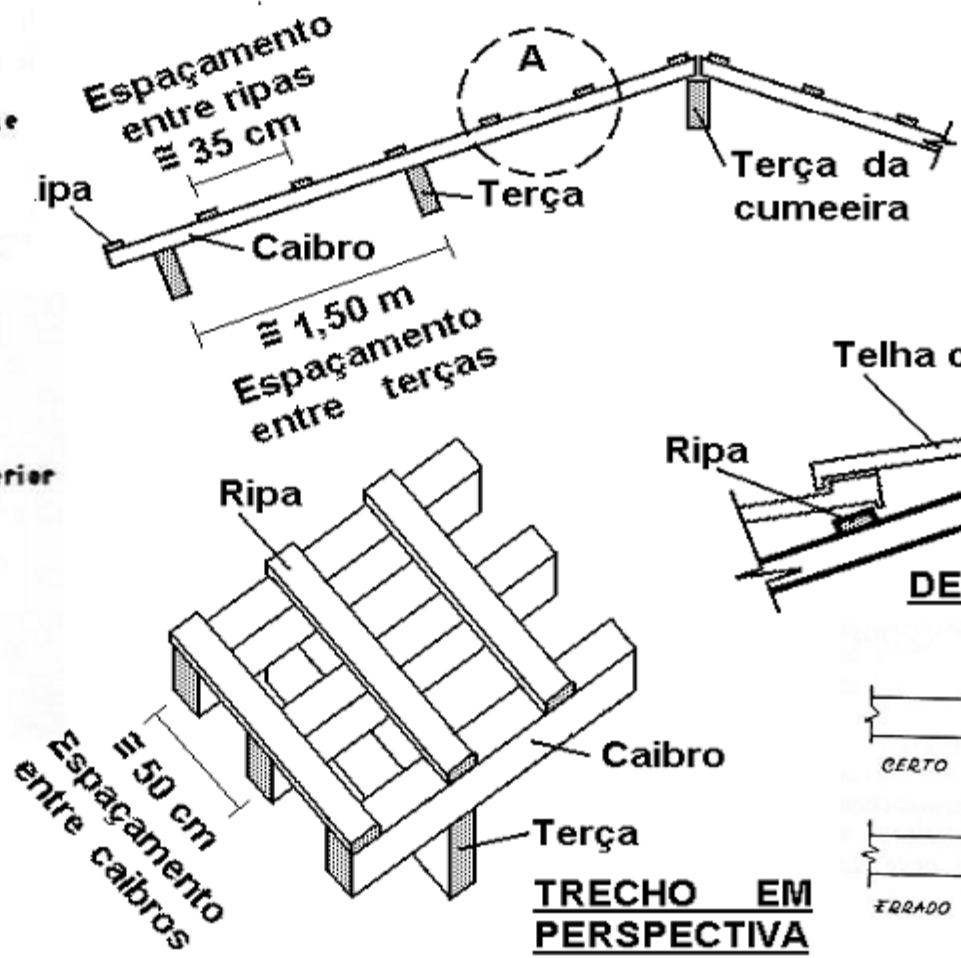




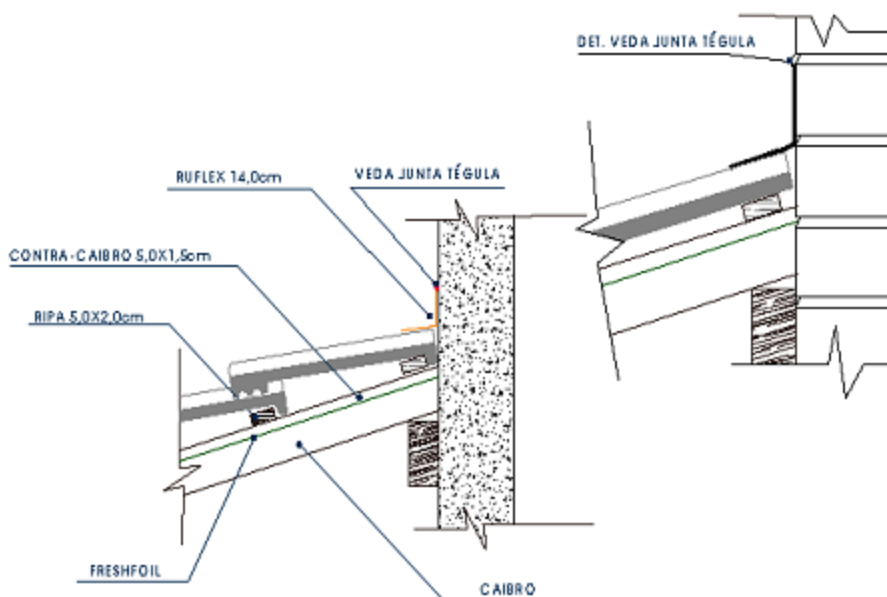
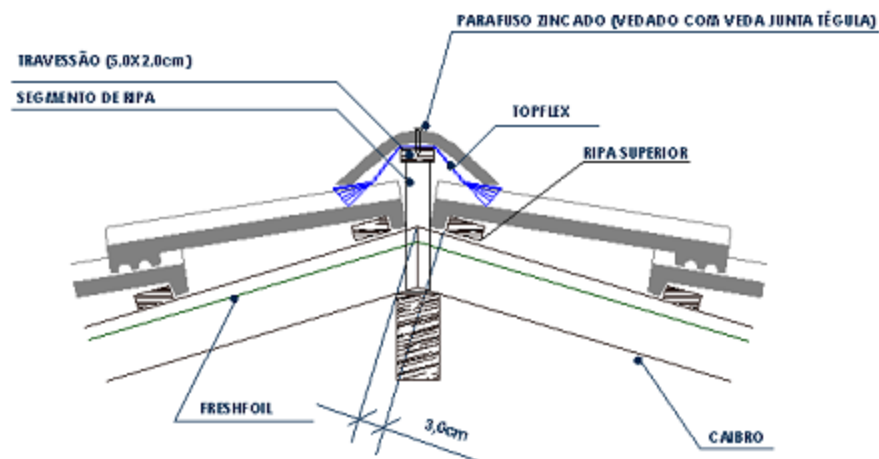
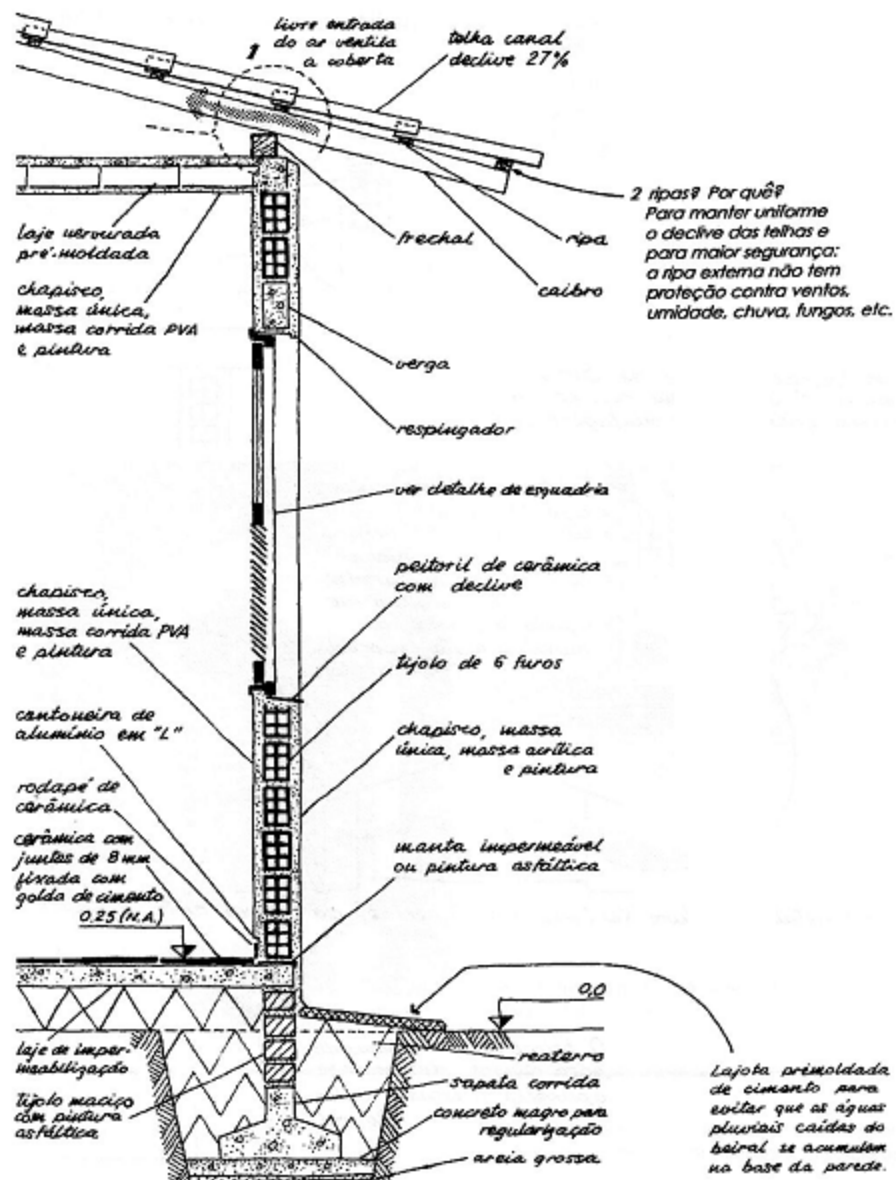
**GUIA PARA RIPAMENTO**

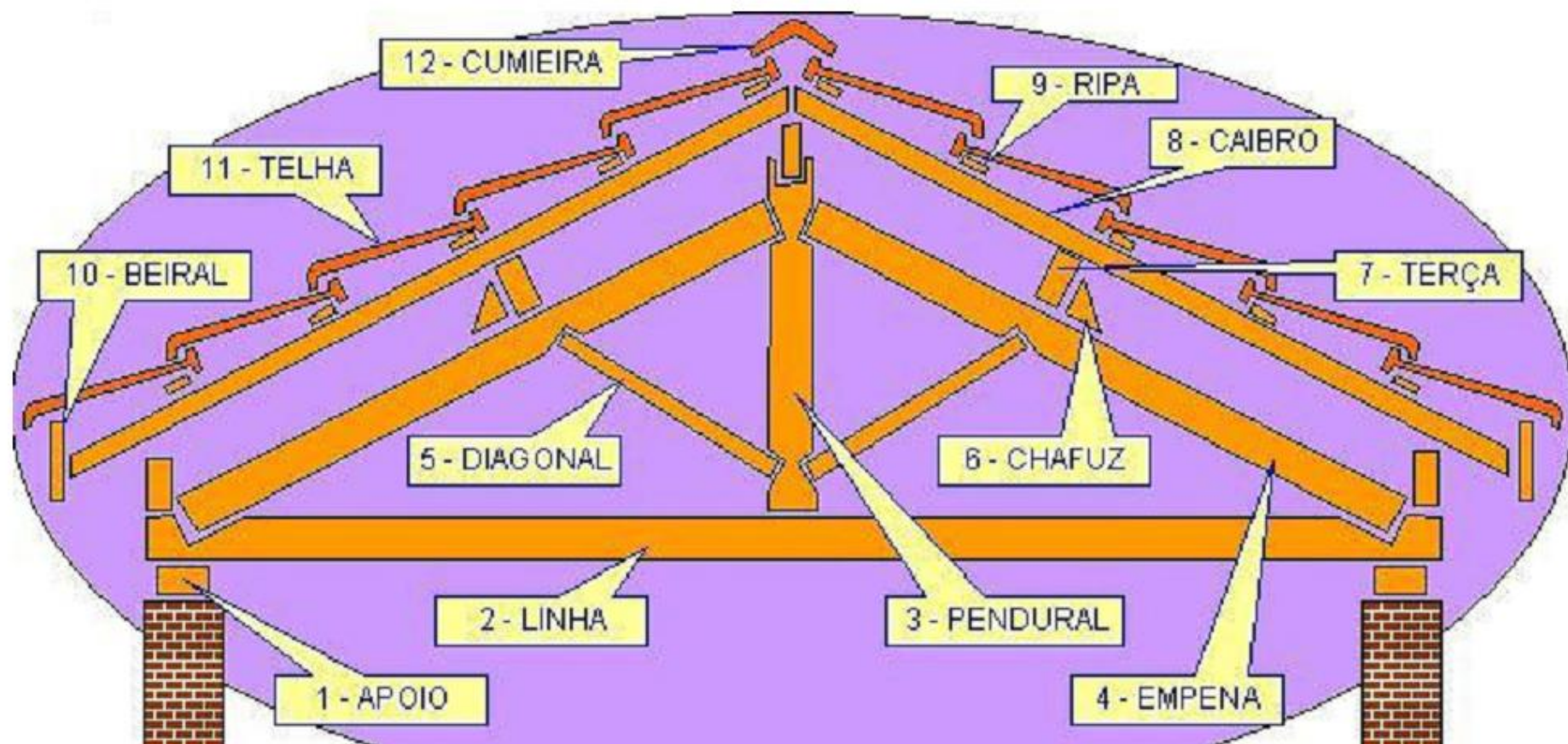


PONTAS DE CAIBROS E TERÇAS PARA BEIRAIS À VISTA (SEM REVESTIMENTO)



Trama de um telhado convencional com telhas cerâmicas







## Tesouras e detalhes de encaixe dos componentes

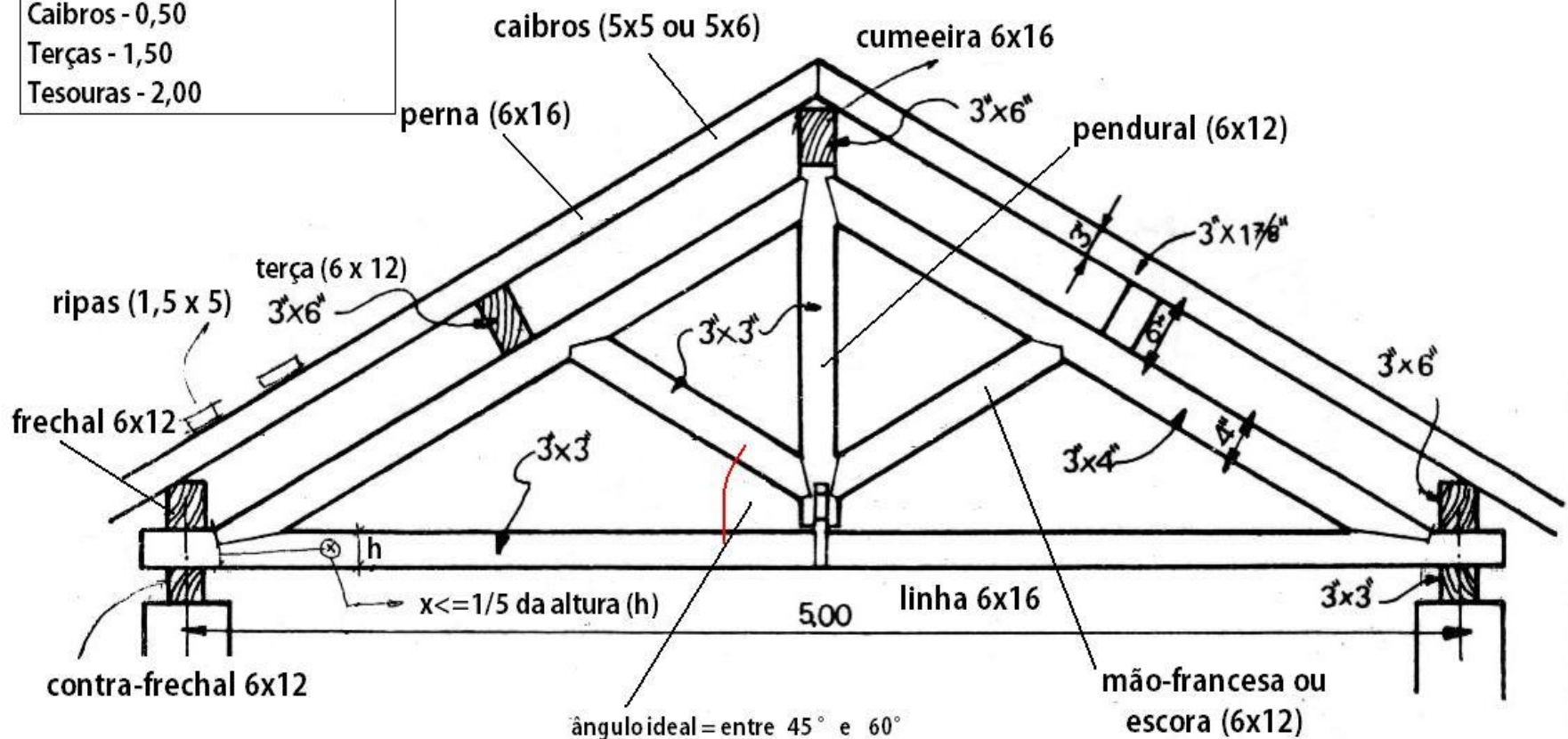
### Distância entre peças

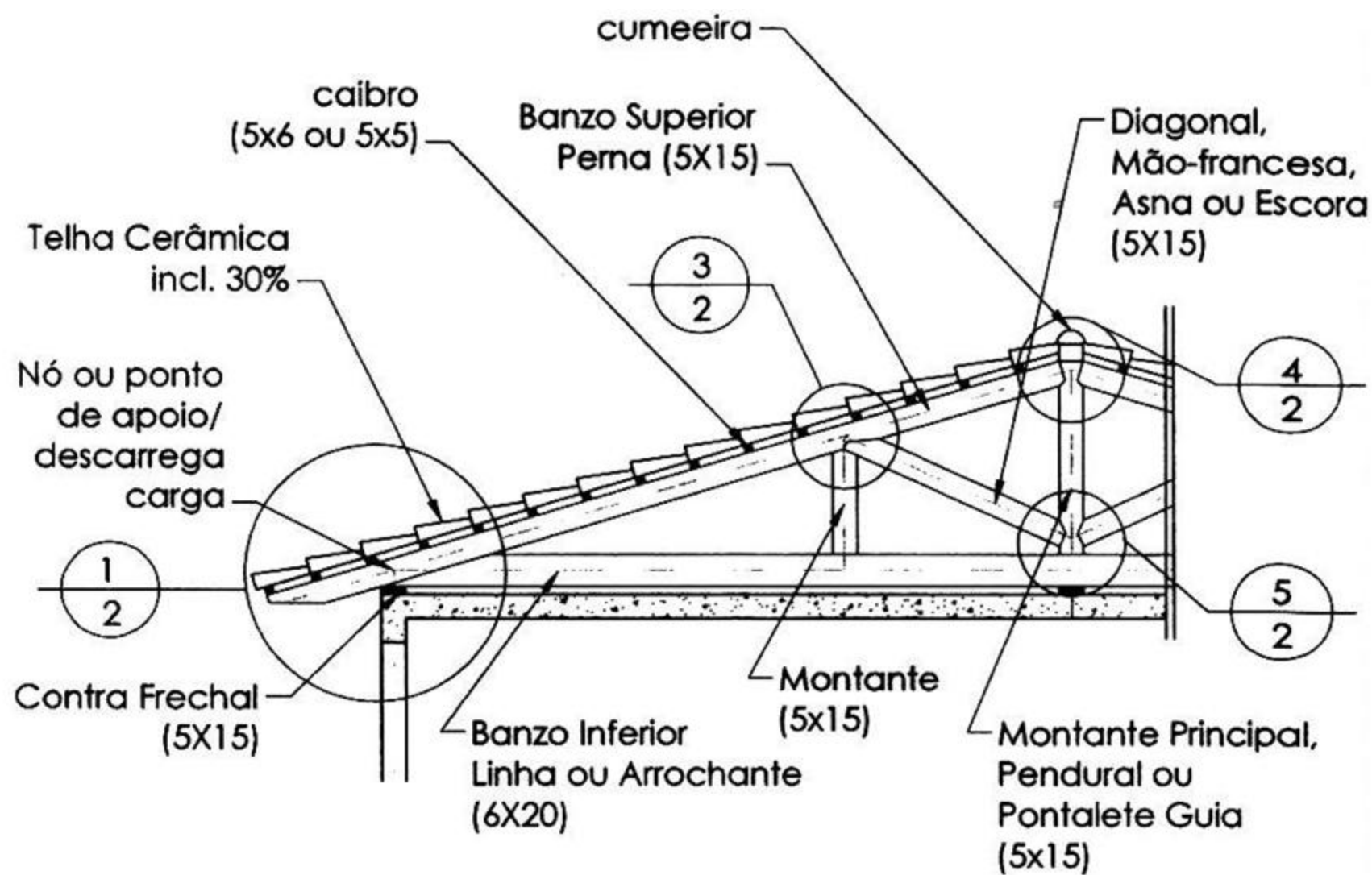
Ripas - 0,33 (depende da telha)

Caibros - 0,50

Terças - 1,50

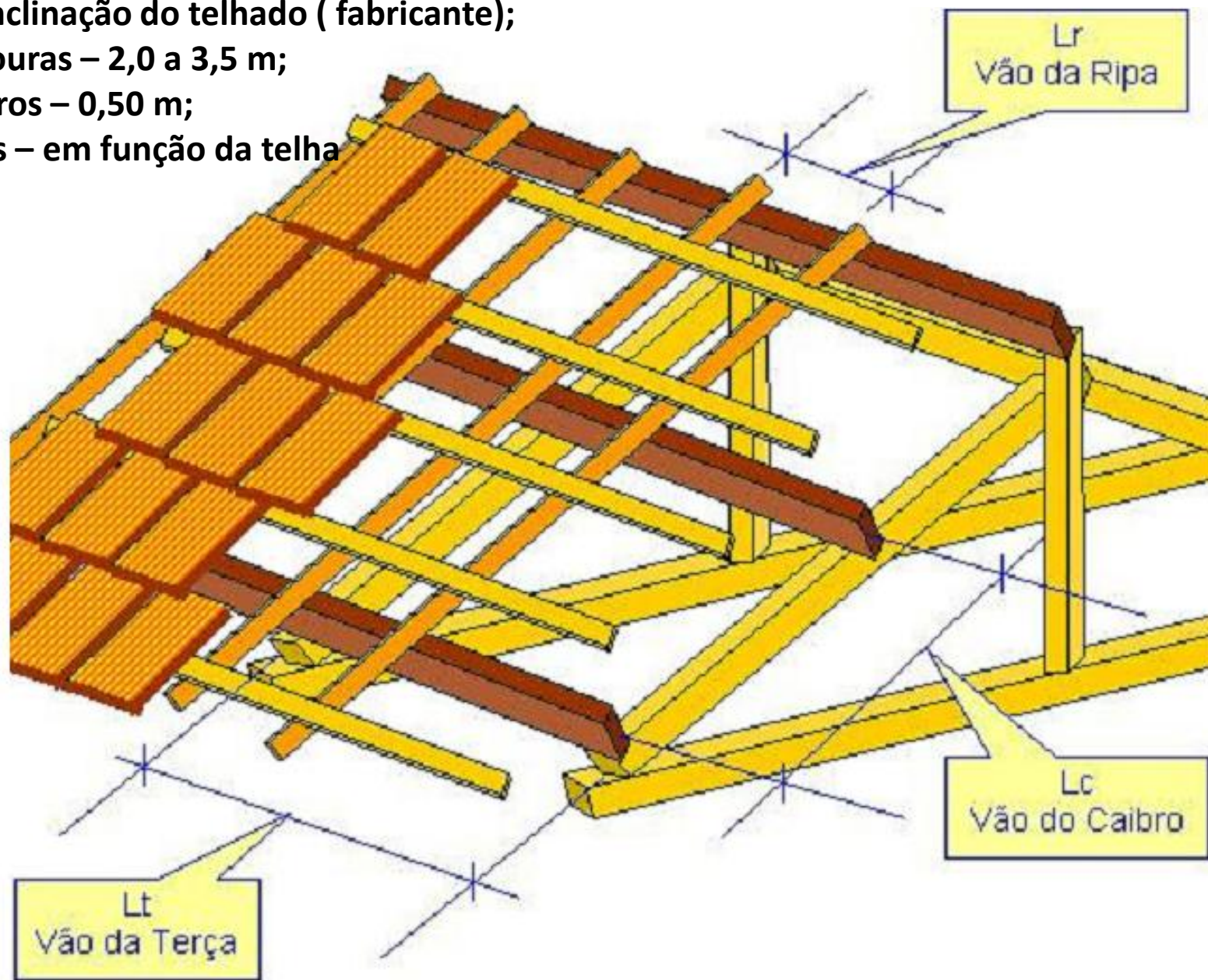
Tesouras - 2,00







**Ponto – inclinação do telhado ( fabricante);**  
**entre tesouras – 2,0 a 3,5 m;**  
**entre caibros – 0,50 m;**  
**Entre ripas – em função da telha**

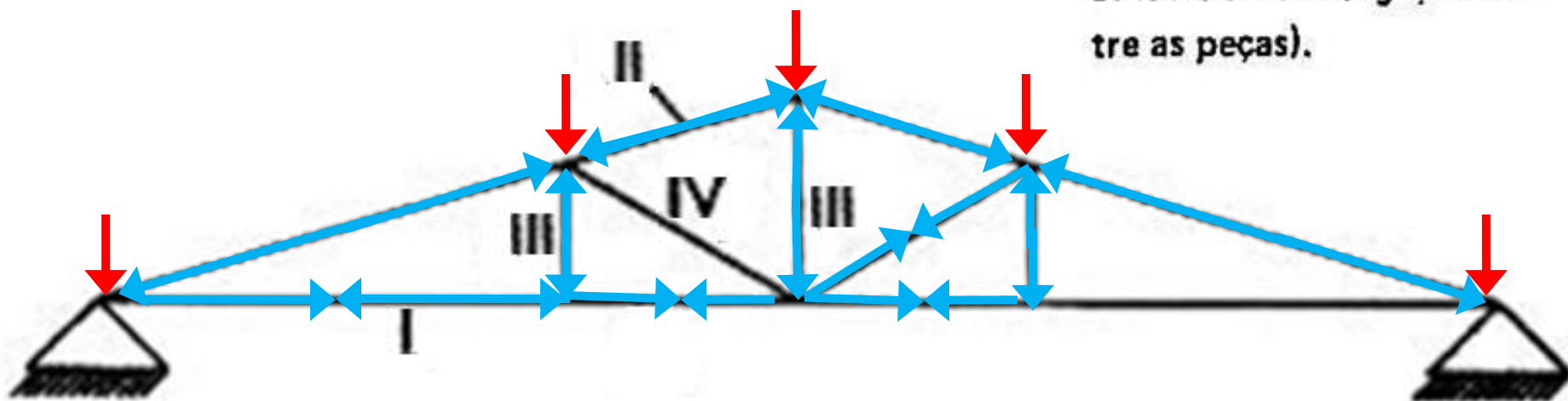


$L_r = \text{Vão da Ripa} = 50 \text{ centímetros.}$

Para colocar a Diagonal dividi-se o eixo do banzo superior em 3 partes iguais.

Dando um ângulo maior que  $45^\circ$  será necessário a colocação de mais uma escora

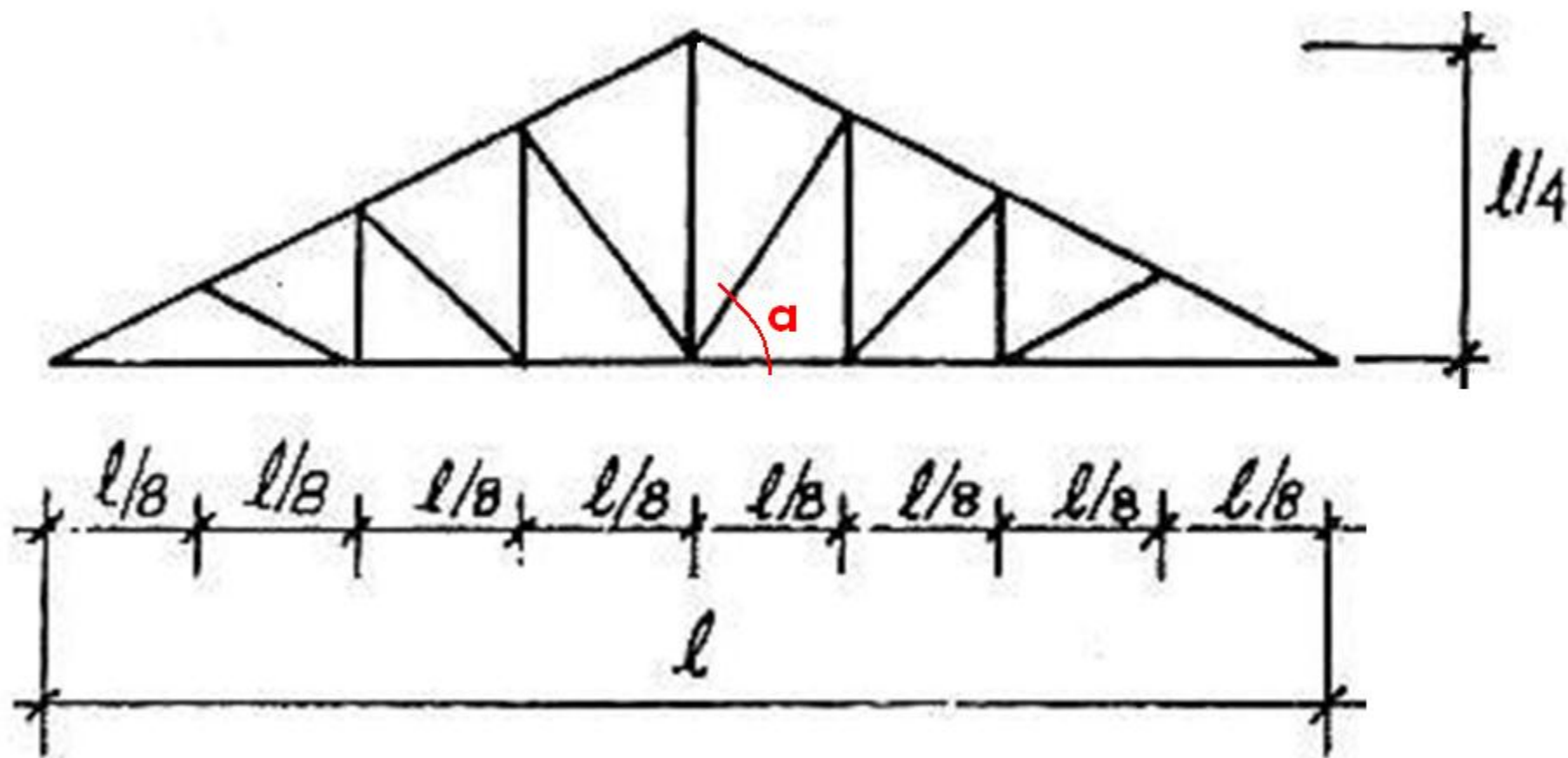
A distância entre as terças deverá ser sempre menor ou igual a 3,00 m e de preferência apoiadas nos eixos dos nós (ligação entre as peças).



I	Banzo inferior	compressão
II	Banzo superior	tração
III	Montante	tração
IV	Diagonal	compressão

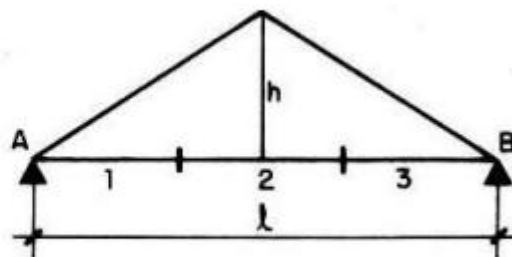
Dimensão do caibro	Espaçamento entre as tesouras
5x6	1,80m
5x5	1,50m

Para colocar a Diagonal dividi-se  
o eixo do banzo superior  
em 3 partes iguais.  
Dando um ângulo maior que  
 $45^\circ$  será necessário a colocação  
de mais uma escora



## TELHADO DE TELHAS PLANAS (Tipo Francesa ou Marselha)

Ponto:  $\frac{1}{3}$  AB  $(\frac{h}{l} = \frac{1}{3})$

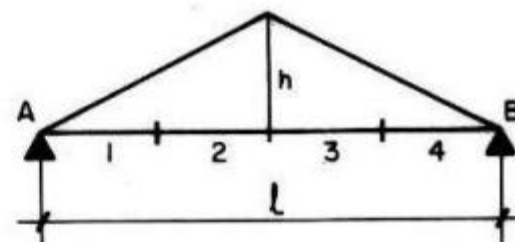


Caimento: 35%

Quantidade: 17 telhas por m<sup>2</sup>

## TELHADO DE TELHAS CURVAS (Tipo Paulista ou Colonial)

Ponto:  $\frac{1}{4}$  a  $\frac{1}{5}$  AB



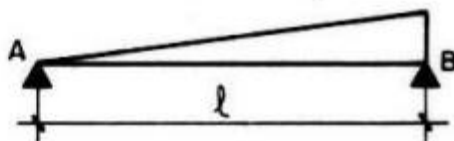
Caimento: 20% a 35%

Quantidade: 30 telhas por m<sup>2</sup> (15 canais + 15 capas)

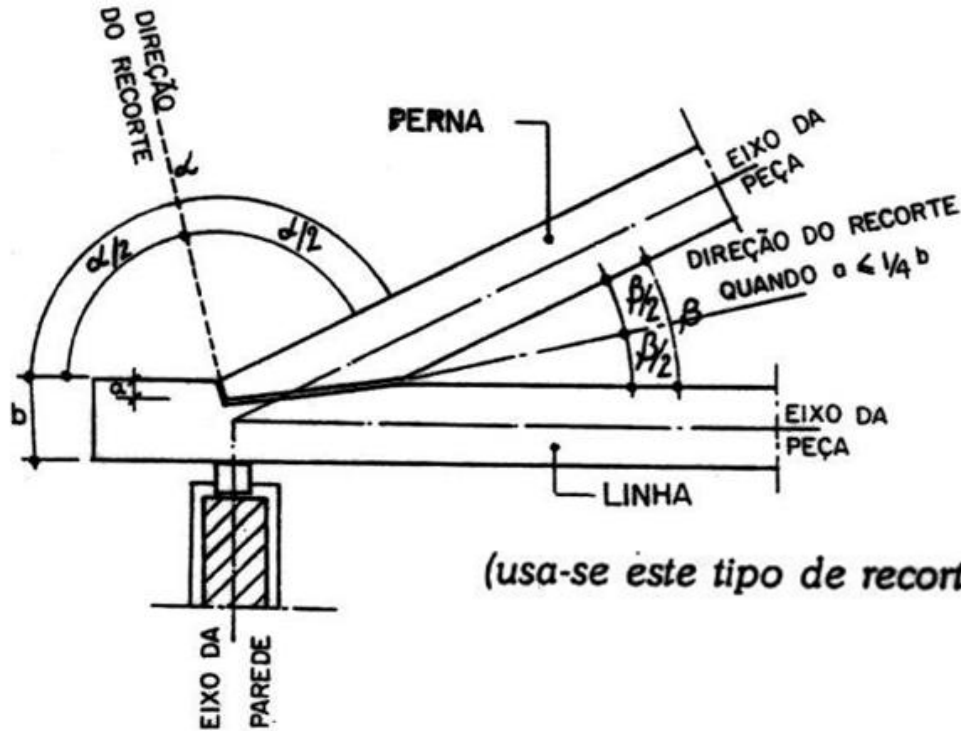
## TELHADOS DE TELHAS CHAPAS FIBROCIMENTO (Ondulado, Zinco-Alumínio, Plástico etc.)

Ponto:  $\frac{1}{5}$  a  $\frac{1}{10}$  AB

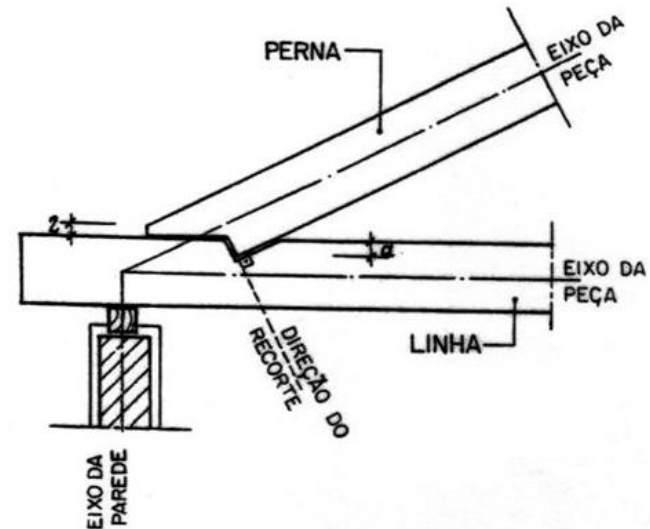
Caimento: 20% a 12%



# Tesouras e detalhes de recortes, encaixes e emendas dos componentes das tesouras

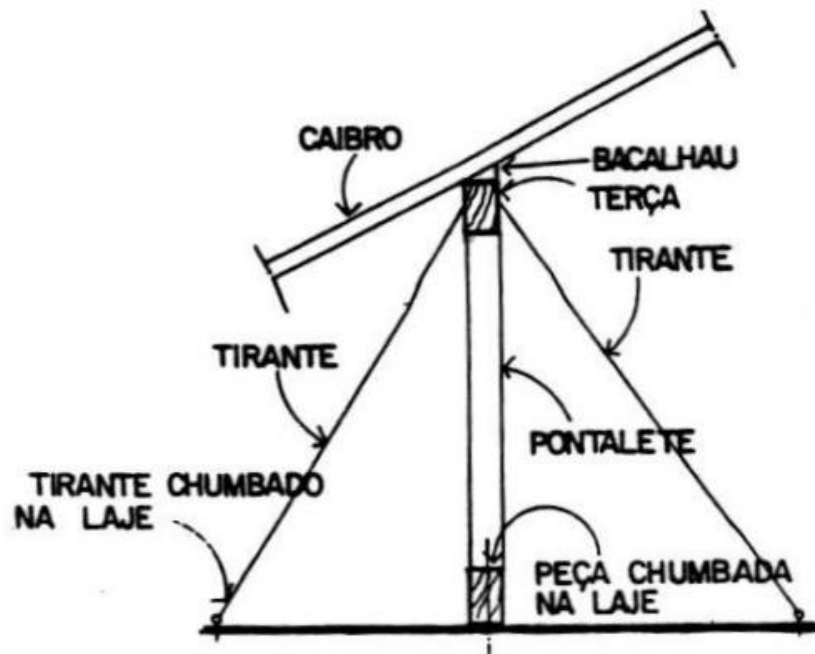
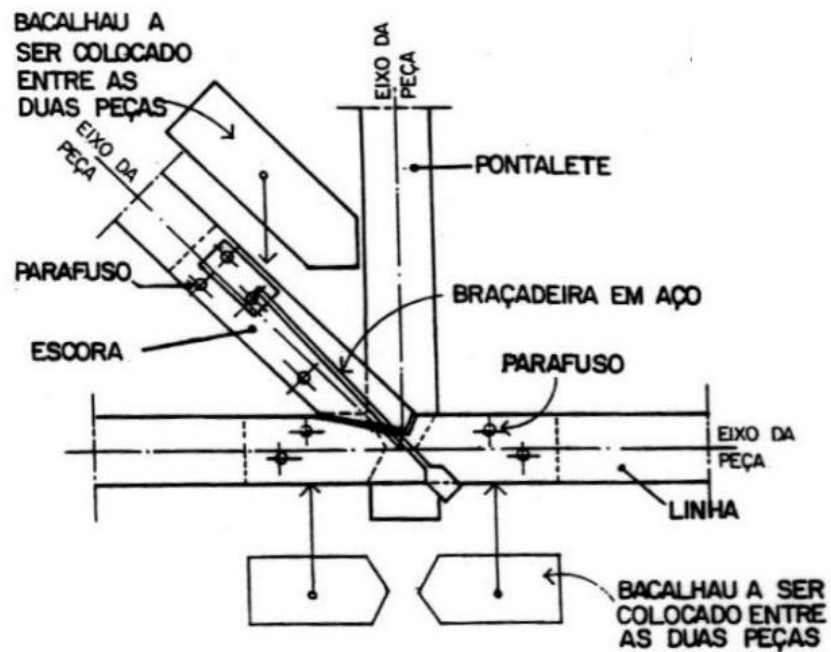
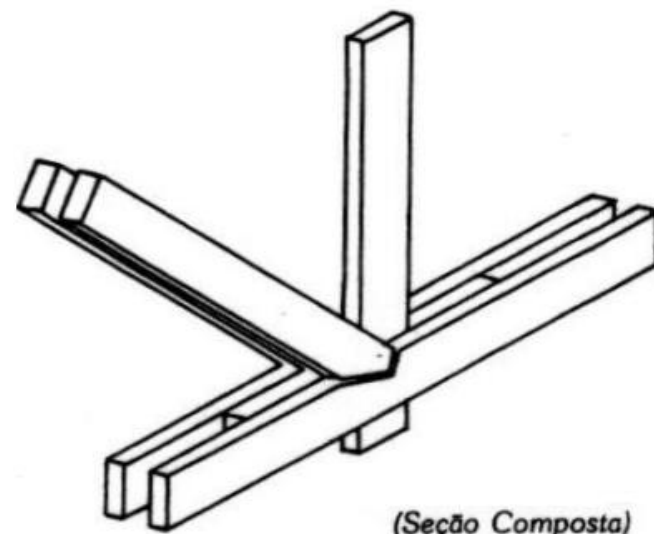
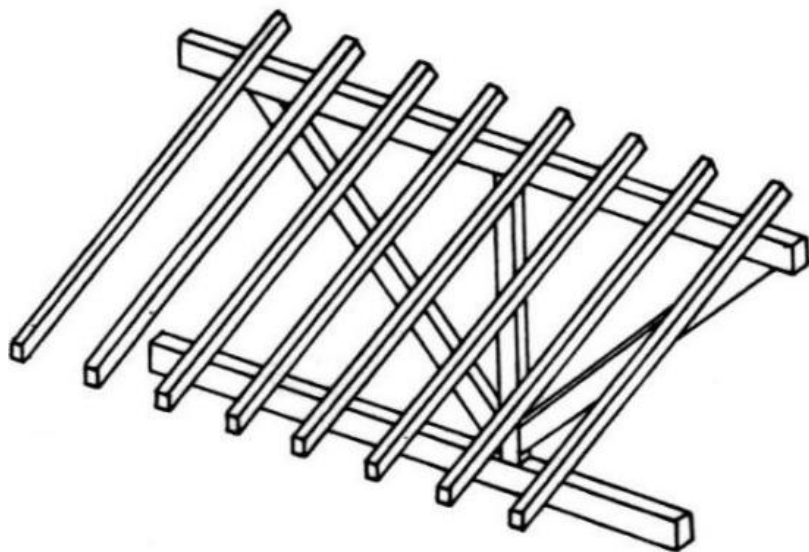


*(usa-se este tipo de recorte em telhados de pequena declividade)*

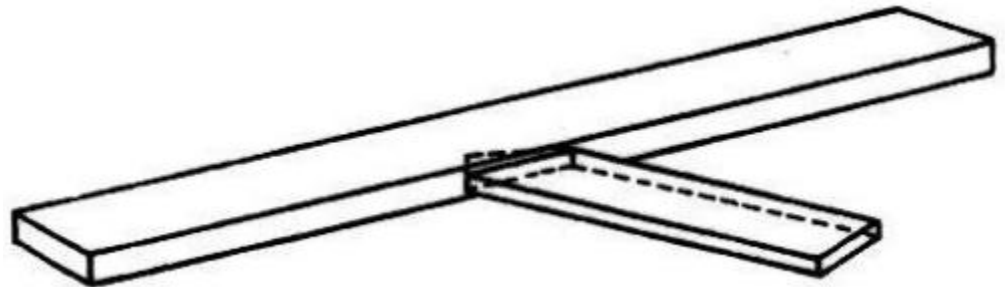
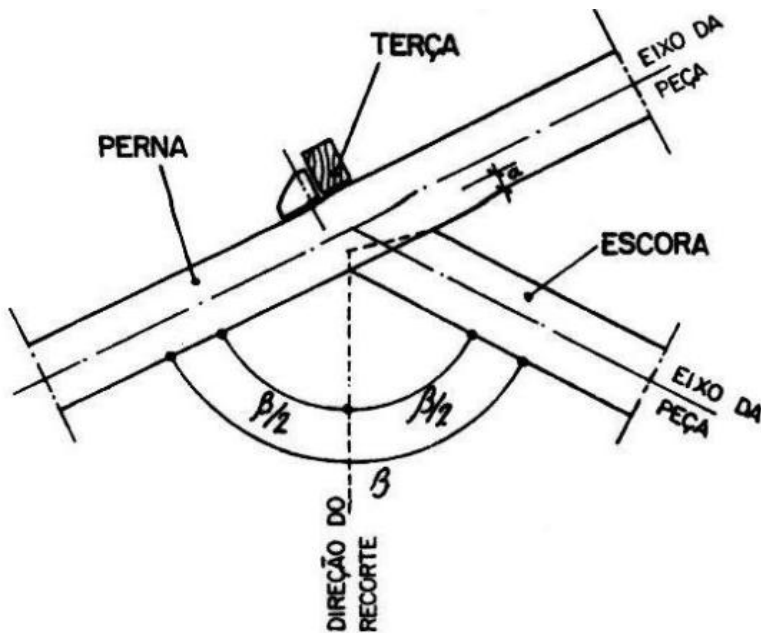
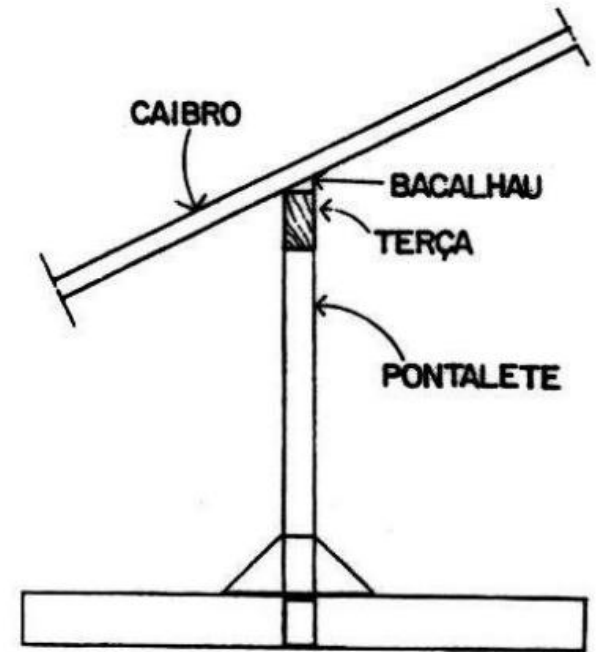
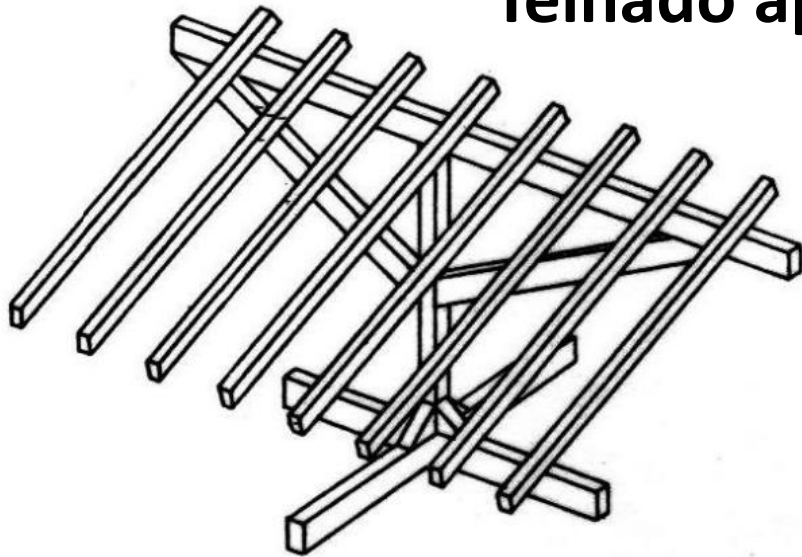


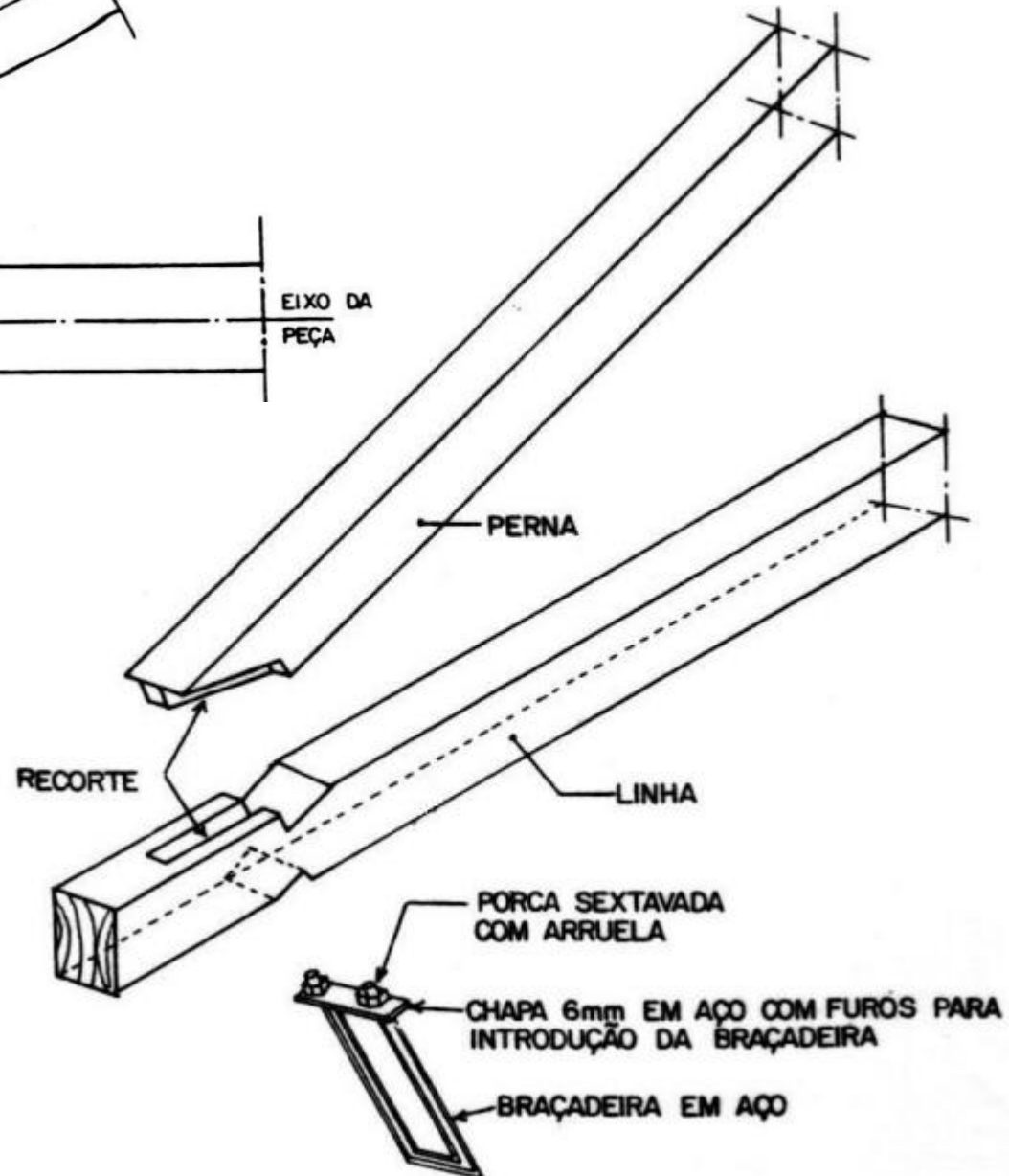
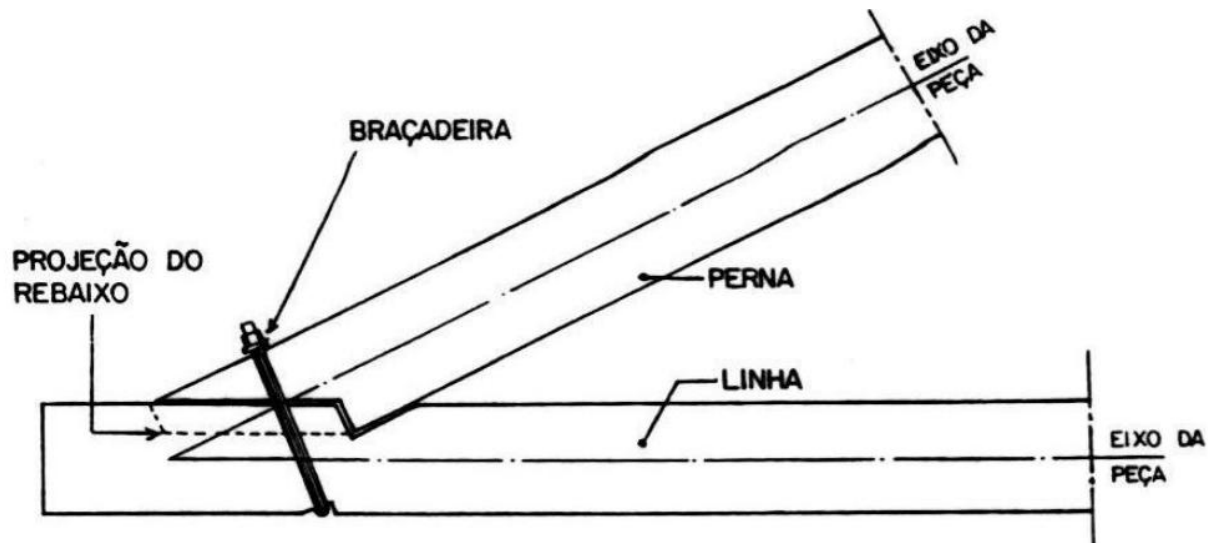


# Telhado apoiado sobre pontaletes em lajes



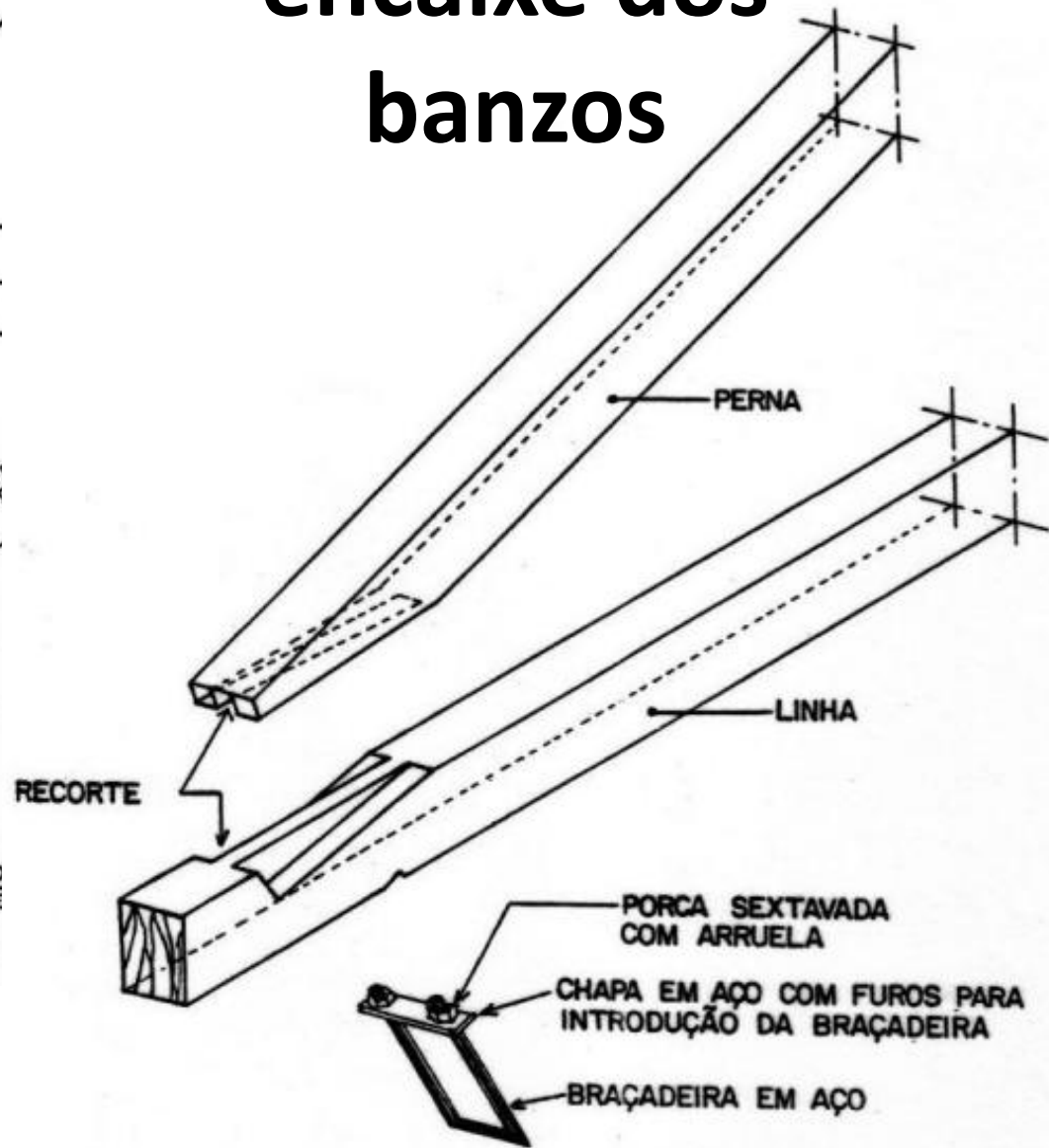
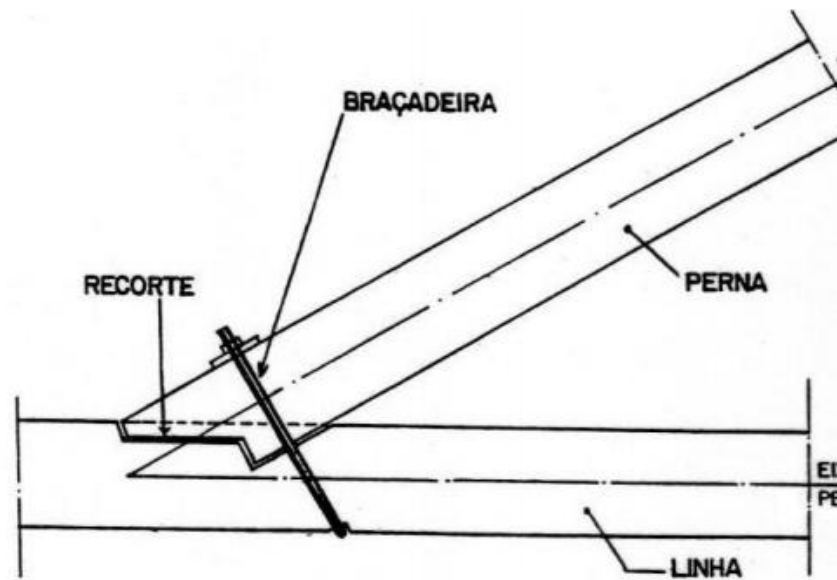
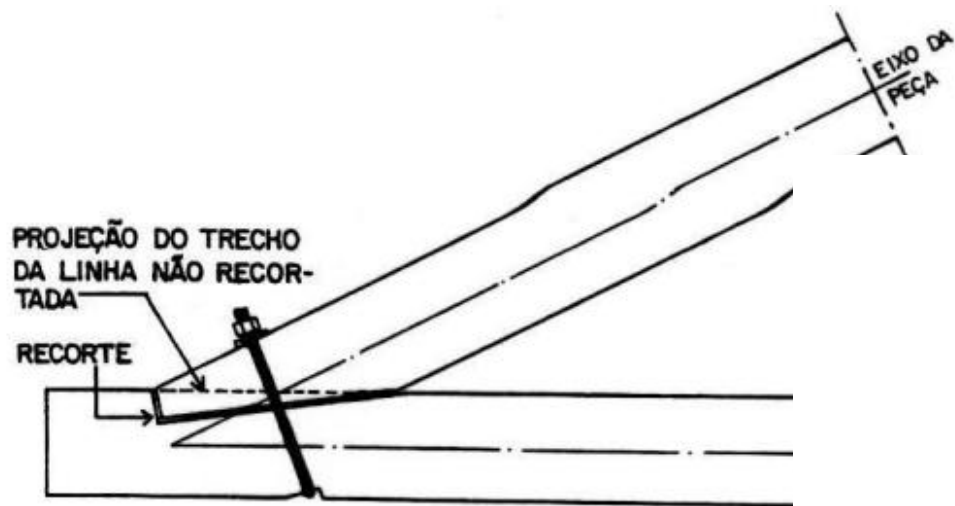
# Telhado apoiado sobre pontaletes em lajes



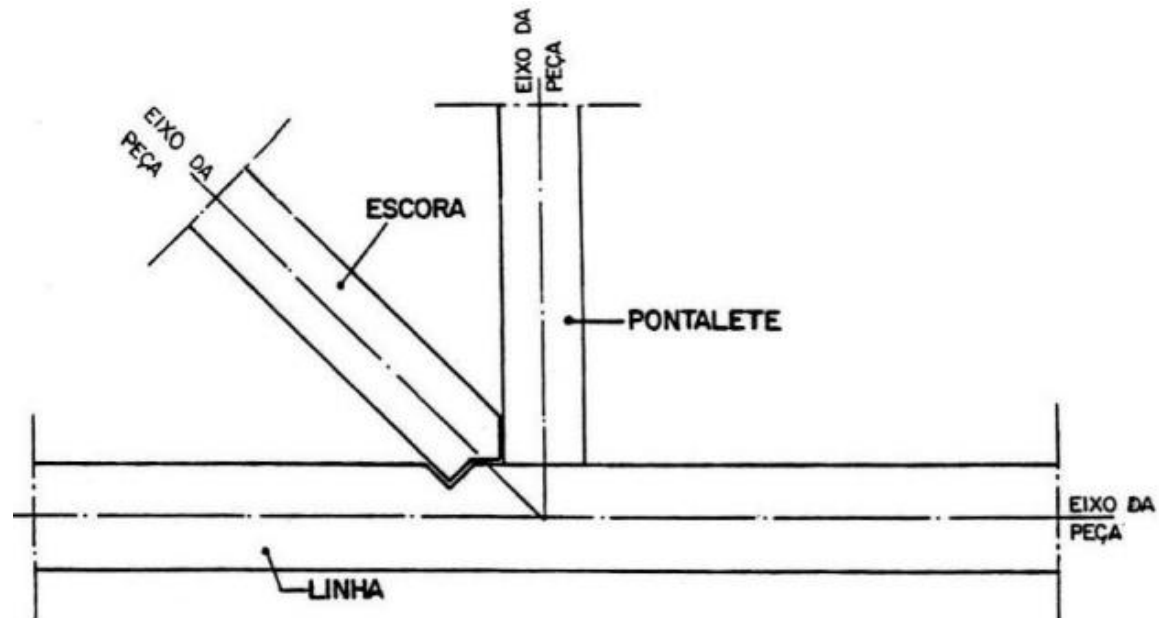
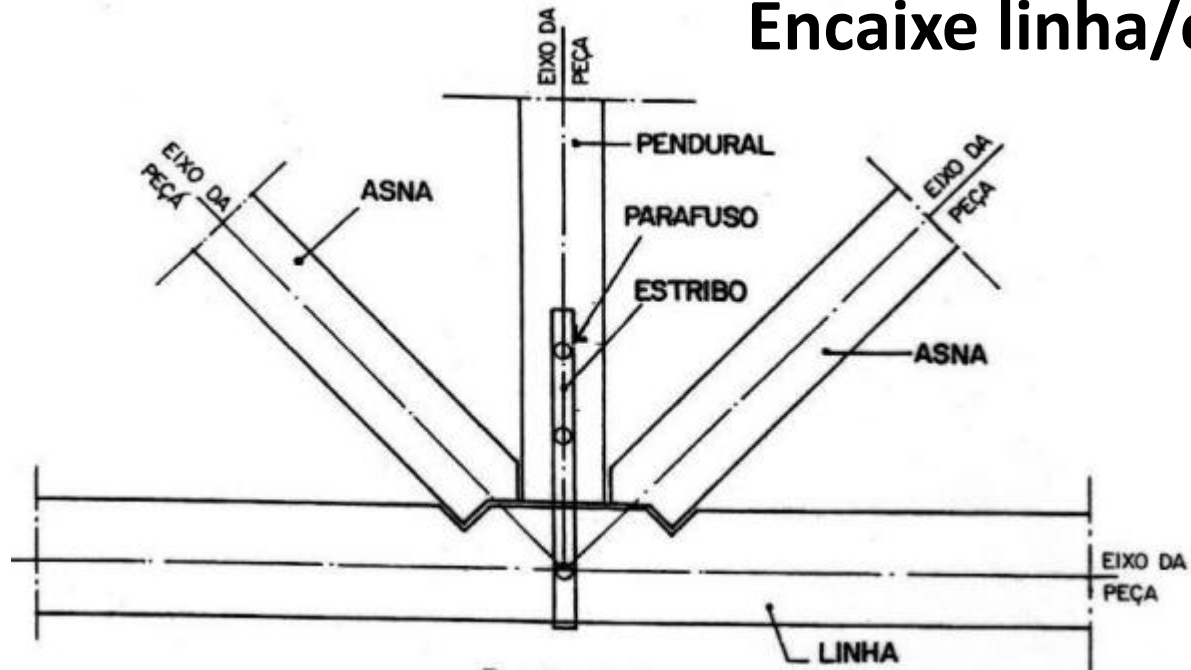


**Detalhes do  
encaixe dos  
banzos**

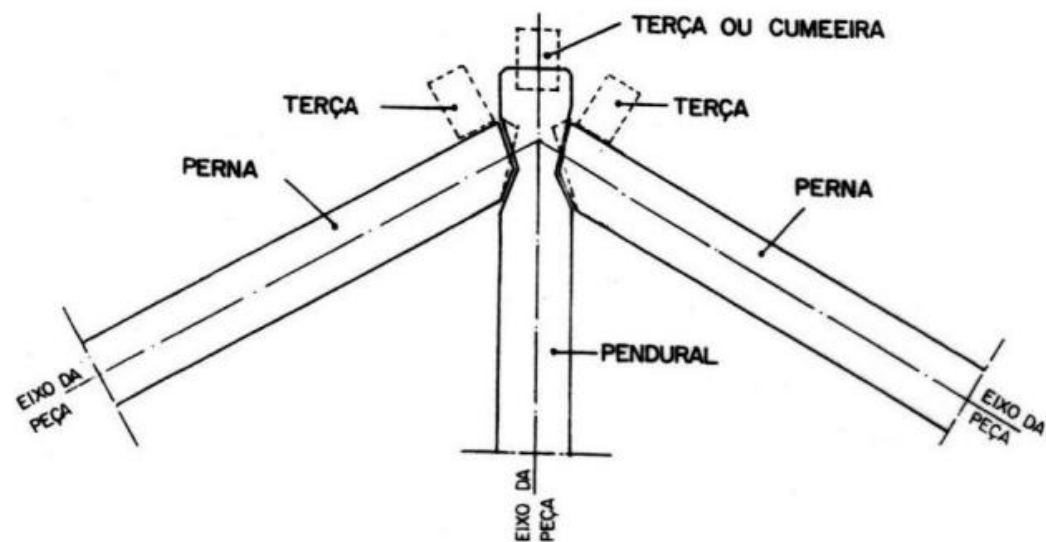
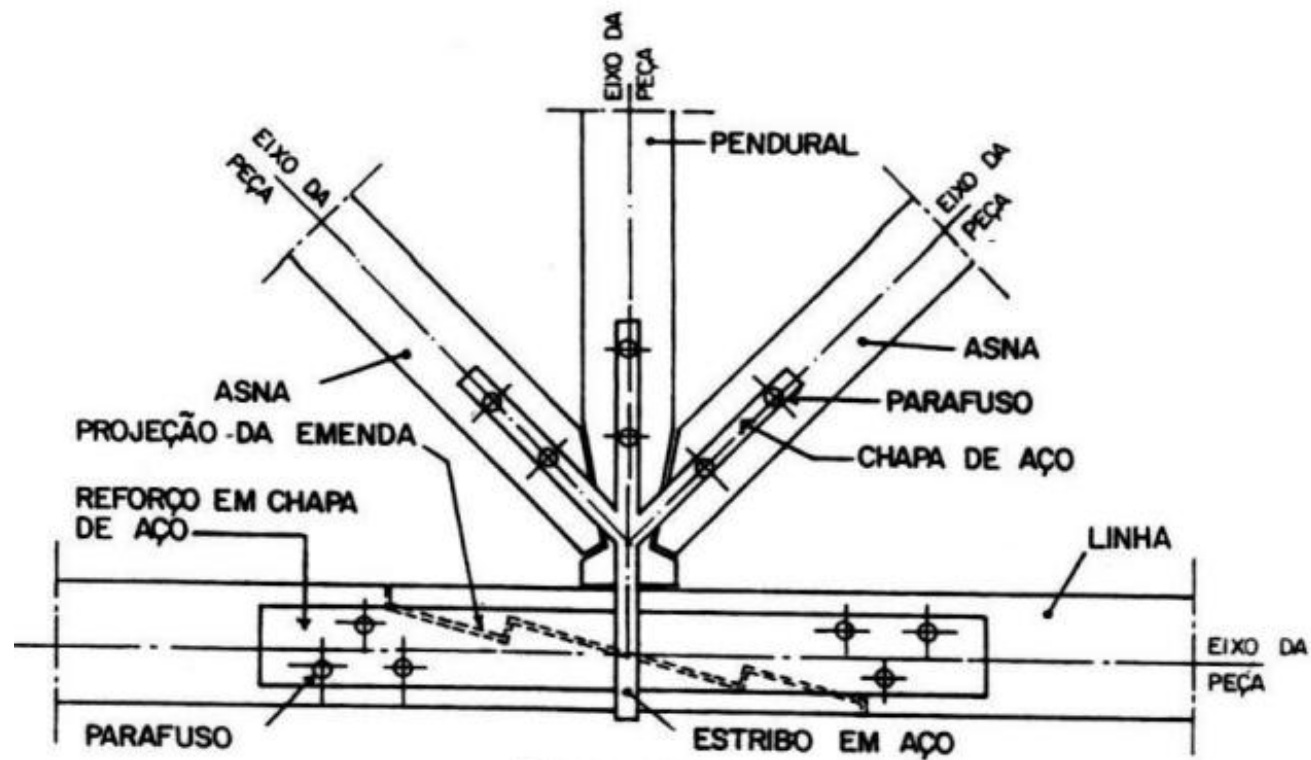
# Detalhes do encaixe dos banzos



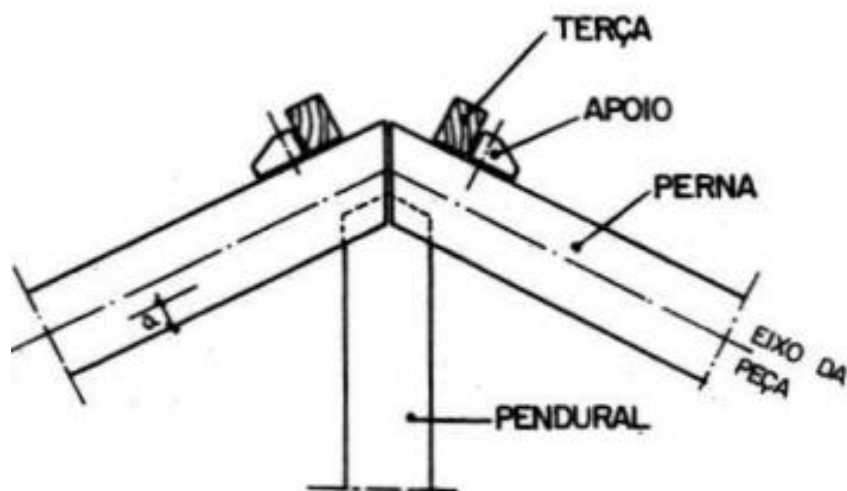
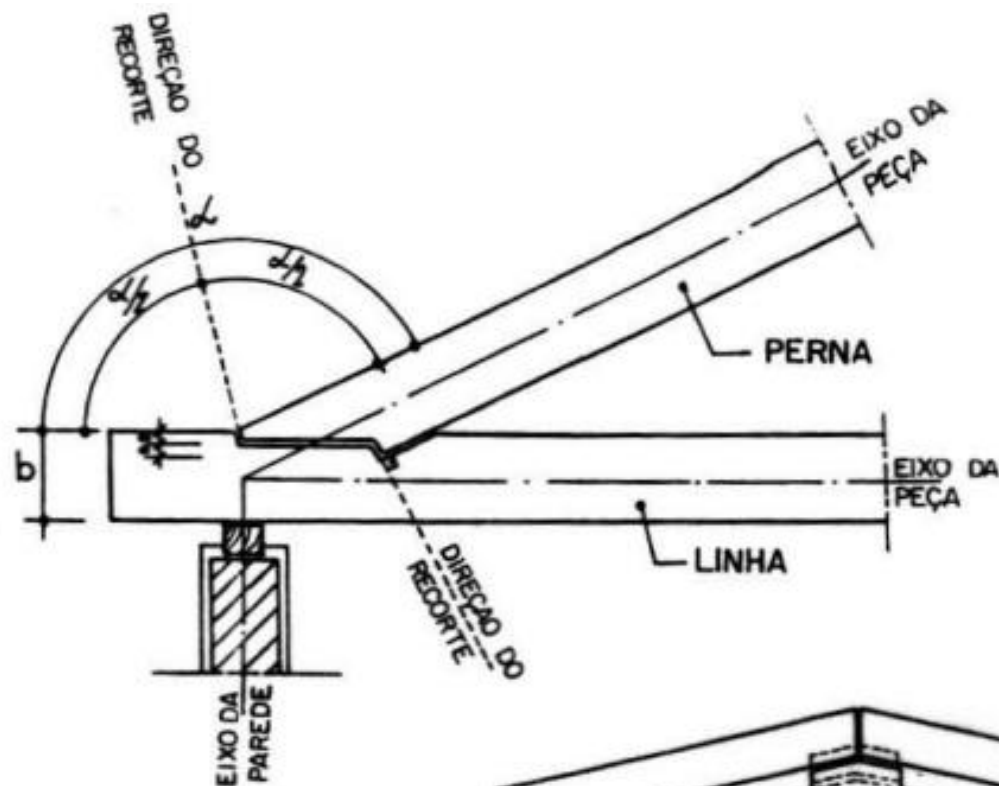
# Encaixe linha/escora

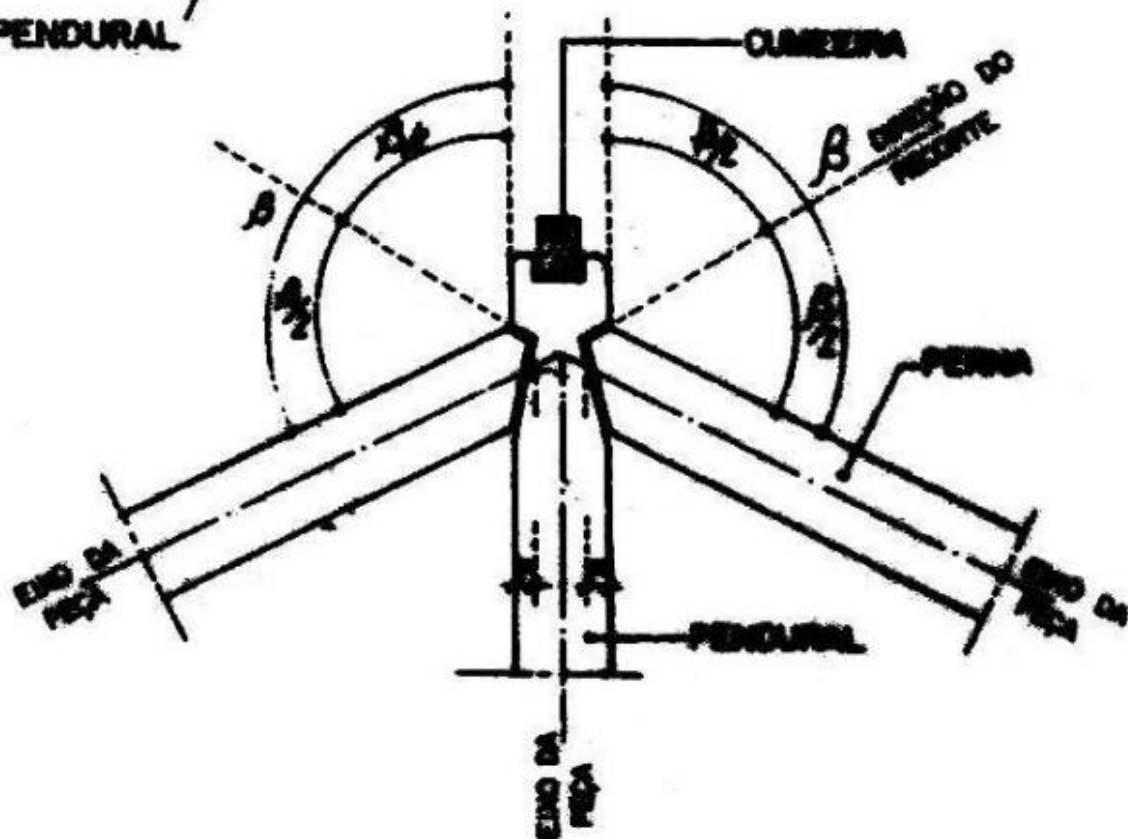
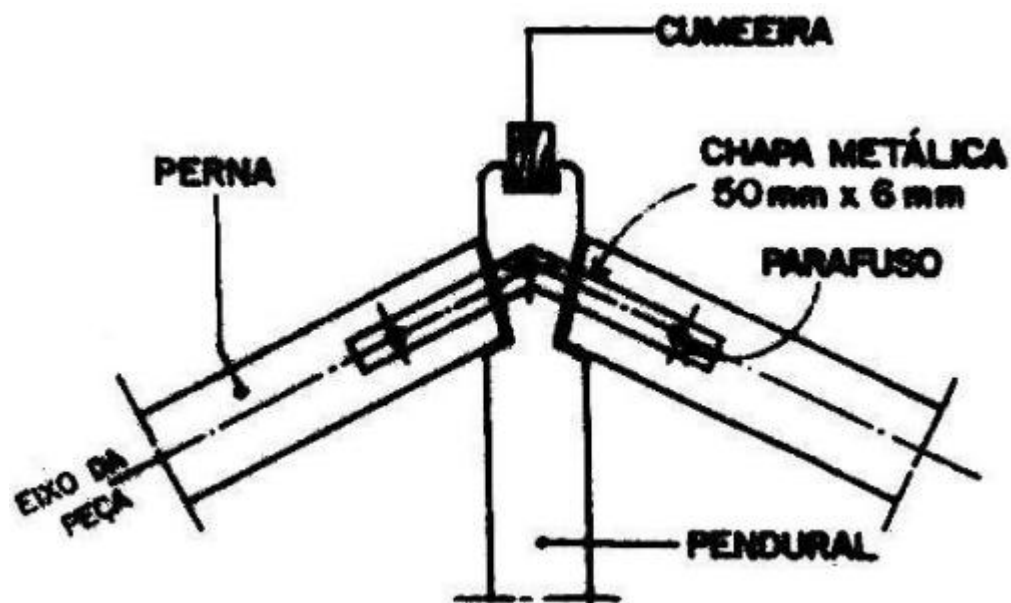


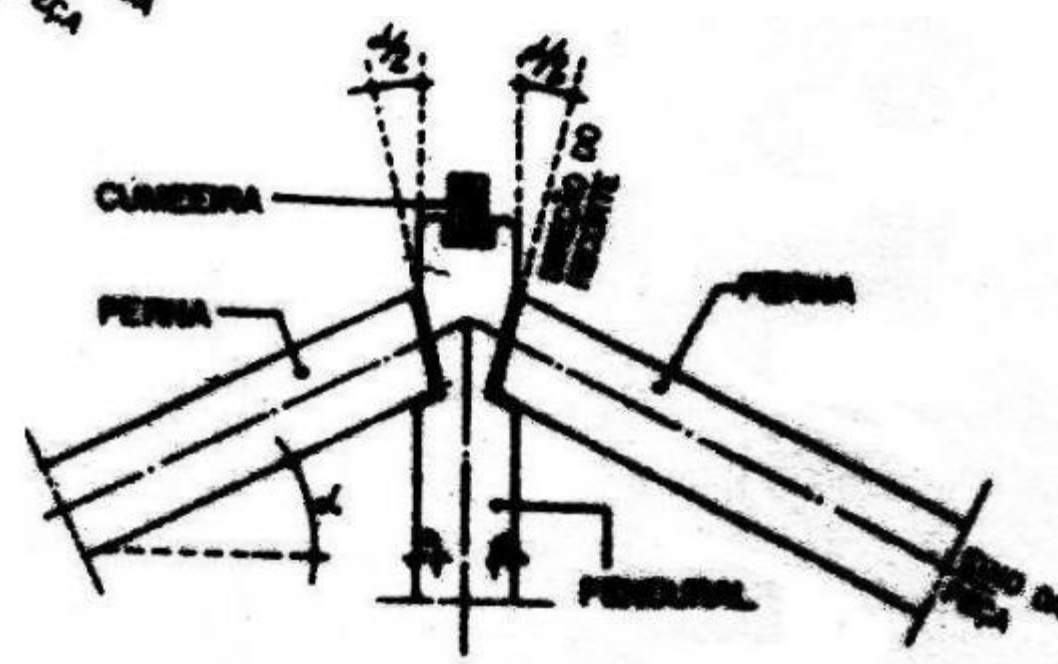
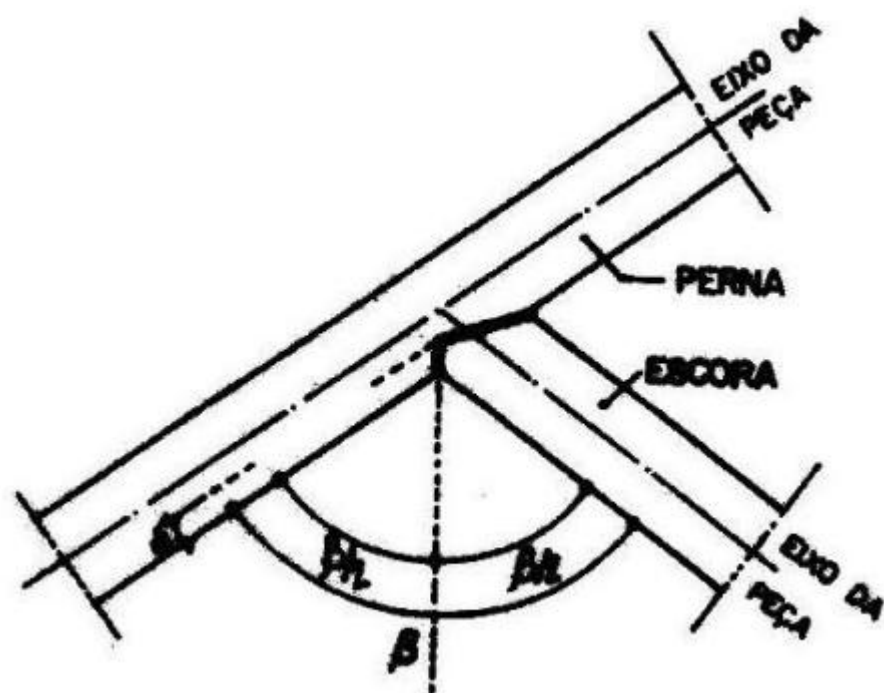






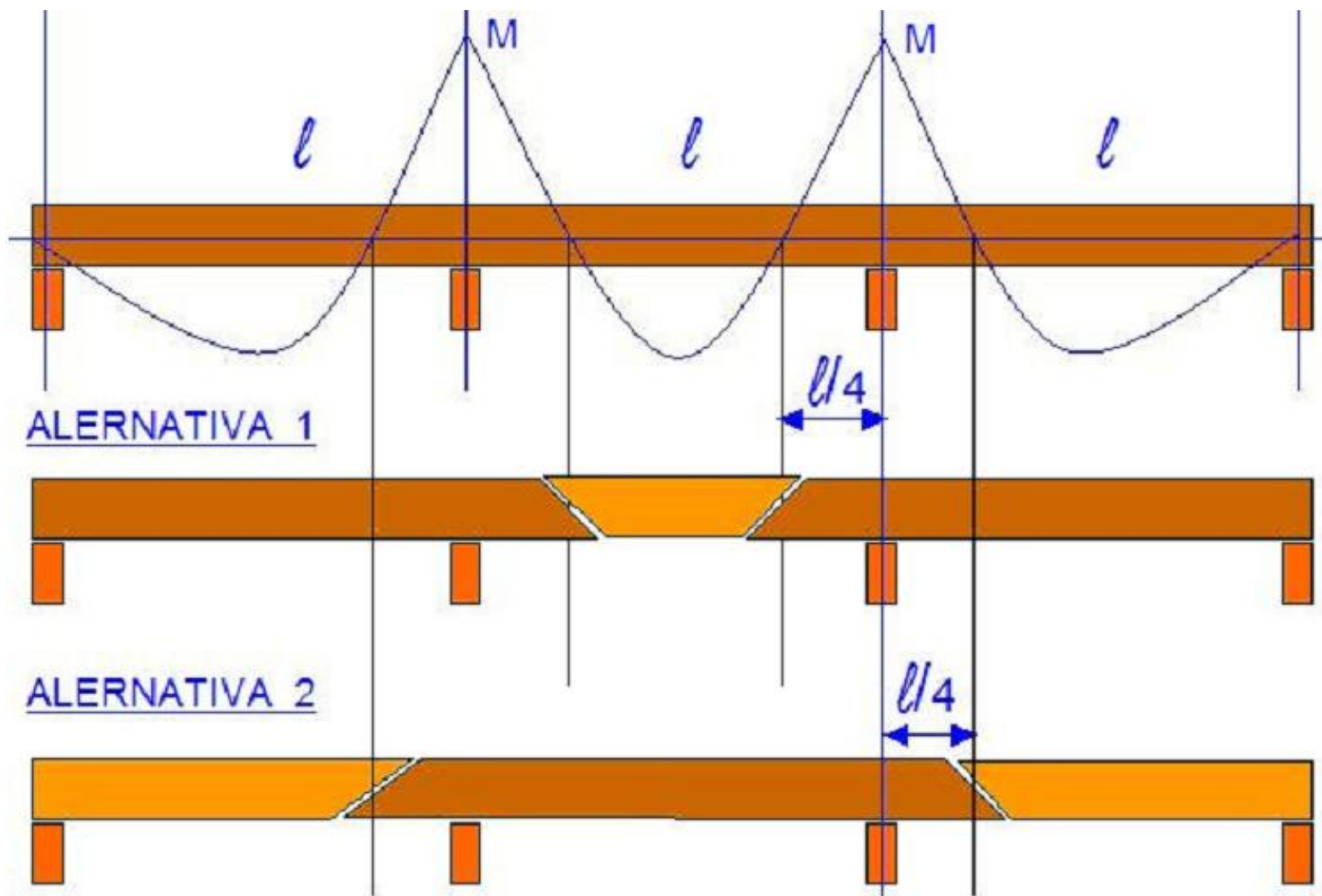








# EMENDAS DAS TERÇAS

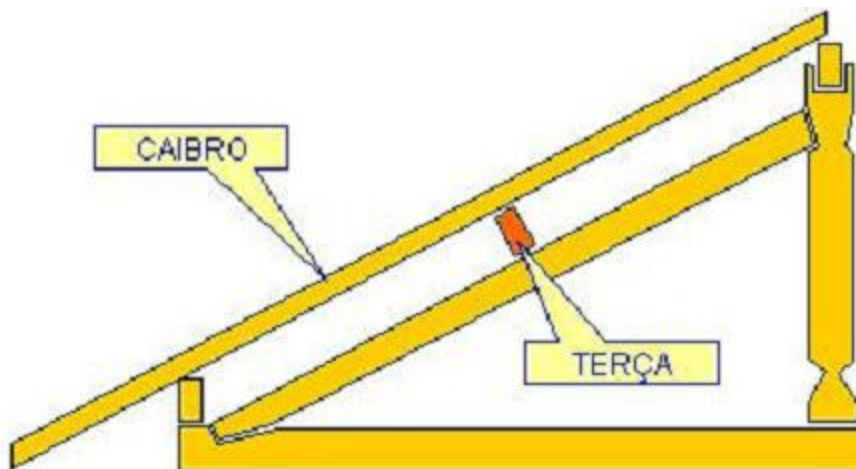


# CONSTRUÇÃO DOS CAIBROS

Não deixar vãos muito grandes, pois o caibro não vai aguentar o peso das telhas e vai envergar.

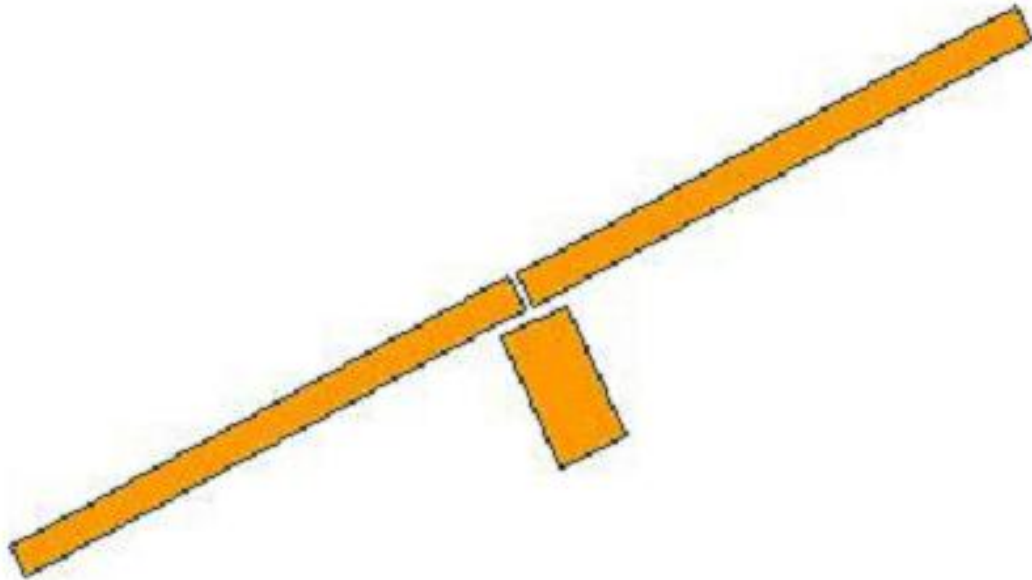


Coloca-se uma terça para evitar que os caibros fiquem abaulados.

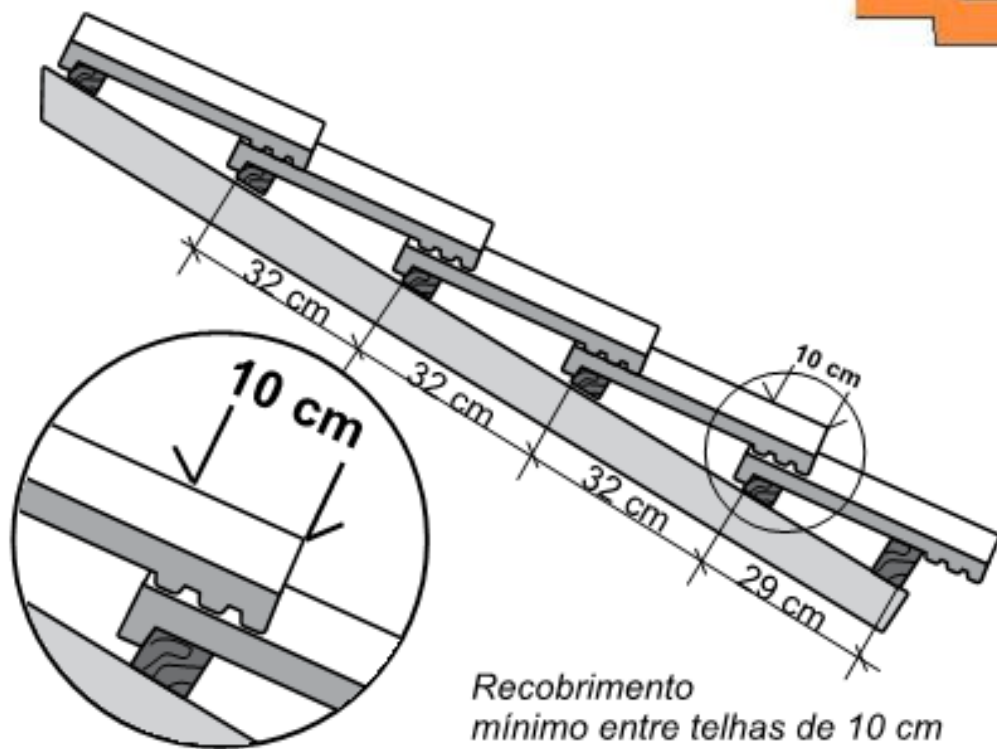
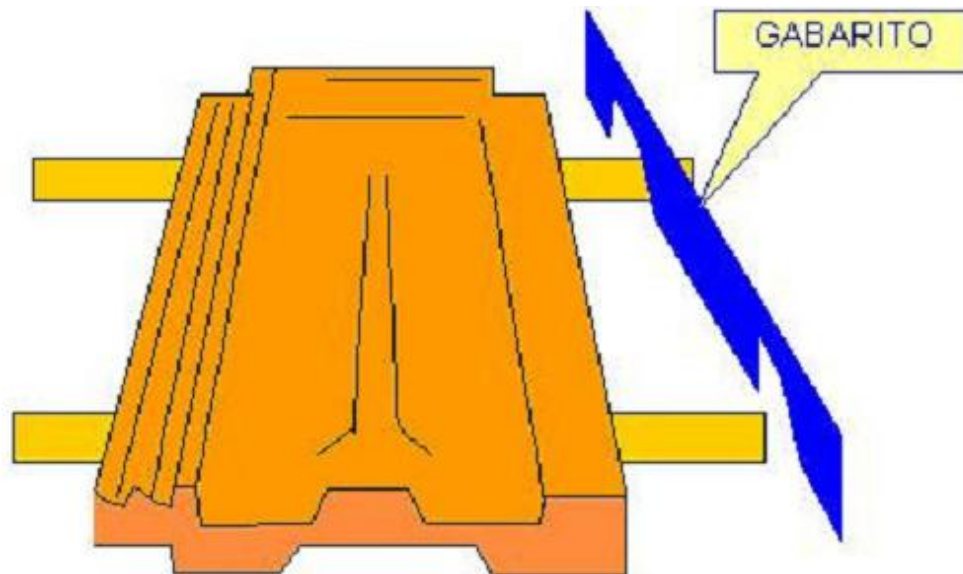


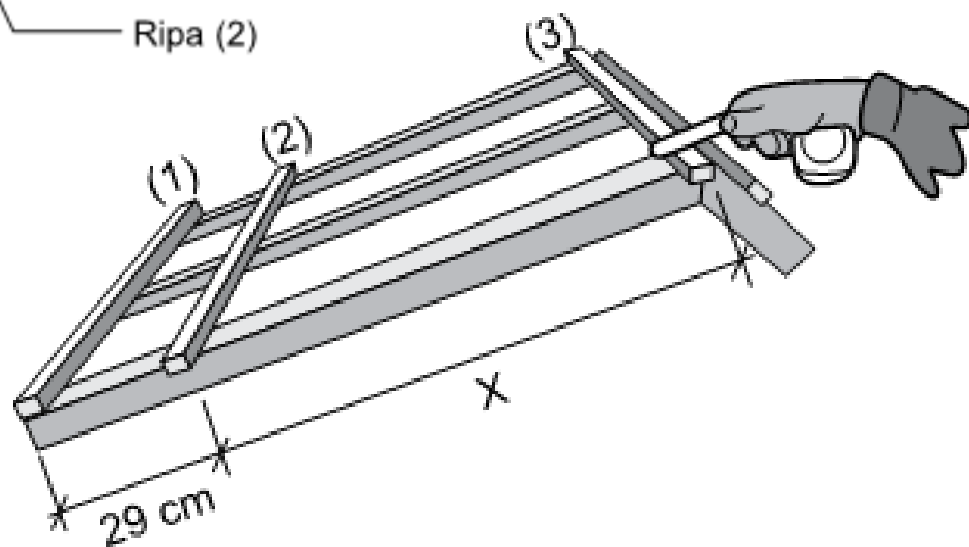
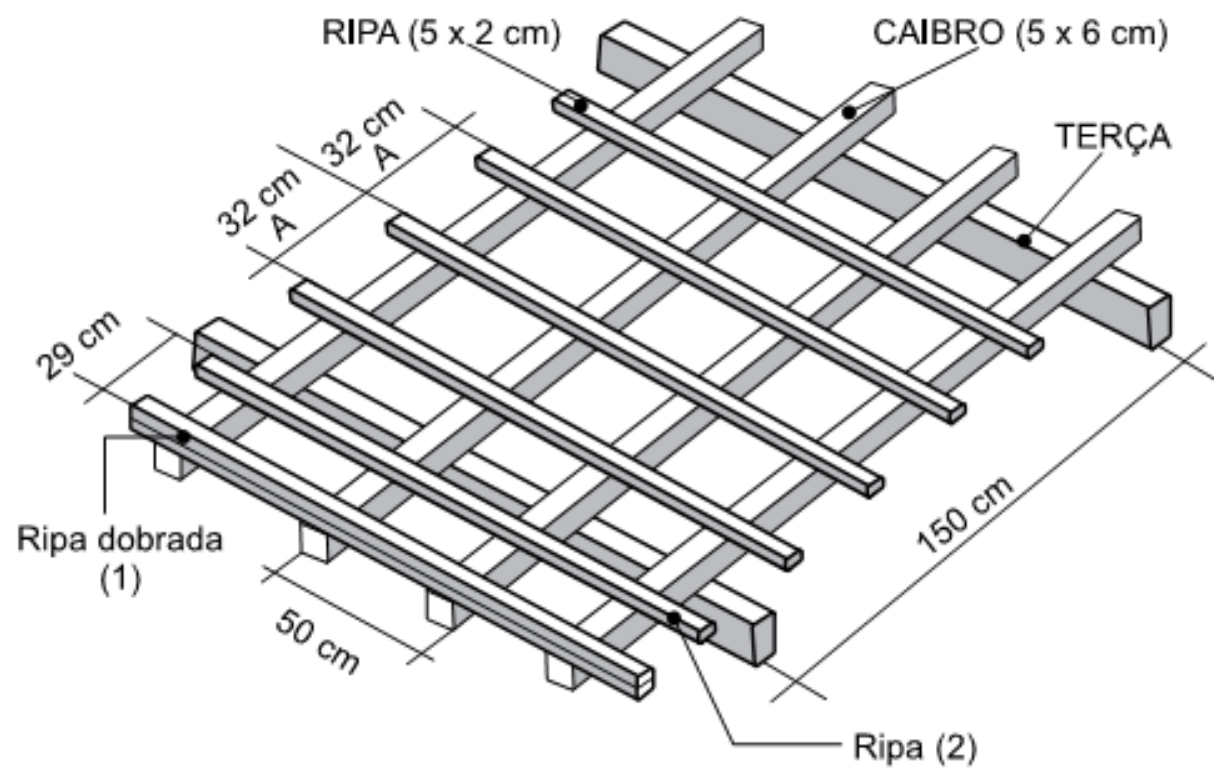
# EMENDA DE CAIBROS

Faz-se a emenda em cima de uma terço.



# CONSTRUÇÃO DAS RIPAS



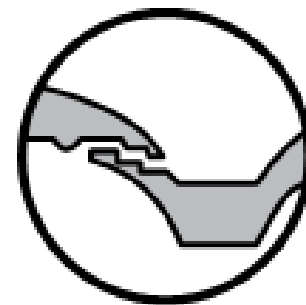




# Na montagem das telhas

A sobreposição lateral é sempre fixa, acompanhando o encaixe normal da telha.

A montagem do telhado começa do lado direito para o lado esquerdo do pano, e de baixo para cima, com as telhas sempre alinhadas na horizontal e na vertical.



*Detalhe do encaixe*



# CONSTRUÇÃO DAS FERRAGENS

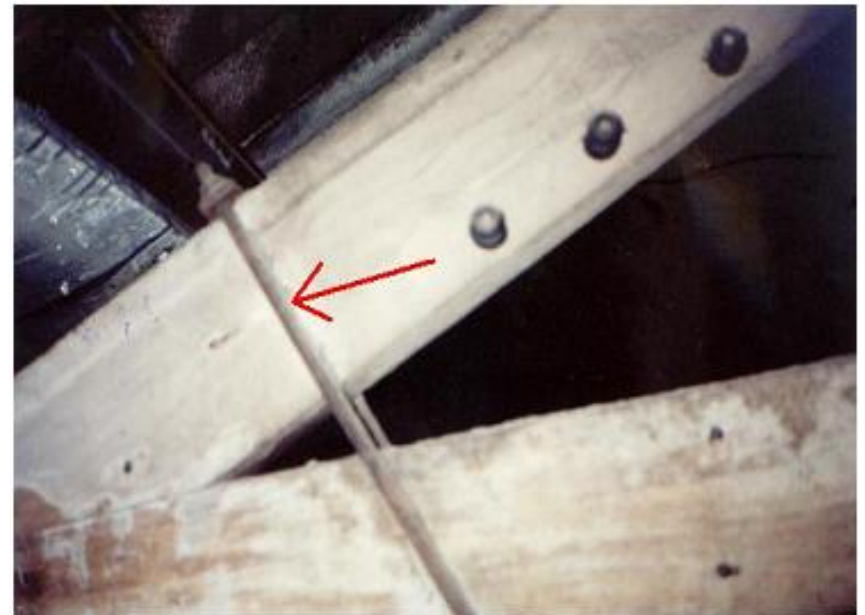
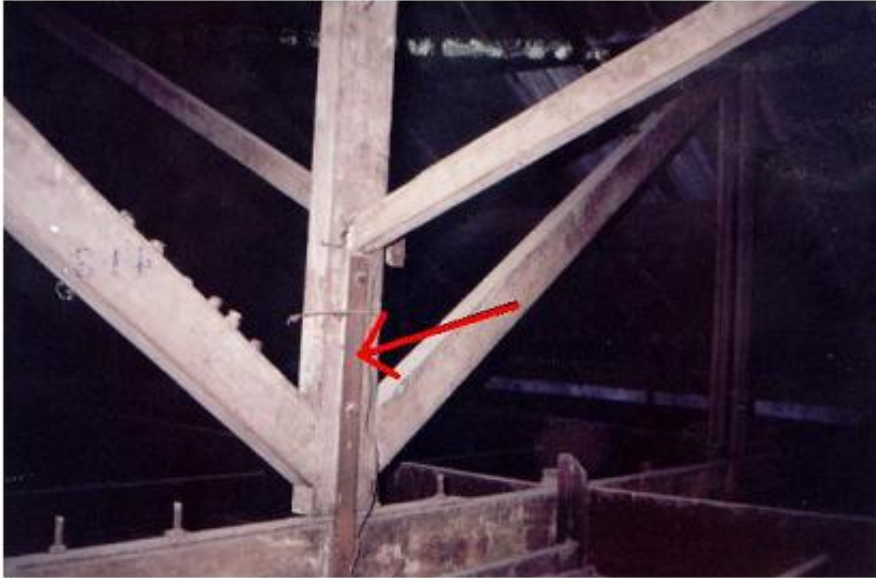


TABELA - DIMENSÕES TÍPICAS SEGUNDO O ESPAÇAMENTO DAS TESOURAS DE TERÇAS

Distância entre terças	DISTÂNCIA ENTRE TESOURAS			
	2,50m	3,00m	3,50m	4,00m
1,50m	6 x 12 cm	6 x 16 cm	6 x 16 cm	6 x 18 cm
2,00m	6 x 16 cm	6 x 16 cm	6 x 18 cm	8 x 24 cm
2,50m	6 x 16 cm	6 x 18 cm	8 x 24 cm	10 x 24 cm
3,00m	6 x 18 cm	8 x 24 cm	10 x 24 cm	10 x 24 cm

TABELA - DIMENSÕES CONVENCIONAIS DOS ELEMENTOS DE UMA TESOURA  
PARA VÃOS MENORES QUE 10 METROS

Peça da Tesoura	VÃO EM METROS		
	6 m	8 m	10 m
Linha .....	6 x 12	6 x 16	6 x 16
Perna .....	6 x 16	6 x 16	6 x 16
Mão Francesa ....	6 x 12	6 x 12	6 x 12
Pendural .....	6 x 12	6 x 12	6 x 12
Tirante .....	6 x 12	6 x 12	6 x 12

TABELA - DIMENSÕES CONVENCIONAIS DOS ELEMENTOS DE VIGAMENTO

Vão entre tesouras: menor que 3 metros; afastamento entre peças do vigamento: menor que 2 metros.

Peça do Vigamento	Dimensão em Centímetro
Frechal, Têrça ou Cumeeira	6 x 16



TABELA - DIMENSÕES CONVENCIONAIS DOS ELEMENTOS DO MADEIRAMENTO  
(VÃO ENTRE TERÇAS: MENOR QUE 2 METROS; ESPAÇAMENTO ENTRE CAIBROS: ATÉ 0,5m).

Peças do Madeiramento	Dimensões em Centímetro
Caibro .....	7 x 5
Ripa .....	5 x 1,5