




DIMENSIONAMENTO PROTEÇÕES SOLARES

Conforto Ambiental II – Insolação

MATERIAL DIDÁTICO

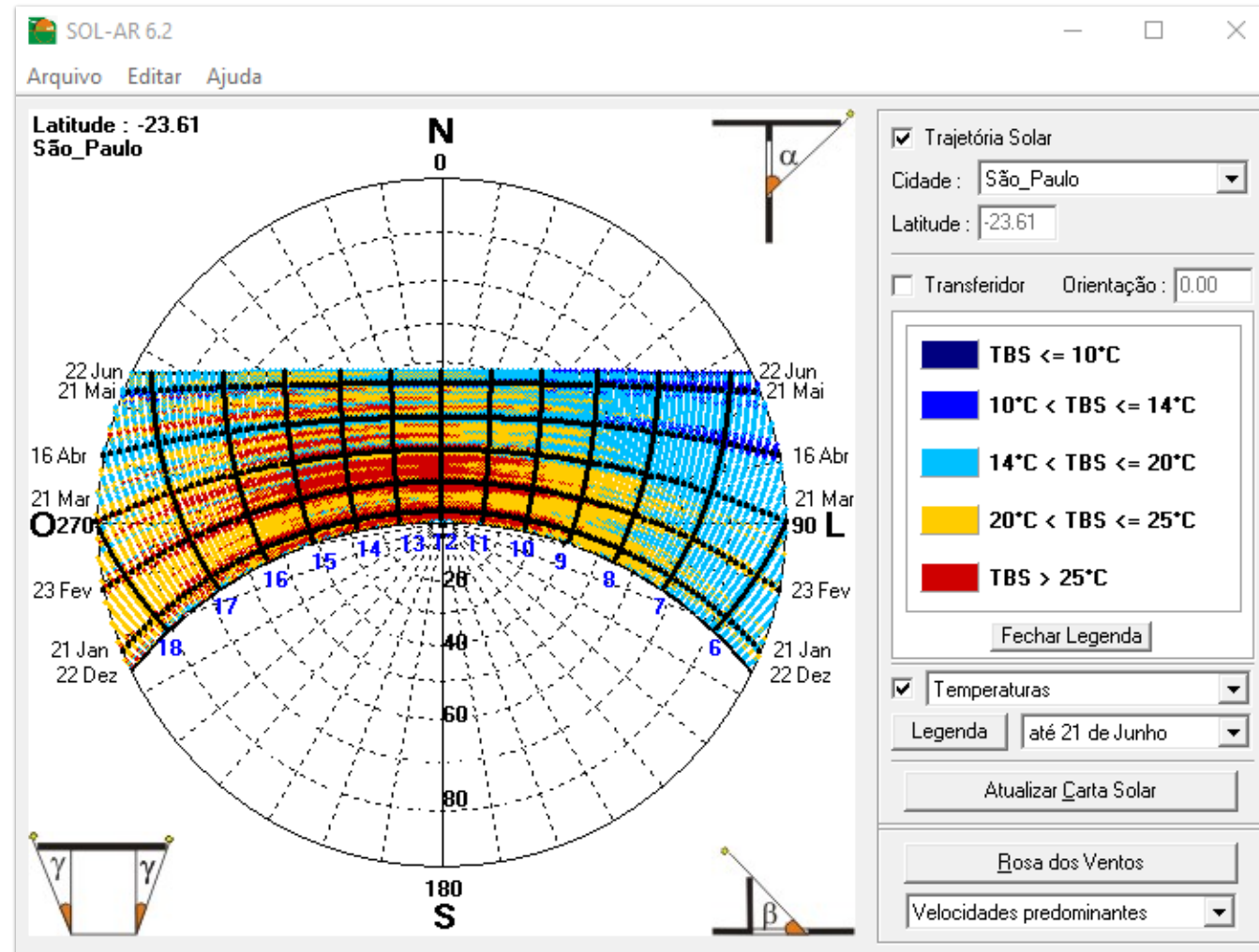
Prof.^a Dr.^a Erika De Figueiredo



Determinação Gráfica dos dispositivos de proteção solar

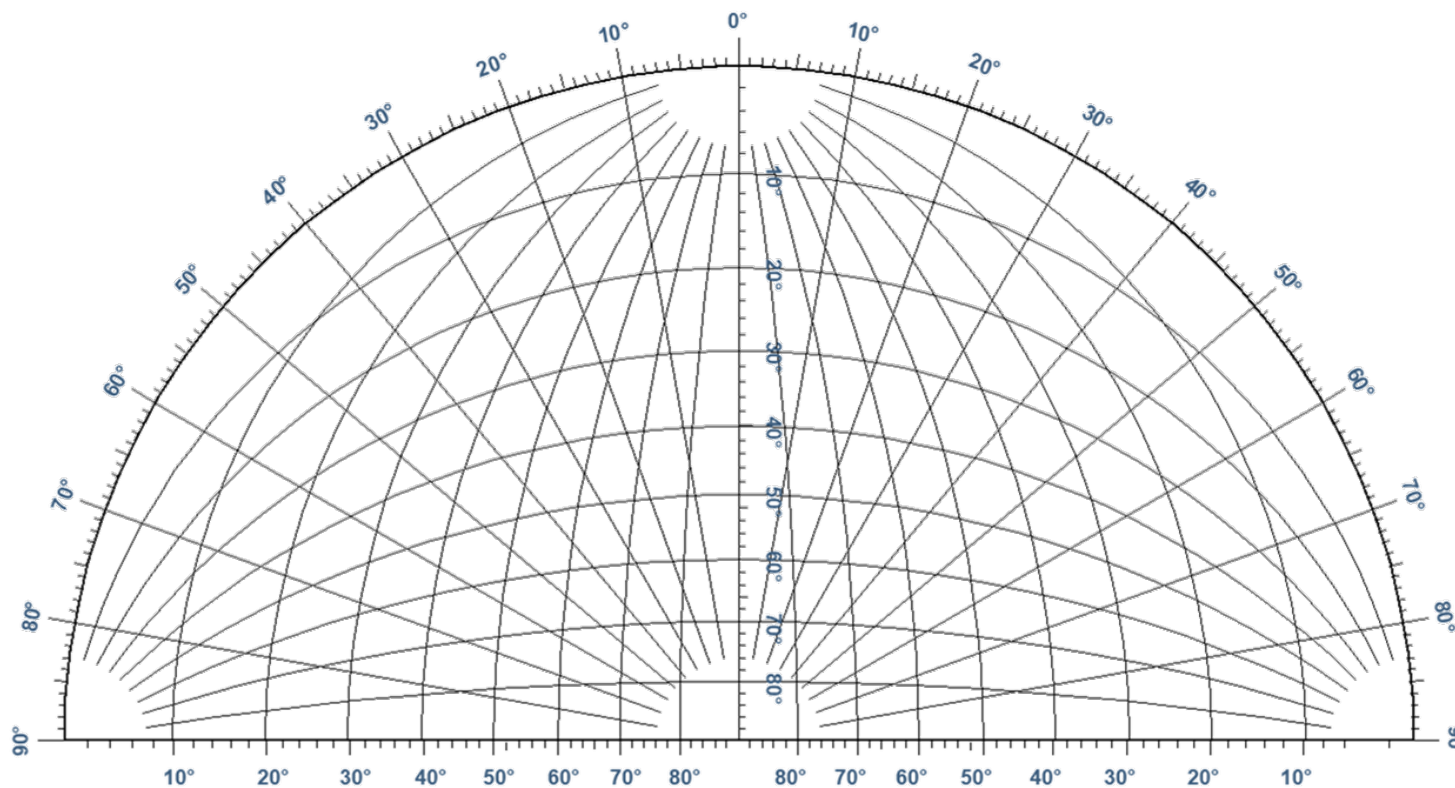
A determinação do tipo e da dimensão de um dispositivo de proteção solar será feita em função da eficácia desejada. Um dispositivo de proteção solar será eficaz quando for capaz de barrar a radiação solar direta sobre uma dada superfície ou abertura no período que se julgar conveniente” (FROTA, 1999, p. 90).

Analysis SOL-AR



<http://www.labee.ufsc.br/downloads/software/analysis-sol-ar>

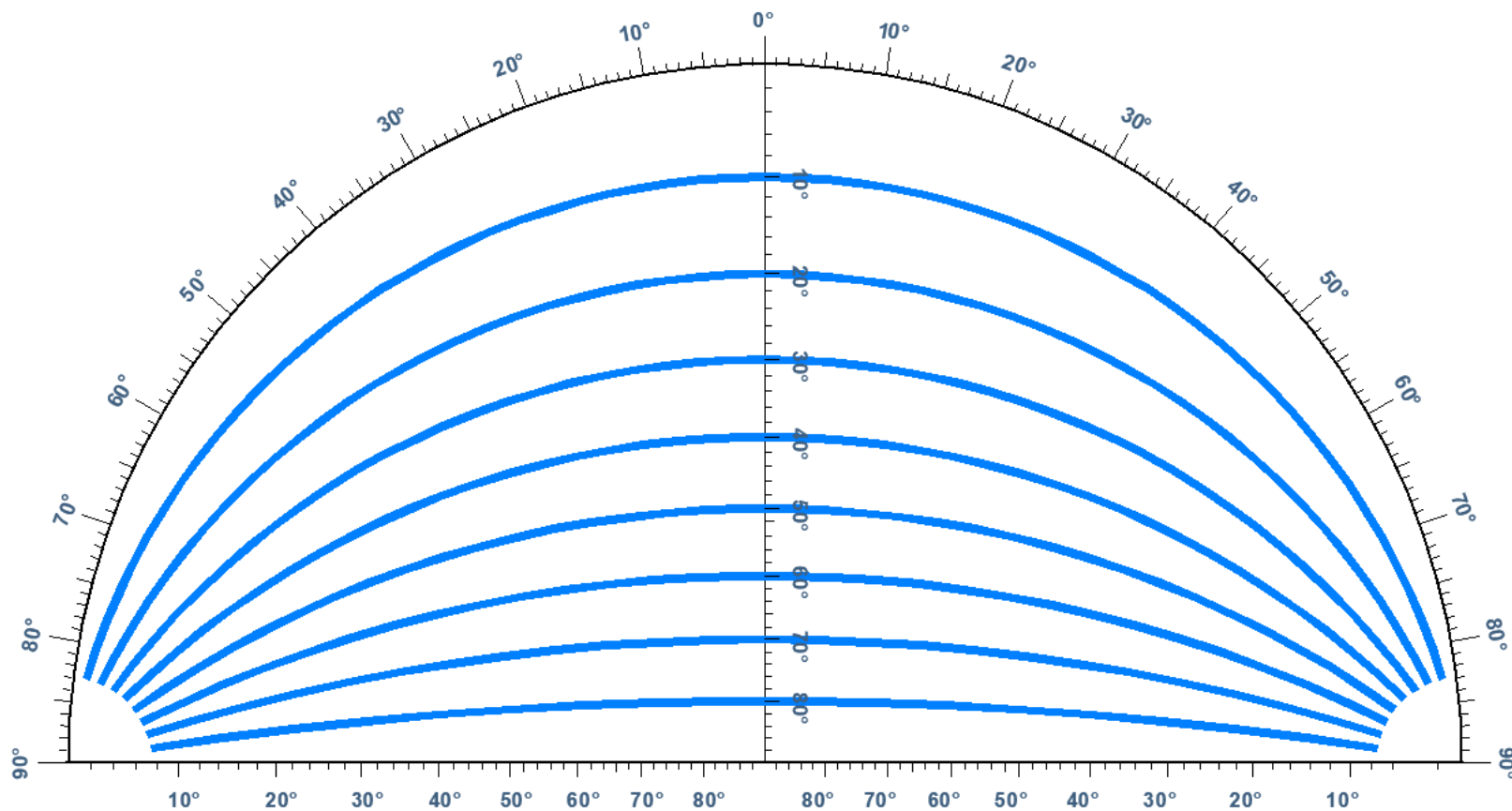
Gráfico Auxiliar para o Traçado de Máscaras



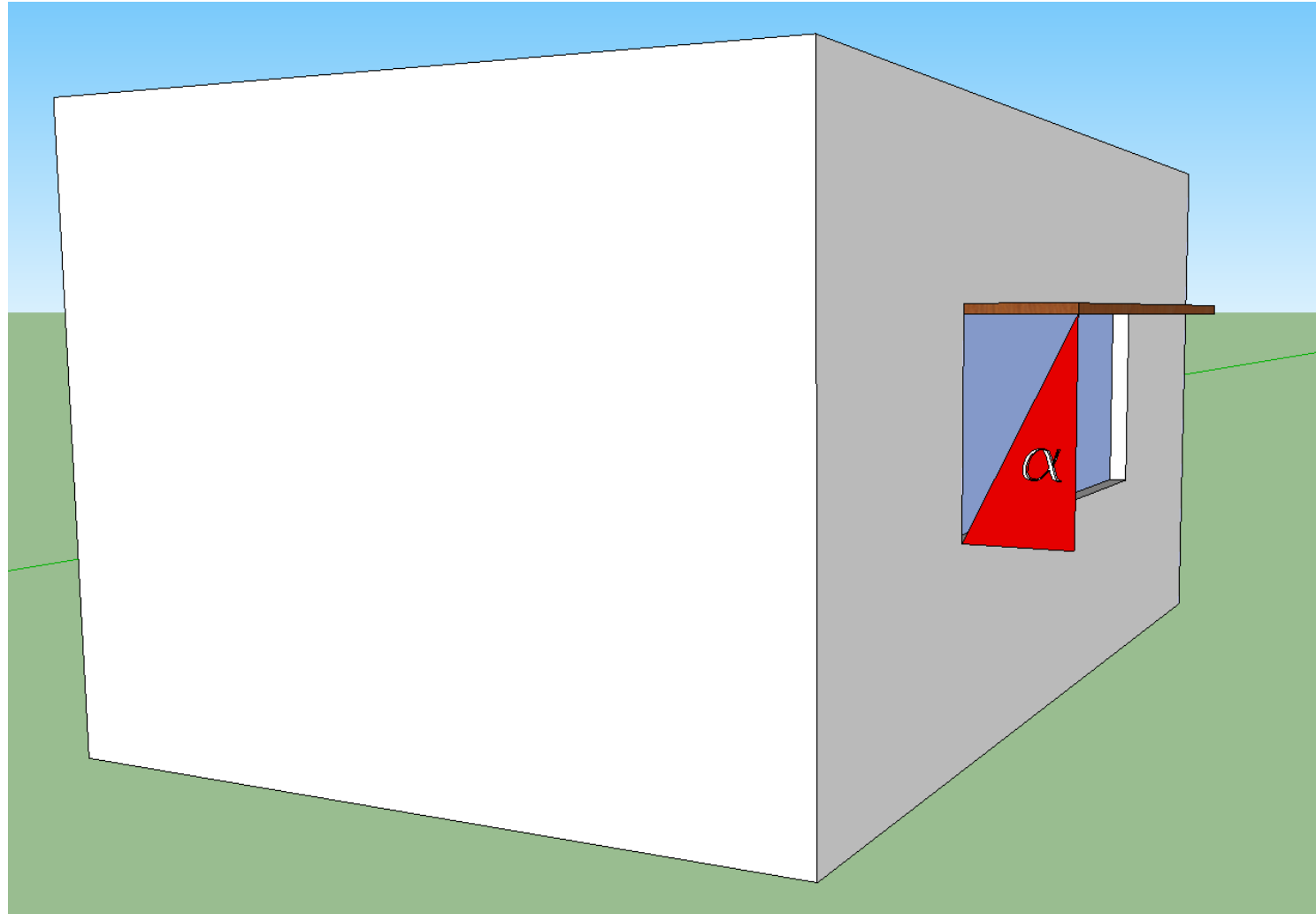
Transferidor com os ângulos alfa, beta e gama.

Ângulo α

GRÁFICO AUXILIAR PARA O TRAÇADO DE MÁSCARAS



Dimensionamento de Proteções Solares: α



Ângulo Alfa:
Largura do brise

O ângulo alfa é obtido por meio do corte ou da elevação lateral.



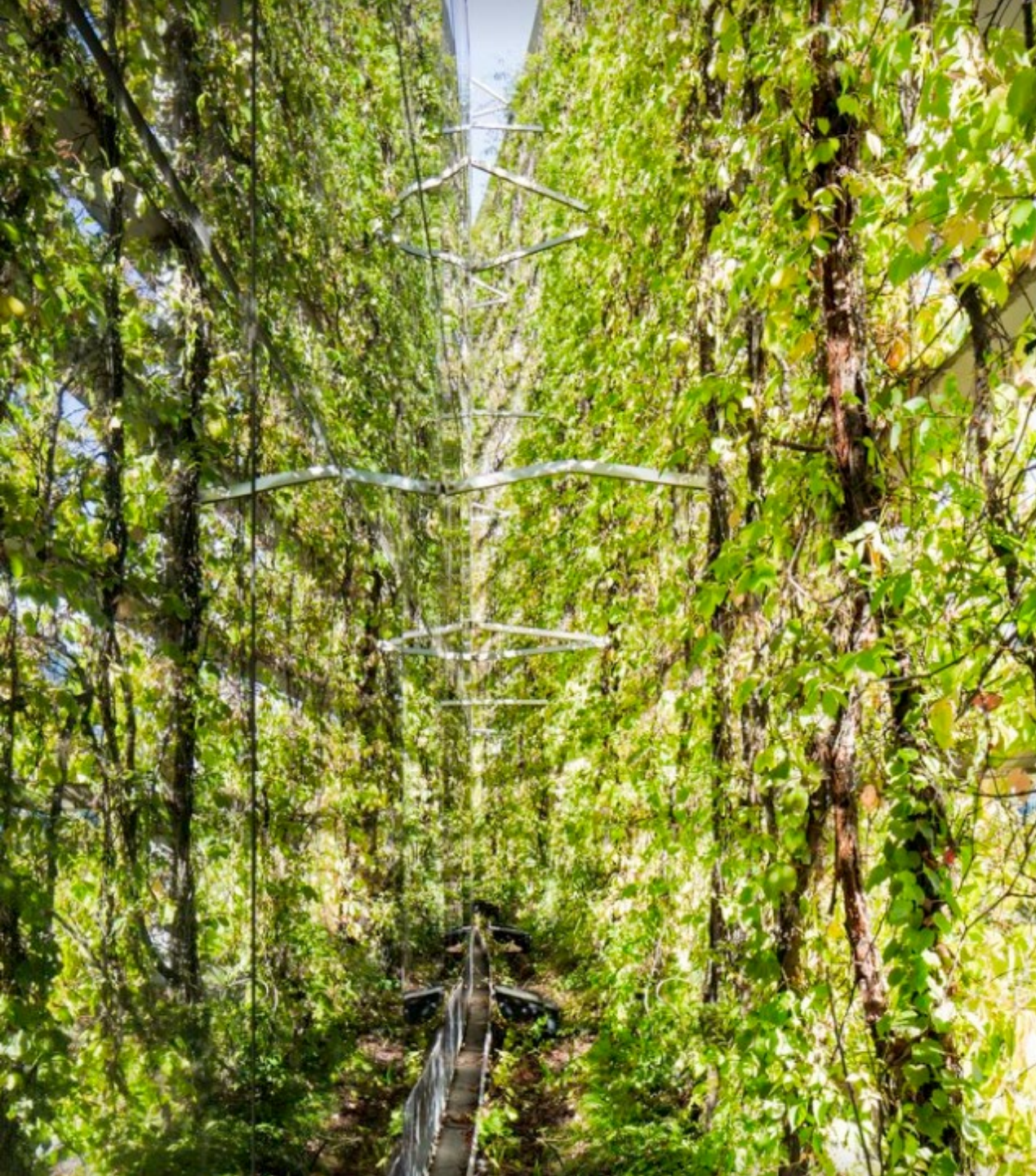
Edificio Consorcio

Arquitectos: **Enrique Browne
+ Borja Huidobro**

Santiago, Chile

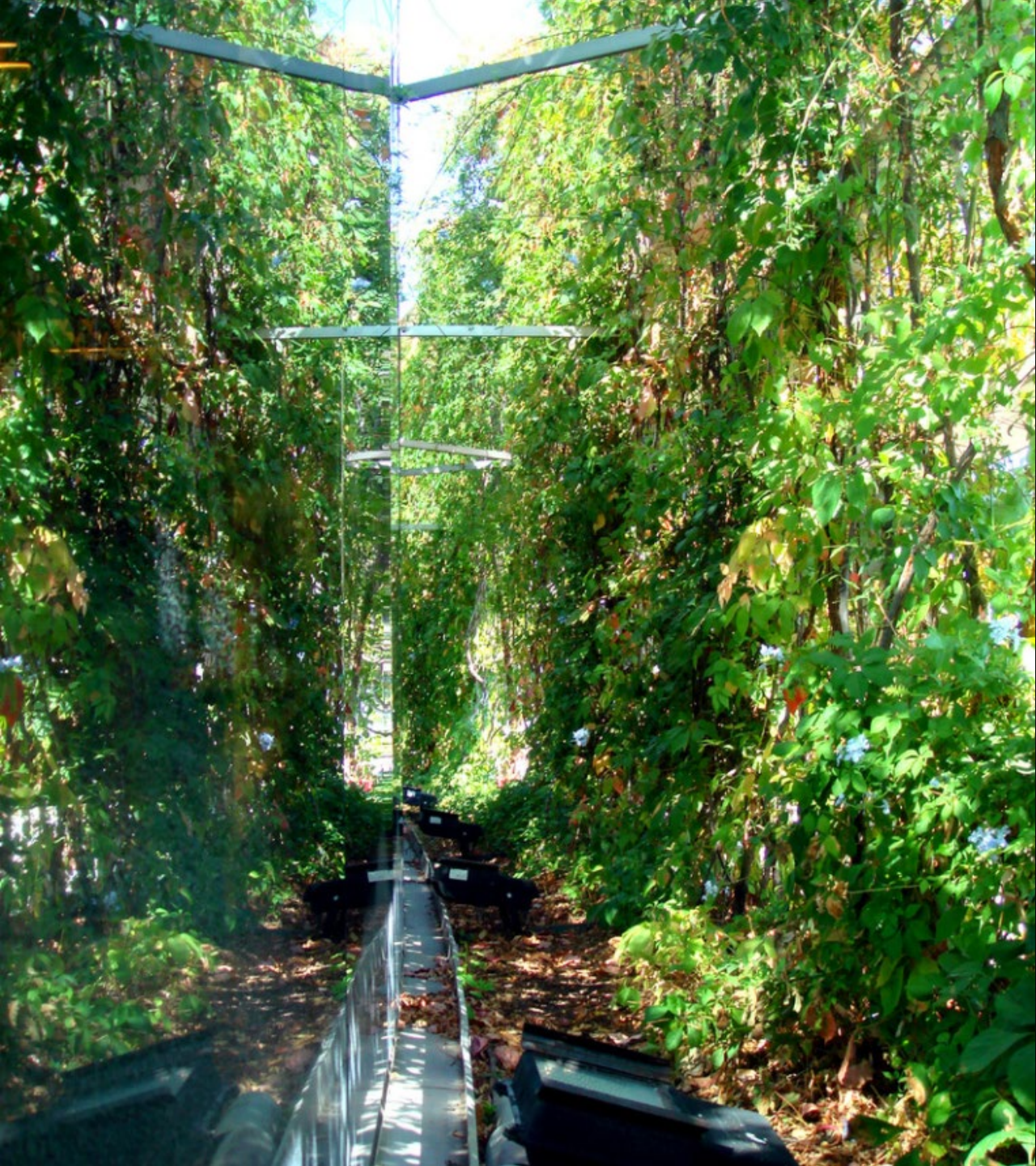




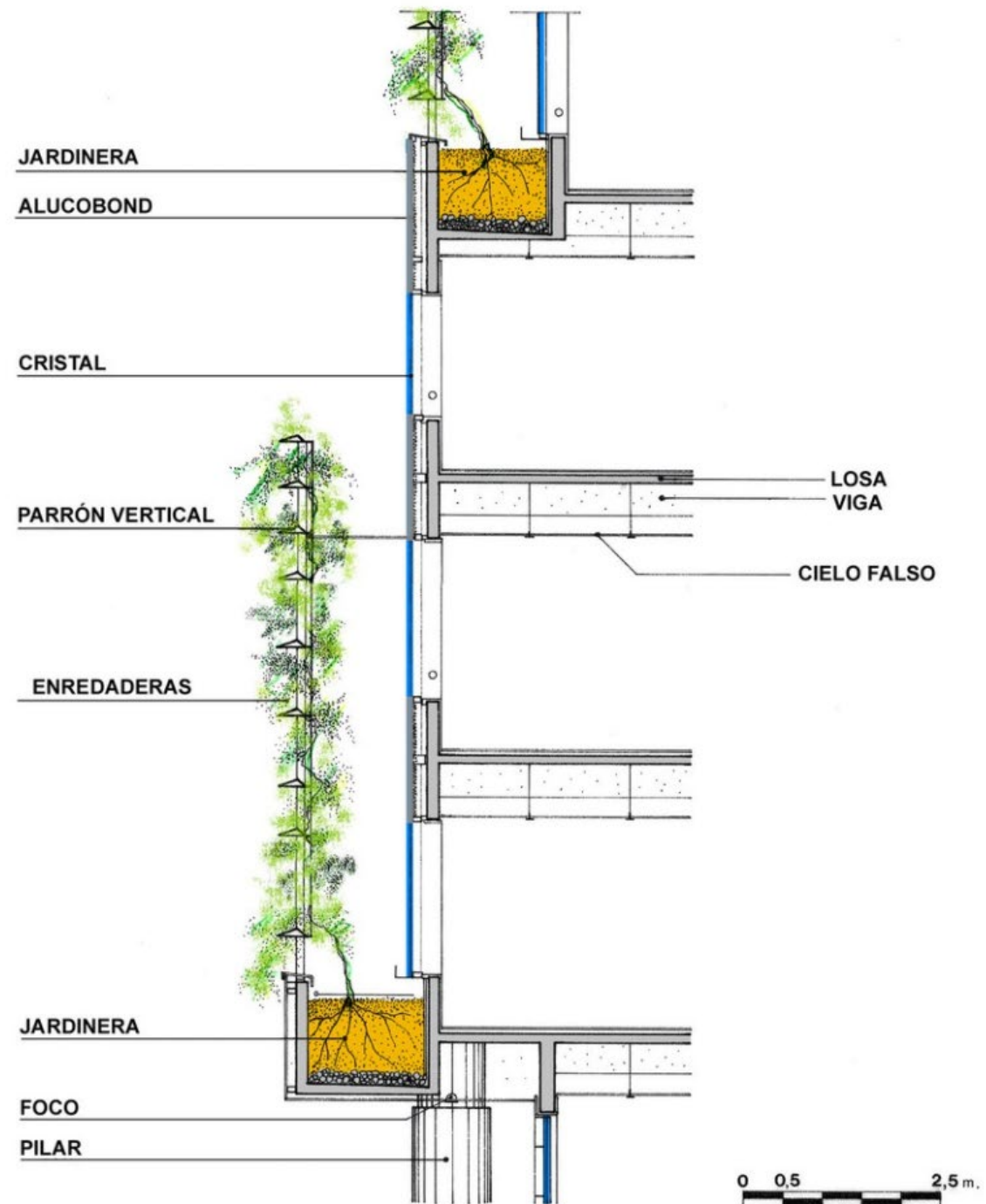


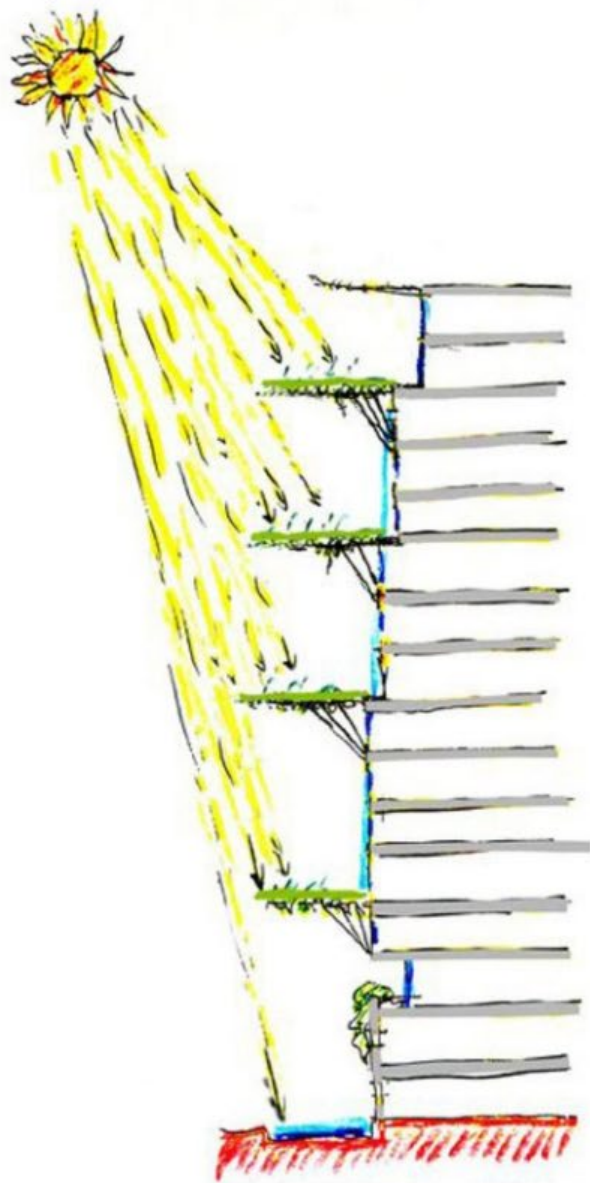








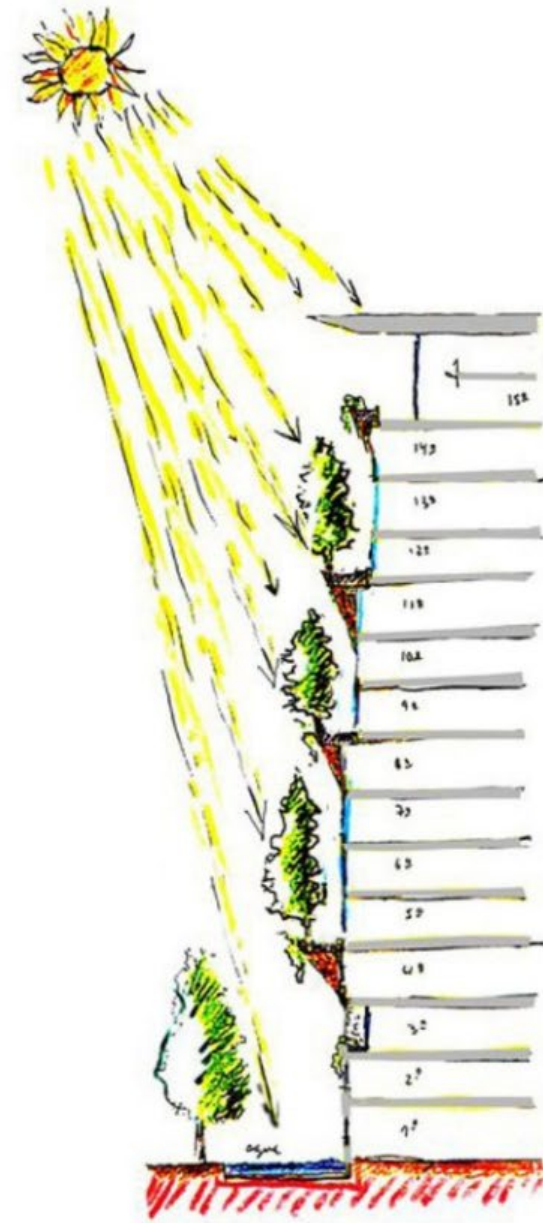




" PARRONES " HORIZONTALES



" PARRONES " VERTICALES

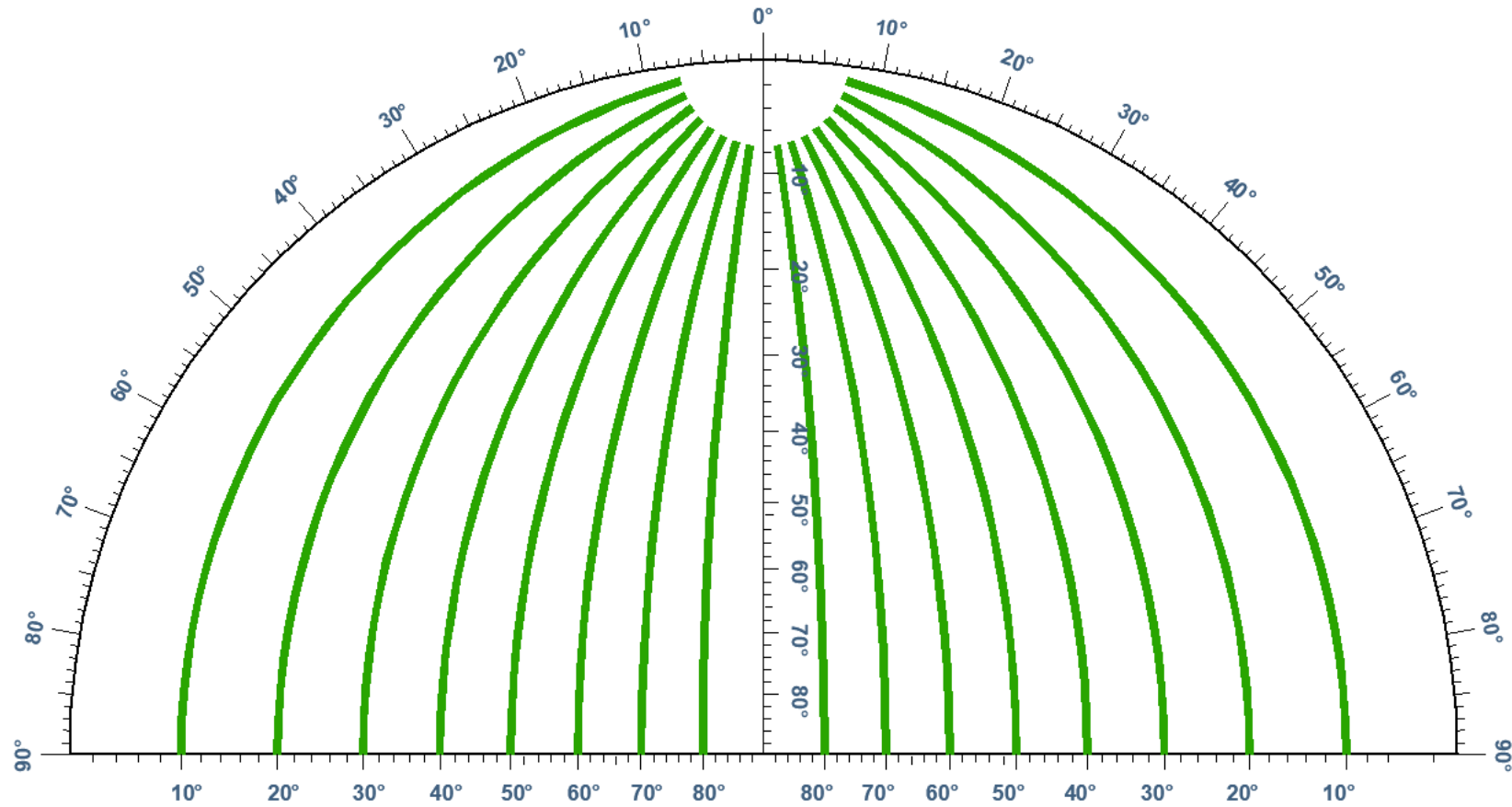


ÁRBOLES

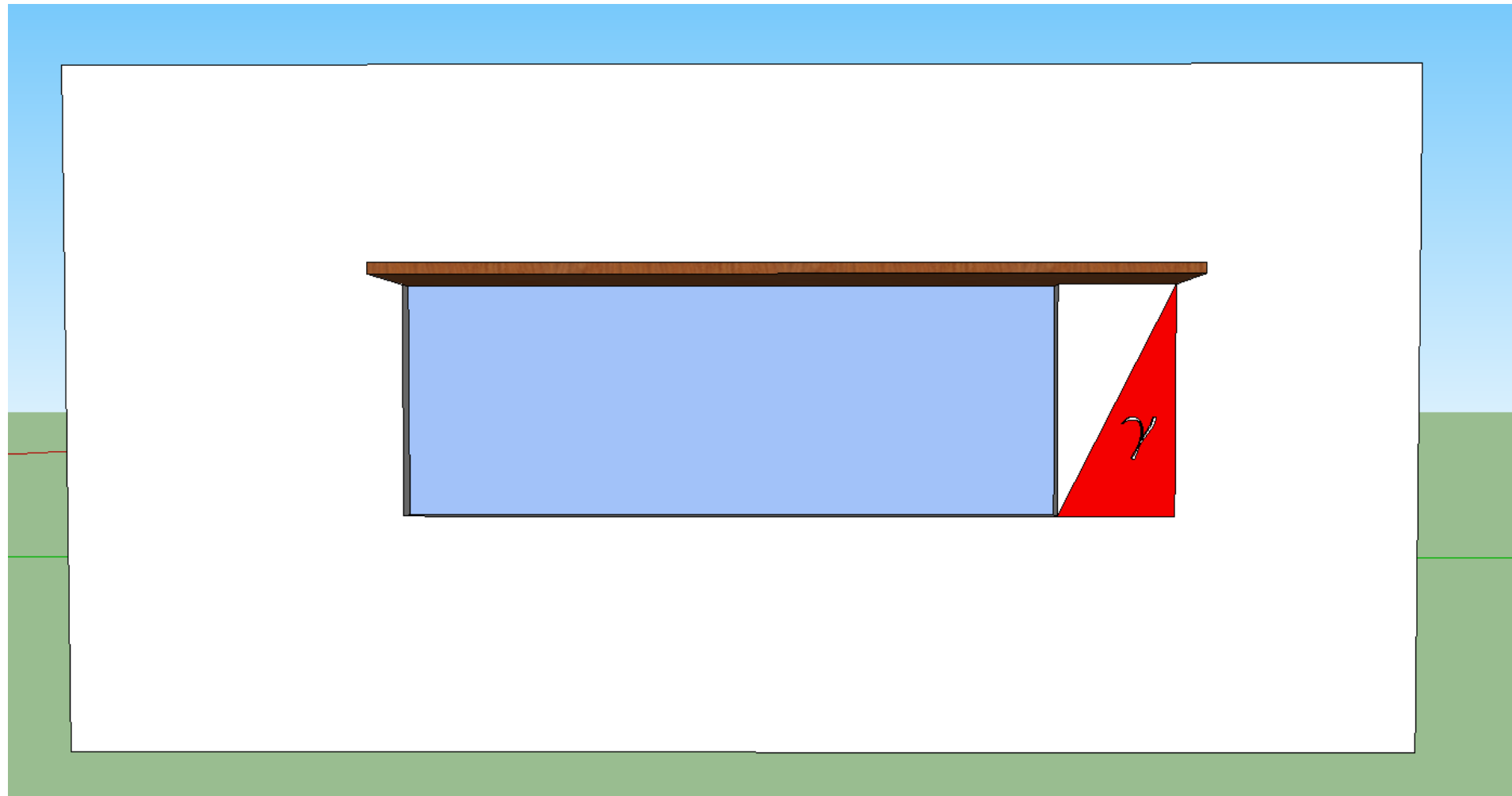
Alternativas de protección solar vegetal

Ângulo γ

GRÁFICO AUXILIAR PARA O TRAÇADO DE MÁSCARAS



Dimensionamento de Proteções Solares: γ

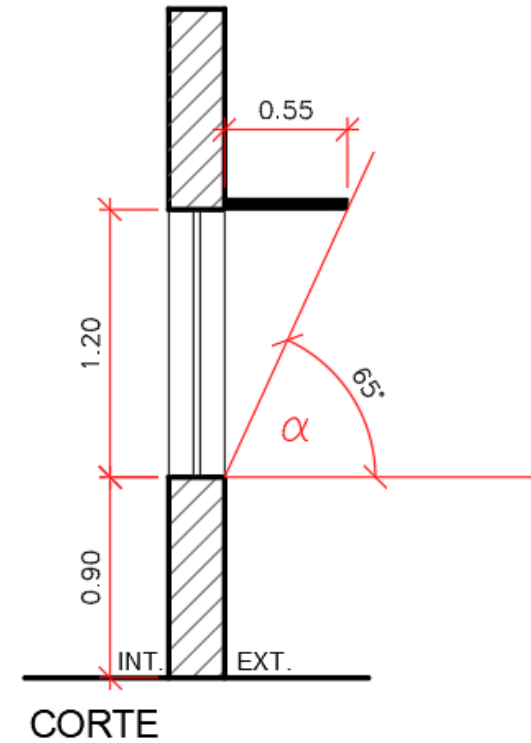
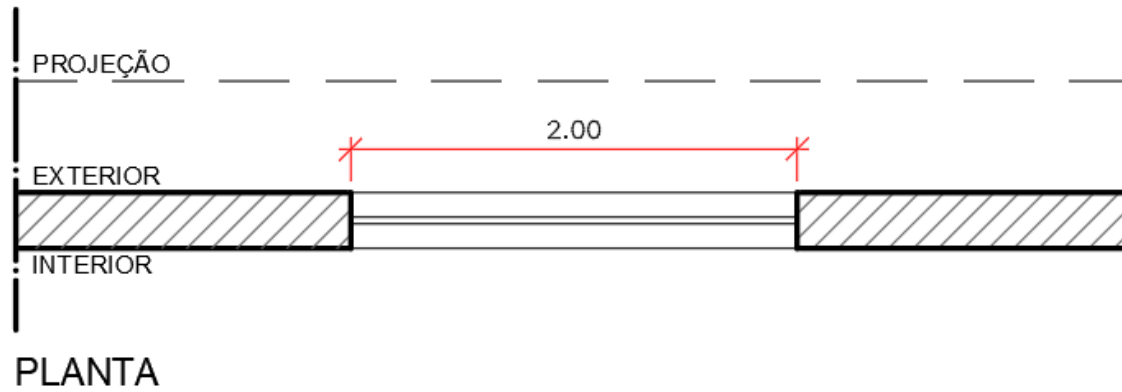


Ângulo Gama:
Comprimento
do brise

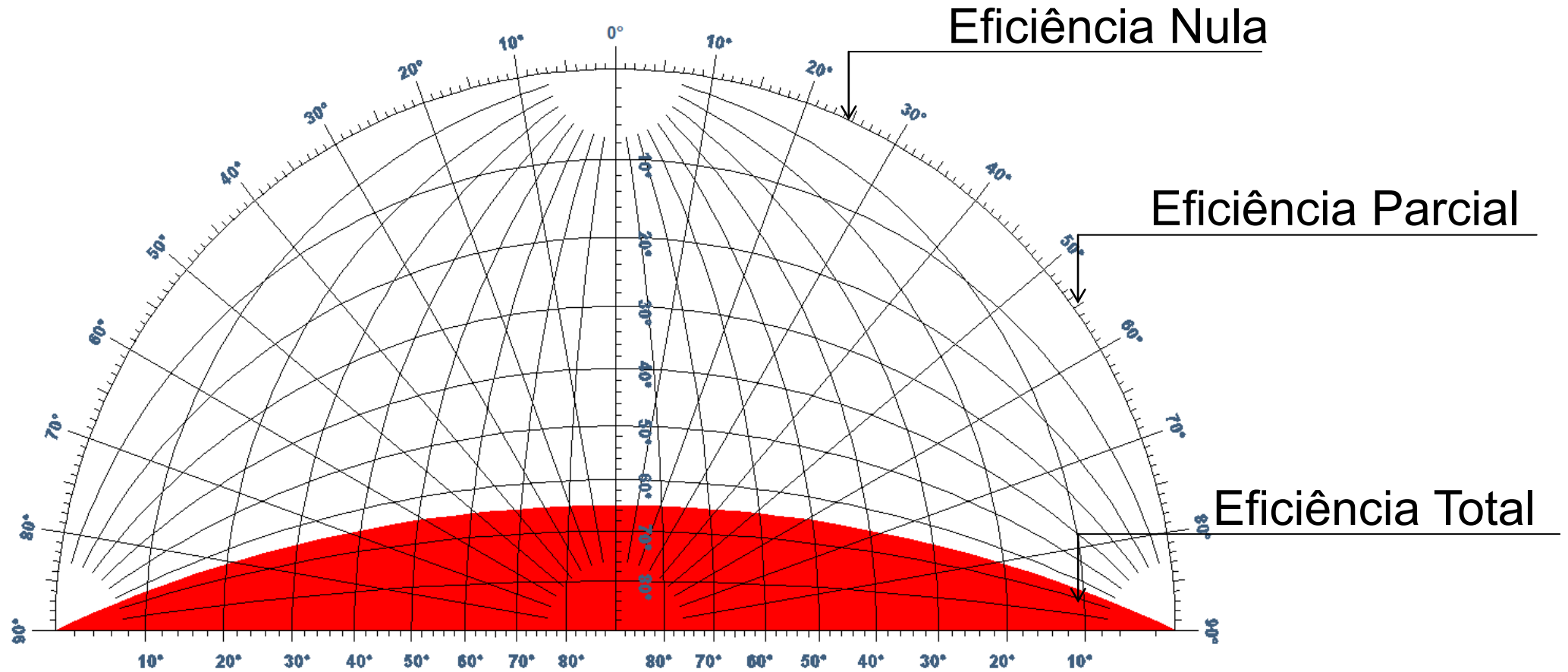
O ângulo gama é obtido por meio da elevação frontal.

Proteção Solar de Eixo Horizontal

Proteção Solar Horizontal Infinita

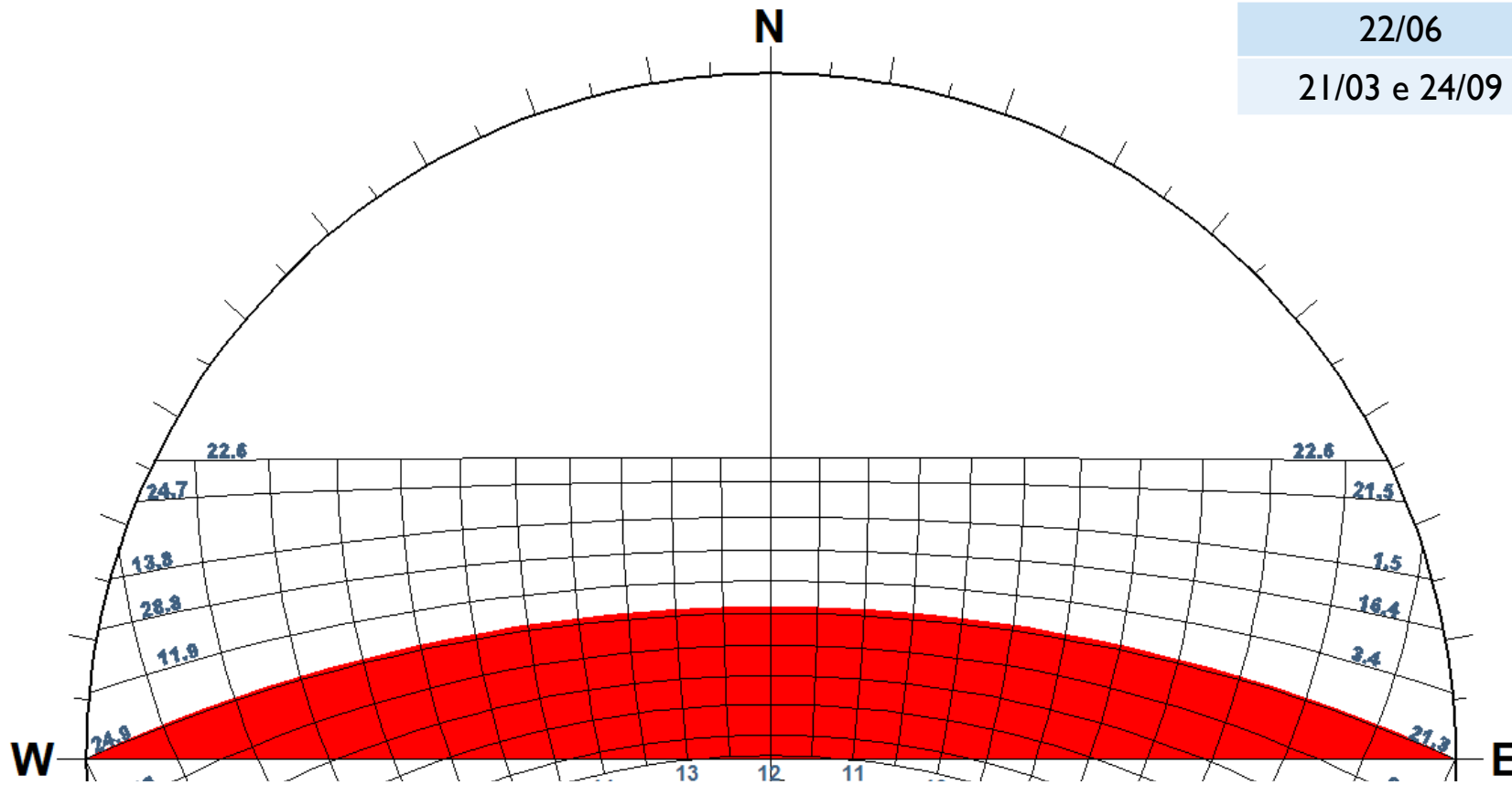


Proteção Solar Horizontal Infinita - Máscara



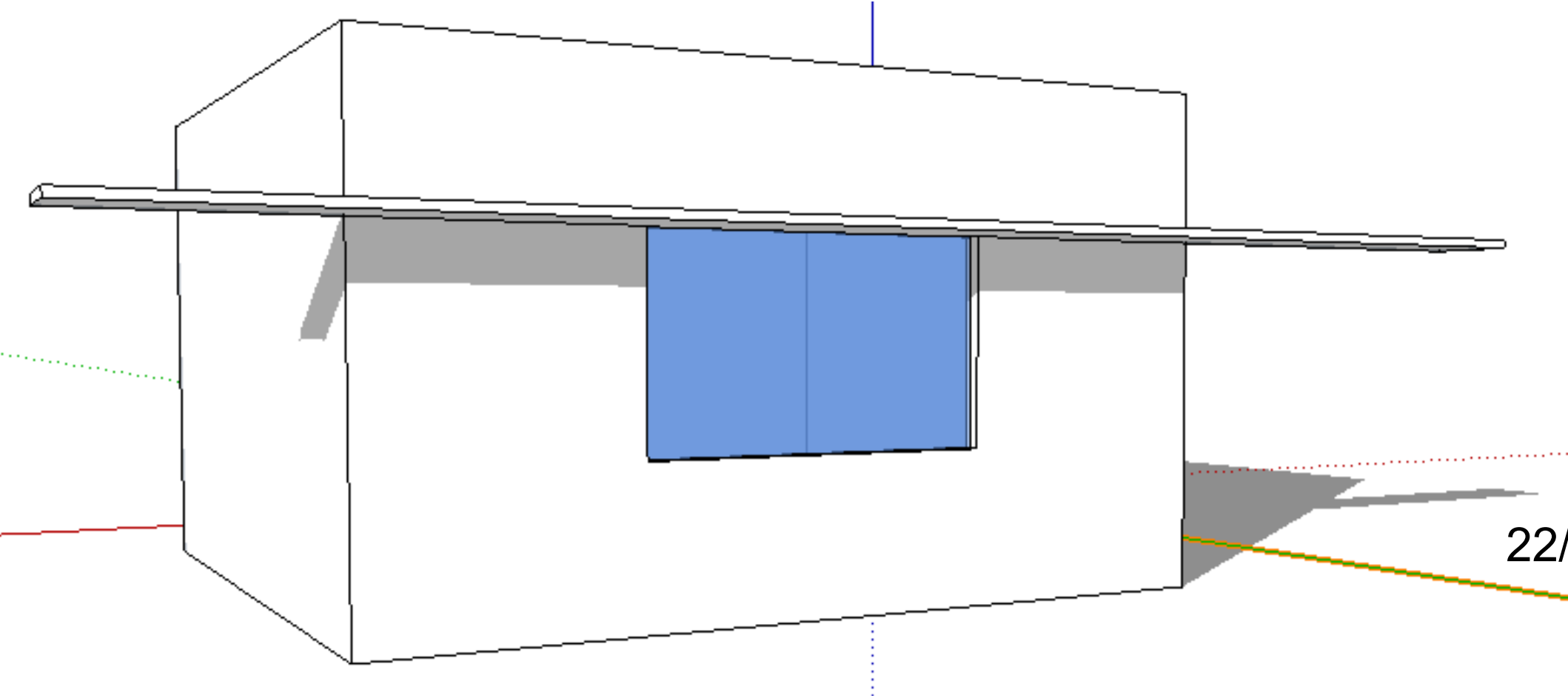
Proteção Solar Horizontal Infinita - Horários

Data	Período Insolação
22/06	6h45 – 17h15 (parcial)
21/03 e 24/09	Não bate sol



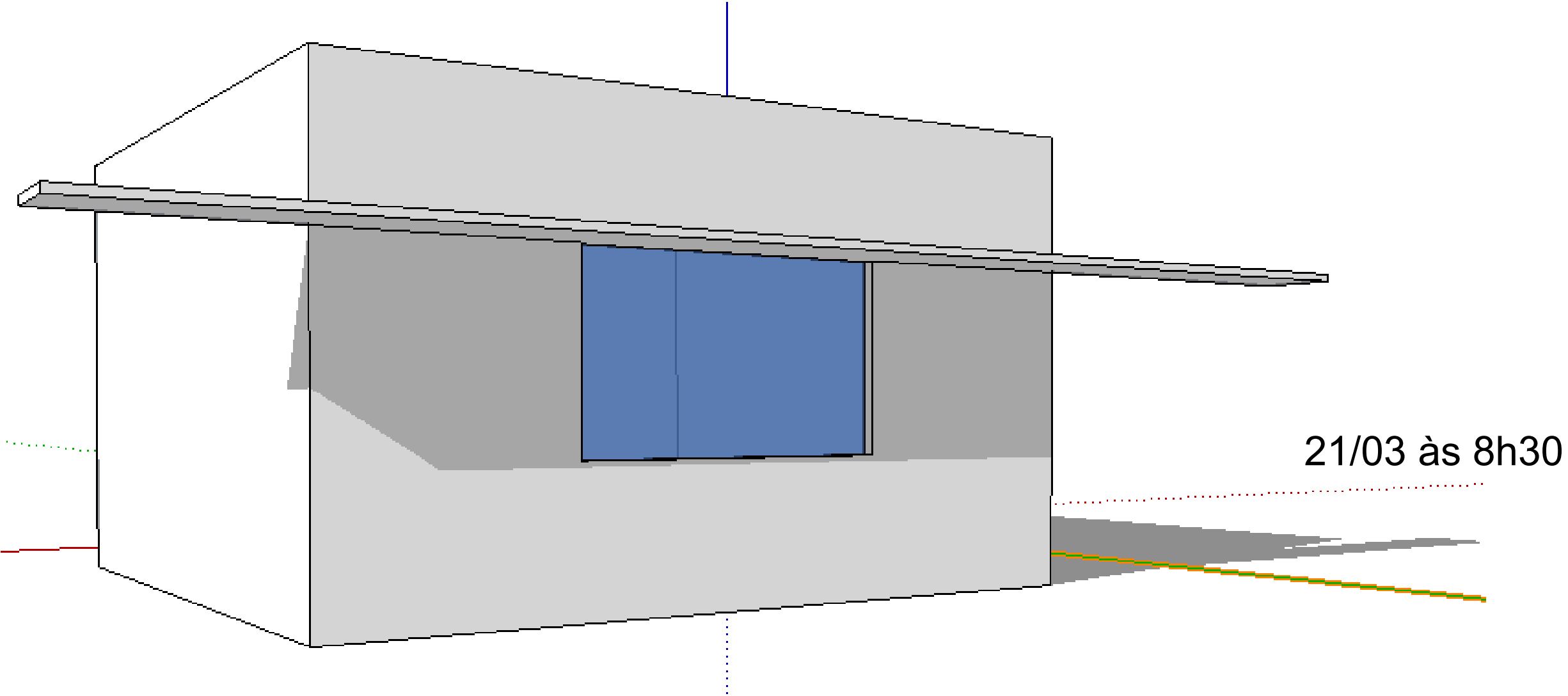
Se o sol ocupar qualquer posição dentro da máscara, não incidirá sobre a janela.

Proteção Solar Horizontal Infinita - Maquete



22/06 às 8h30

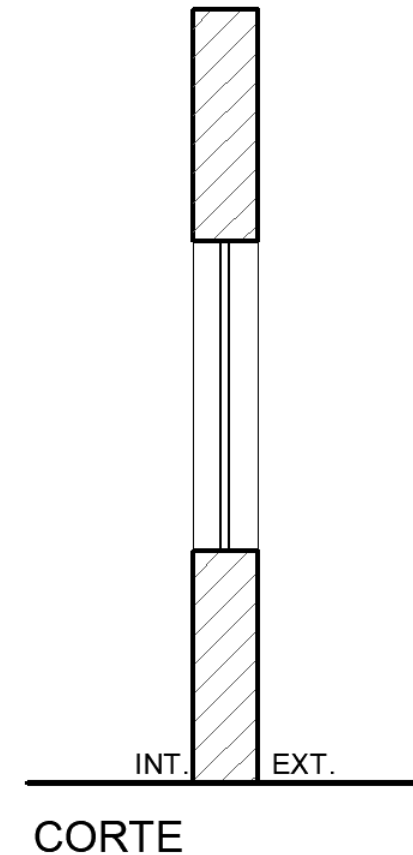
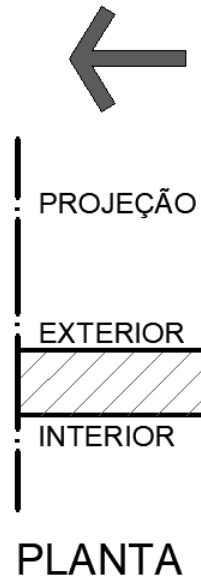
Proteção Solar Horizontal Infinita - Maquete



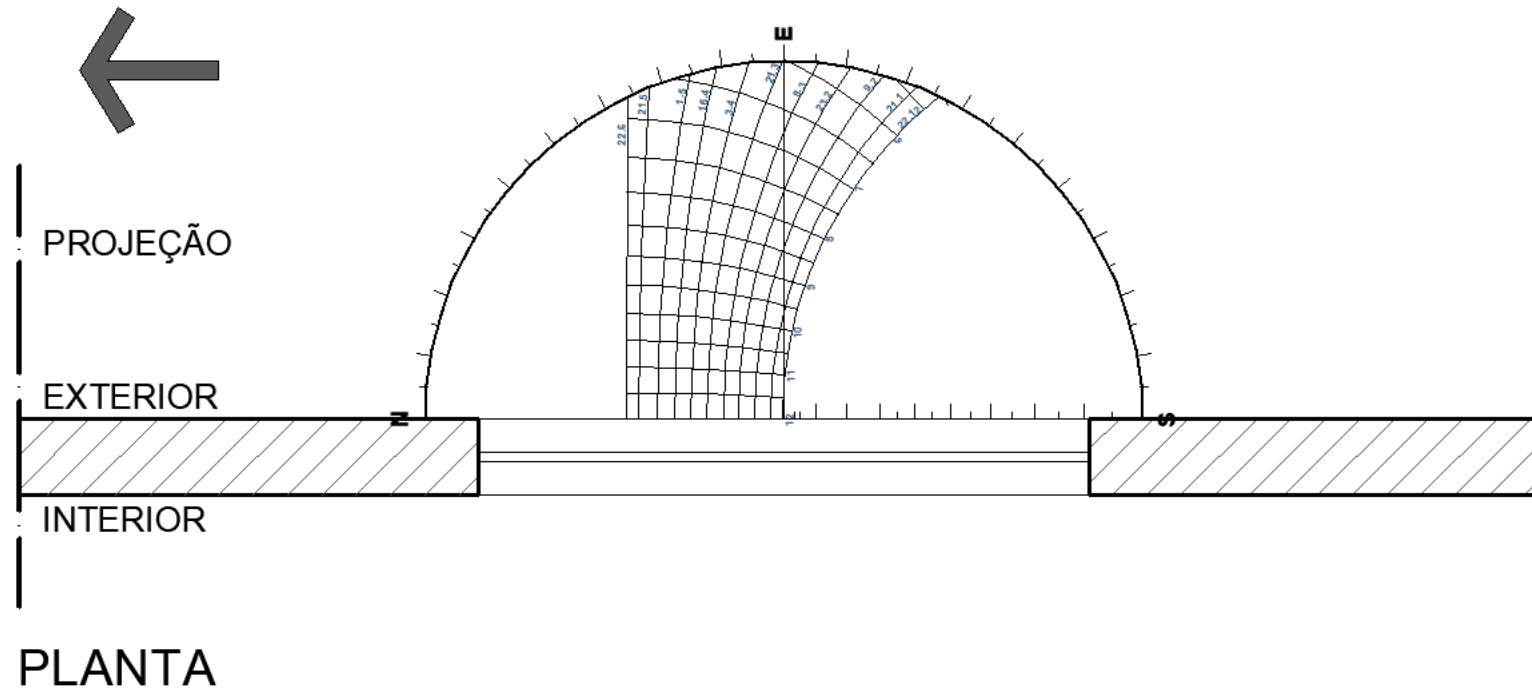
EXERCÍCIO I

Faça o dimensionamento da proteção solar

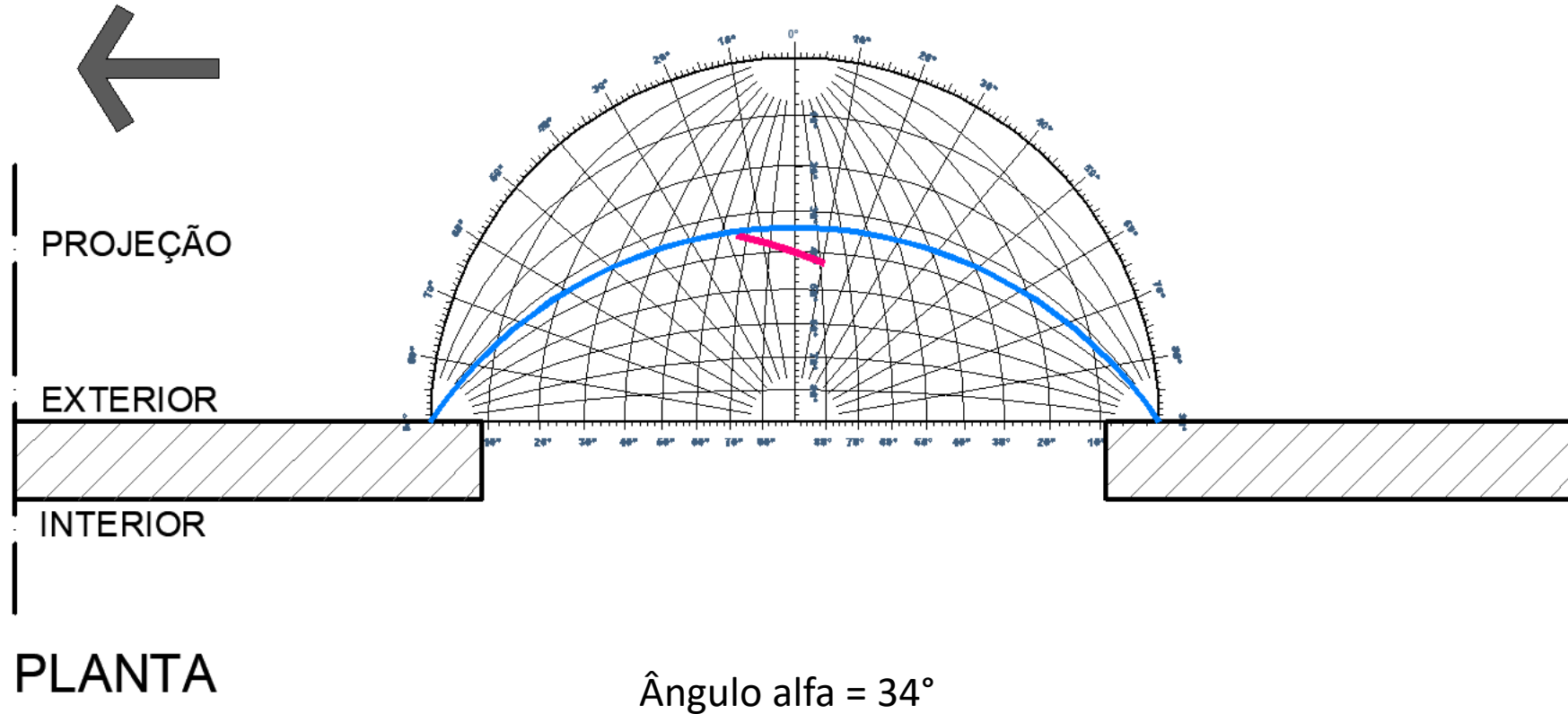
Período: 8h30 às 12h nos Equinócios



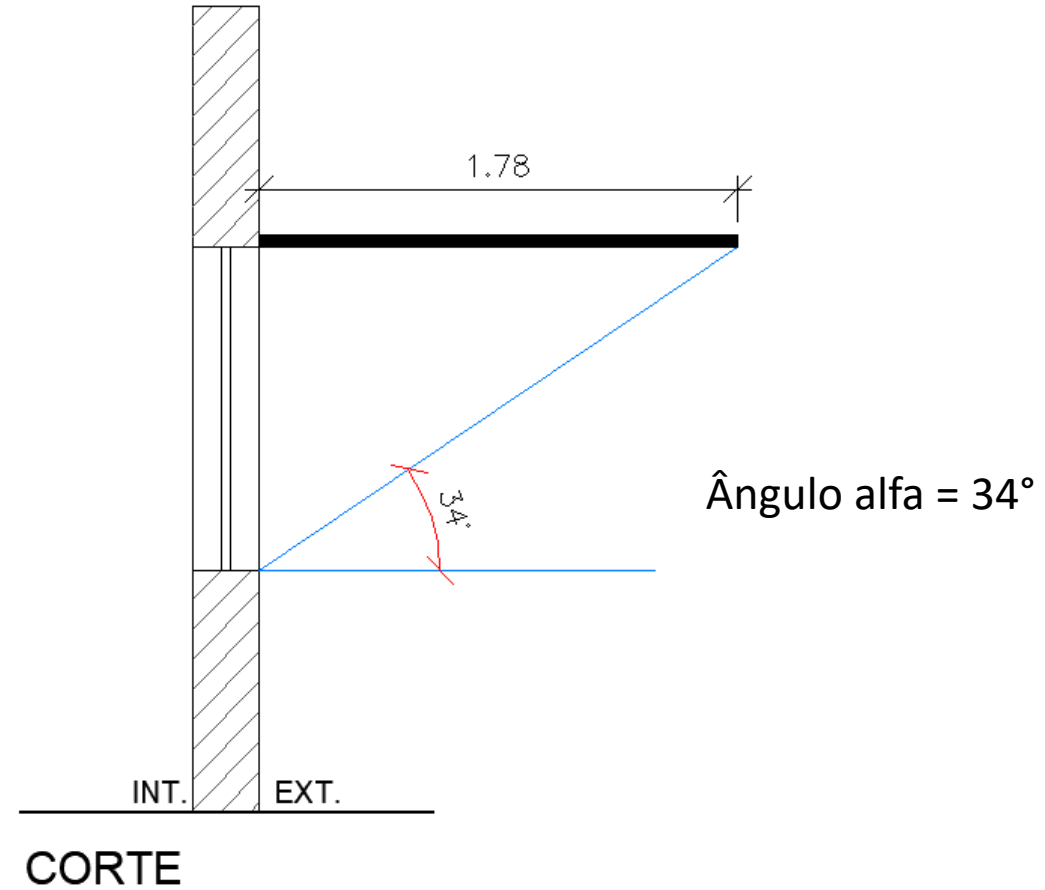
Período de insolação



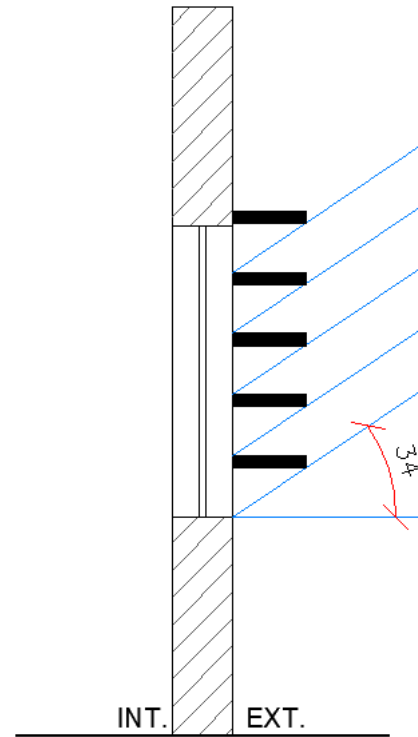
Definição do ângulo alfa



Desenho da proteção solar



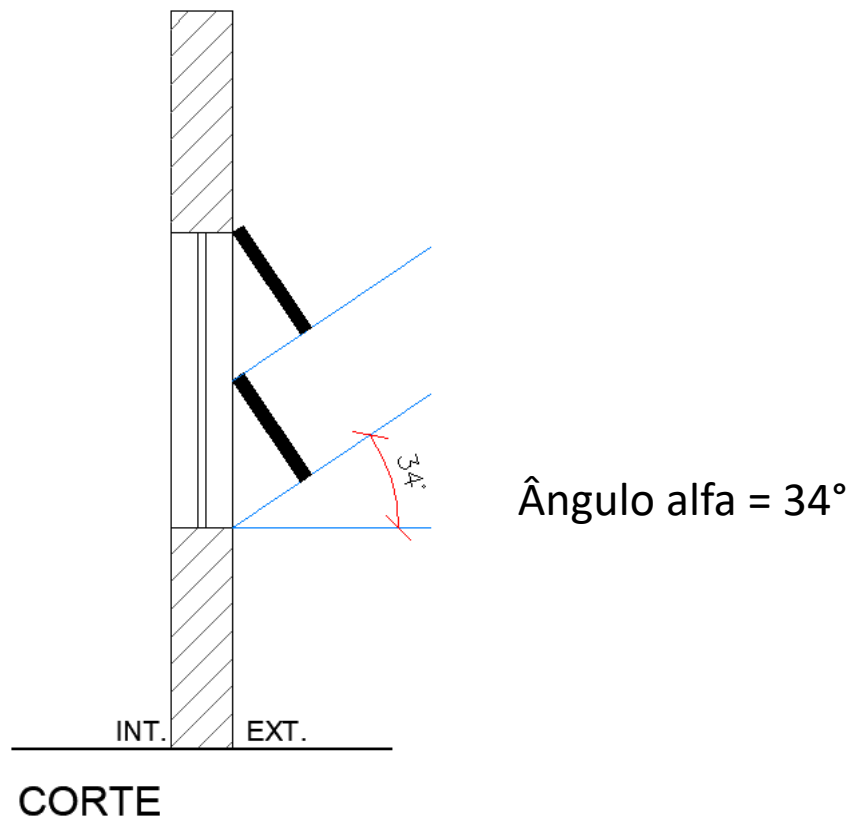
Desenho da proteção solar



Ângulo alfa = 34°

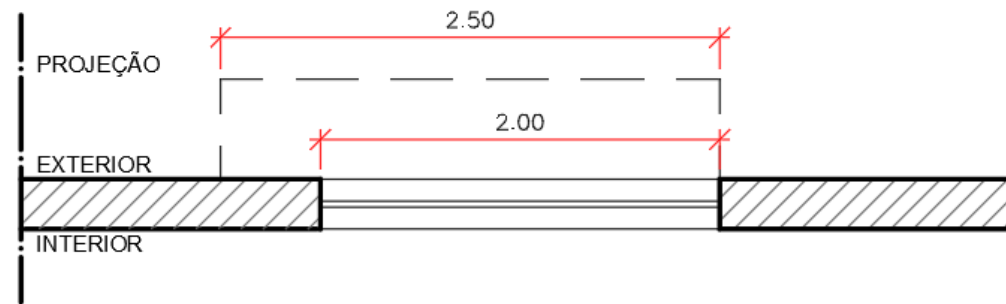
CORTE

Desenho da proteção solar

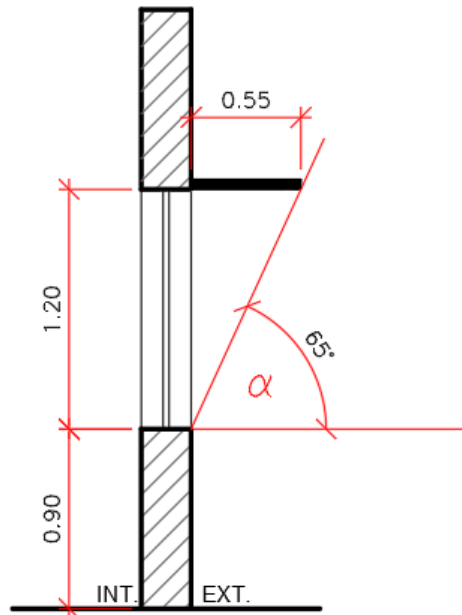


Proteção Solar de Eixo Horizontal Finita

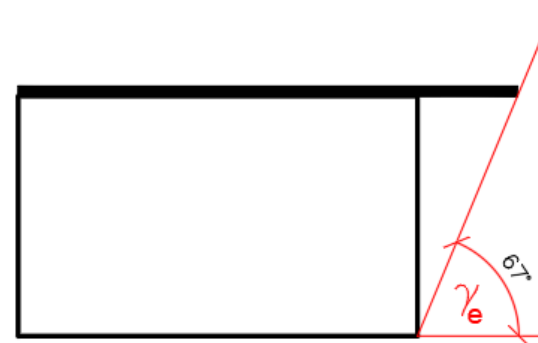
Proteção Solar de Eixo Horizontal Finita



PLANTA



CORTE



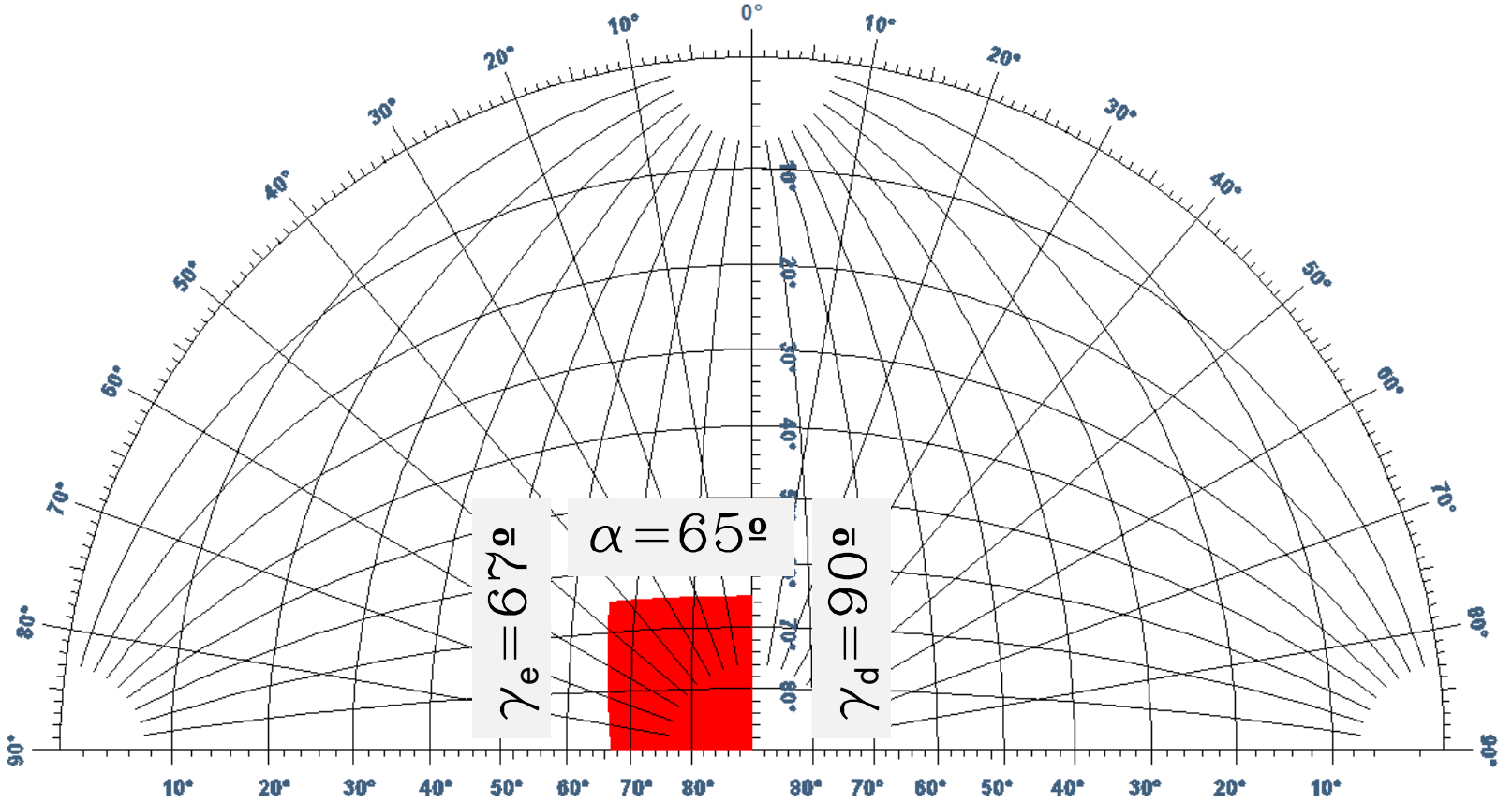
ELEVAÇÃO



$$\gamma_d = 90^\circ$$

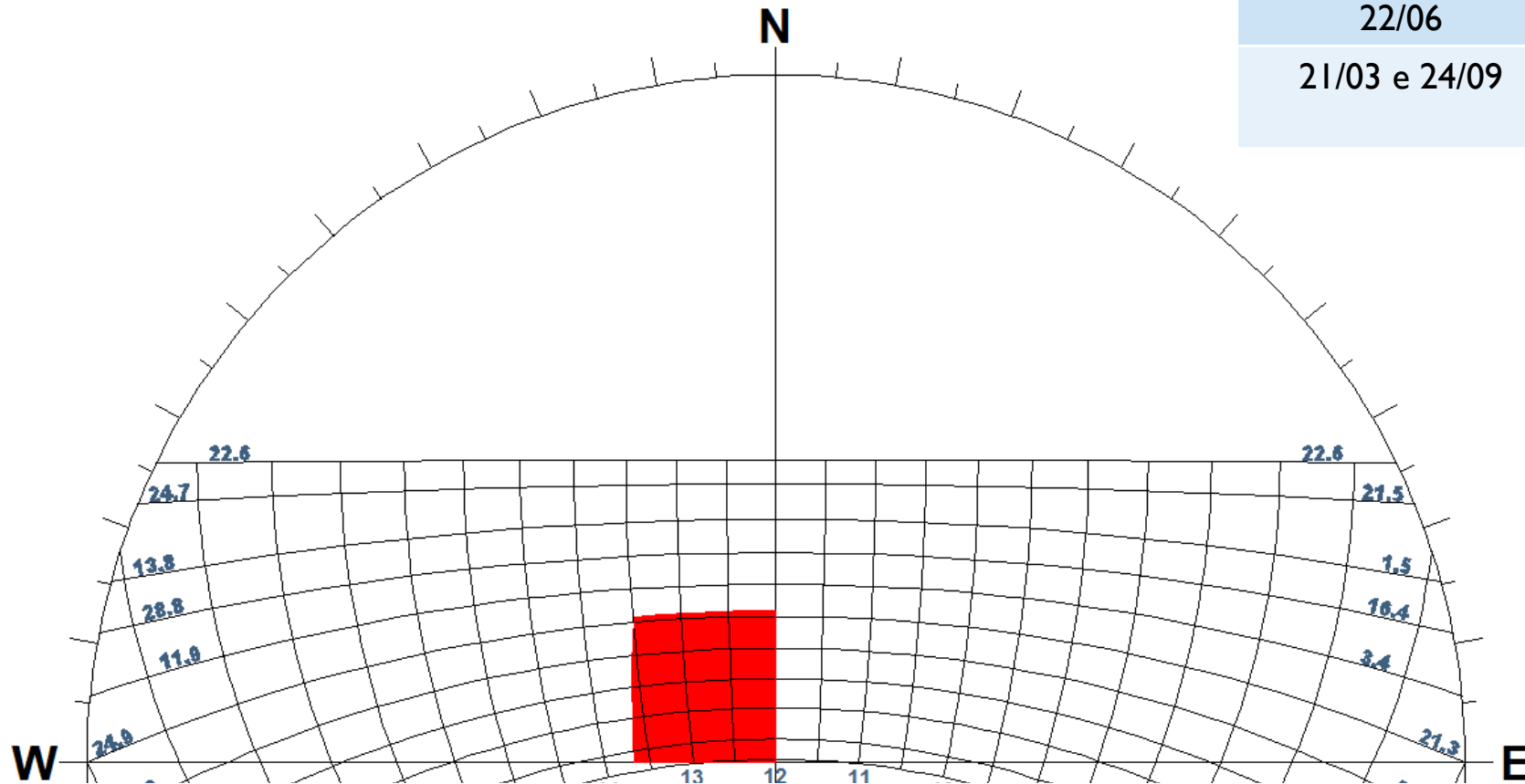
$$\alpha = 65^\circ$$
$$\gamma_e = 67^\circ$$

Proteção Solar de Eixo Horizontal Finita - Máscara

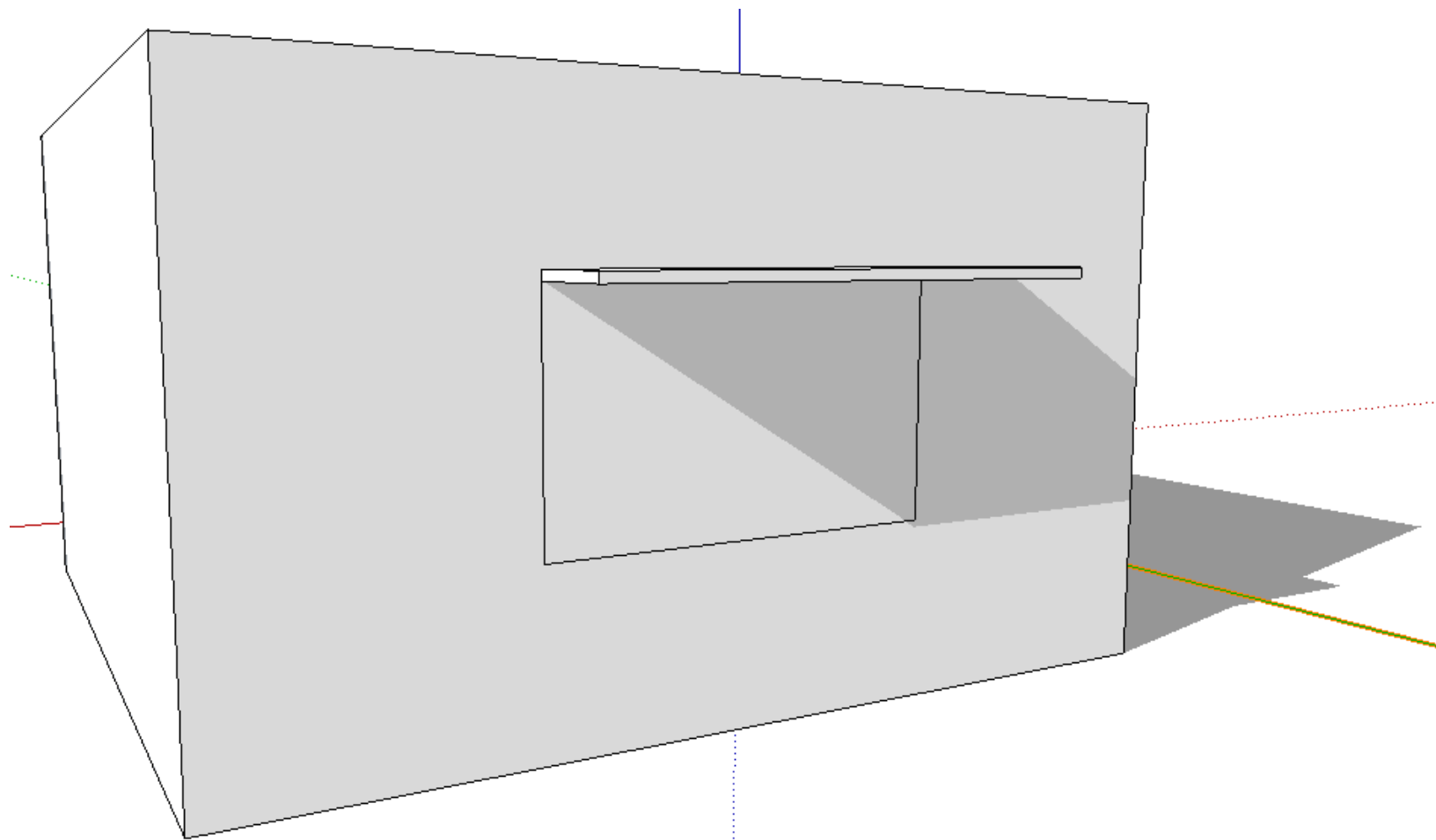


Proteção Solar de Eixo Horizontal Finita - Horários

Data	Período Insolação
22/06	6h45 – 17h15 (parcial)
21/03 e 24/09	6h – 12h e 13h30 – 18h (parcial)

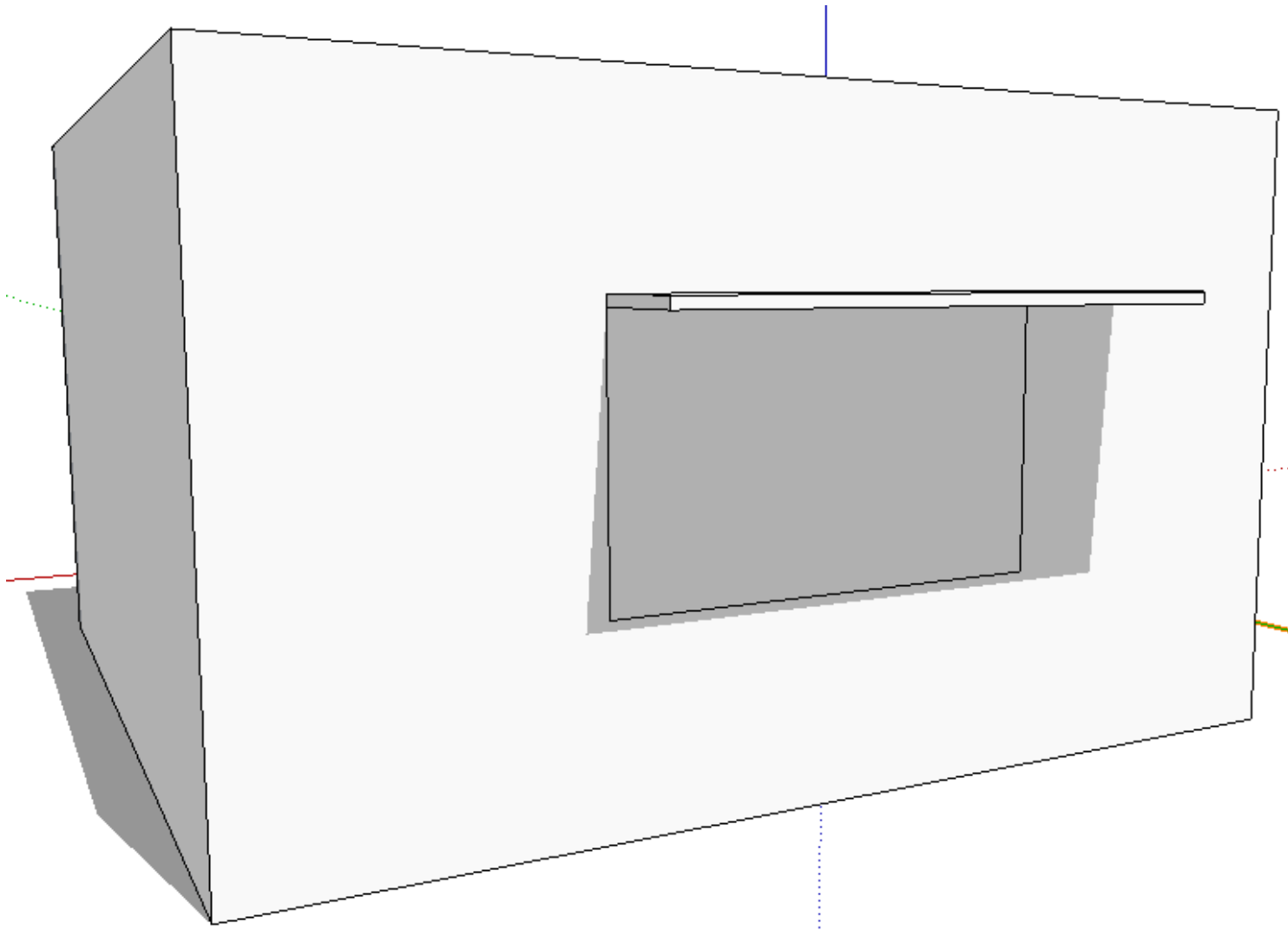


Proteção Solar de Eixo Horizontal Finita - Maquete



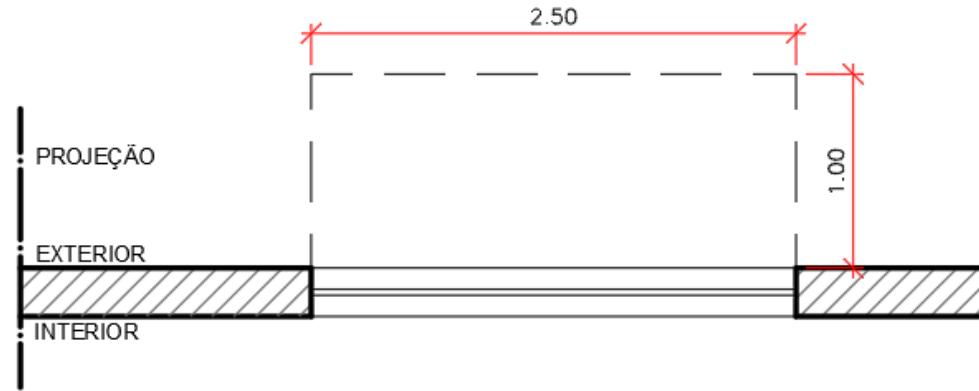
22/06 às 8h30

Proteção Solar de Eixo Horizontal Finita - Maquete

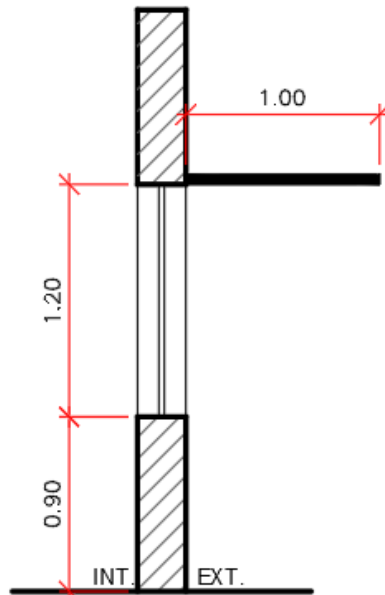


21/03 às 12h30

Proteção Solar de Eixo Horizontal Finita



PLANTA

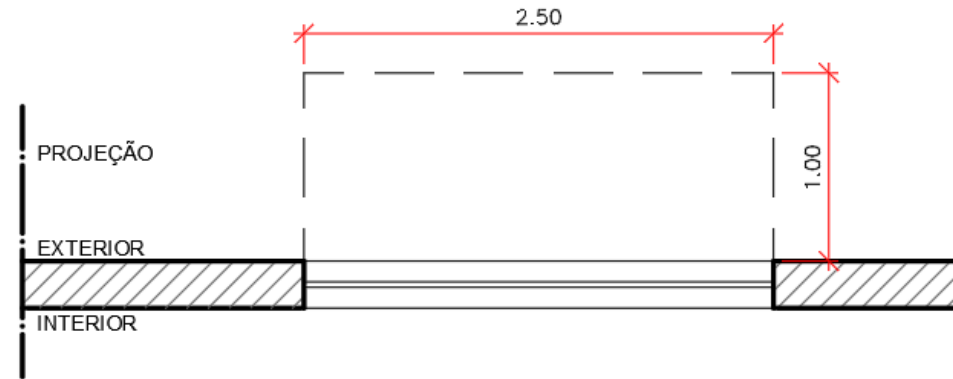


CORTE

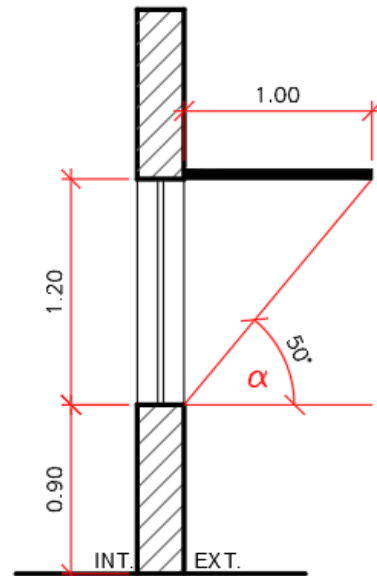


ELEVAÇÃO

Proteção Solar de Eixo Horizontal Finita



PLANTA

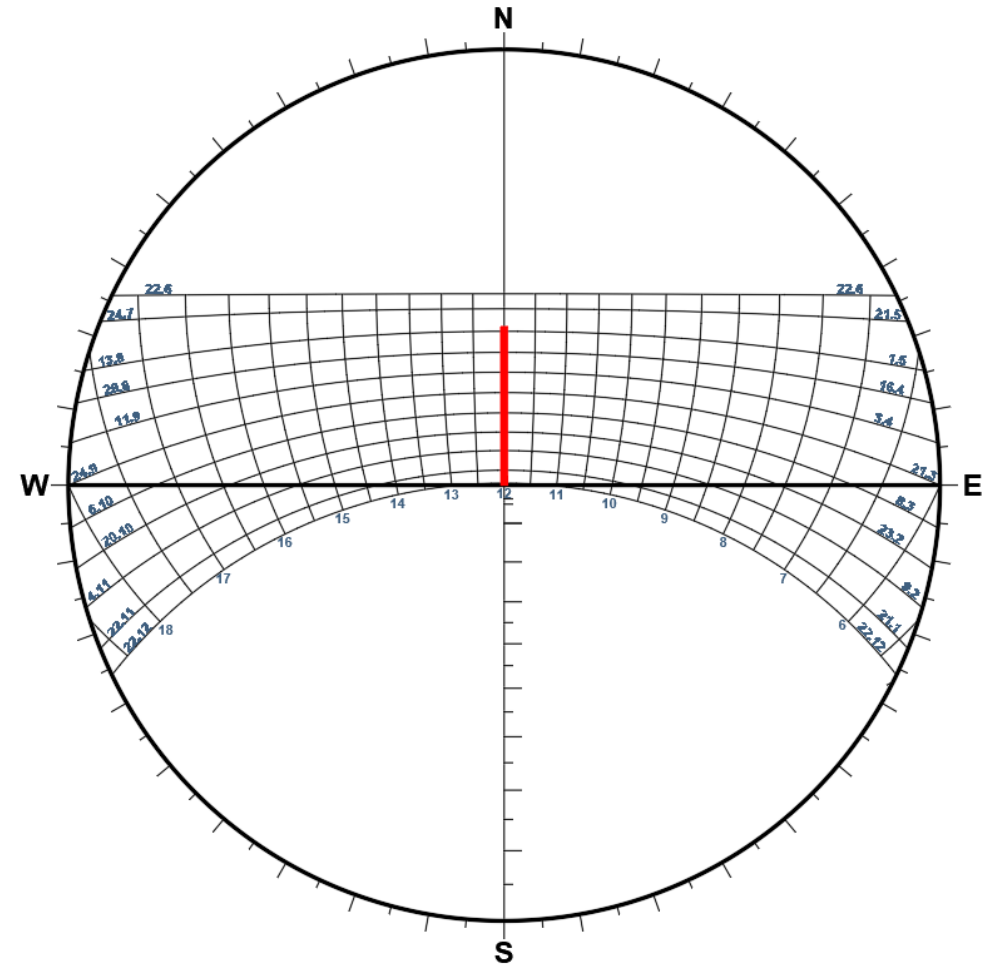
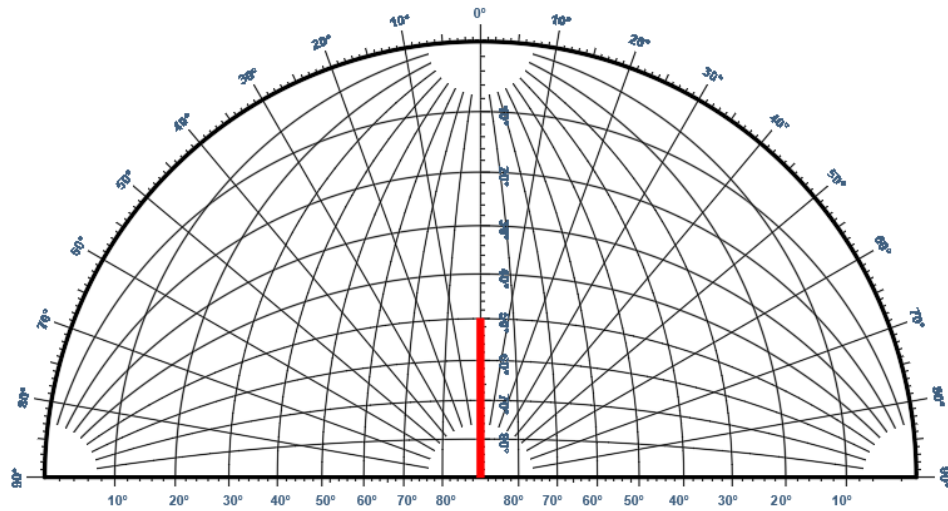


CORTE



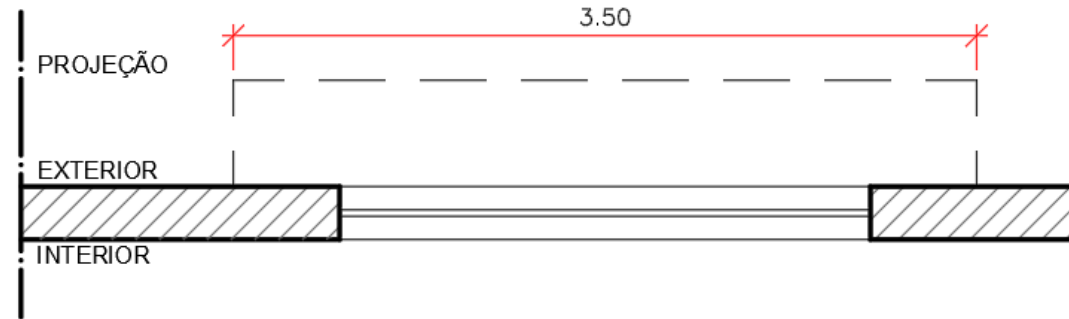
ELEVAÇÃO

Proteção Solar de Eixo Horizontal Finita

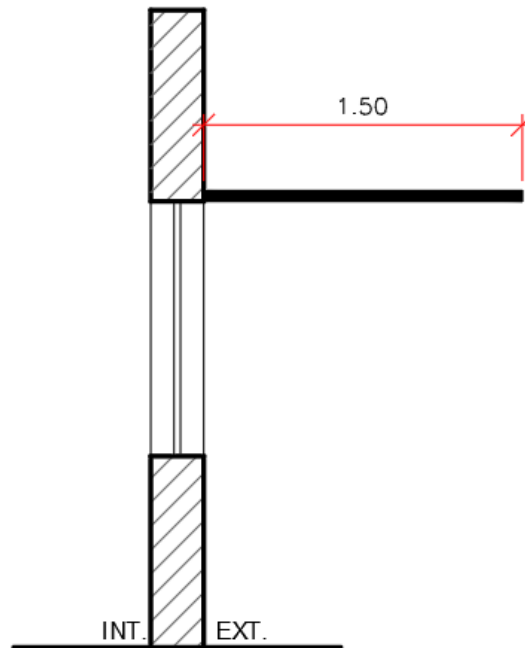


EXERCÍCIO 2

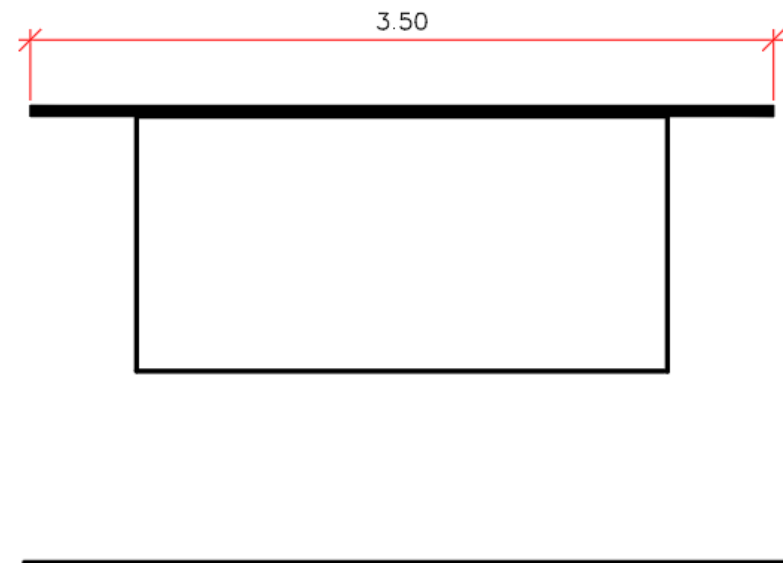
Proteção Solar de Eixo Horizontal Finita



PLANTA

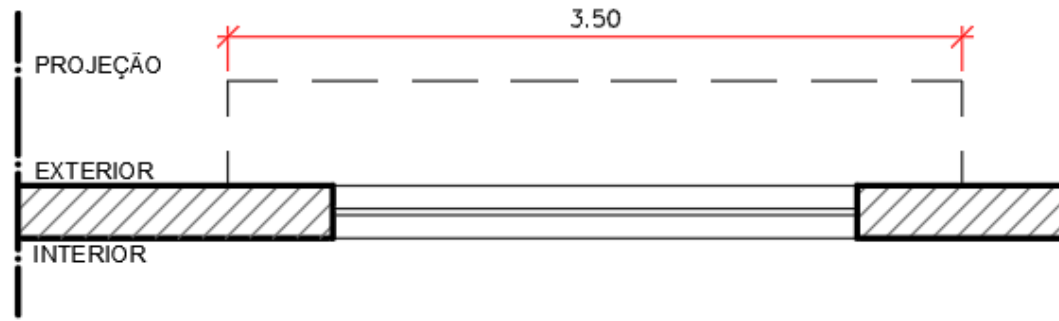


CORTE

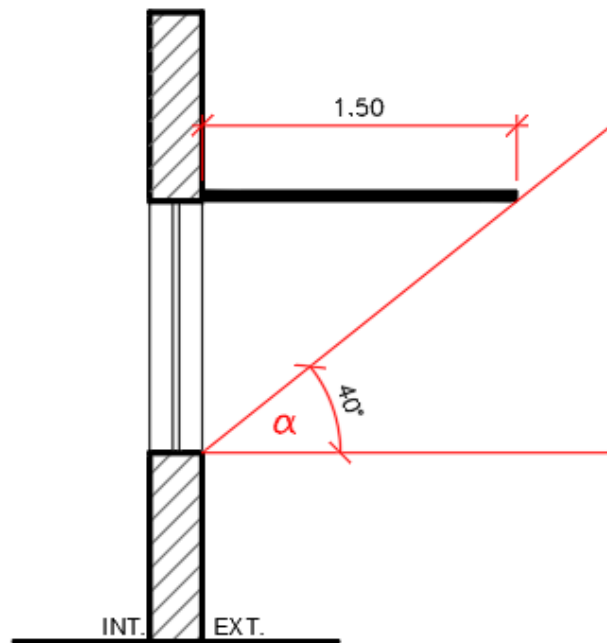


ELEVAÇÃO

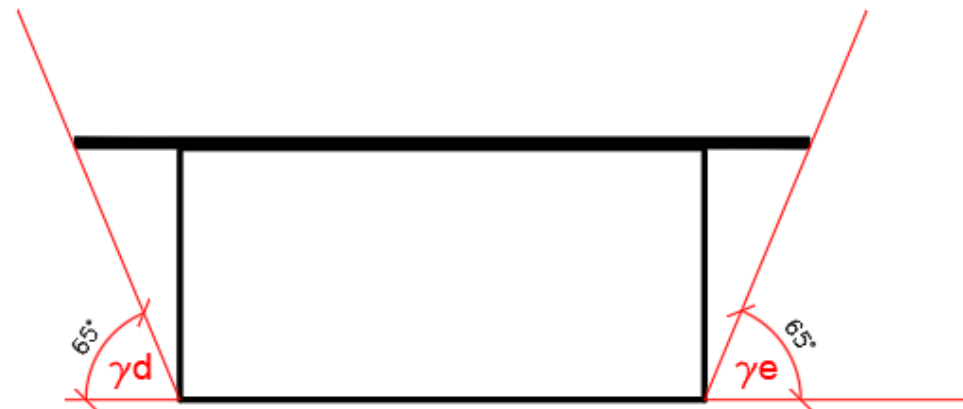
Proteção Solar de Eixo Horizontal Finita



PLANTA

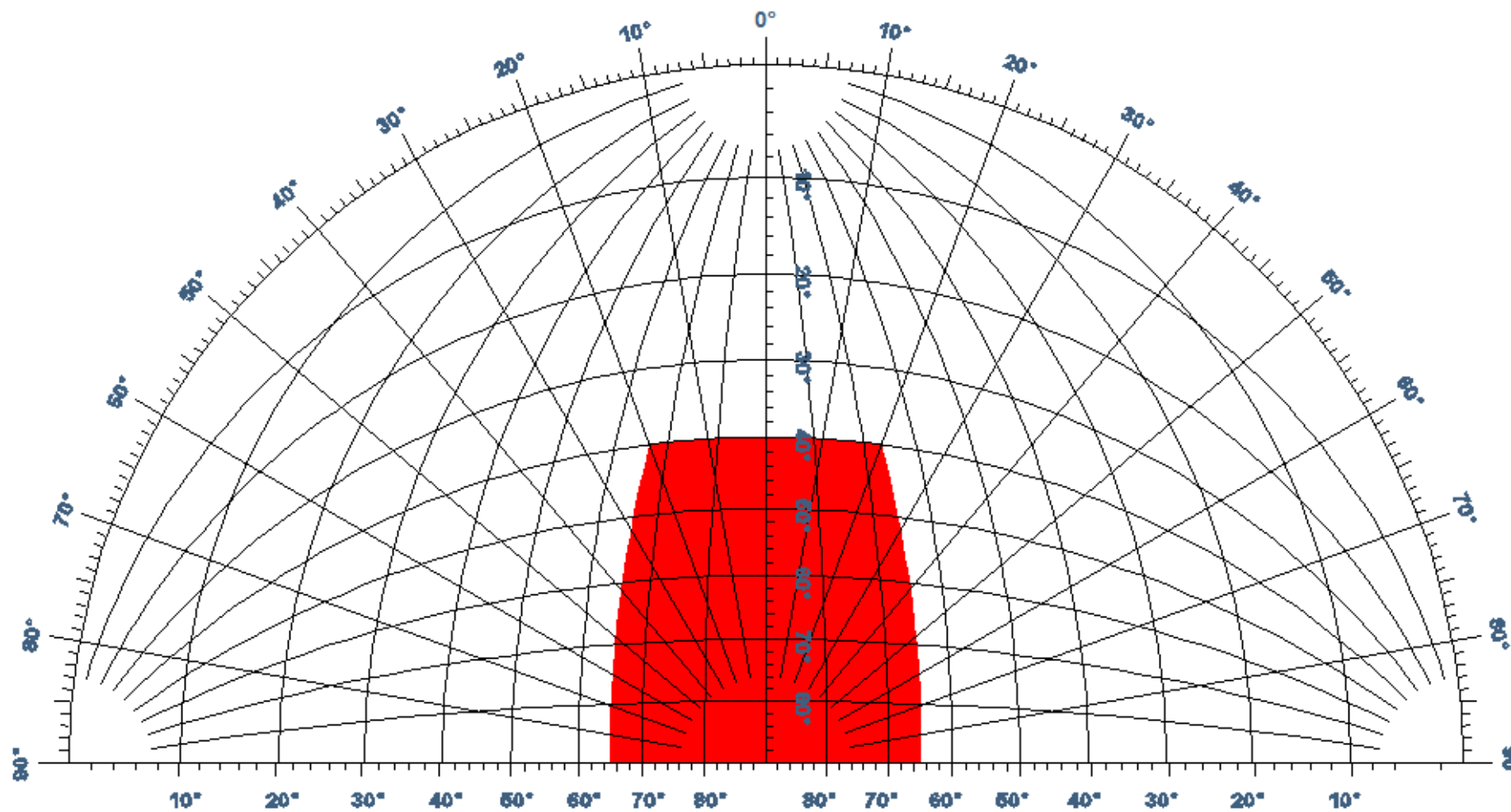


CORTE



ELEVAÇÃO

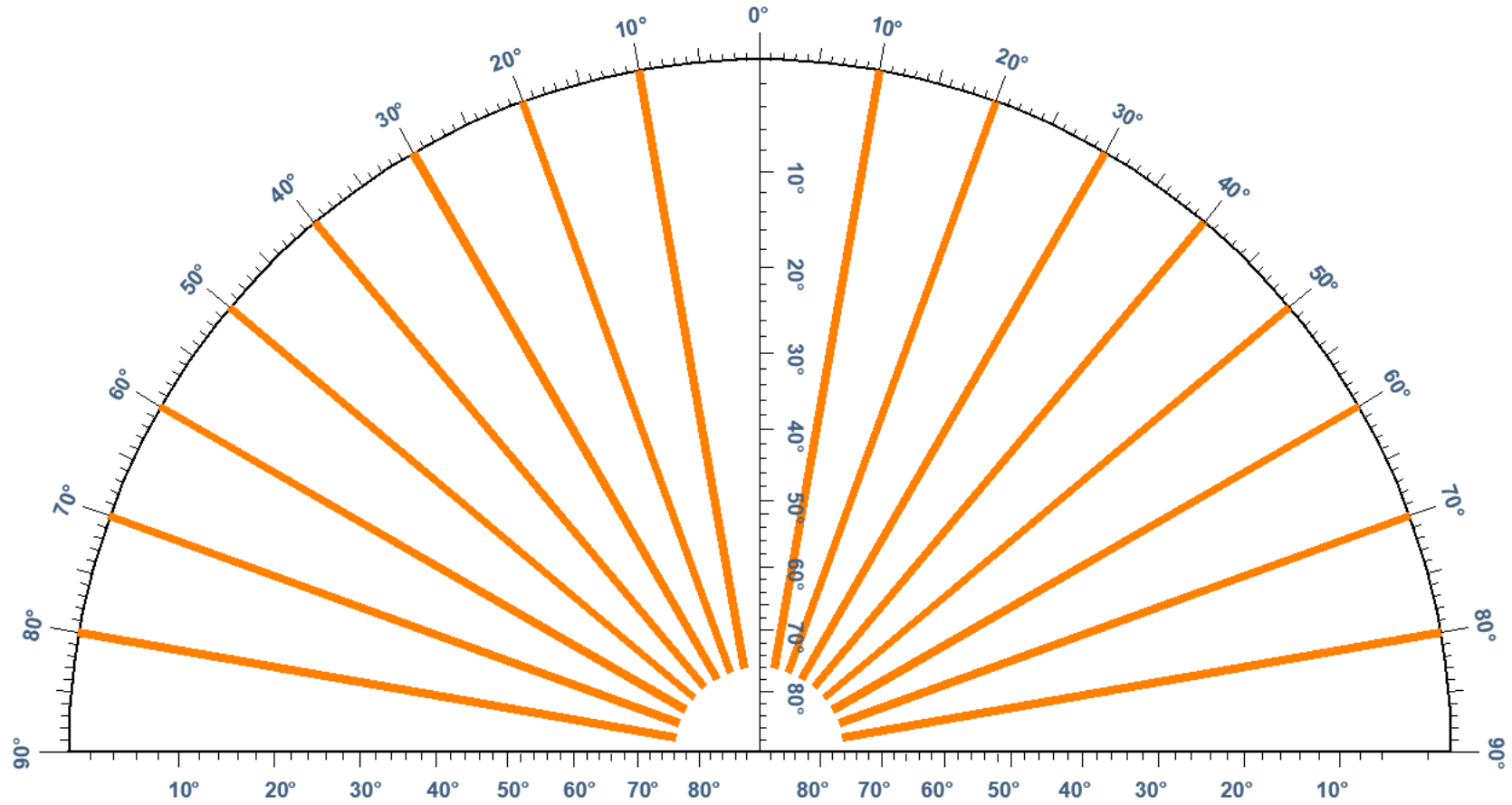
Proteção Solar de Eixo Horizontal Finita



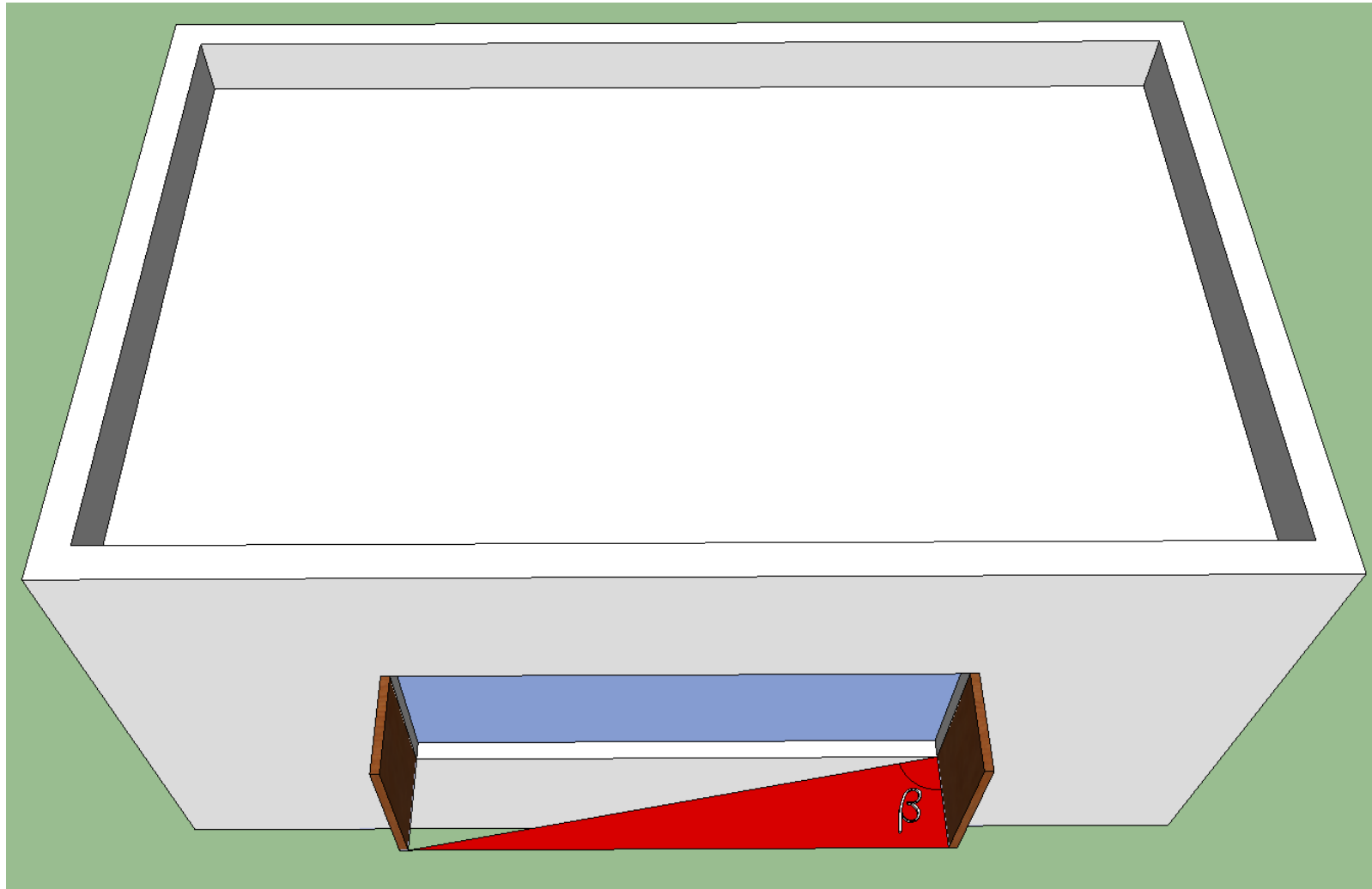
Proteção Solar de Eixo Vertical

Ângulo β

GRÁFICO AUXILIAR PARA O TRAÇADO DE MÁSCARAS

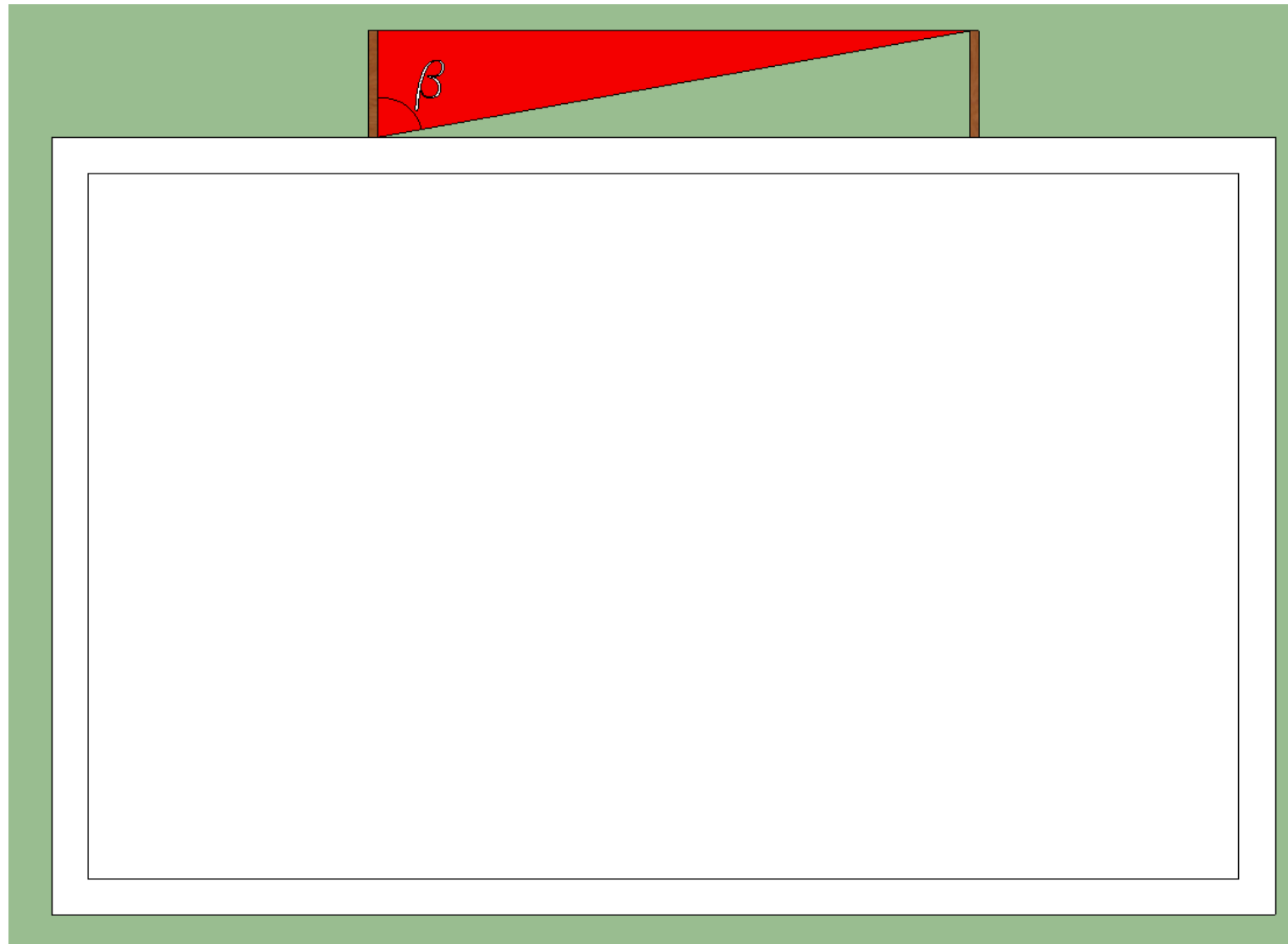


Dimensionamento de Proteções Solares: β



O ângulo beta é obtido por meio da planta.

Dimensionamento de Proteções Solares: β



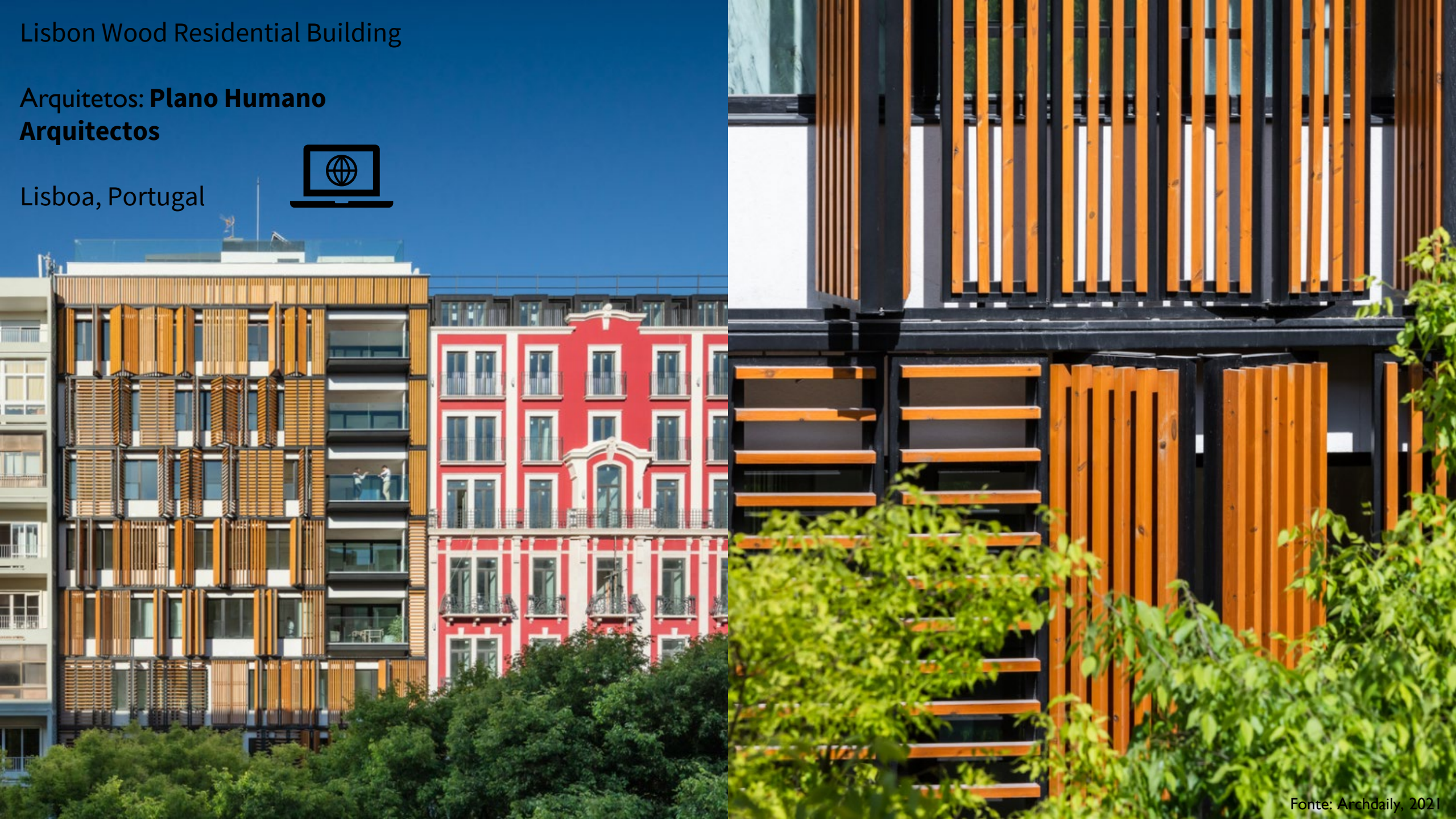
Ângulo Beta:
Largura do brise

O ângulo beta é obtido por meio da planta.

Lisbon Wood Residential Building

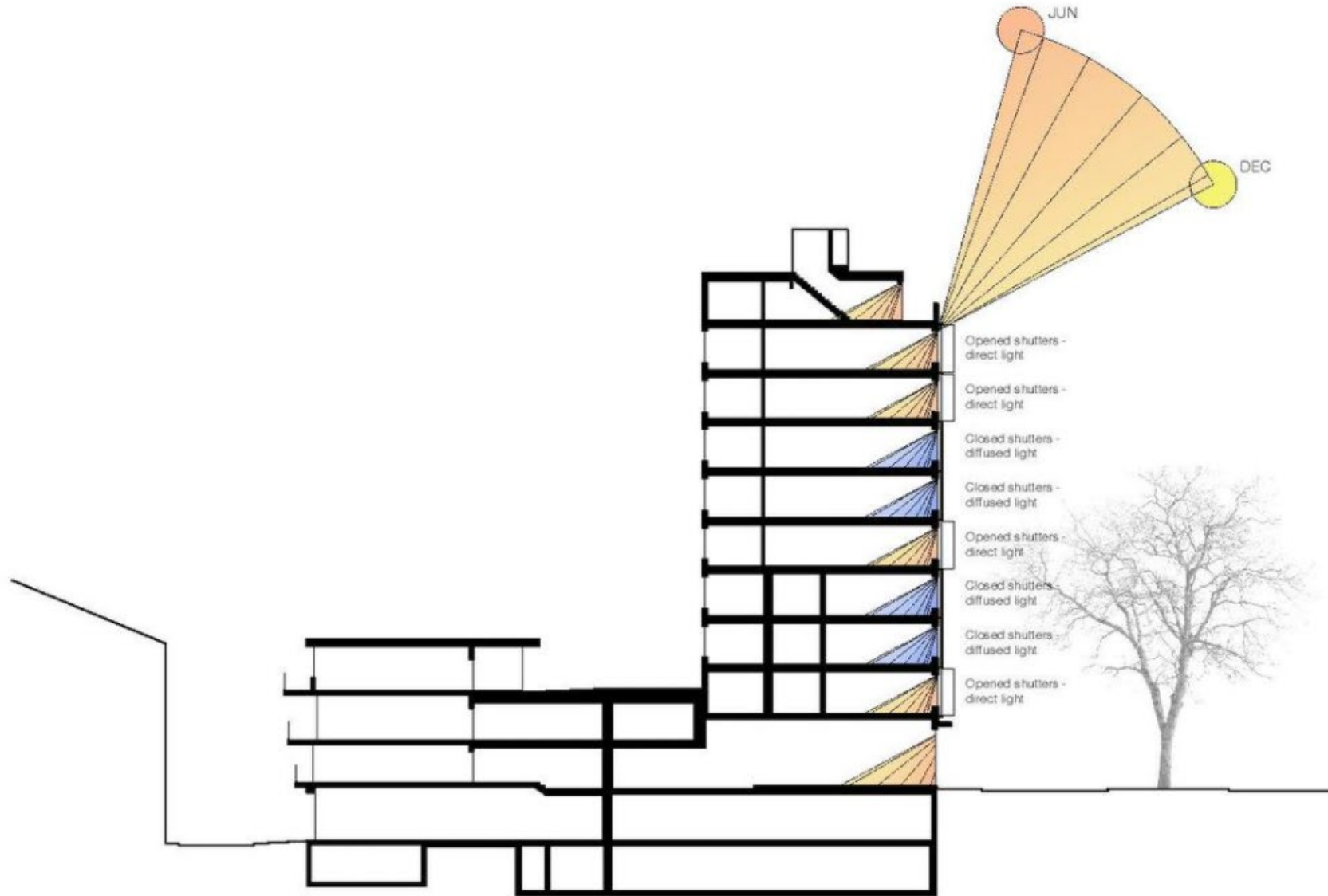
Arquitetos: **Plano Humano**
Arquitectos

Lisboa, Portugal









Sede Sebrae

Arquitetos: **gruposp +
Luciano Margotto**

Brasília, Brasil

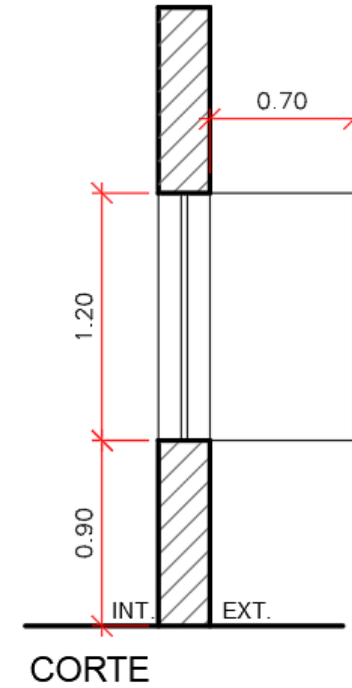
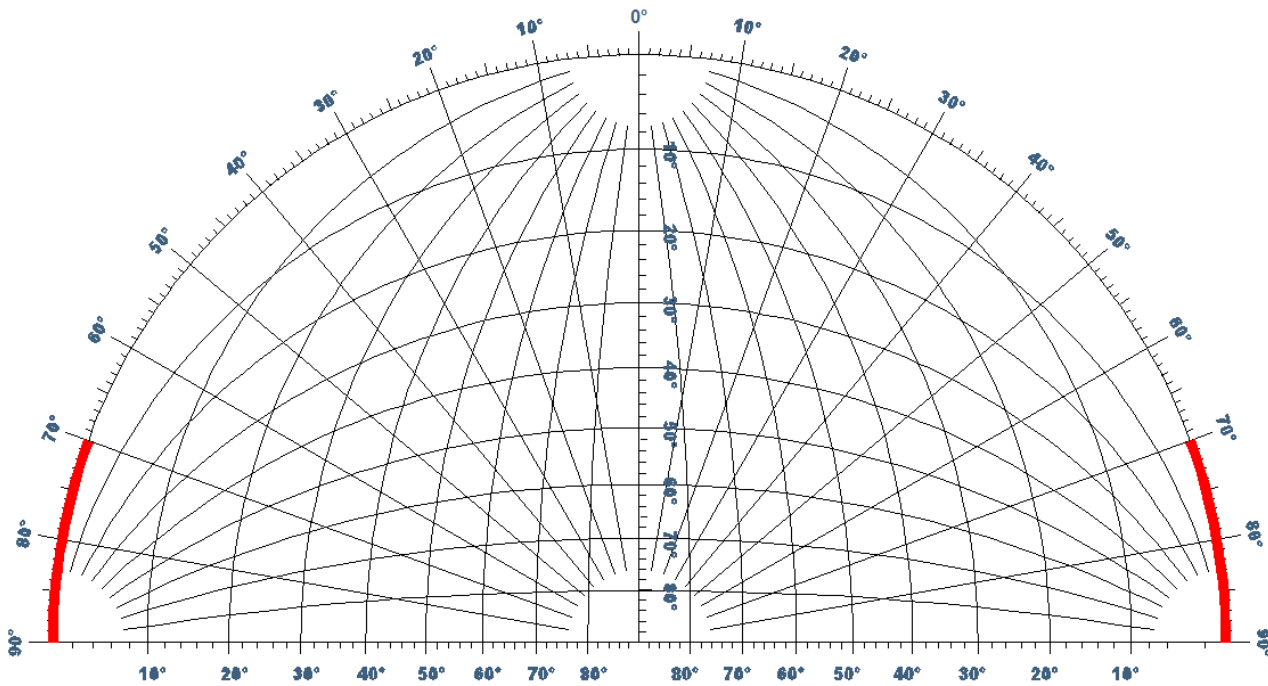
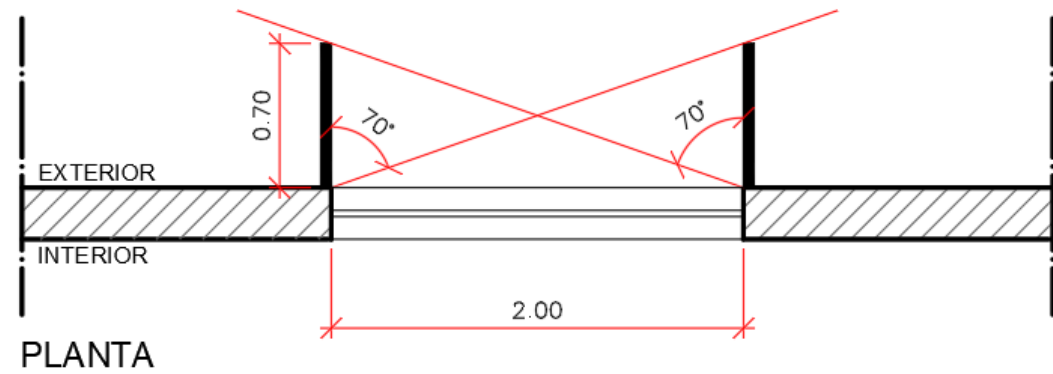






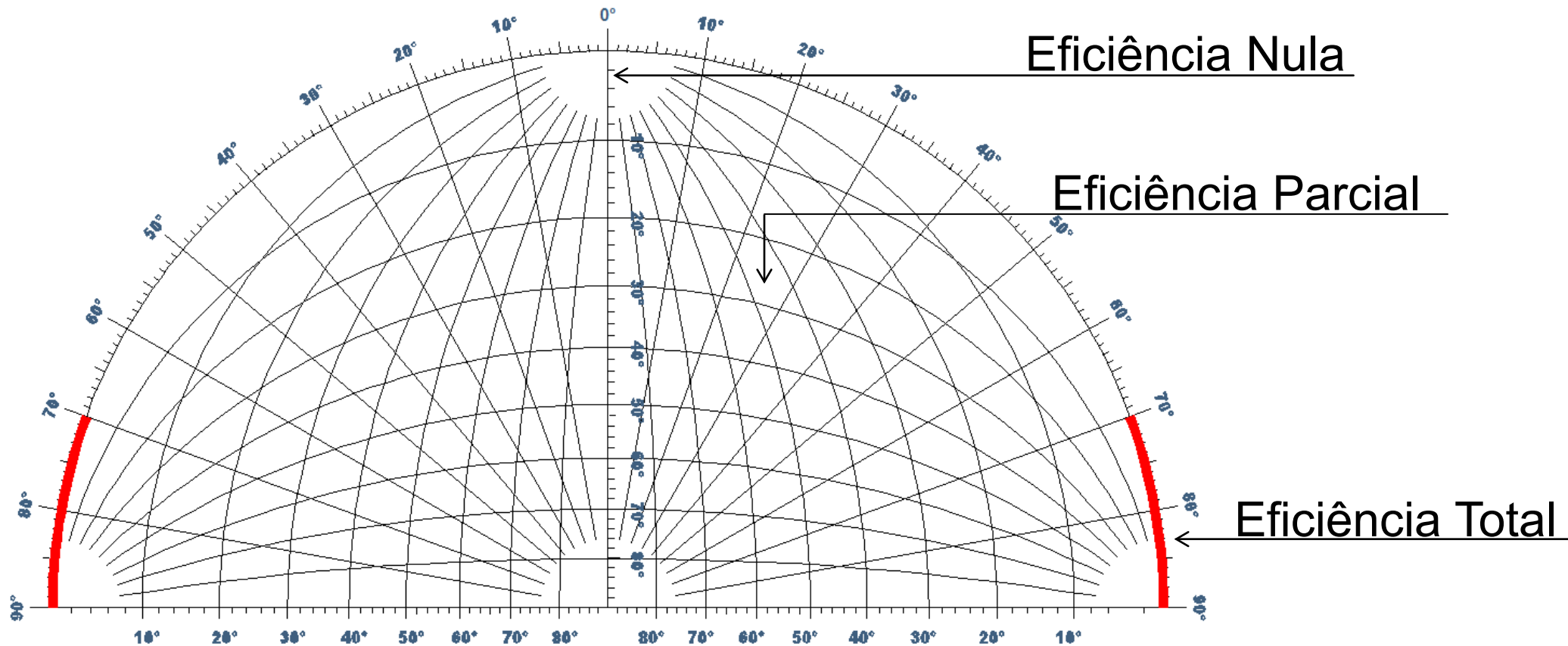


Proteção Solar de Eixo Vertical



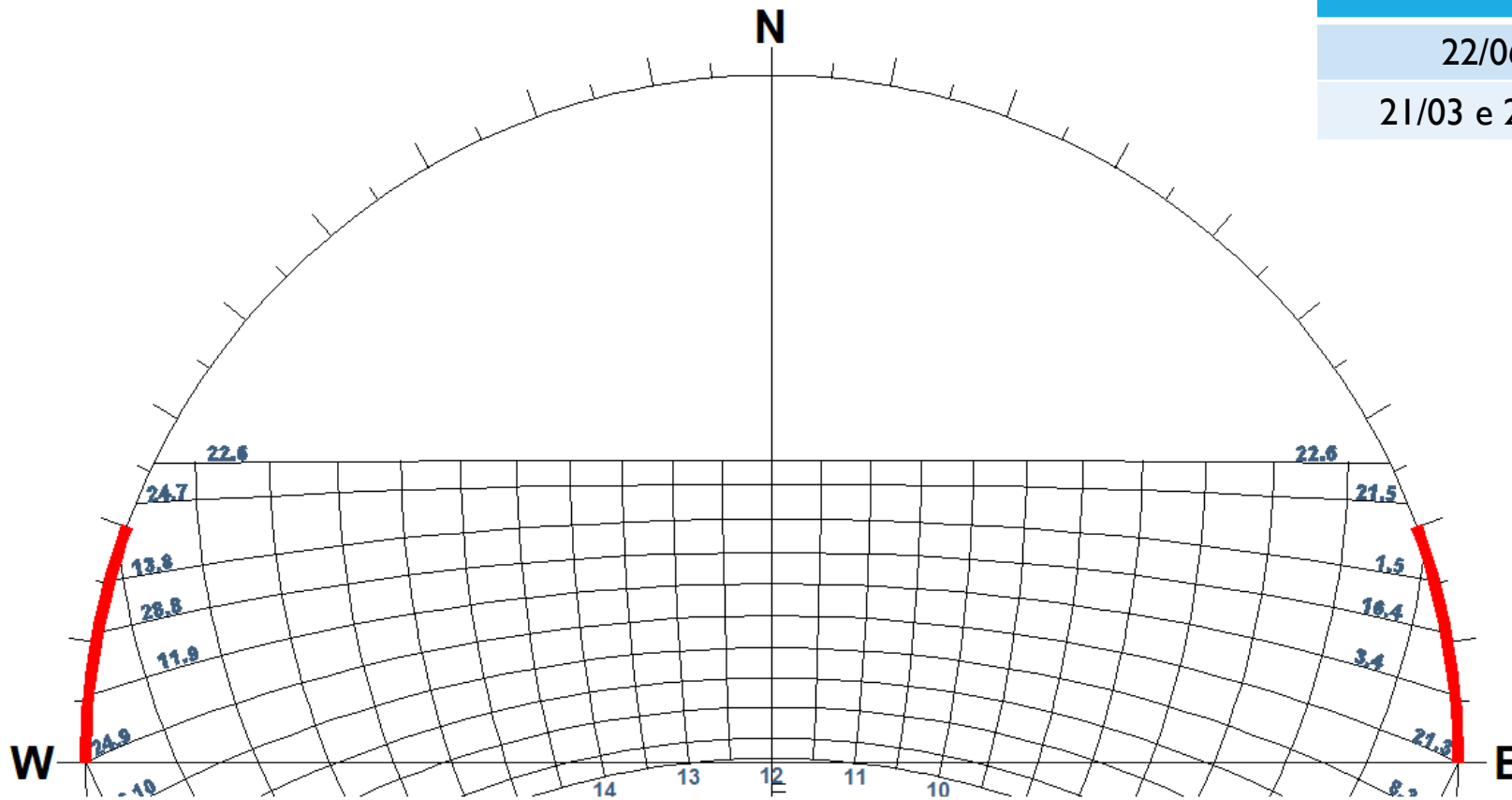
$$\beta_{d=e} = 70^\circ$$

Proteção Solar de Eixo Vertical - Máscara

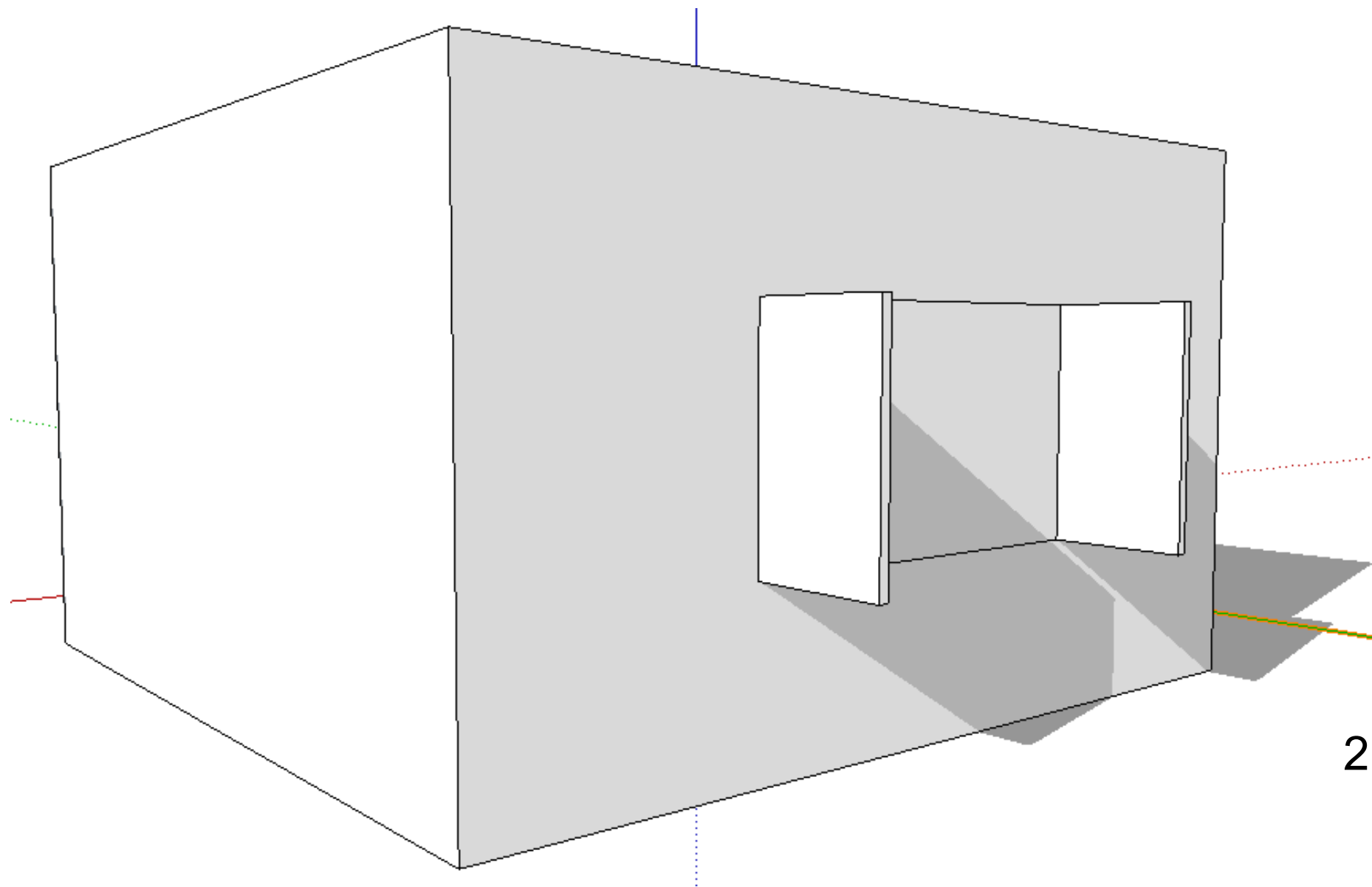


Proteção Solar de Eixo Vertical - Horários

Data	Período Insolação
22/06	6h45 – 17h15
21/03 e 24/09	Nascer e Pôr do Sol

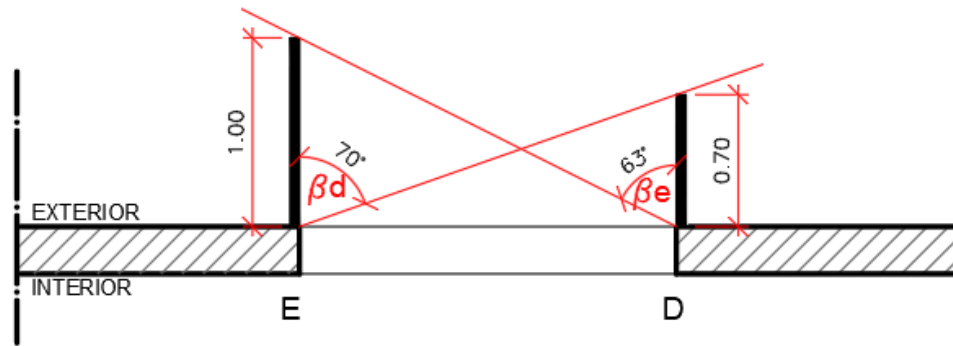


Proteção Solar de Eixo Vertical - Maquete

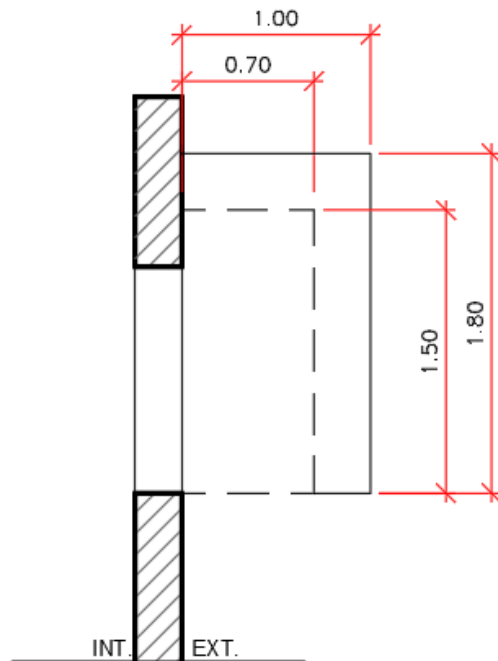


21/03 às 8h30

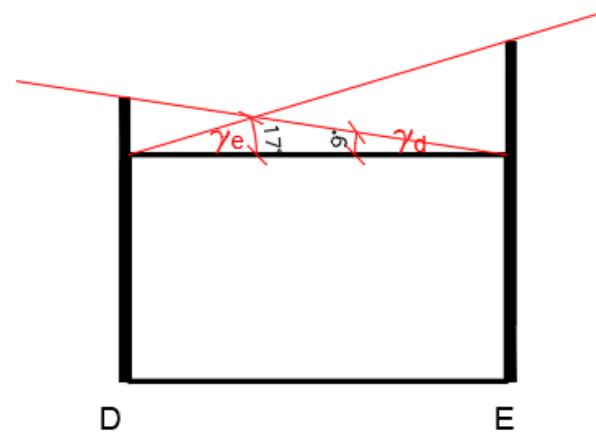
Proteção Solar de Eixo Vertical



PLANTA



CORTE



ELEVAÇÃO

$$\beta_d = 70^\circ$$

$$\beta_e = 63^\circ$$

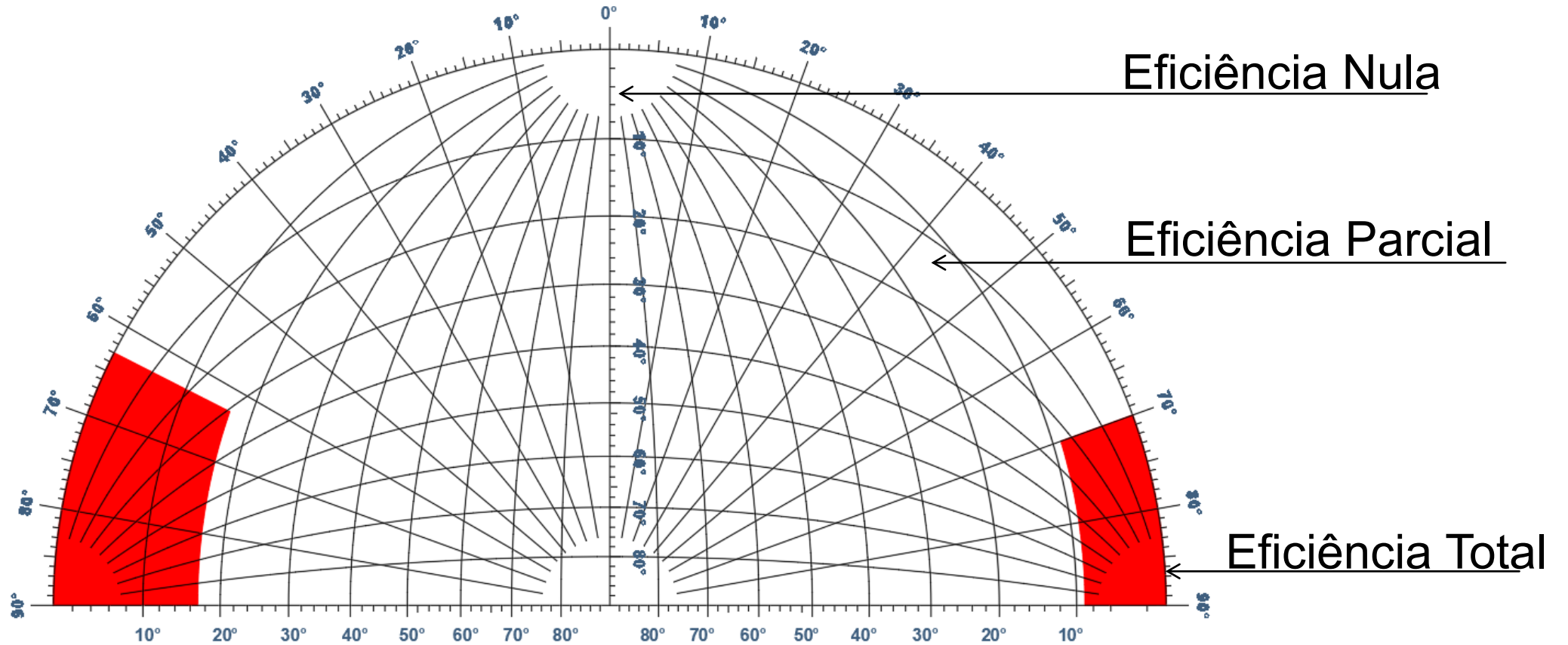
$$\gamma_d = 9^\circ$$

$$\gamma_e = 17^\circ$$

Proteção Solar de Eixo Vertical - Máscara

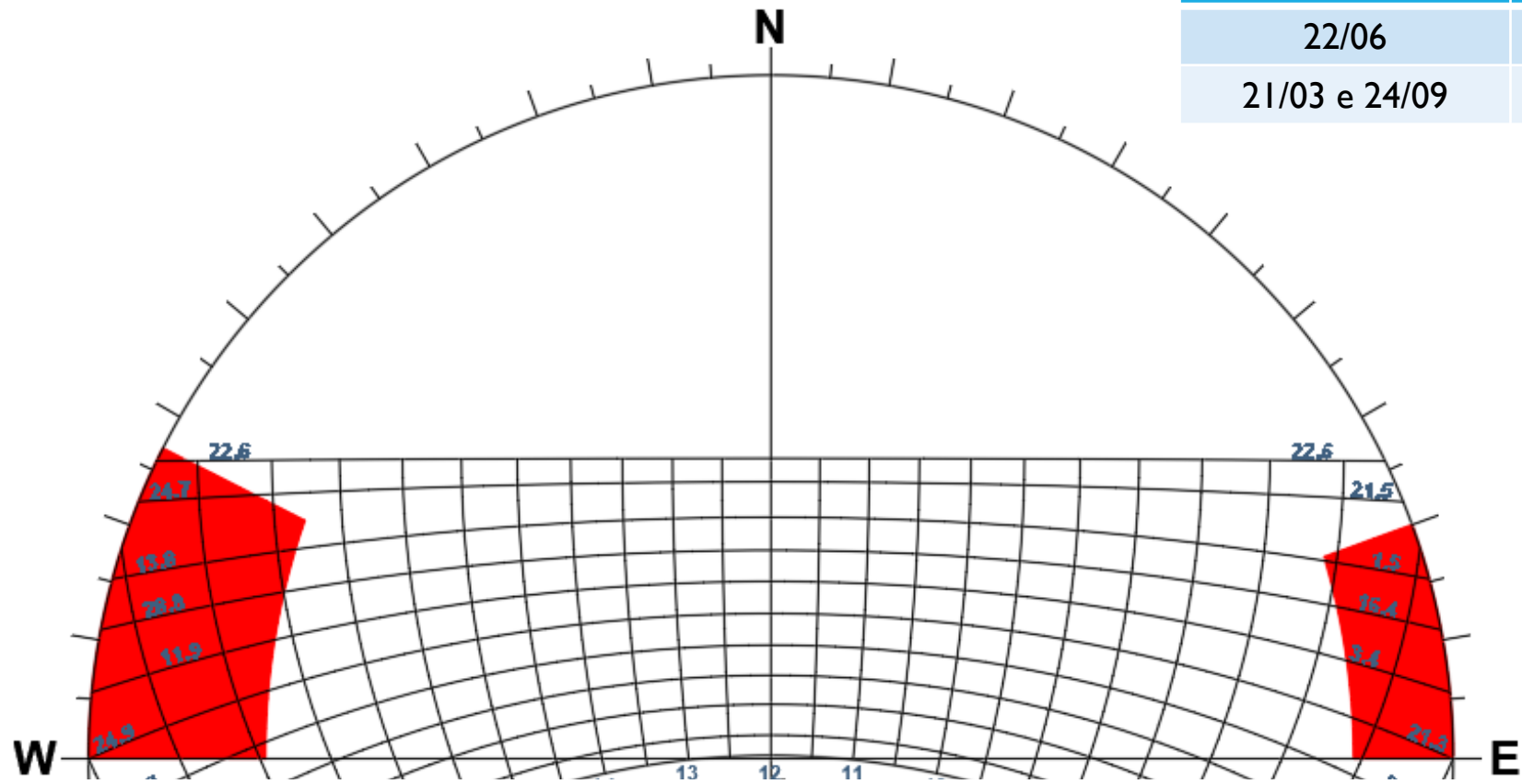
$$\beta_d = 70^\circ$$
$$\beta_e = 63^\circ$$

$$\gamma_d = 9^\circ$$
$$\gamma_e = 17^\circ$$

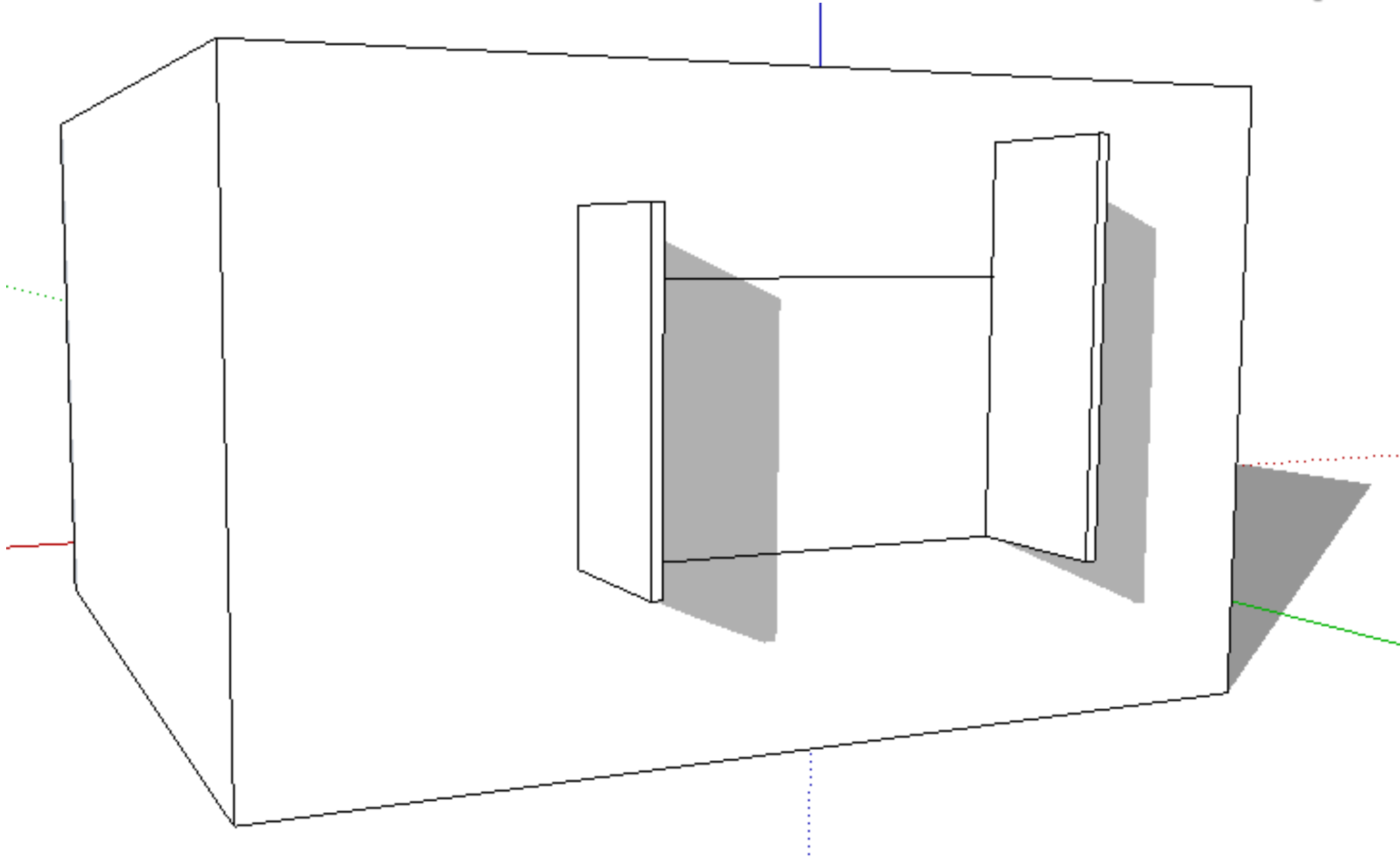


Proteção Solar de Eixo Vertical - Horários

Data	Proteção Parcial
22/06	6h45 – 16h45
21/03 e 24/09	7h15 – 17h15

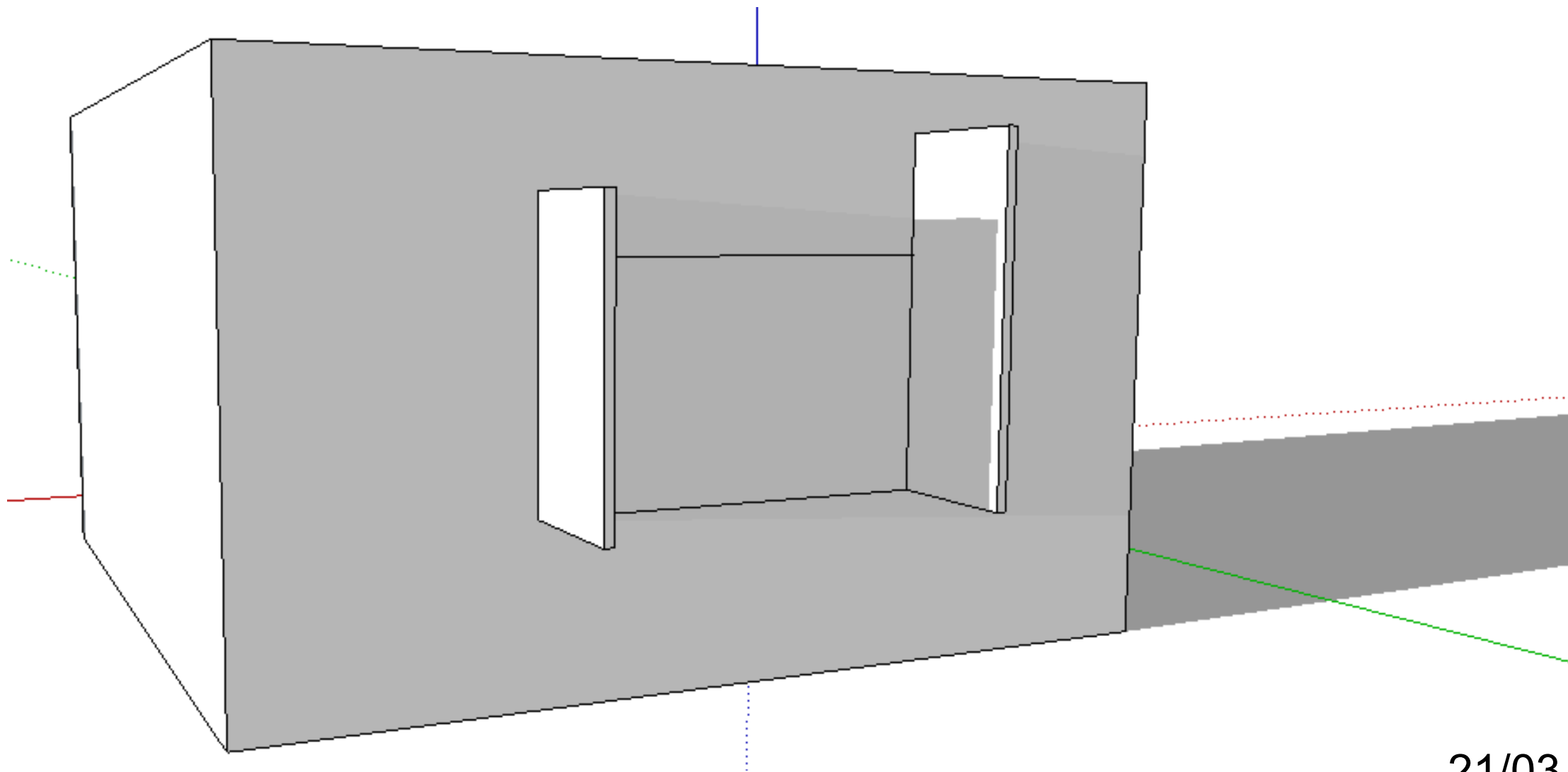


Proteção Solar de Eixo Vertical - Maquete



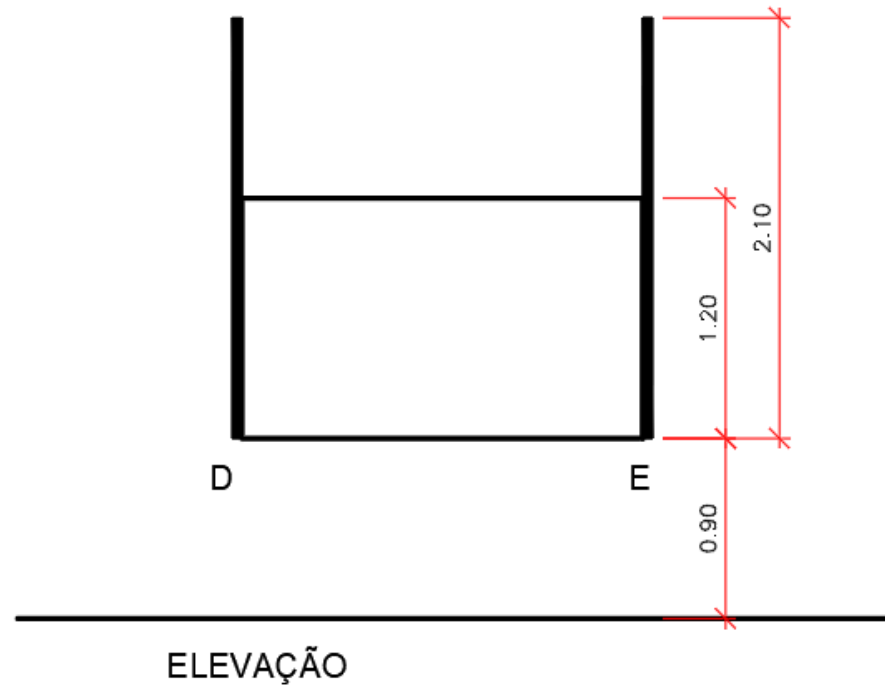
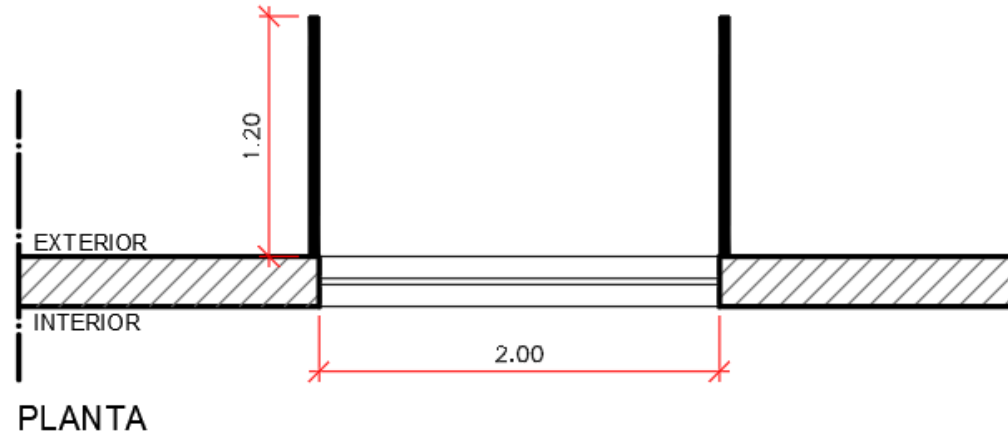
22/06 às 6h50

Proteção Solar de Eixo Vertical - Maquete

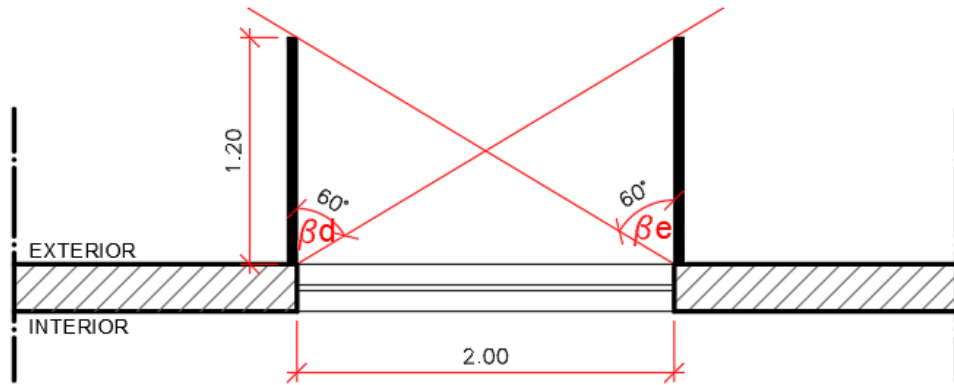


21/03 às 6h30

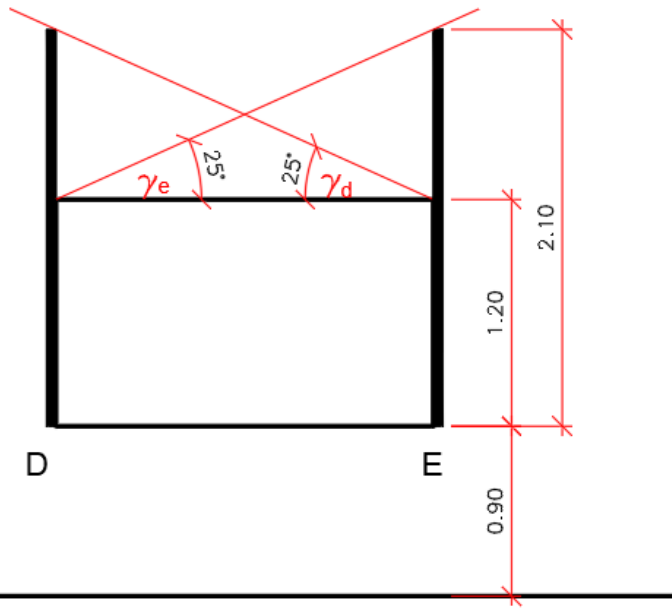
Proteção Solar de Eixo Vertical



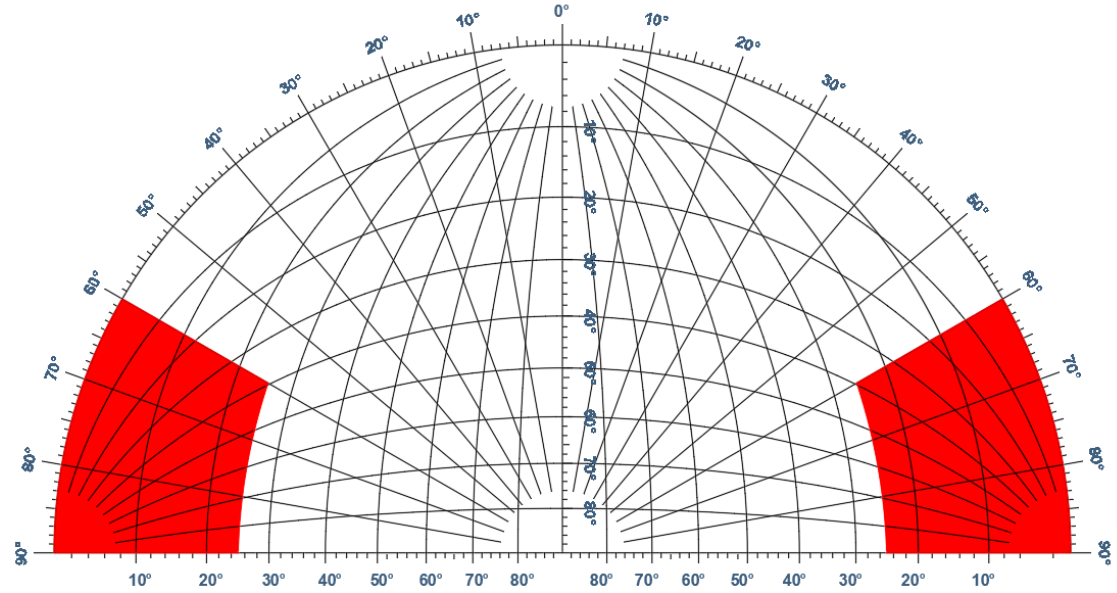
Proteção Solar de Eixo Vertical



PLANTA

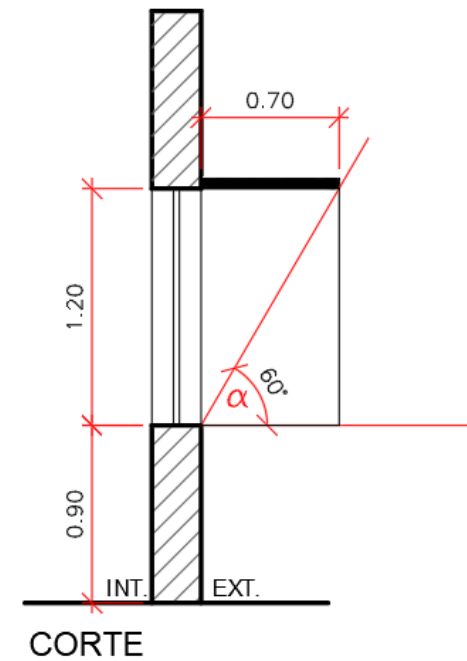
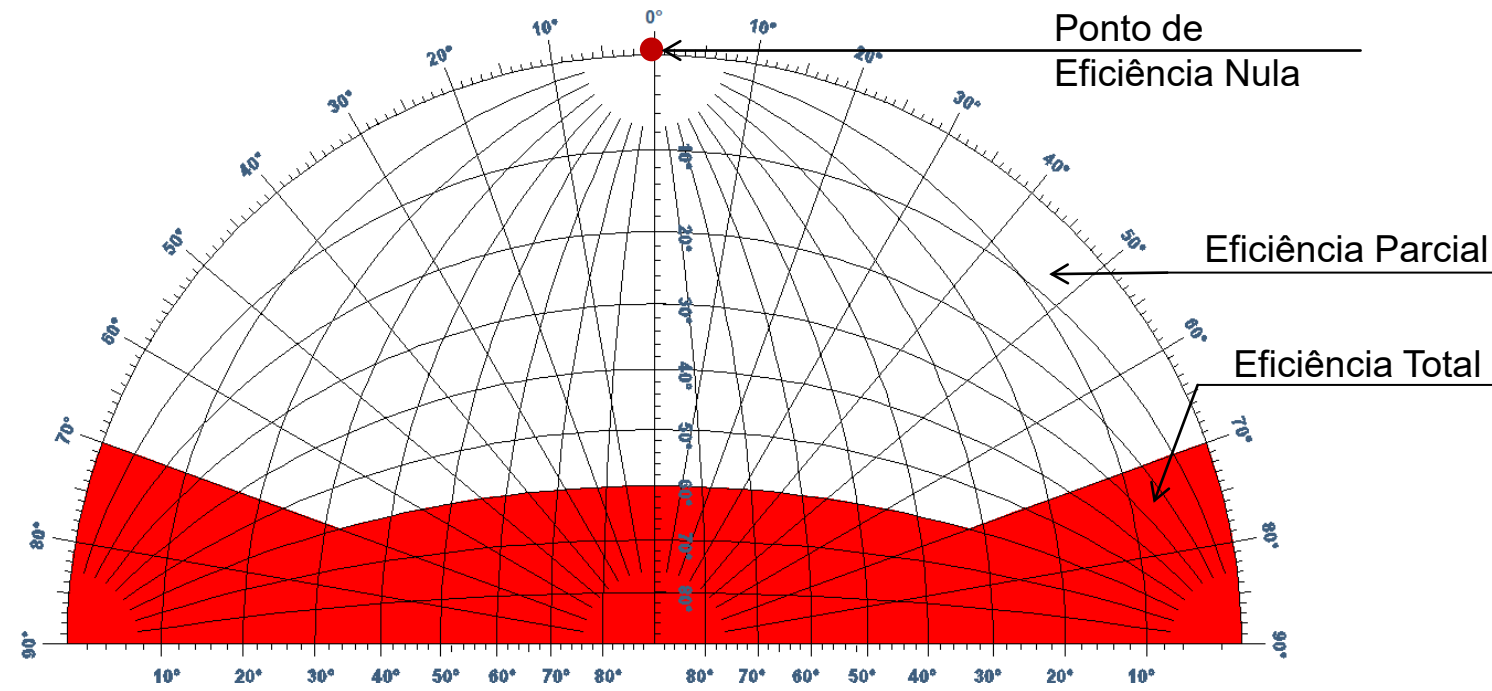
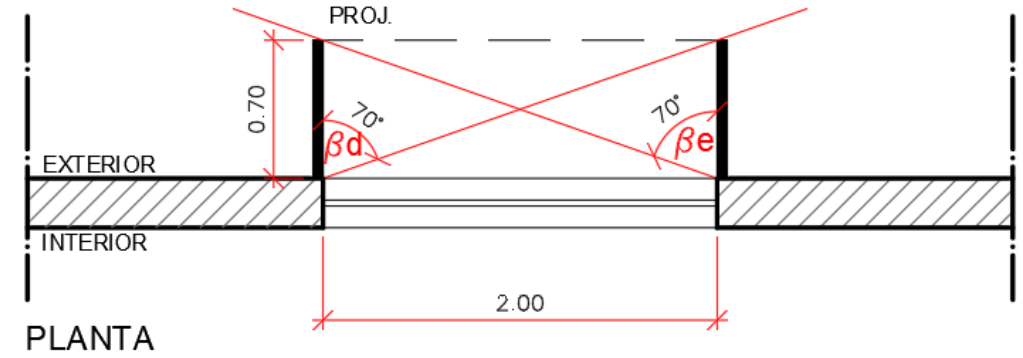


ELEVAÇÃO

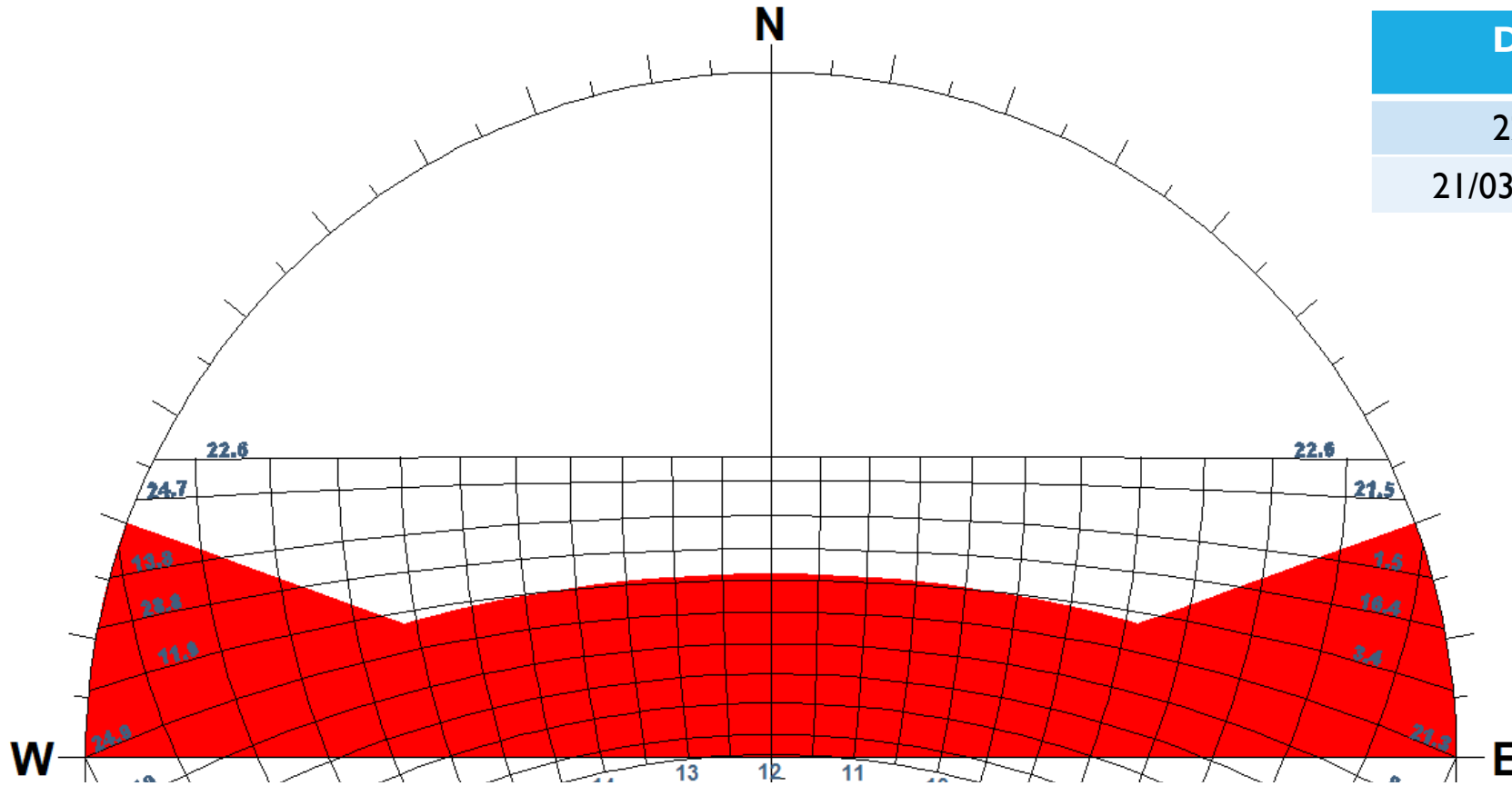


Proteção Solar de Eixos Horizontal e Vertical

Proteção Solar de Eixos Horizontal e Vertical

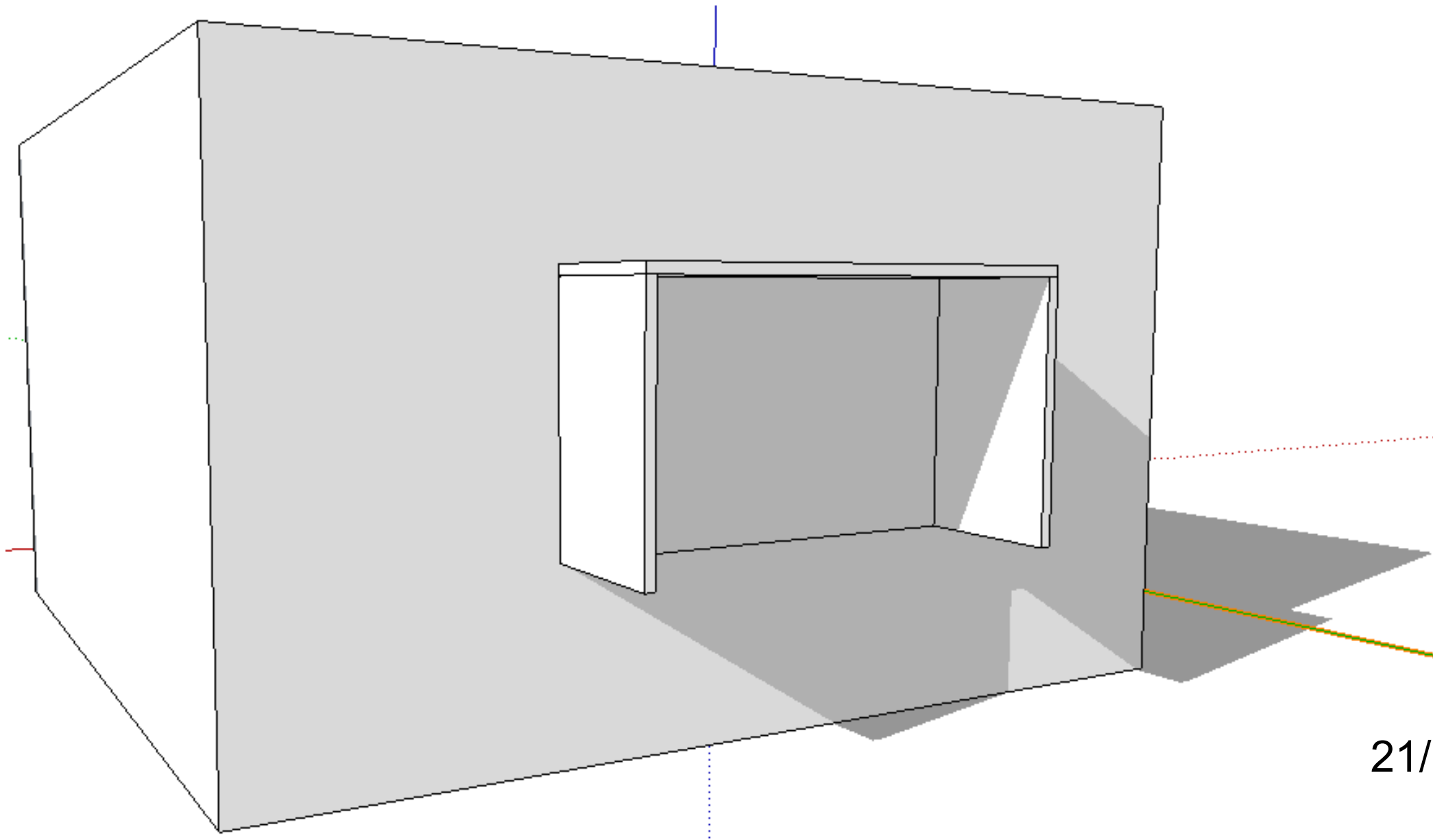


Proteção Solar de Eixos Horizontal e Vertical - Horários



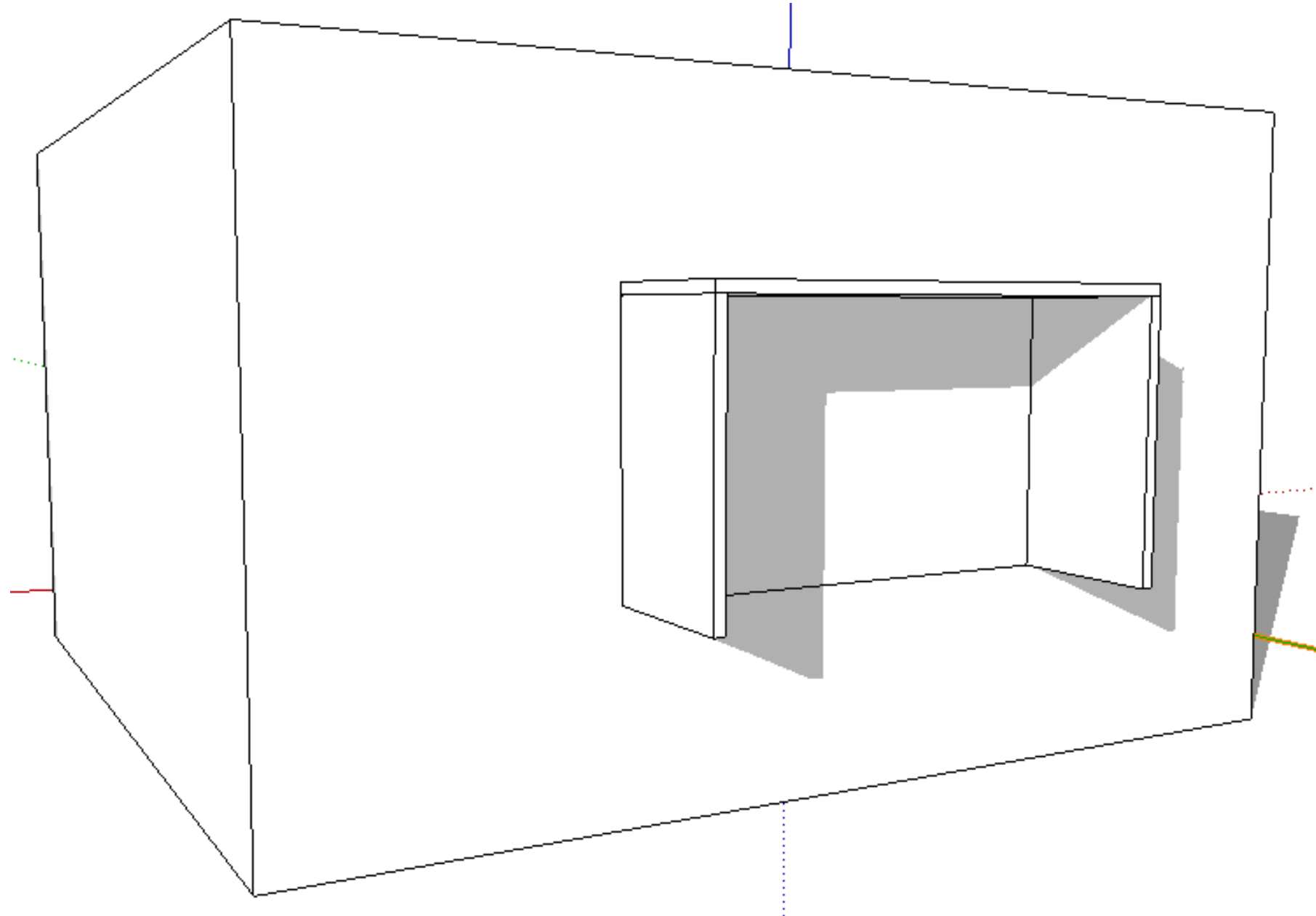
Data	Período Insolação
22/06	6h45 – 17h15 (parcial)
21/03 e 24/09	Não bate sol

Proteção Solar de Eixos Horizontal e Vertical - Maquete



21/03 às 8h30

Proteção Solar de Eixos Horizontal e Vertical - Maquete



22/06 às 8h30



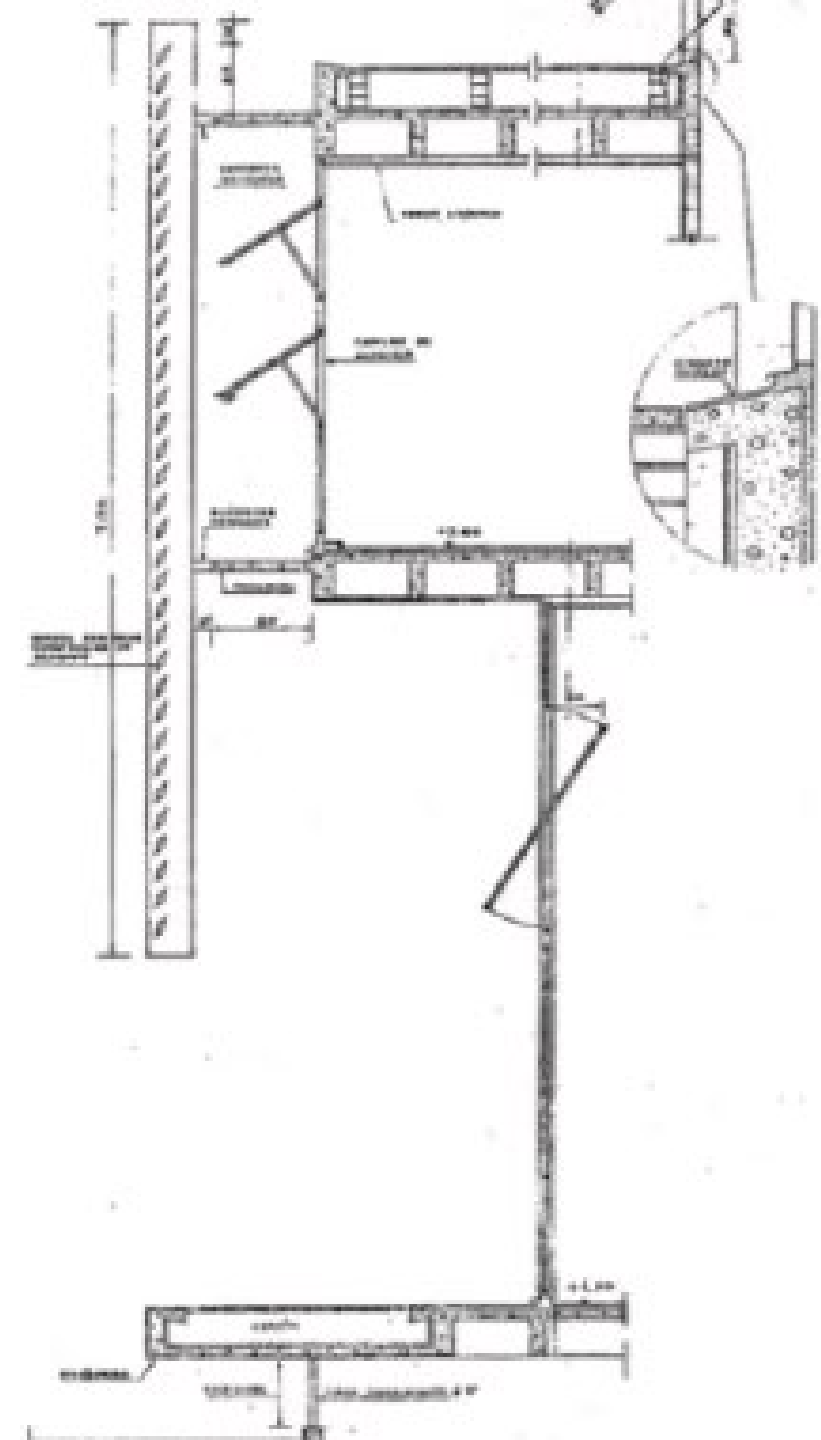
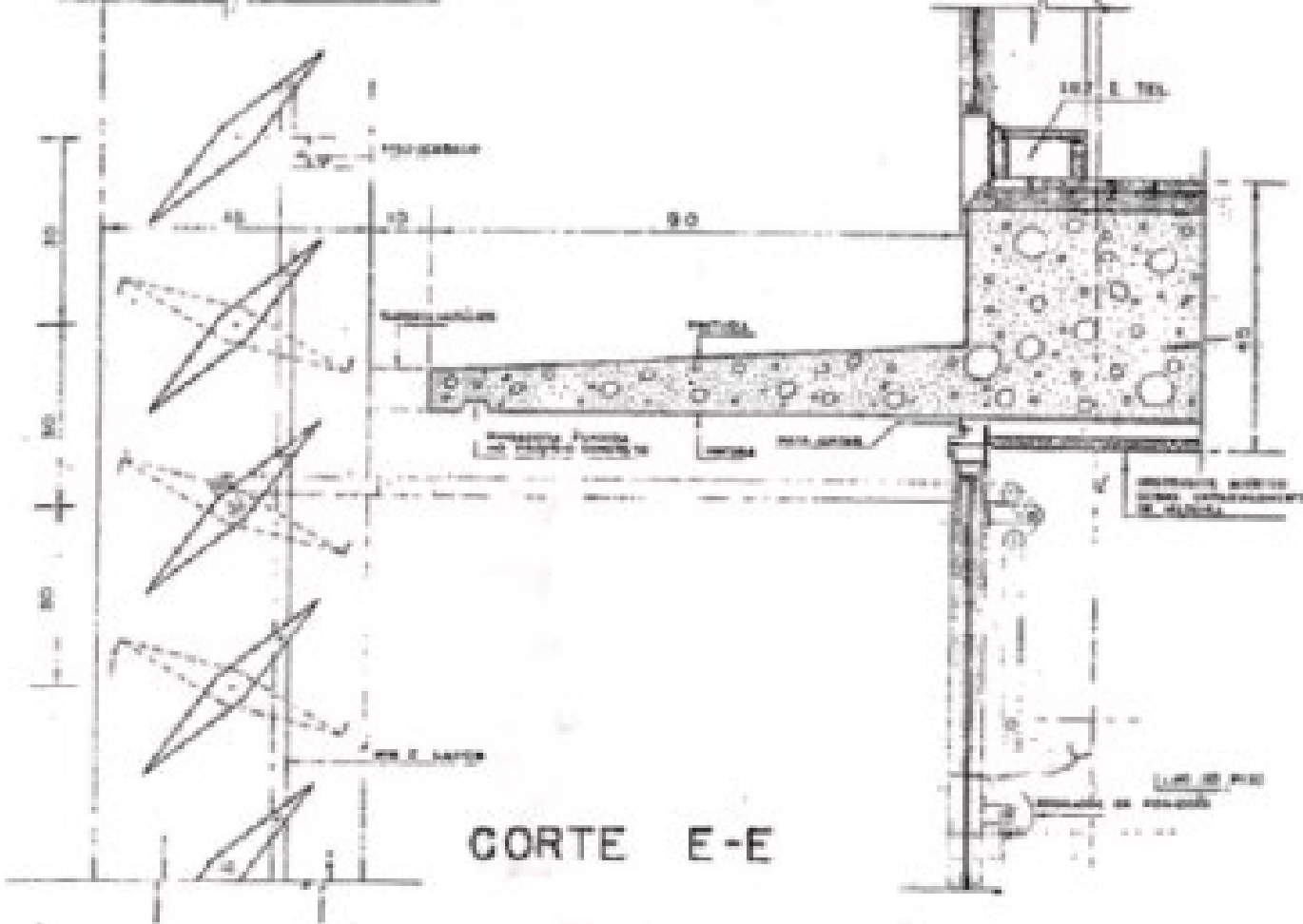
Banco Sul-Americano

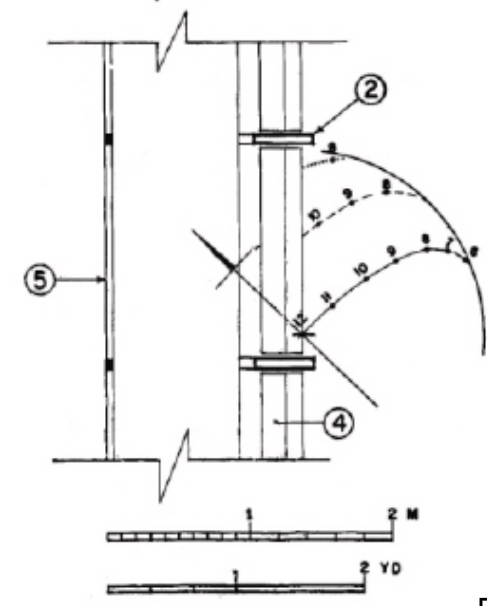
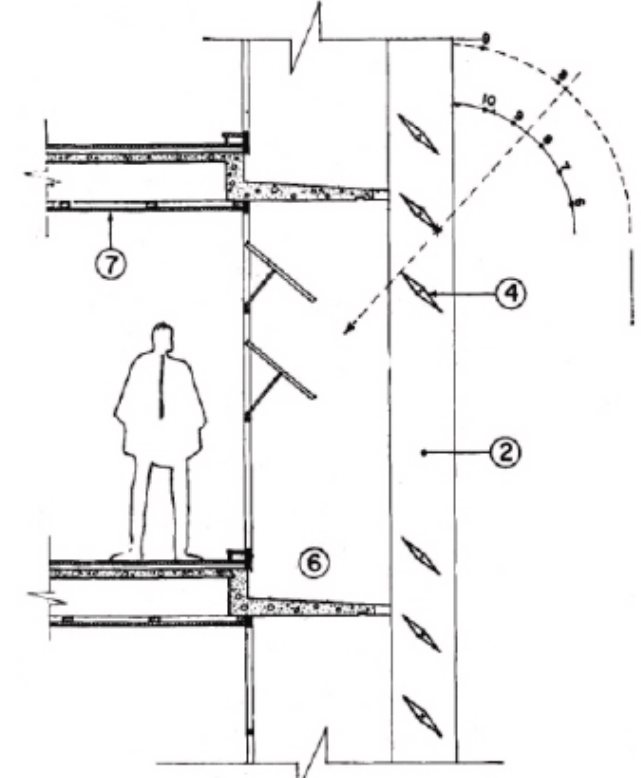
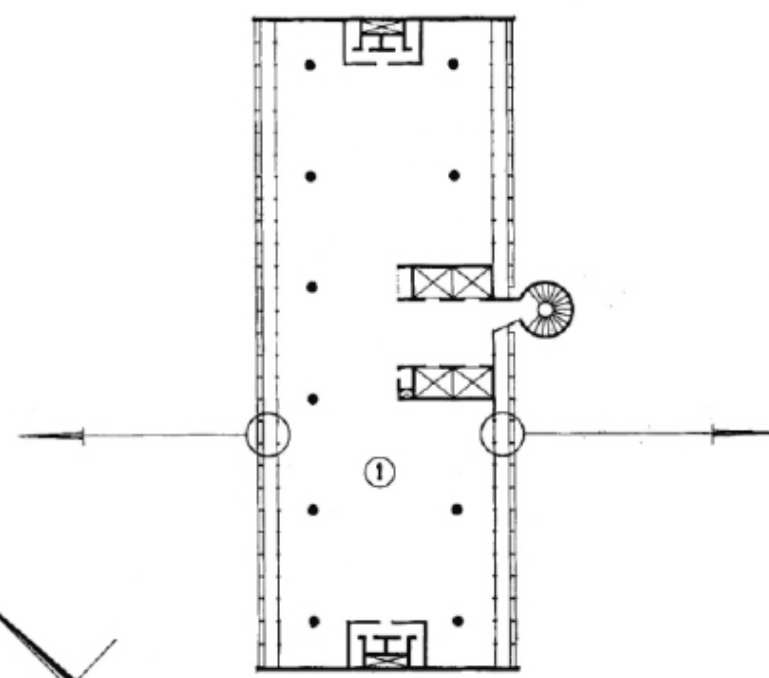
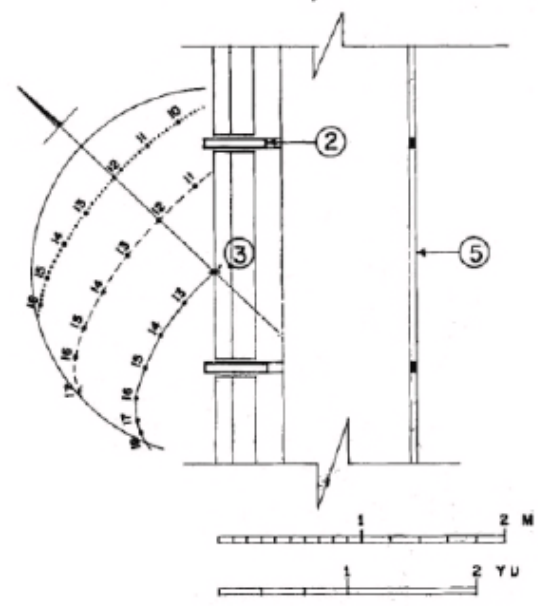
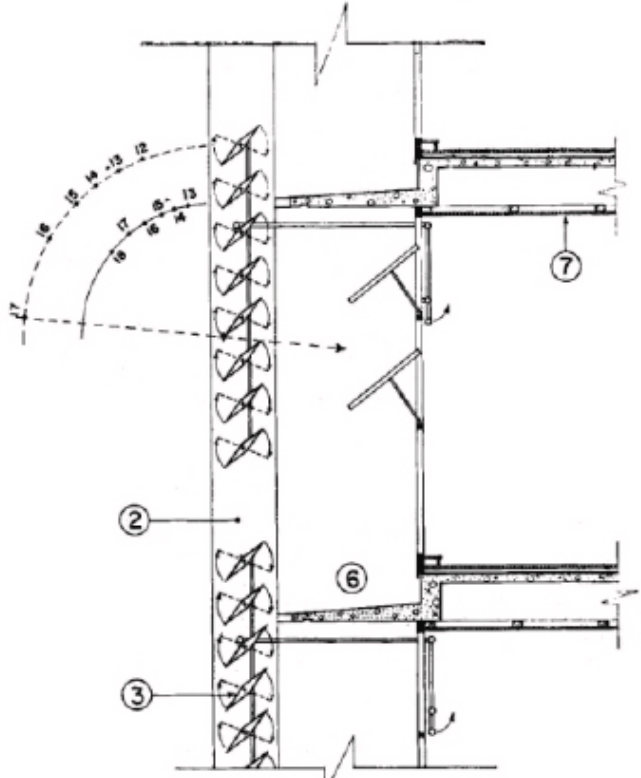
Arquiteto: Rino Levi

São Paulo, Brasil











H House

Arquitetos: **Creative Union Network**

Quito, Equador

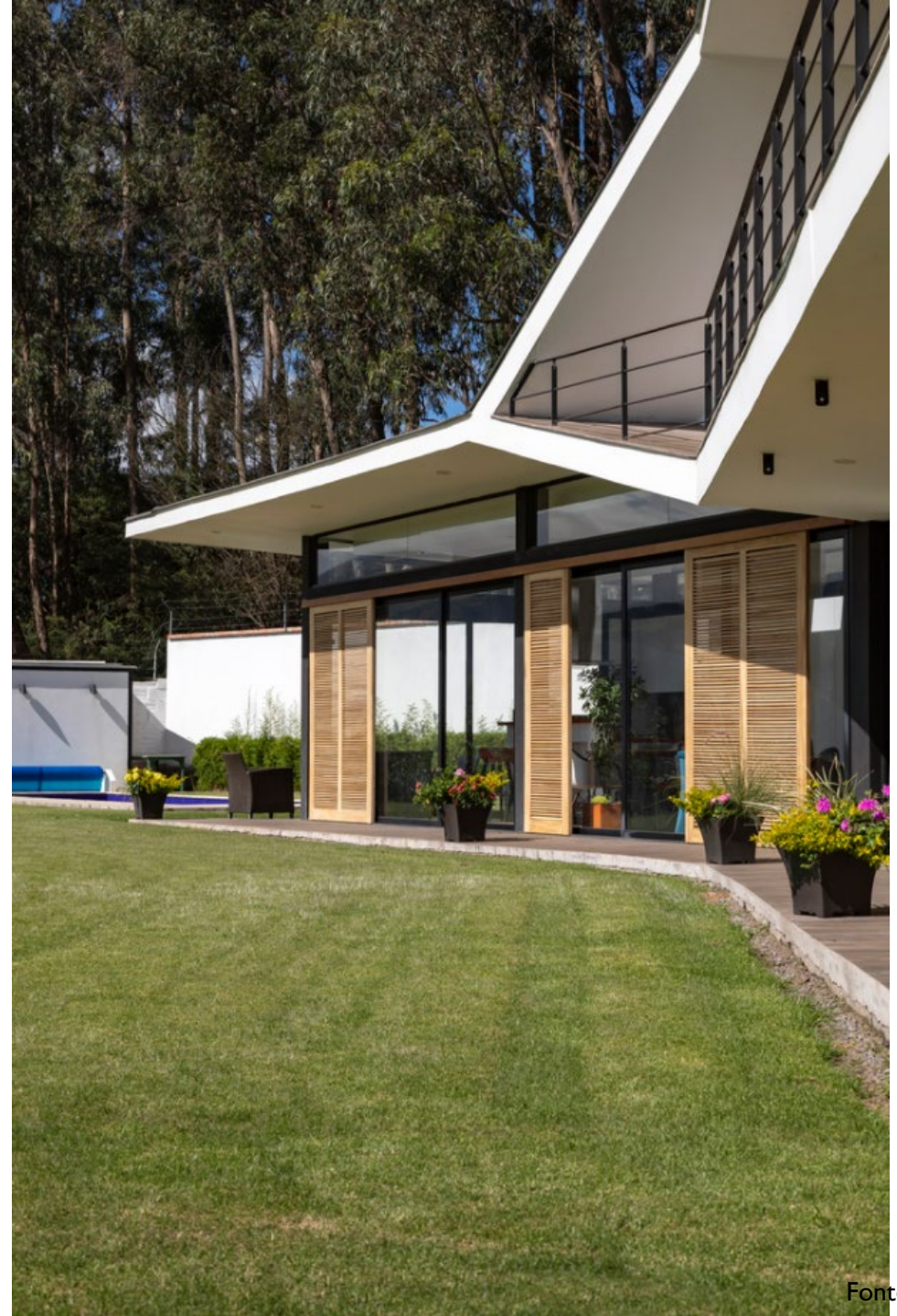


Fonte: Archdaily, 2021



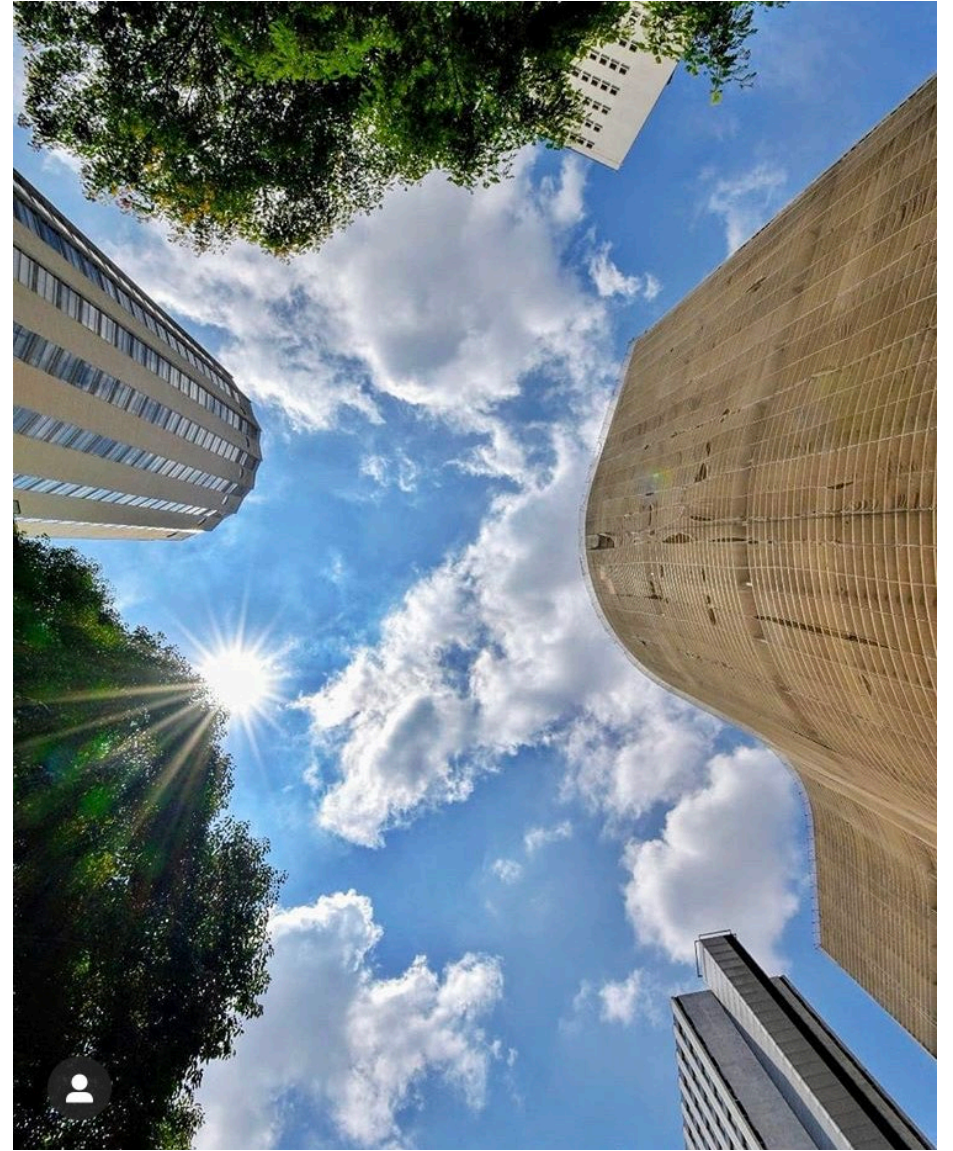






Máscara do Entorno

Imagem câmera olho de peixe



Fonte: @andredvco (Instagram)



Fonte: @renatabsancovski (Instagram)



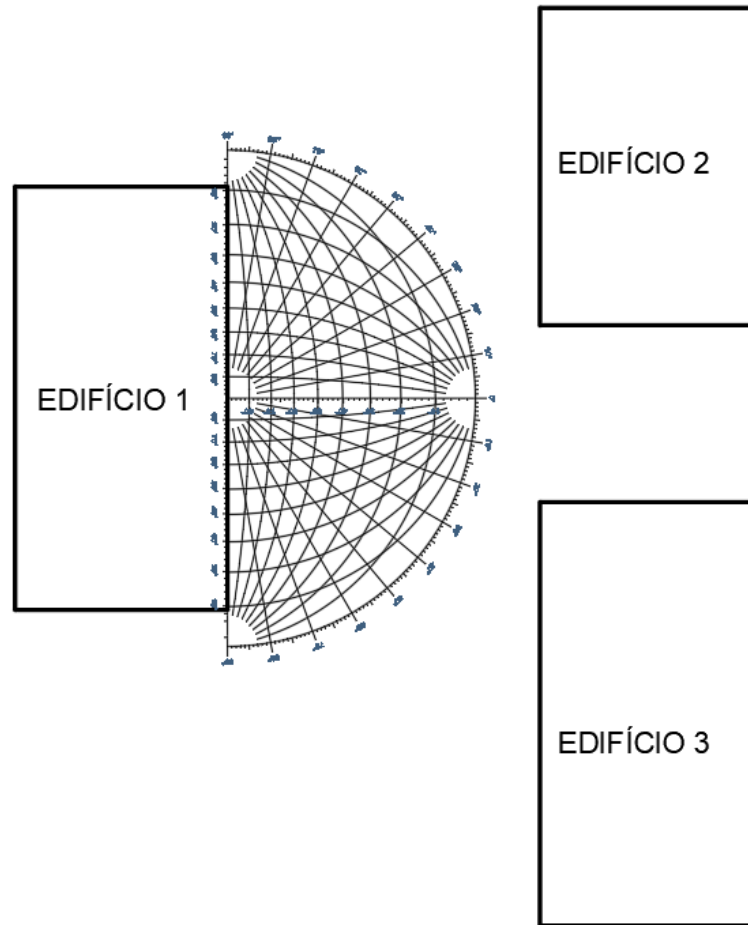
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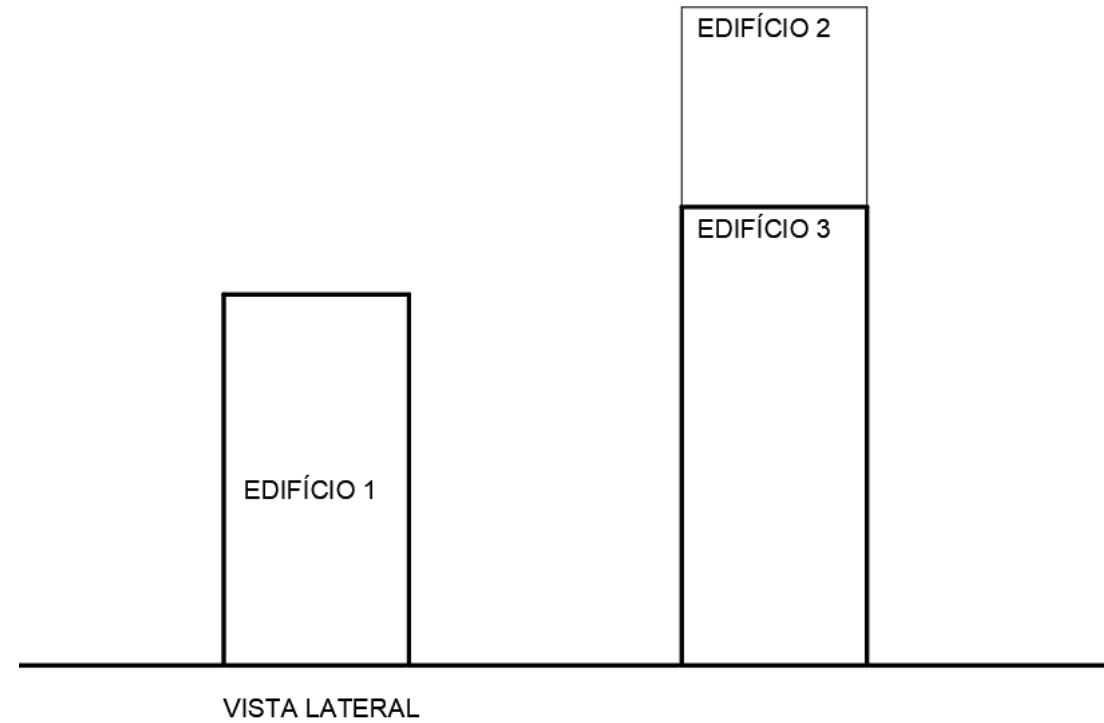
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MÁSCARA PRODUZIDA POR PRÉDIOS FRONTEIROS

Geometria da Insolação

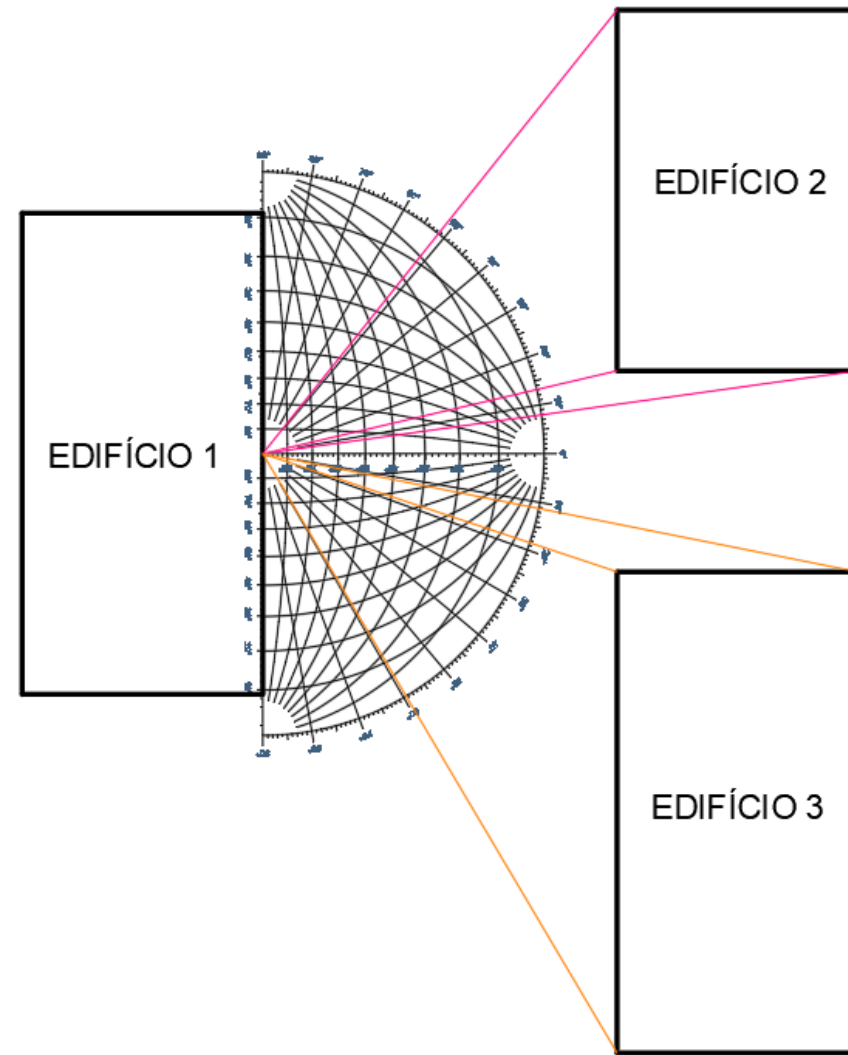


IMPLANTAÇÃO



MÁSCARA PRODUZIDA POR PRÉDIOS FRONTEIROS

Geometria da Insolação

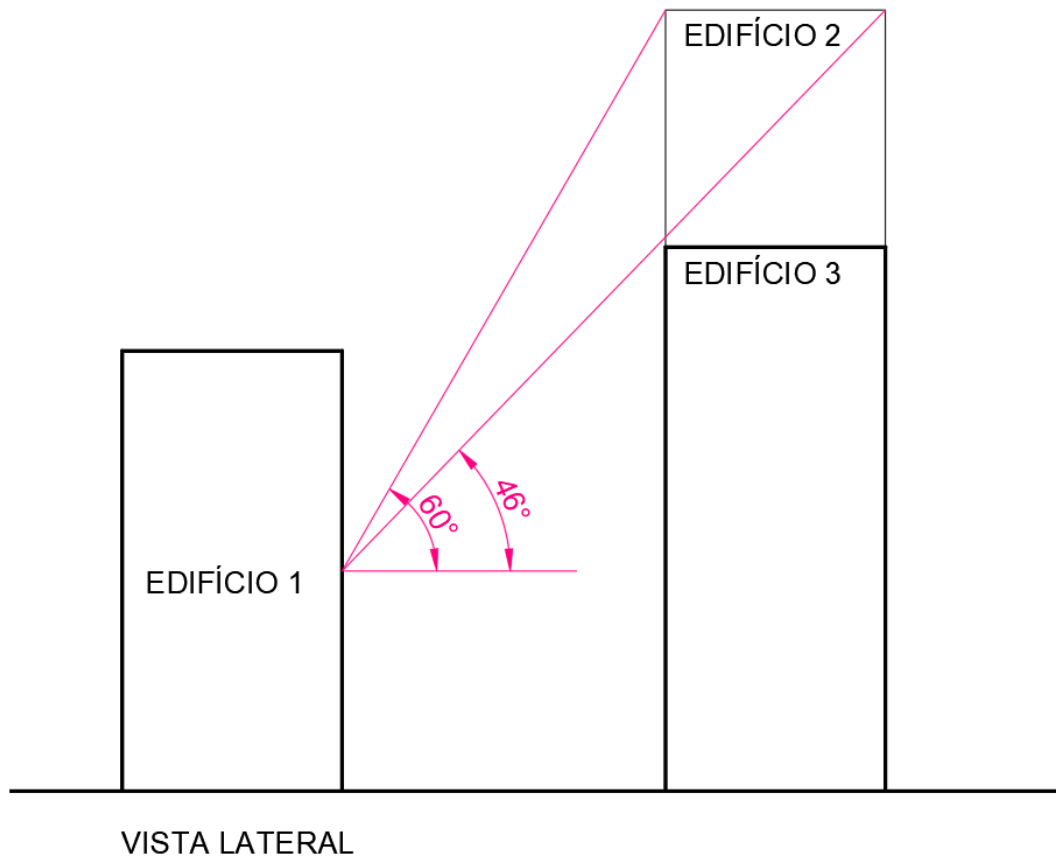


Ângulos Beta

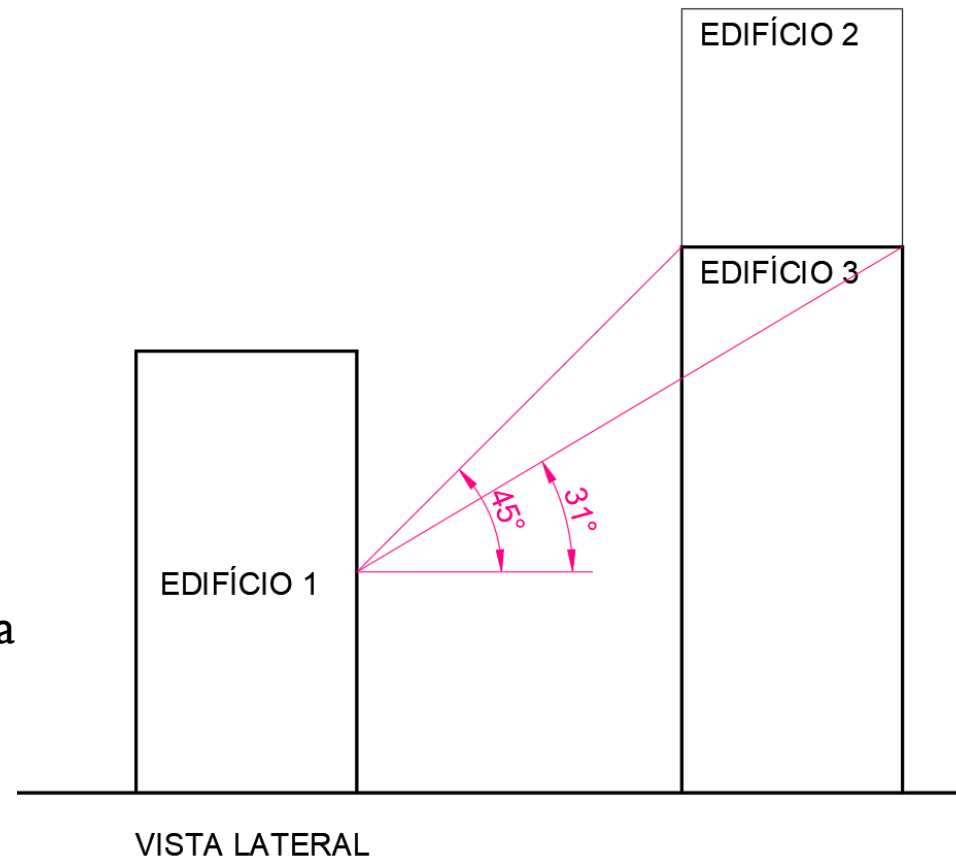
IMPLANTAÇÃO

MÁSCARA PRODUZIDA POR PRÉDIOS FRONTEIROS

Geometria da Insolação

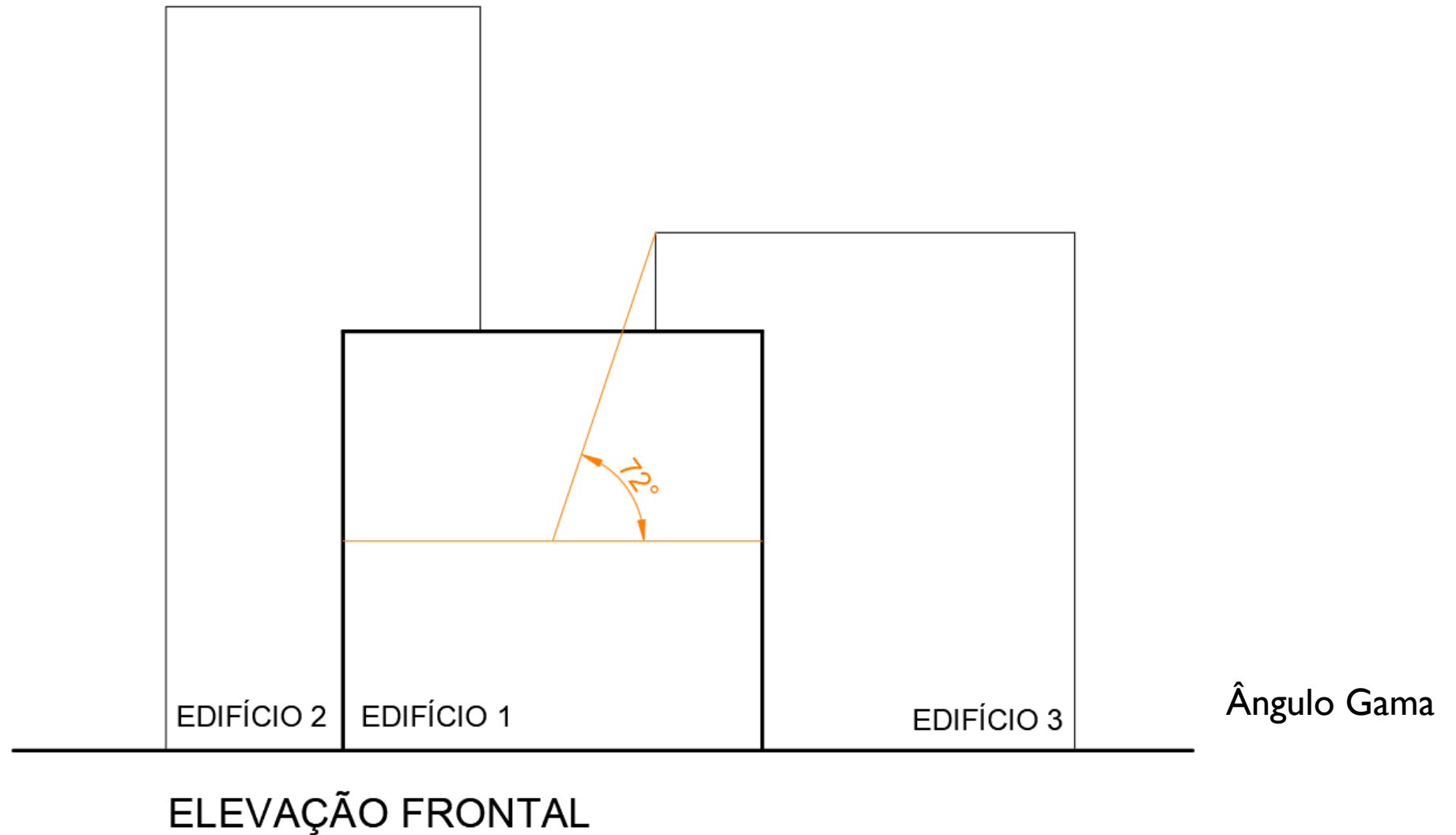


Ângulos Alfa



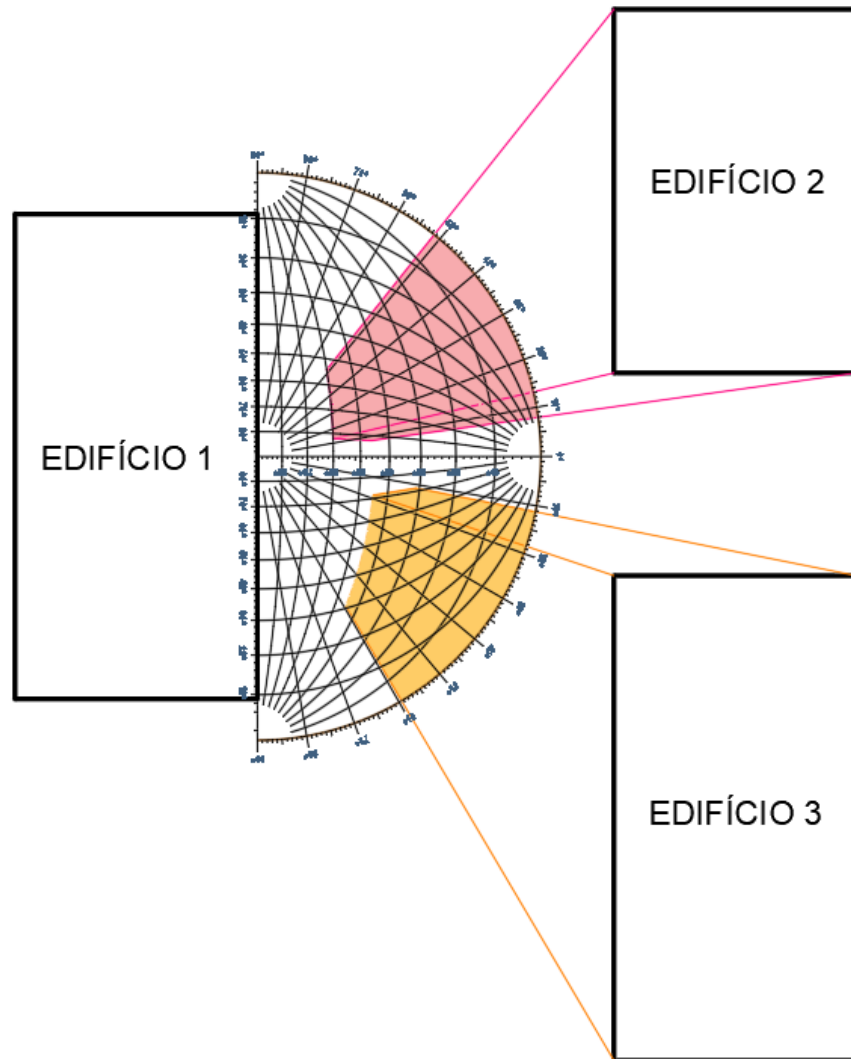
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Geometria da Insolação

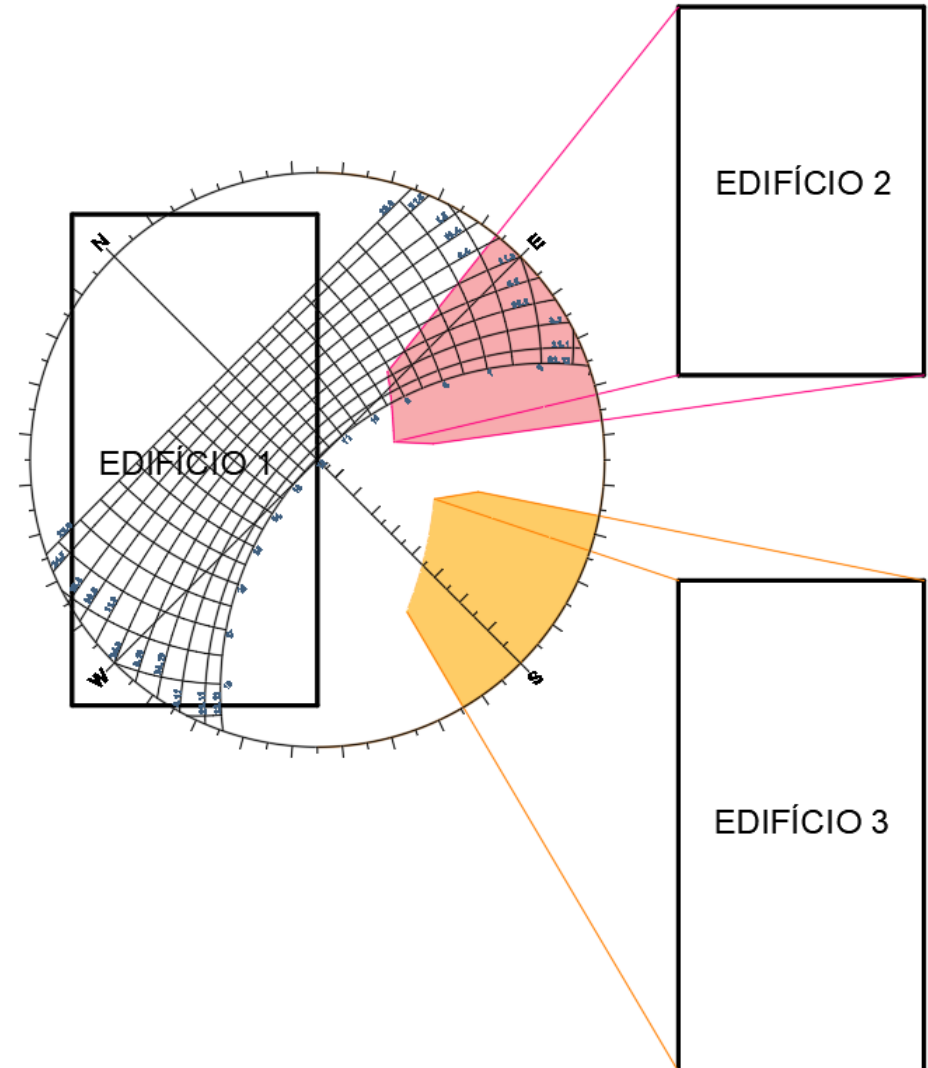


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Geometria da Insolação

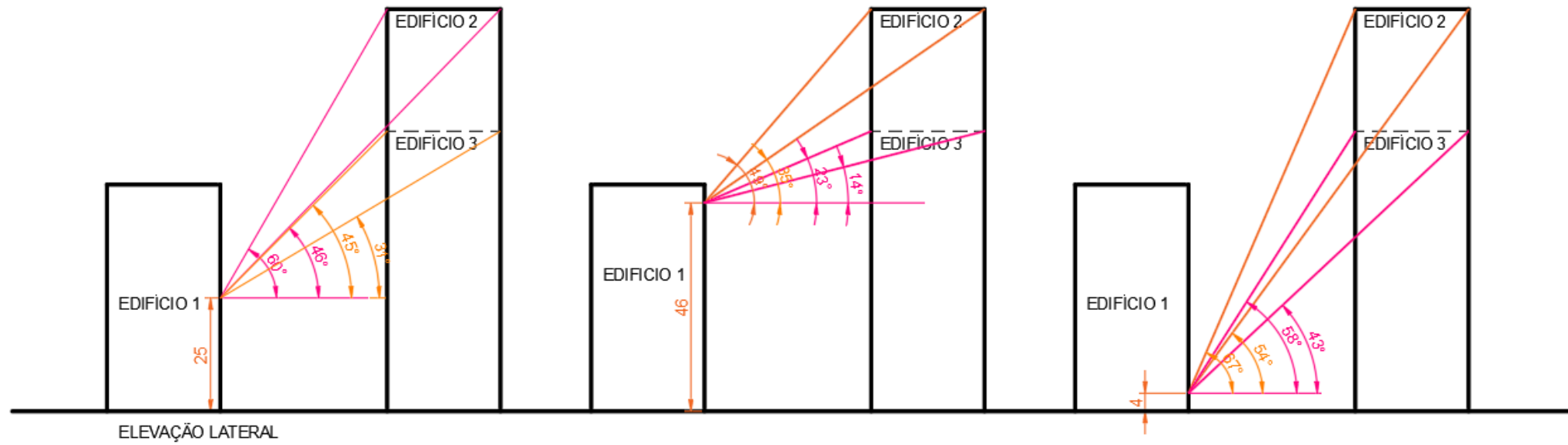


IMPLANTAÇÃO

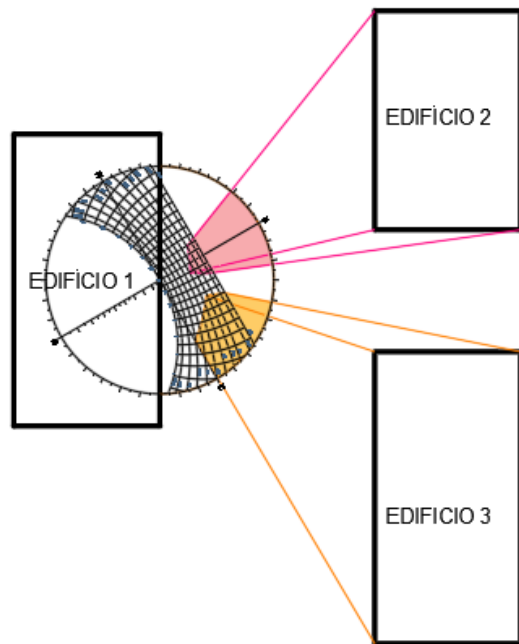


IMPLANTAÇÃO

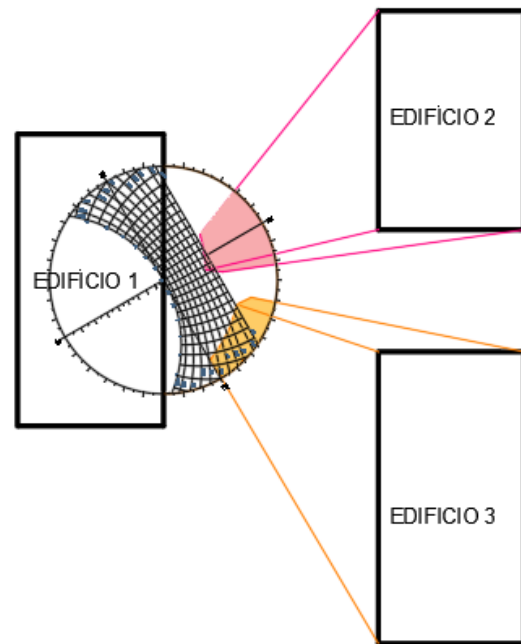
Comparação entre máscaras produzidas por
diferentes andares



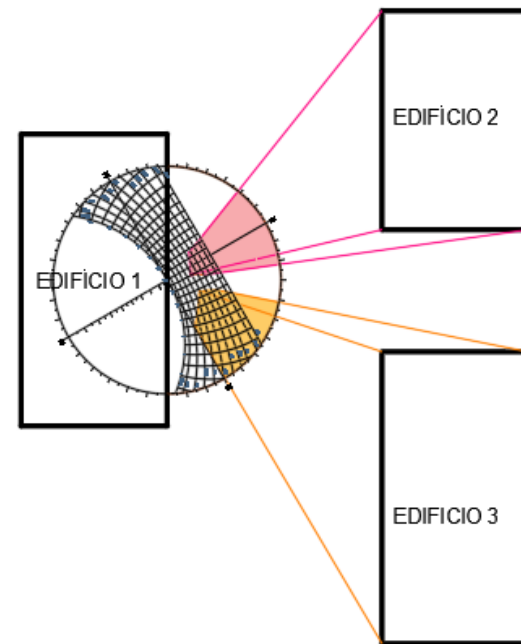
ELEVAÇÃO LATERAL



PAVIMENTO INTERMEDIARIO (MEIO DO EDIFICIO)



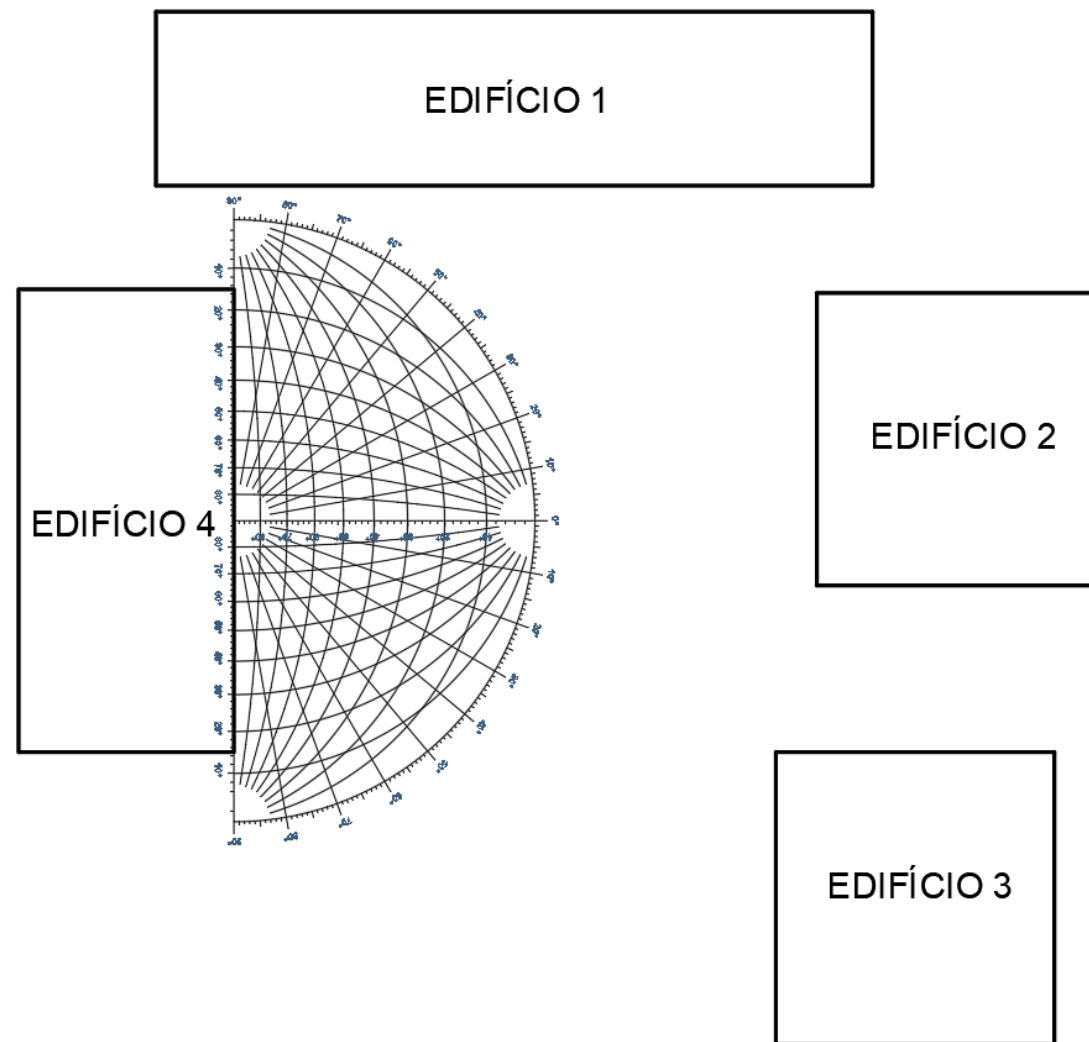
ULTIMO PAVIMENTO



PRIMEIRO PAVIMENTO

MÁSCARA PRODUZIDA POR PRÉDIOS FRONTEIROS E UM LATERAL

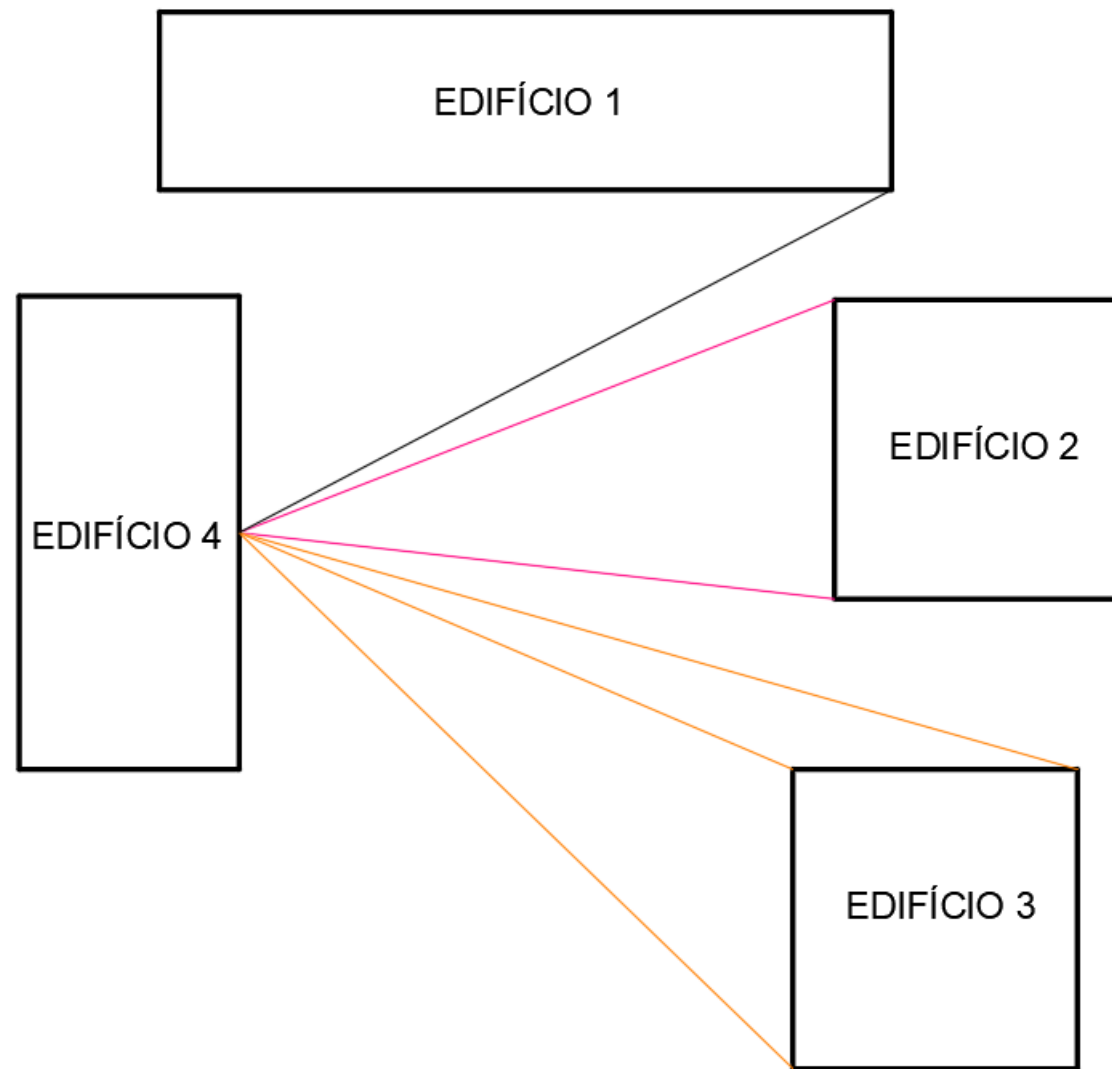
Geometria da Insolação



IMPLANTAÇÃO

MÁSCARA PRODUZIDA POR PRÉDIOS FRONTEIROS E UM LATERAL

Geometria da Insolação

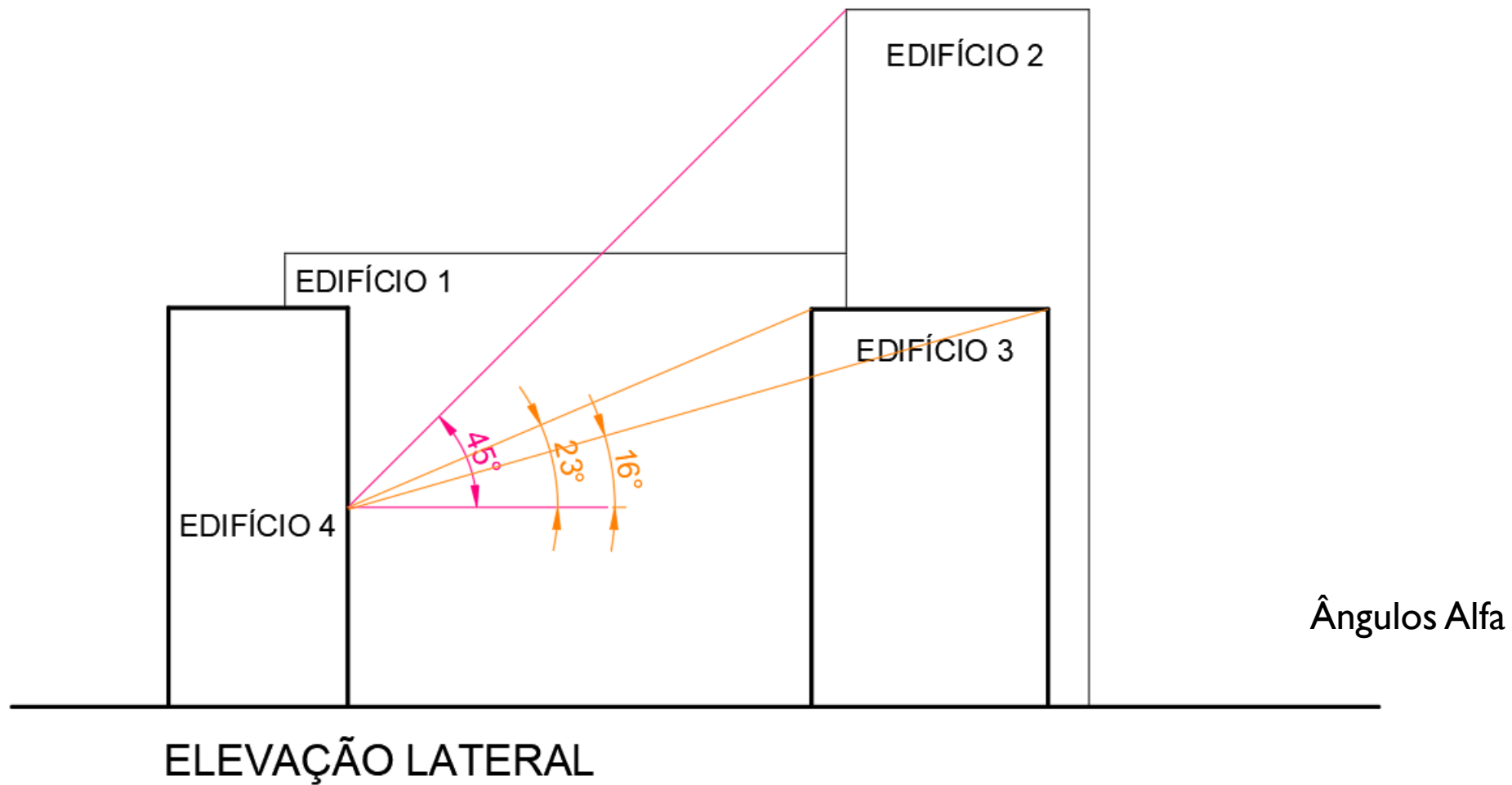


Ângulos Beta

IMPLANTAÇÃO

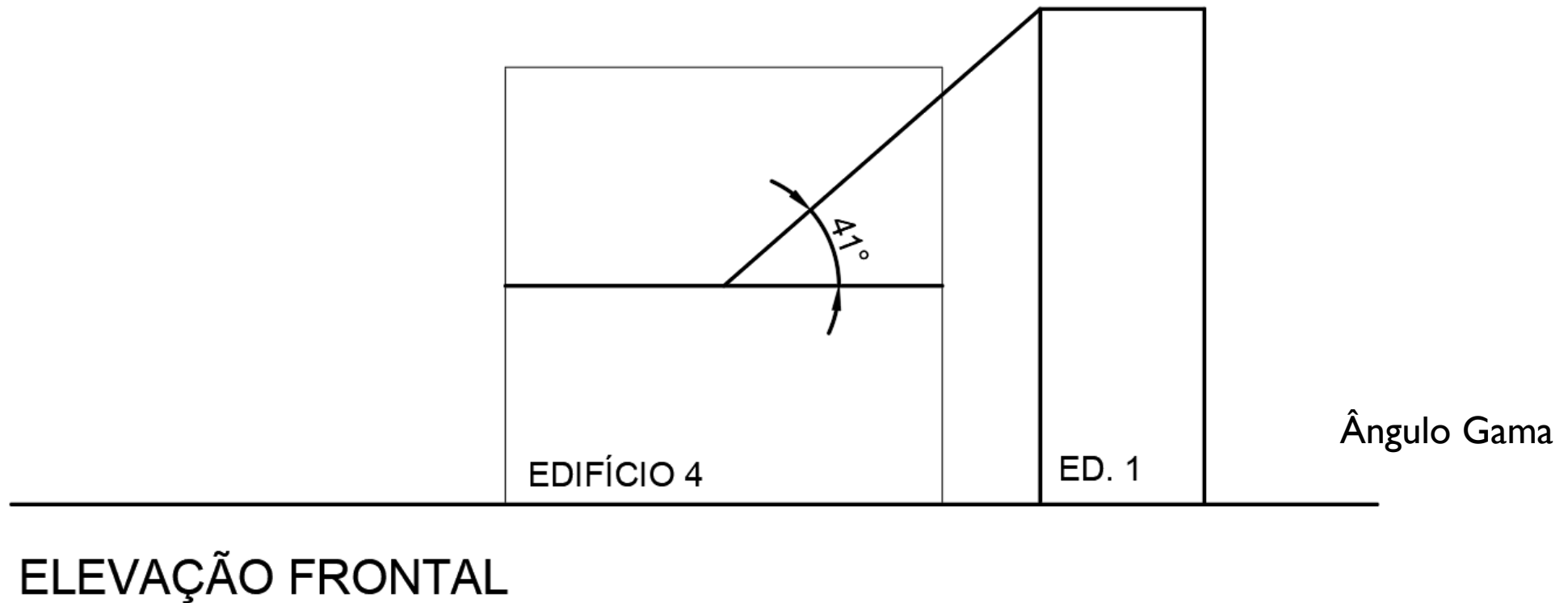
MÁSCARA PRODUZIDA POR PRÉDIOS FRONTEIROS E UM LATERAL

Geometria da Insolação



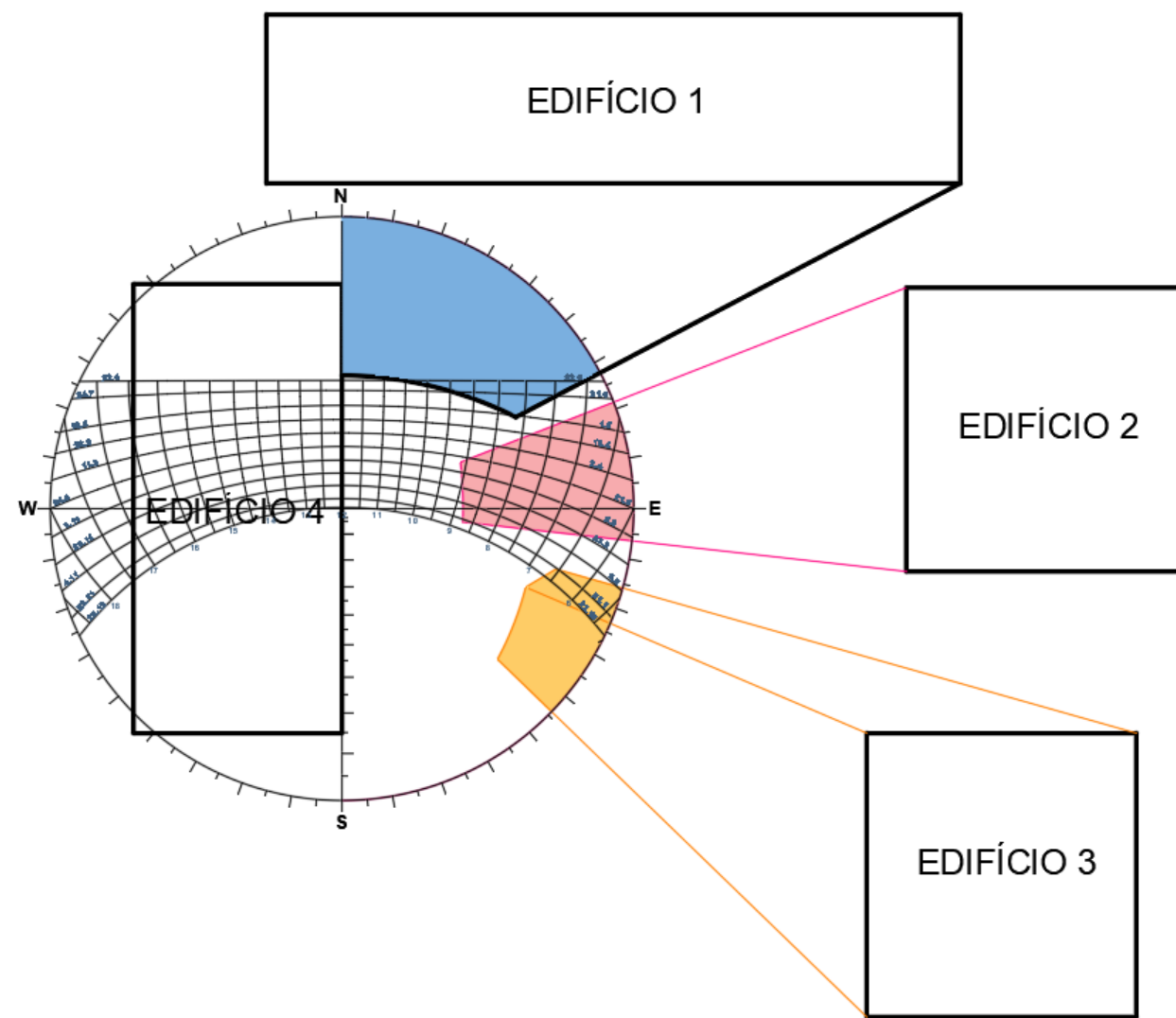
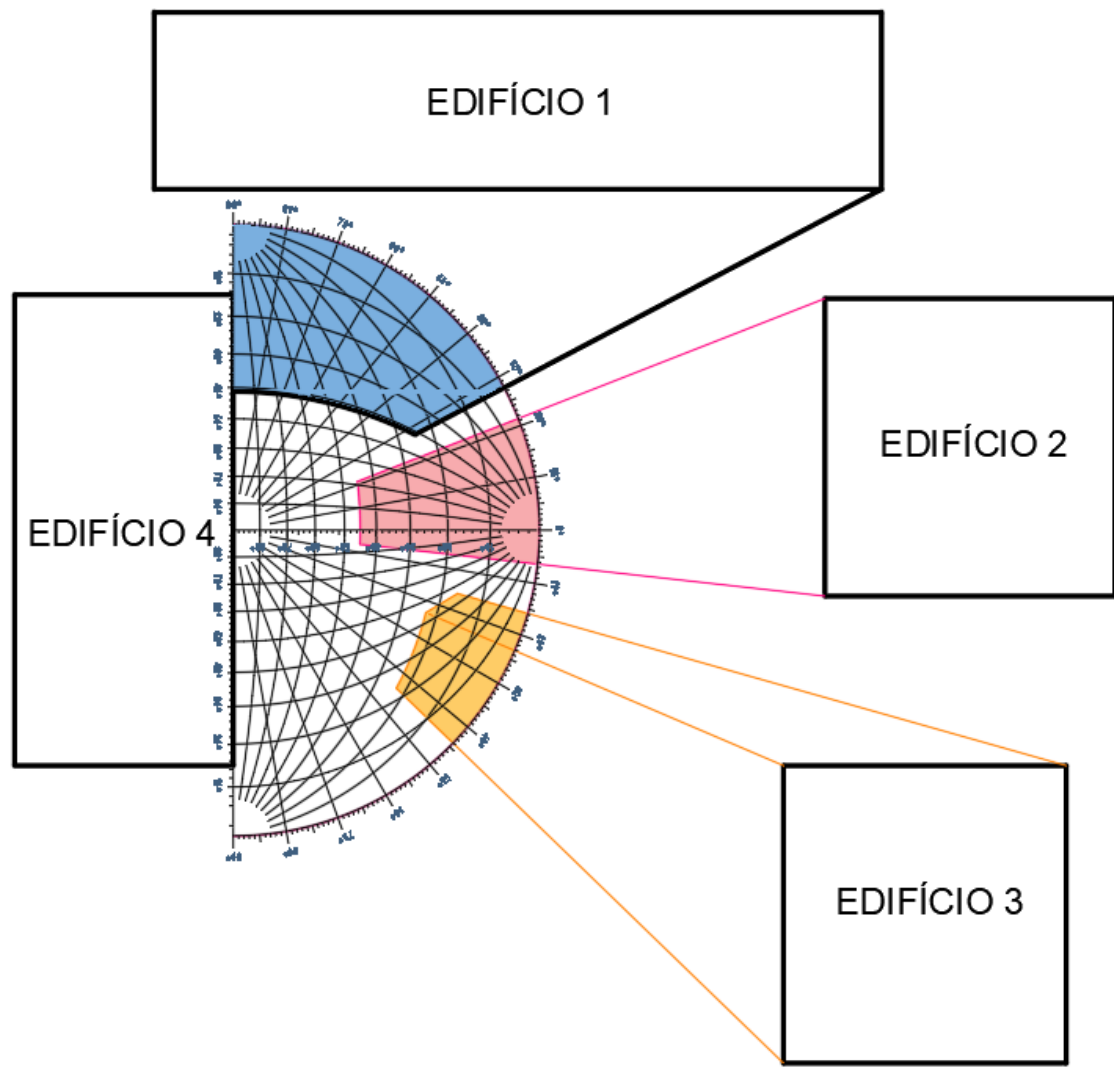
MÁSCARA PRODUZIDA POR PRÉDIOS FRONTEIROS E UM LATERAL

Geometria da Insolação



MÁSCARA PRODUZIDA POR PRÉDIOS FRONTEIROS E UM LATERAL

Geometria da Insolação



IMPLANTAÇÃO

IMPLANTAÇÃO

Referências

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- ◆ Edifício Consorcio. Fonte: <https://www.plataformaarquitectura.cl/cl/02-14392/edificio-consorcio-sede-santiago-enrique-browne-borja-huidobro>
- ◆ H House. Fonte: https://www.archdaily.com/921551/h-house-creative-union-network?ad_medium=gallery
- ◆ Imagem slide de abertura: The Municipal Art Society of New York. Disponível em: <https://www.mas.org/>. Acesso em 20 fev. 2021.
- ◆ Imagem câmera olho de peixe. Fonte: <https://www.antorium.com.br/produto/lente-fisheye-olho-de-peixe-canon-18-55mm/>
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- ◆ Fonte das fotos da seção “Máscara do entorno” nas próprias fotos.