

“Casinha”- Vilanova Artigas



Recém formado em 1942, Artigas projetou e construiu sua primeira residência no Campo Belo, então um bairro quase desabitado.



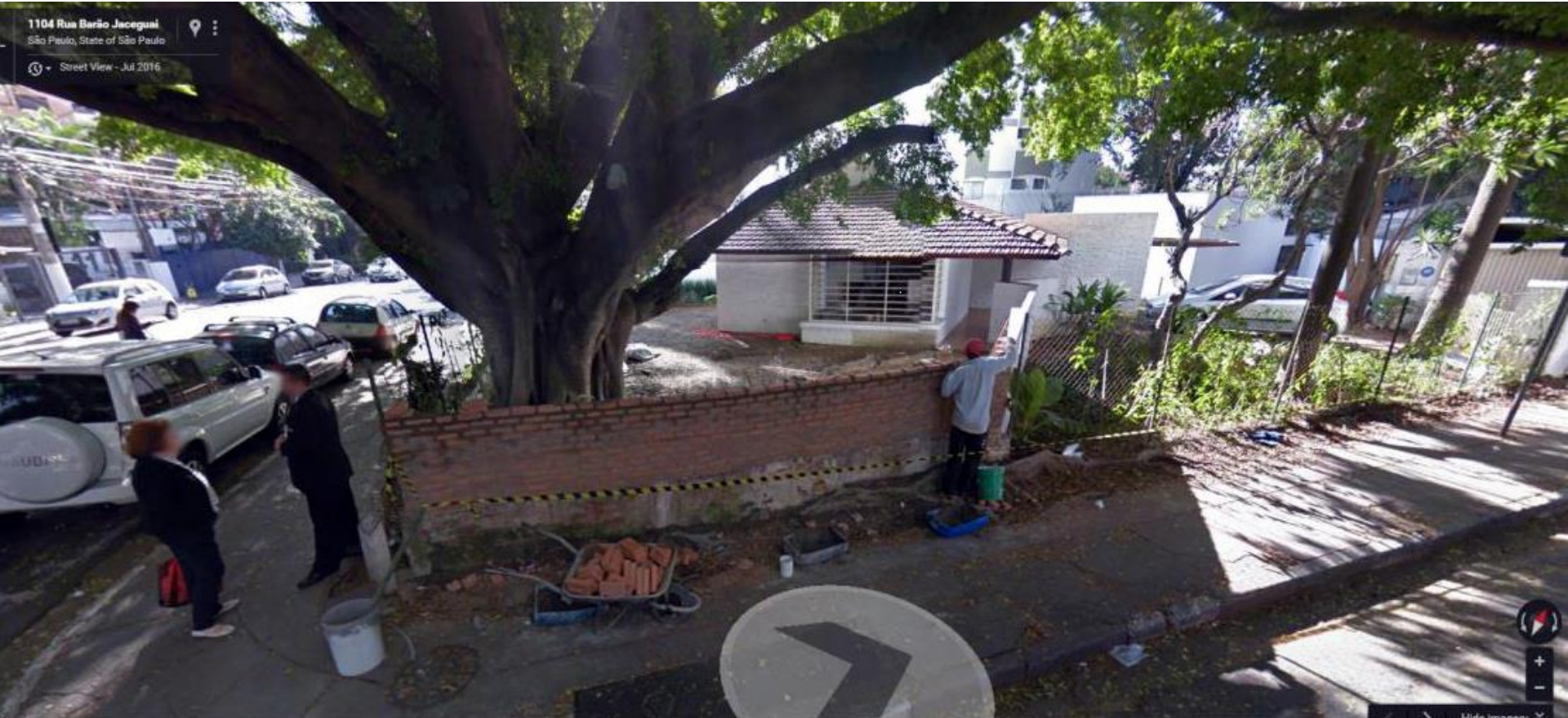
Situada na esquina da rua João de Souza Dias e rua Barão de Jaceguai, a “casinha” foi tombada pelo Conpresp em 2004, quando abrigava uma loja de plantas.

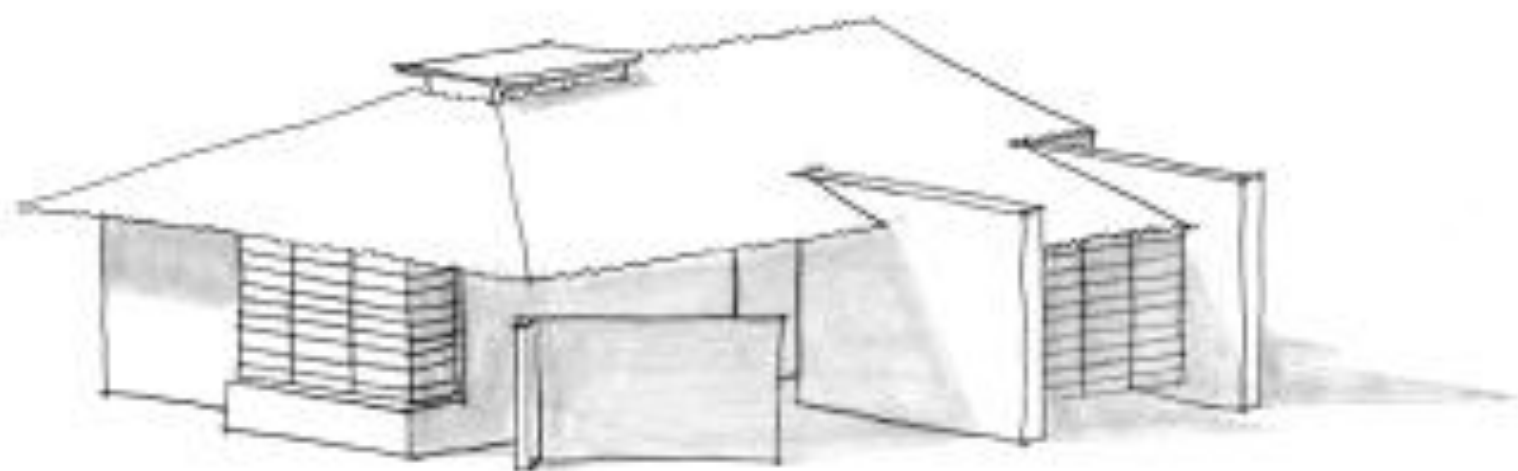


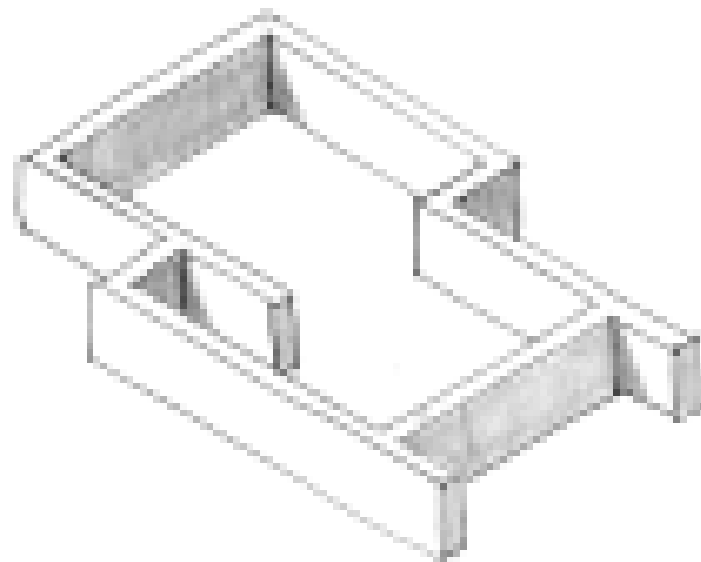
1104 Rue Barão Jaceguai
São Paulo, State of São Paulo

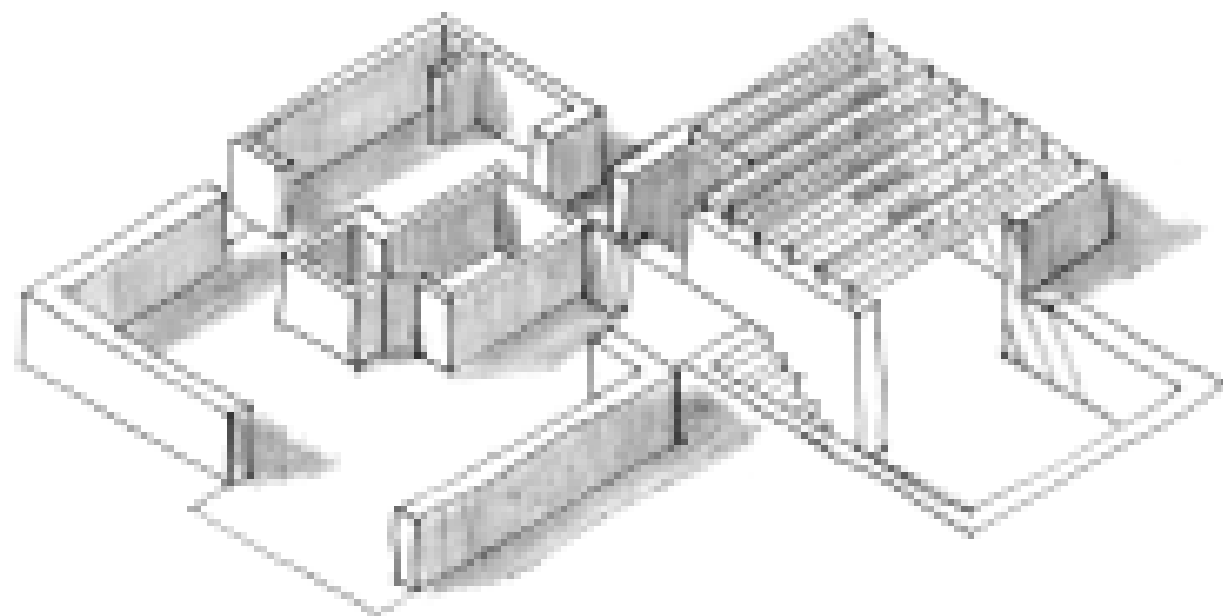


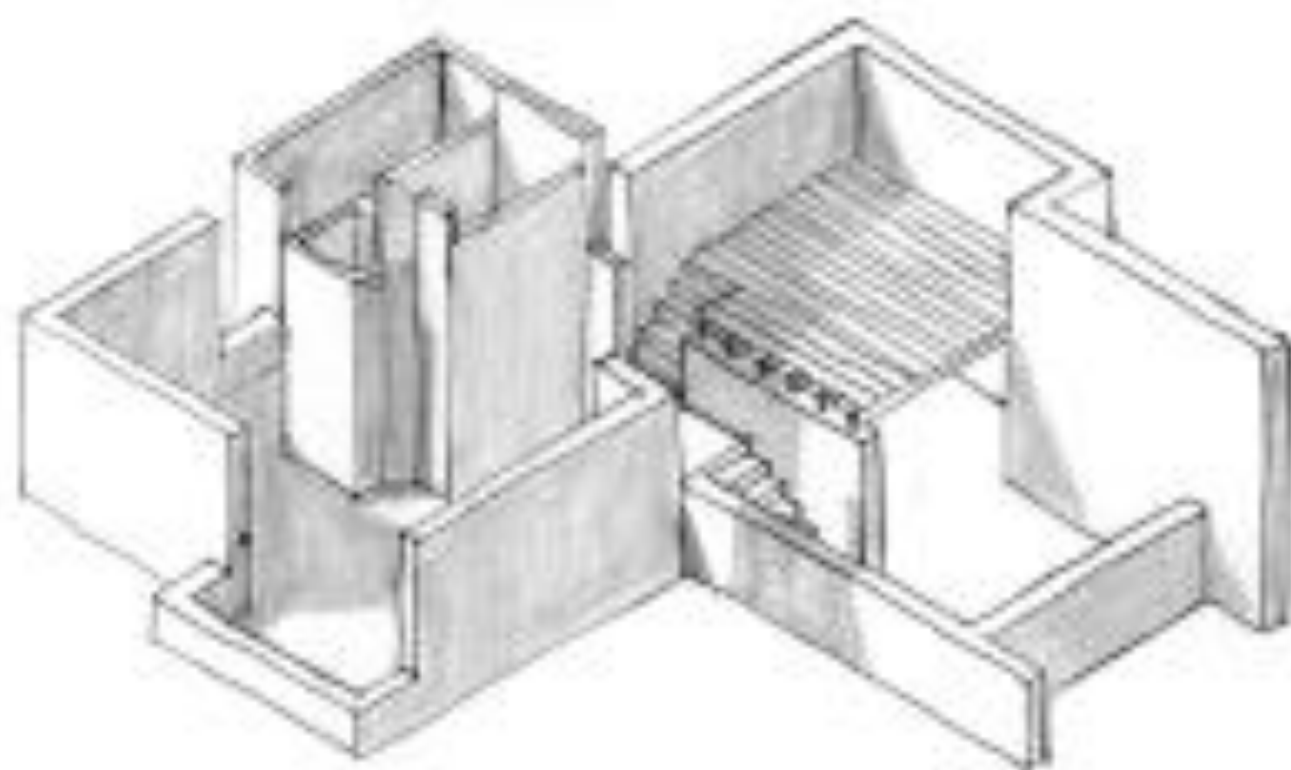
Street View - Jul 2016

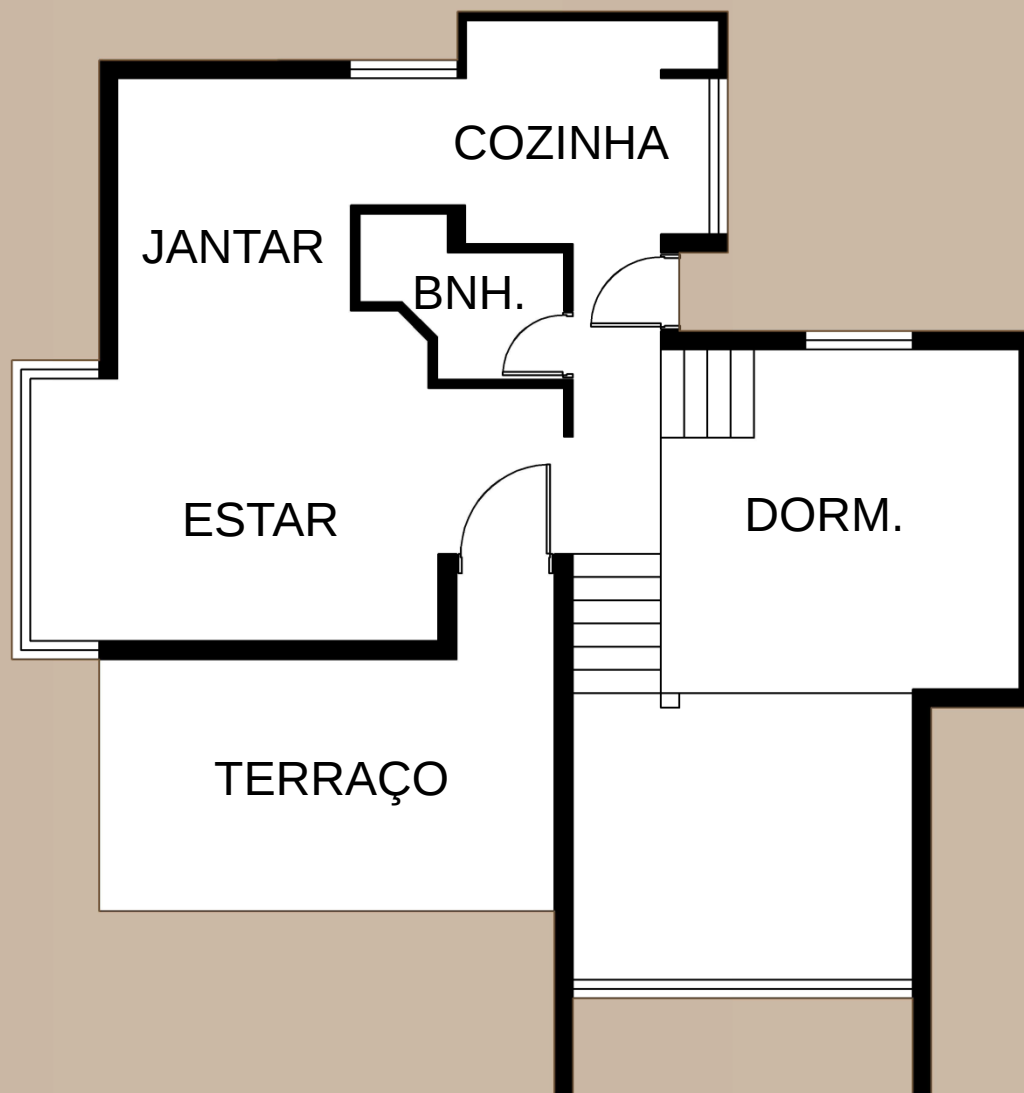


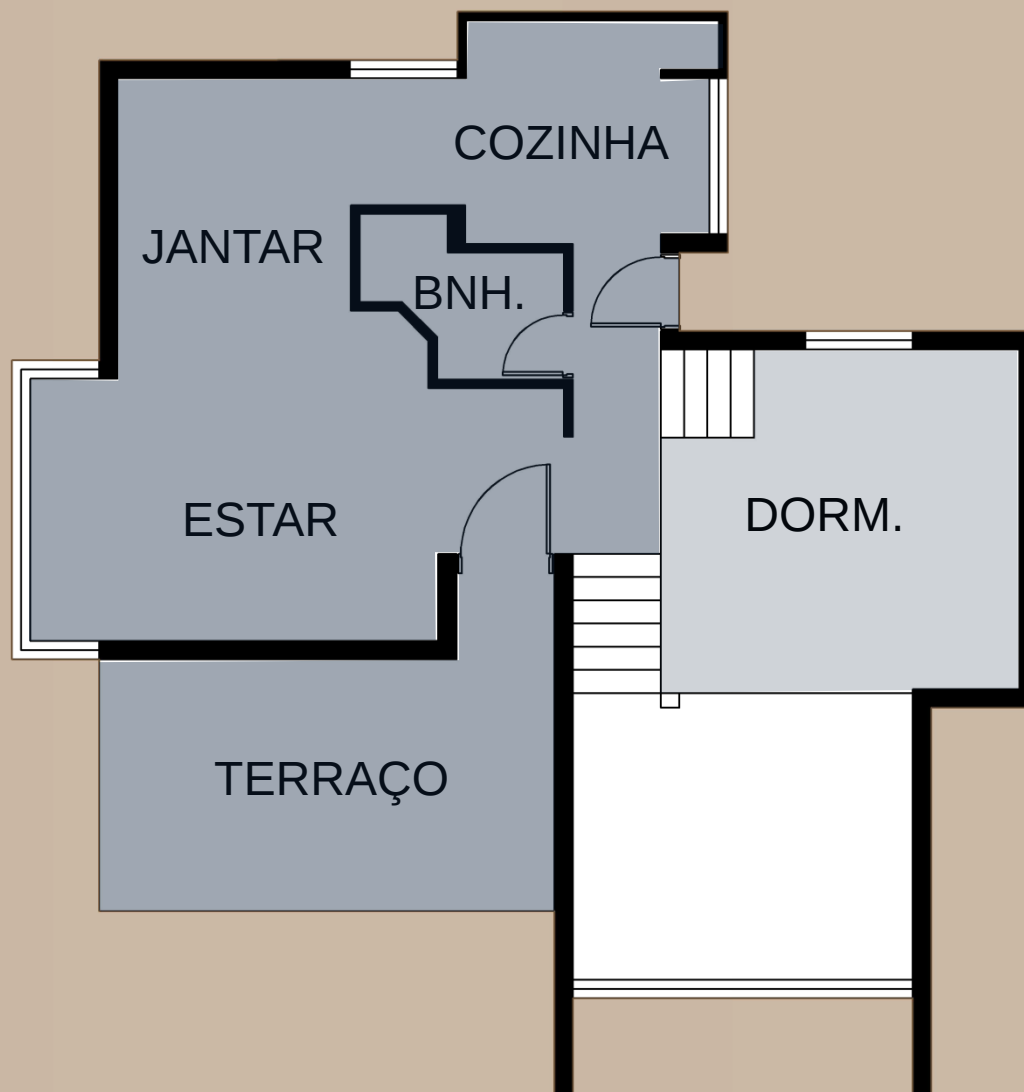


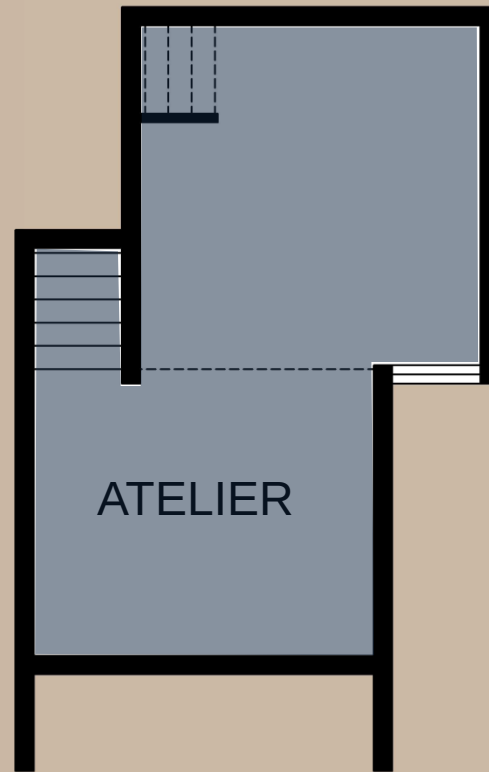


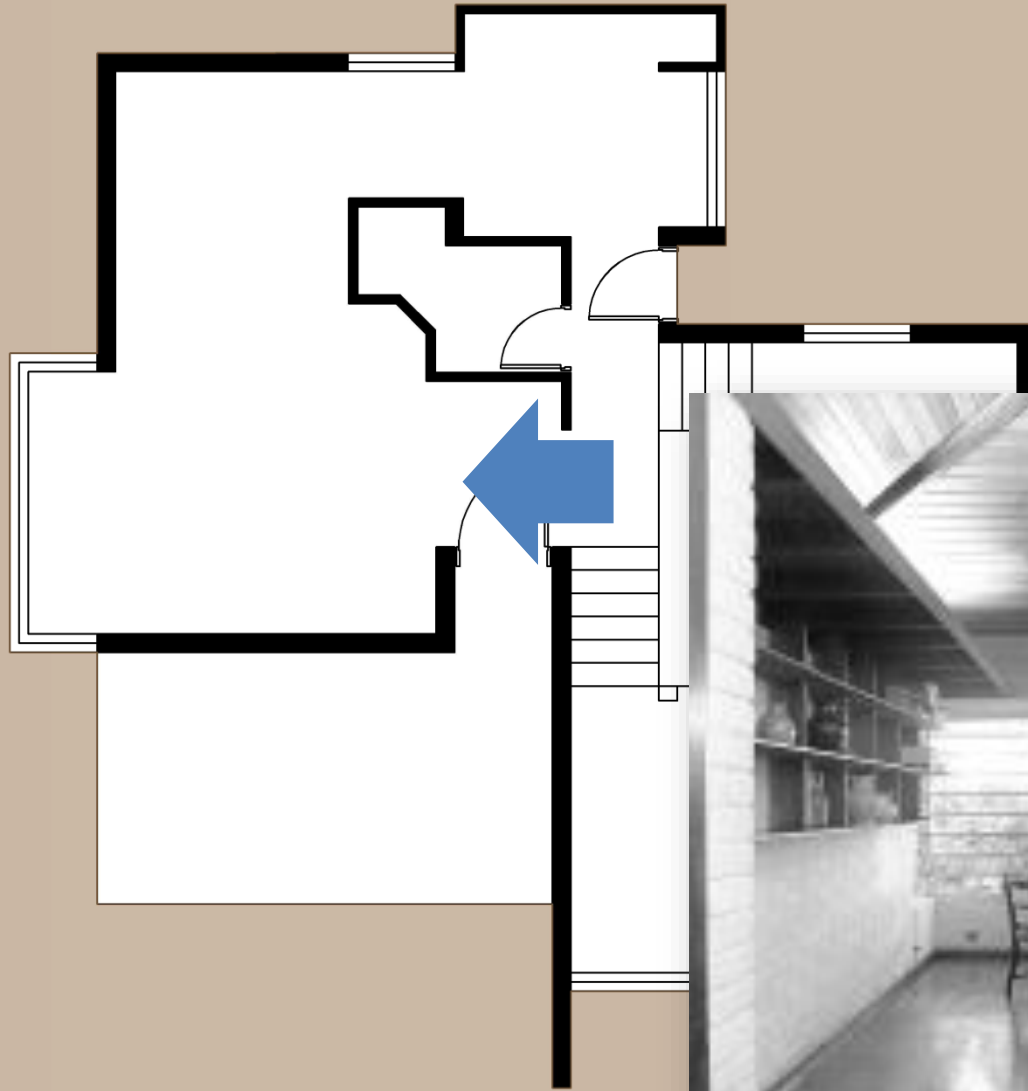


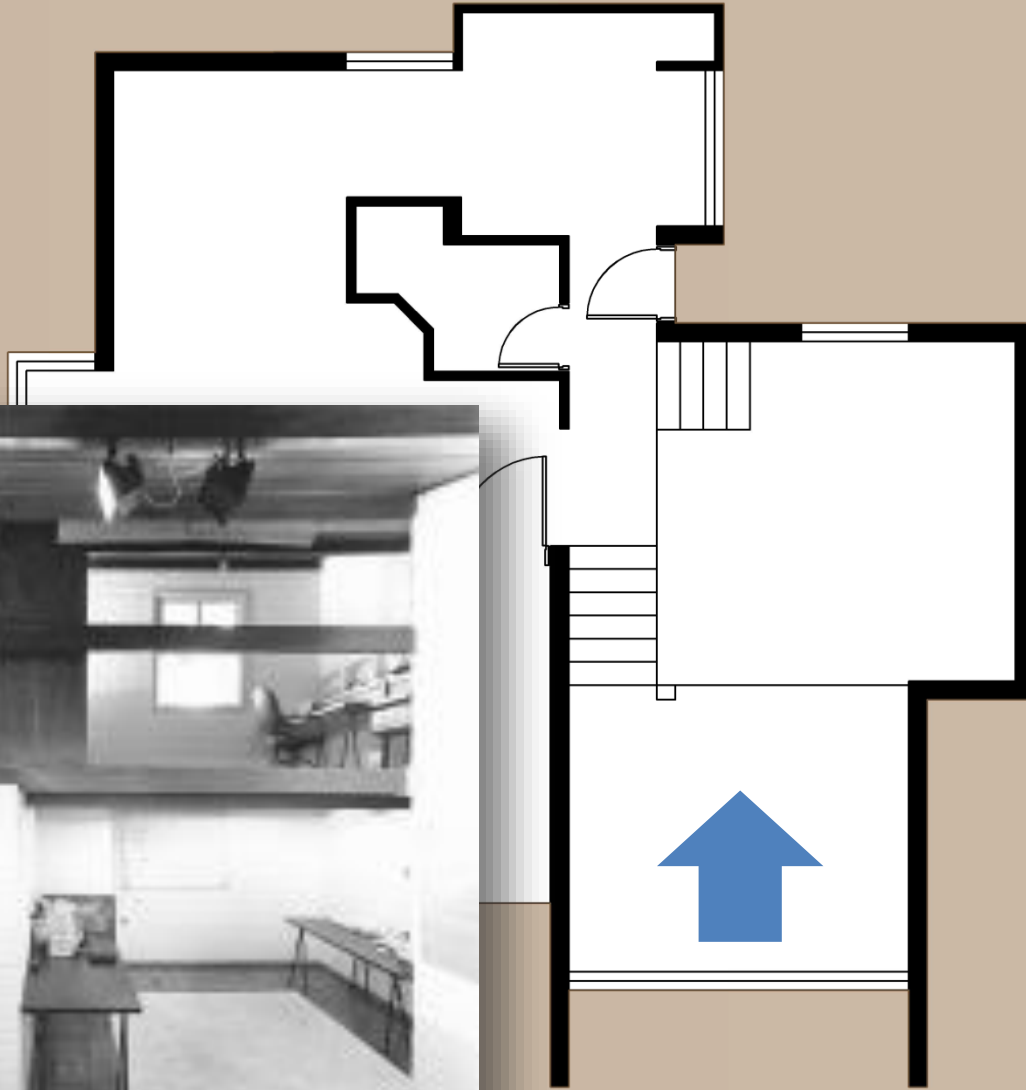


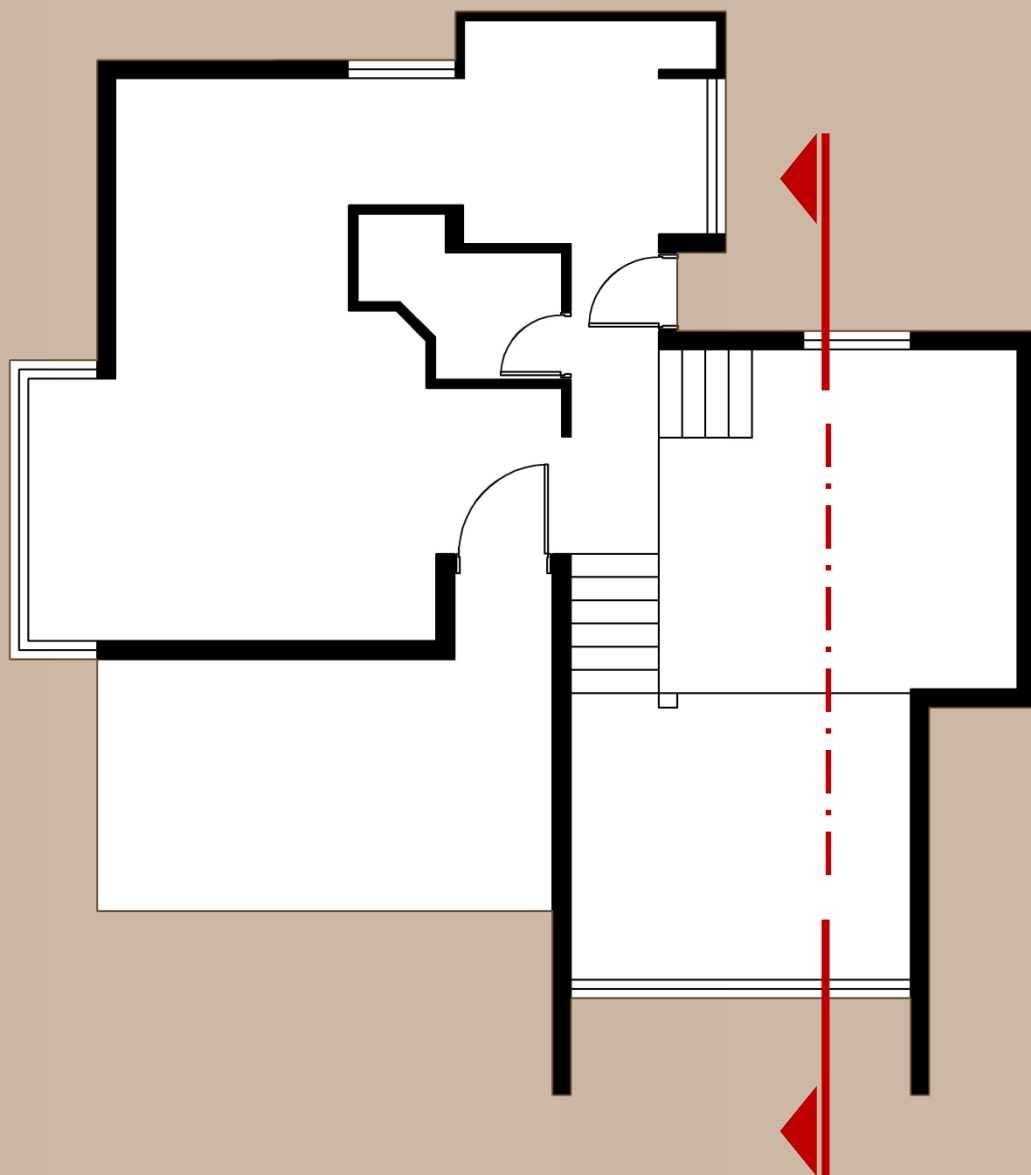


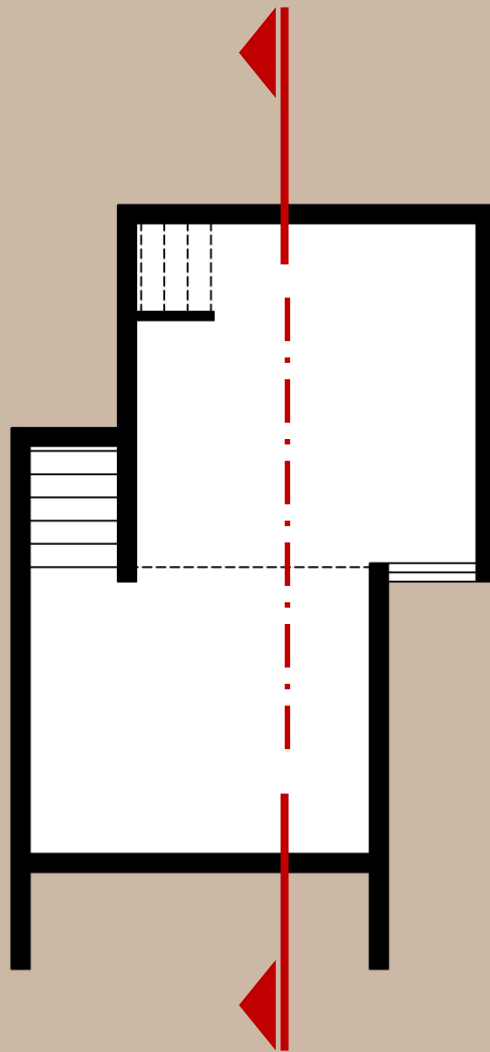


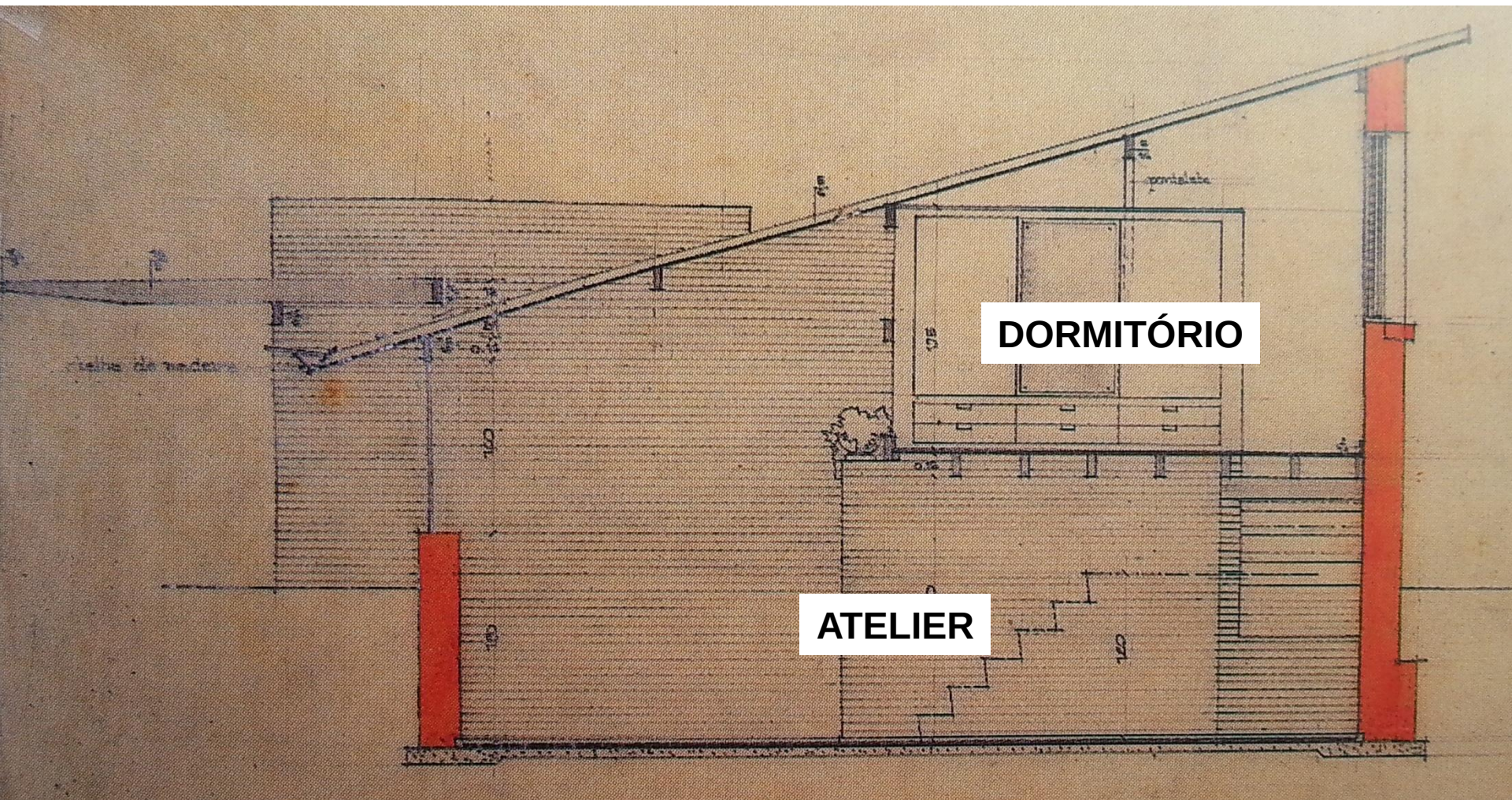






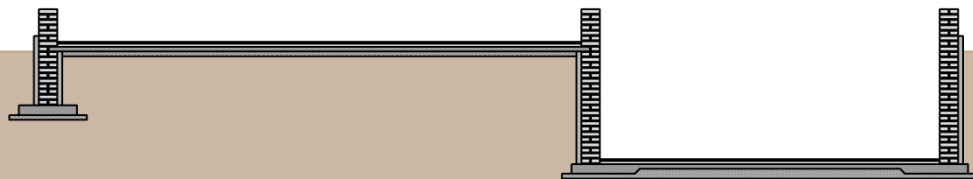
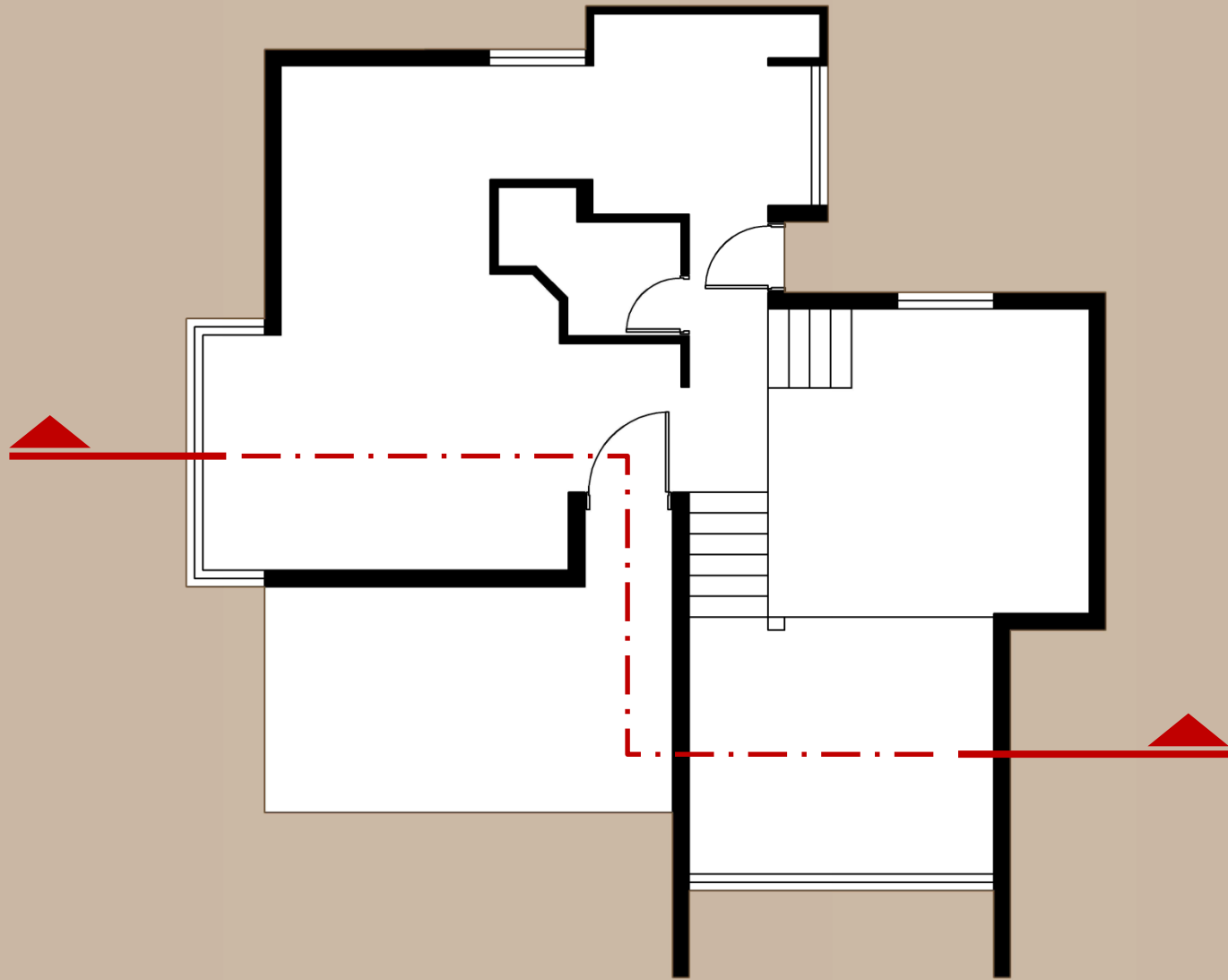


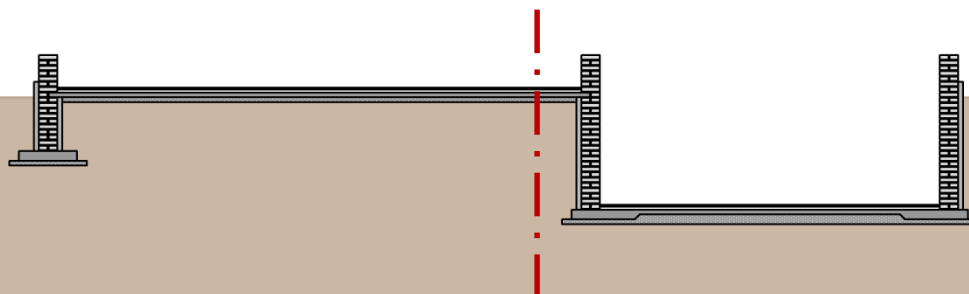
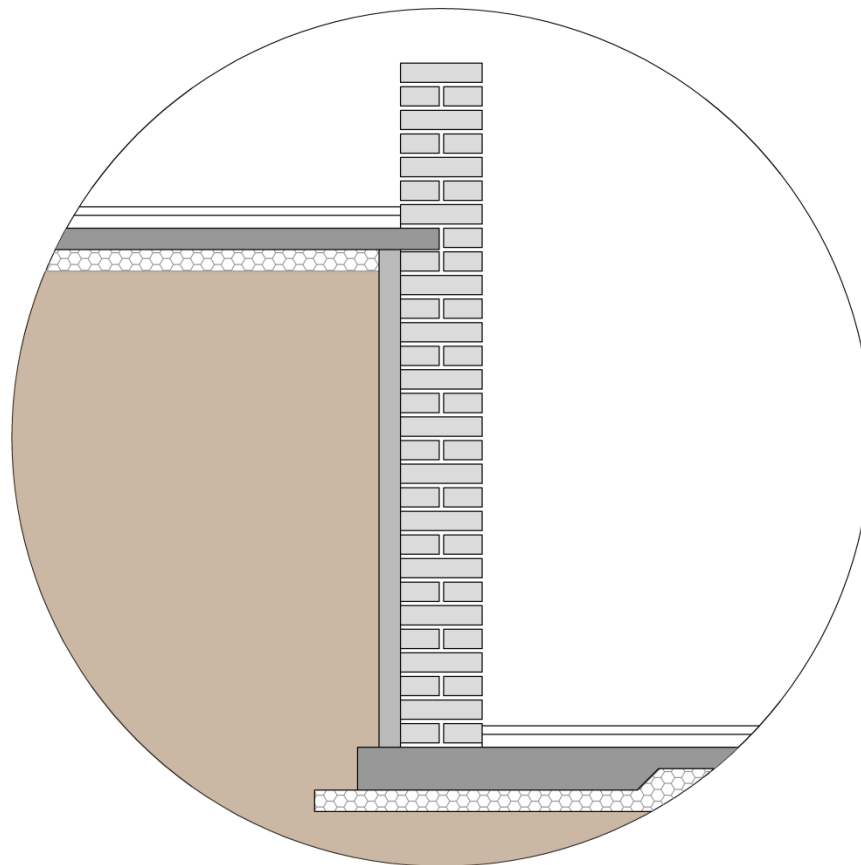




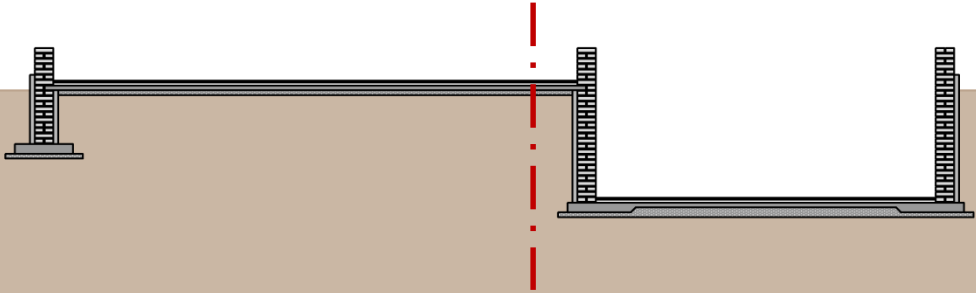
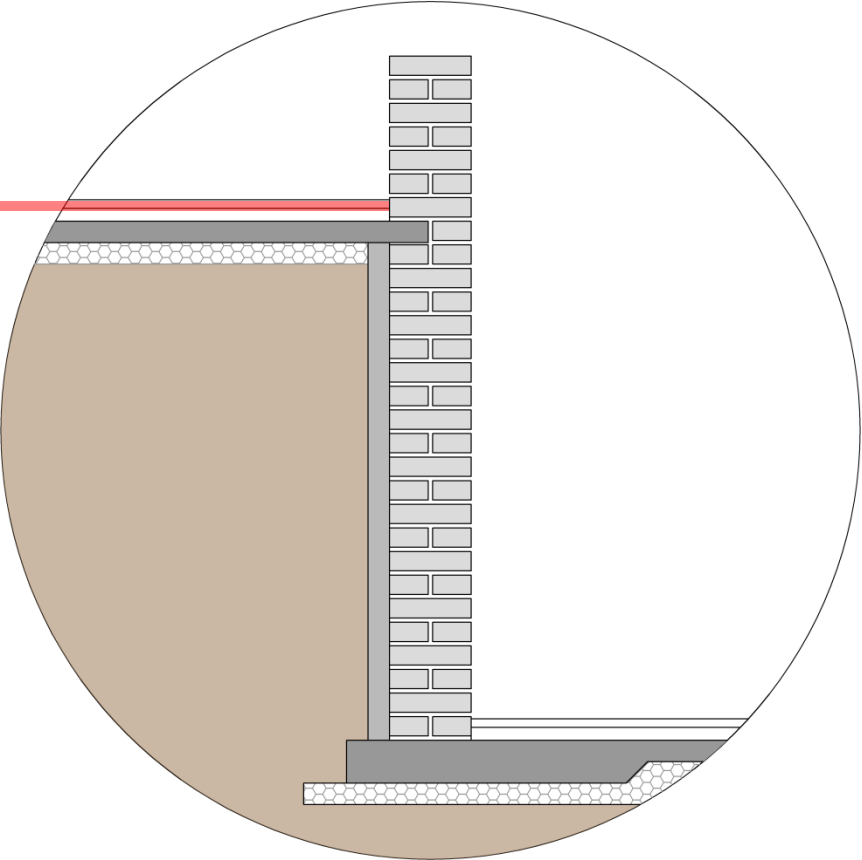
DORMITÓRIO

ATELIER

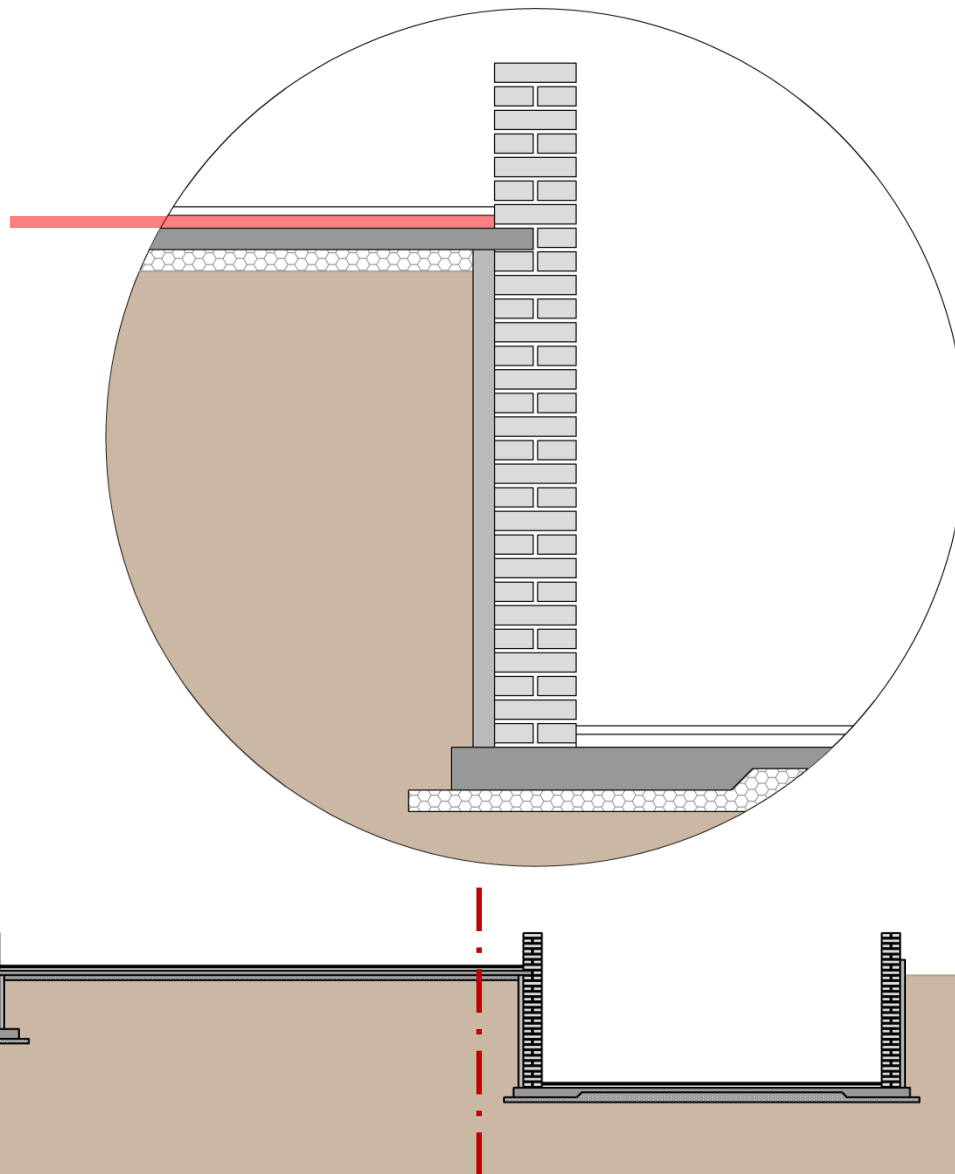




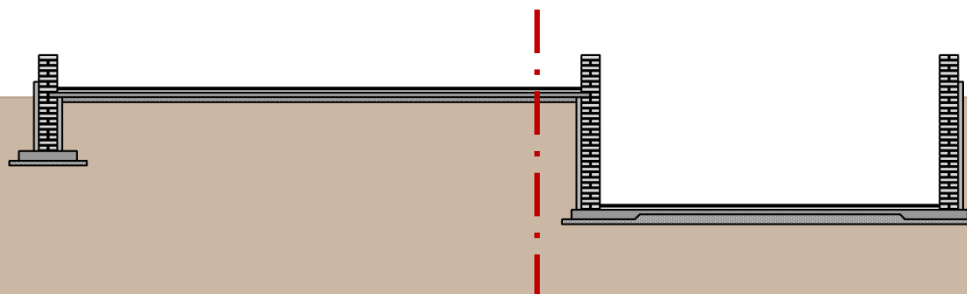
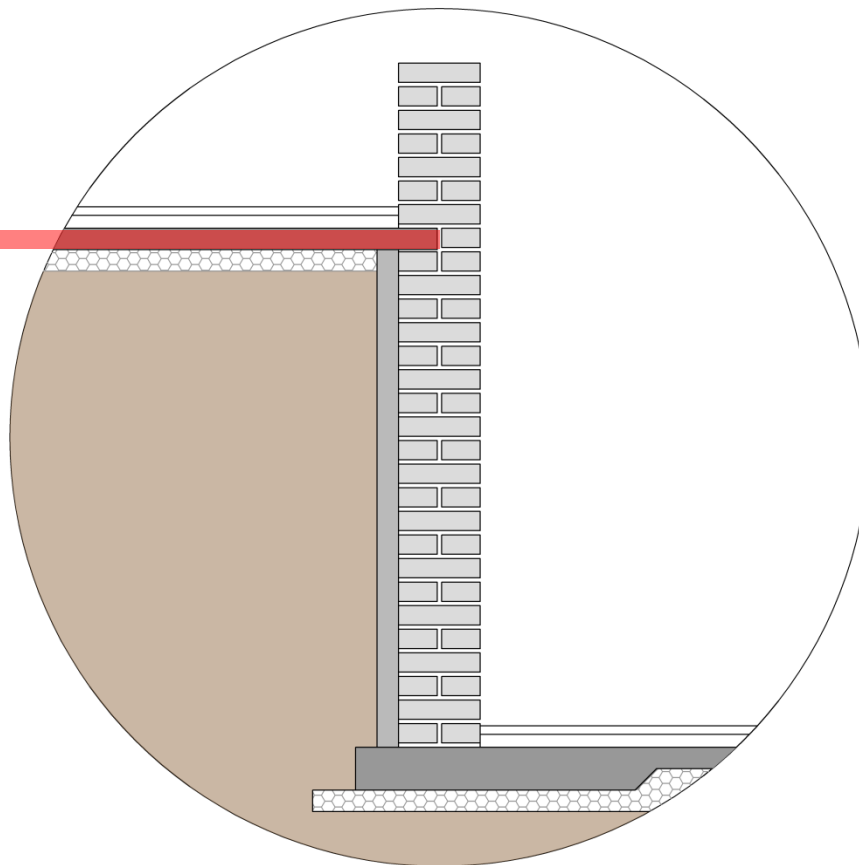
Revestimento
(e = 2 cm)



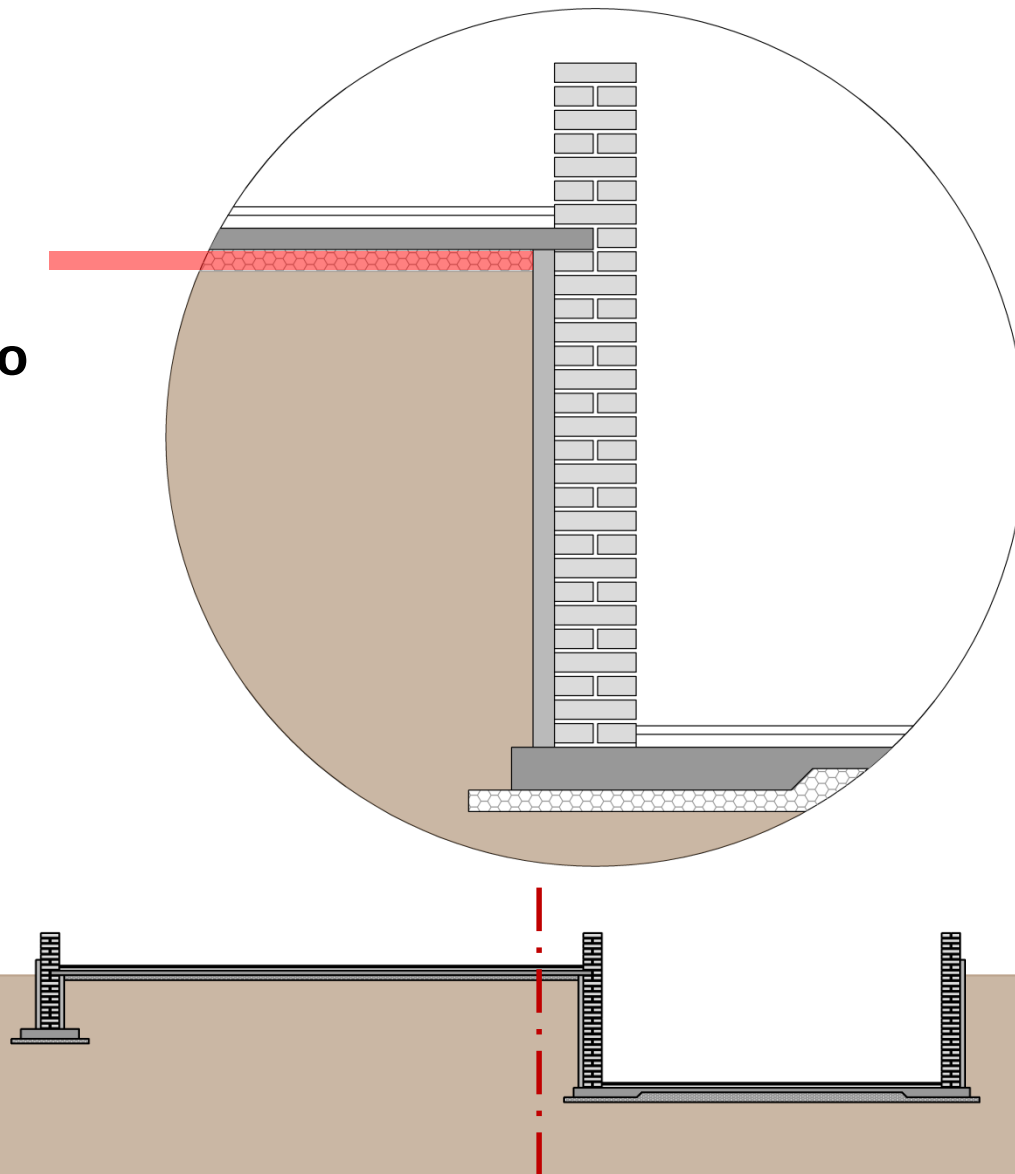
Contrapiso
(e = 3 cm)



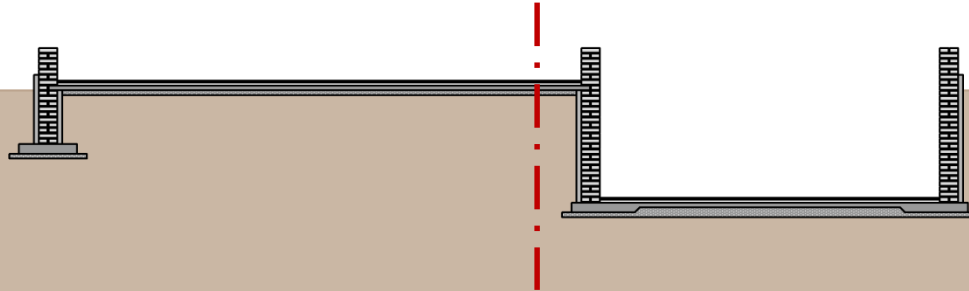
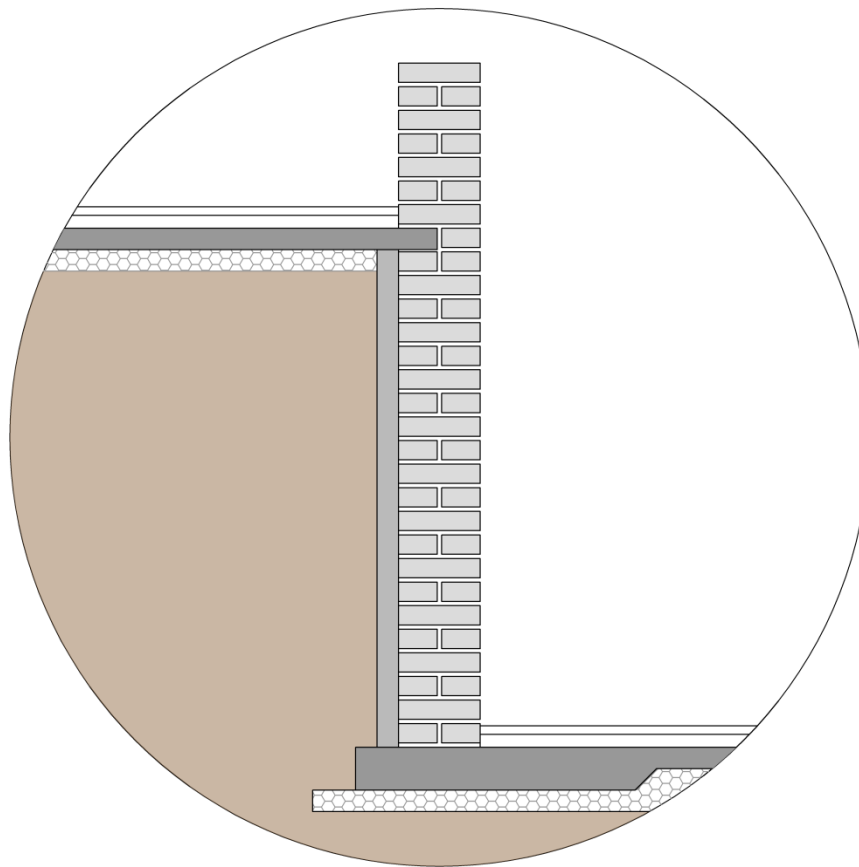
**Lastro
armado
de concreto
($e = 5\text{ cm}$)**



**Lastro
de brita
ou
concreto
não armado
(e = 5 cm)**



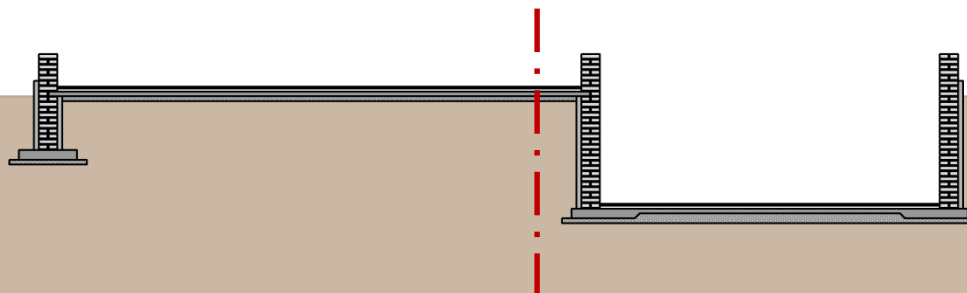
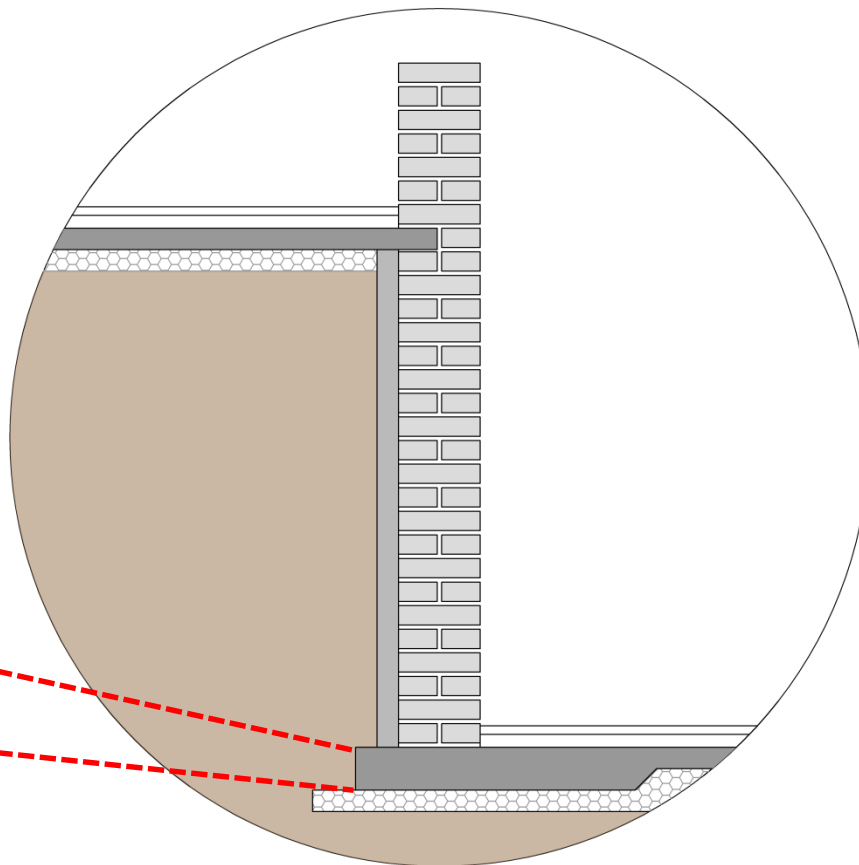
(PISO) 15 cm 



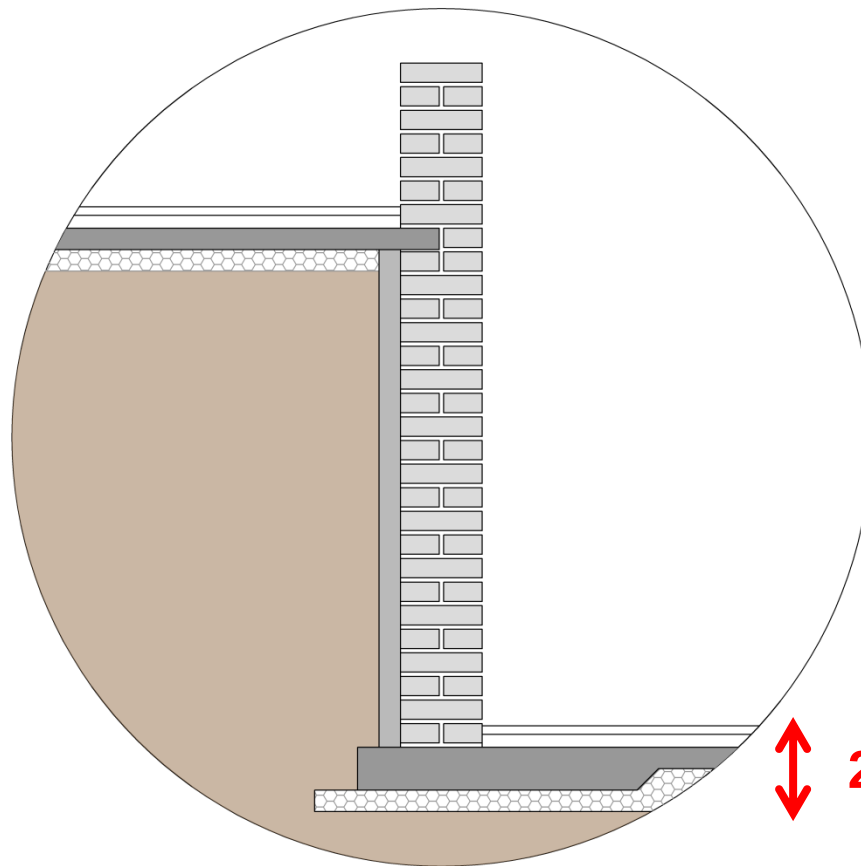
15 cm



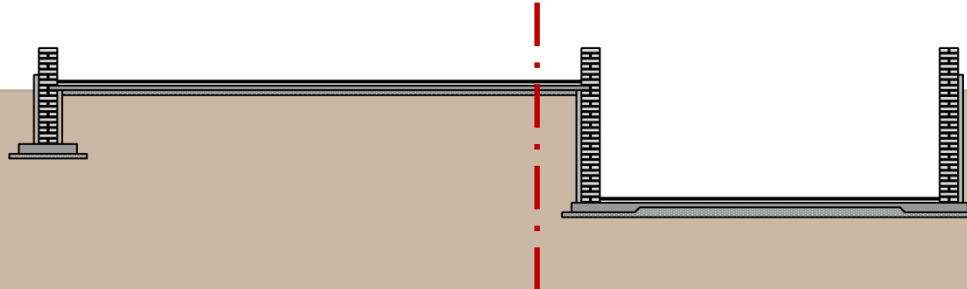
Fundação
(h = 10 cm)

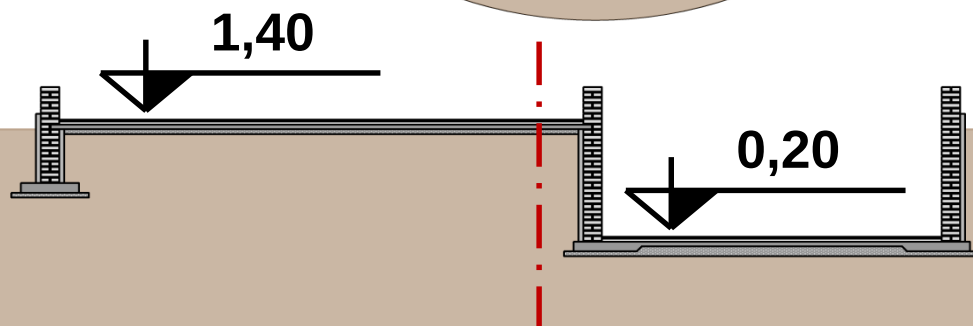
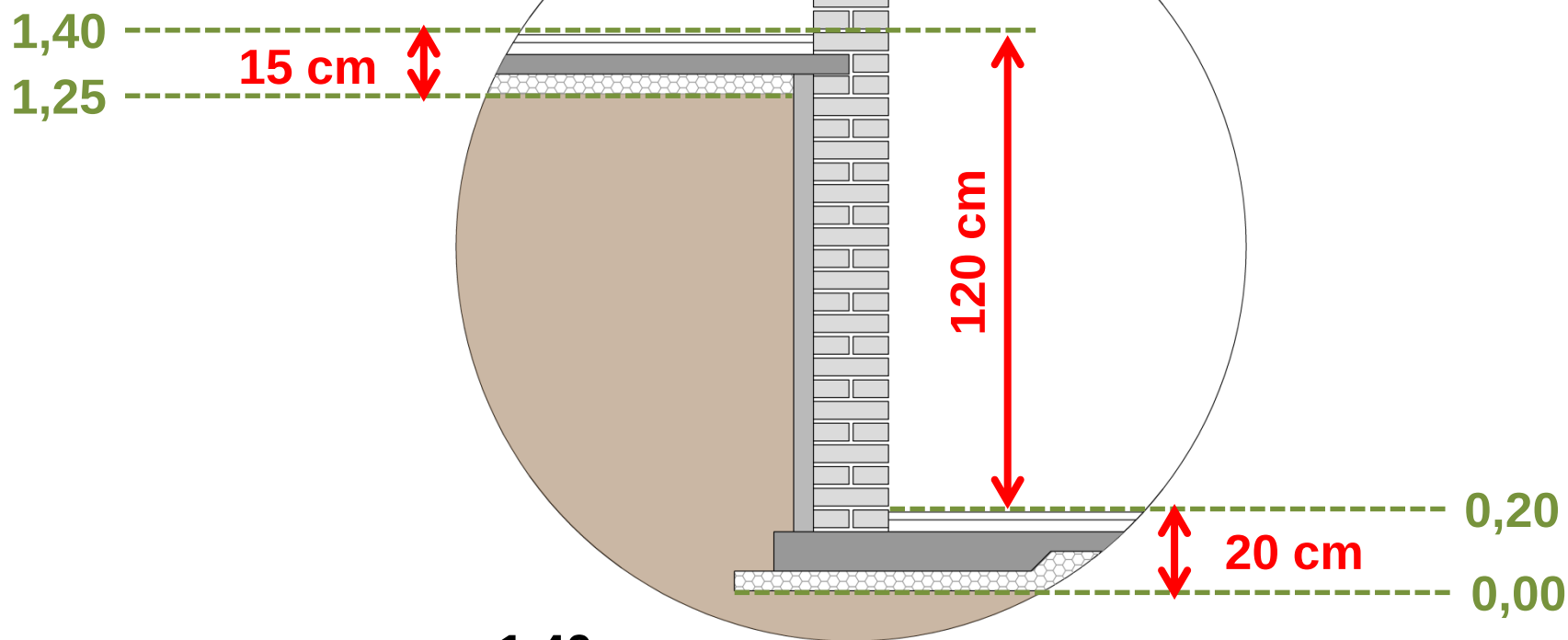


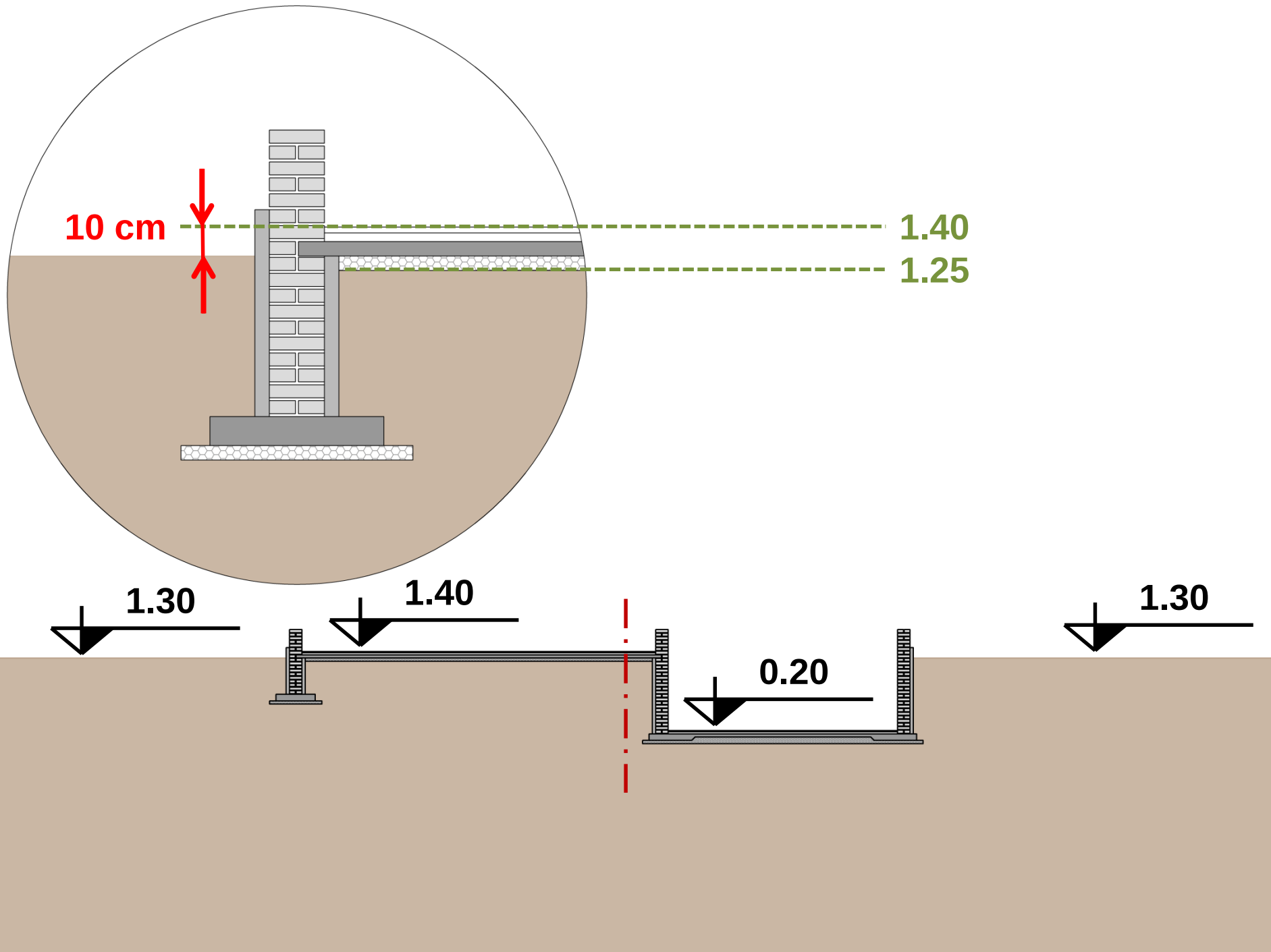
15 cm

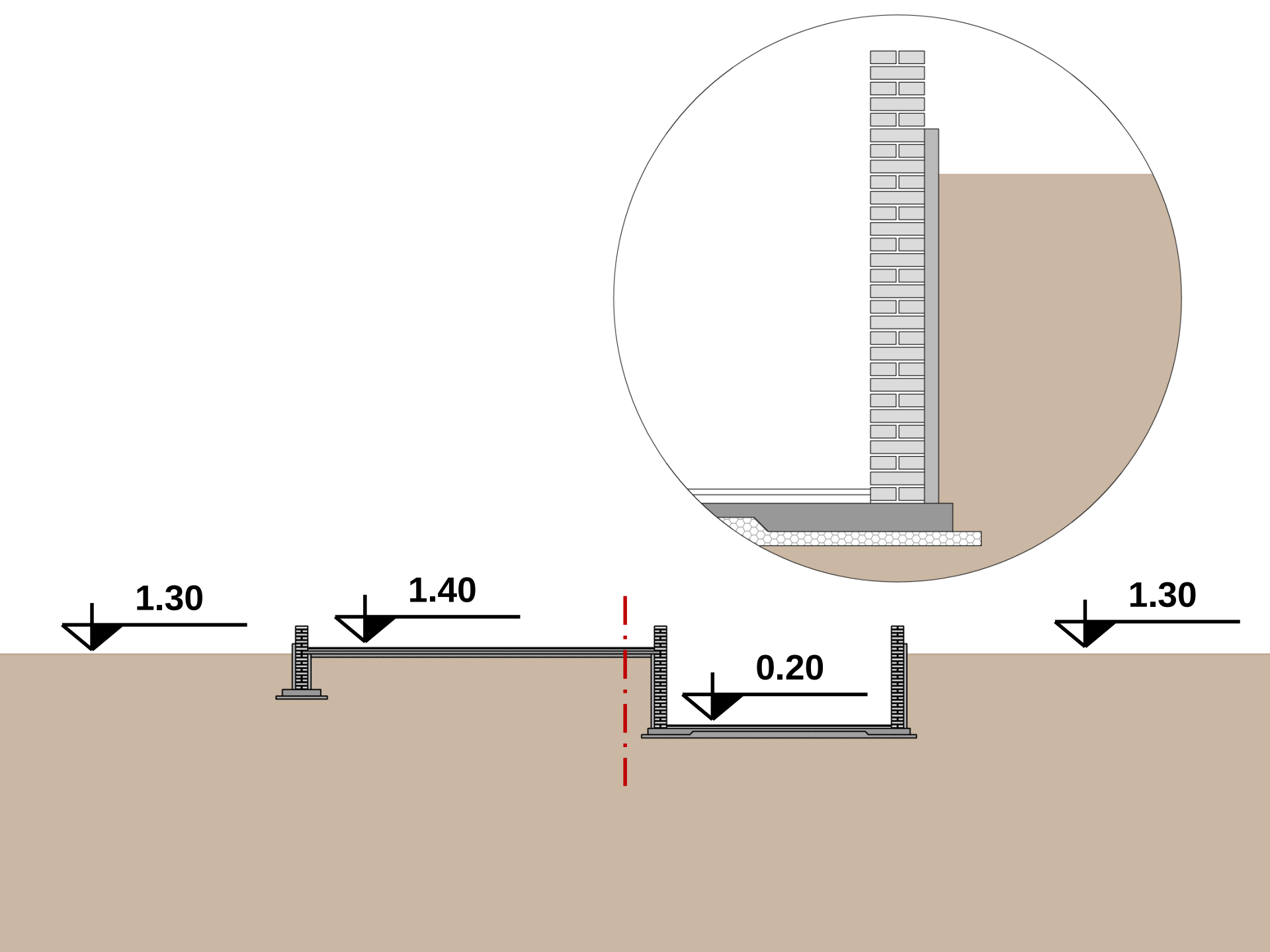


20 cm

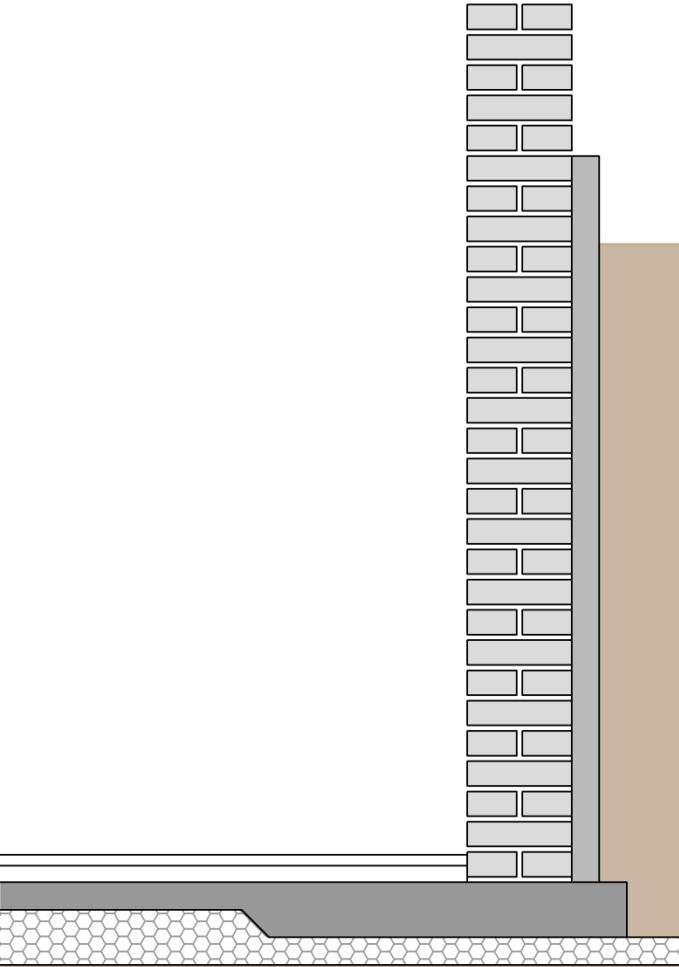








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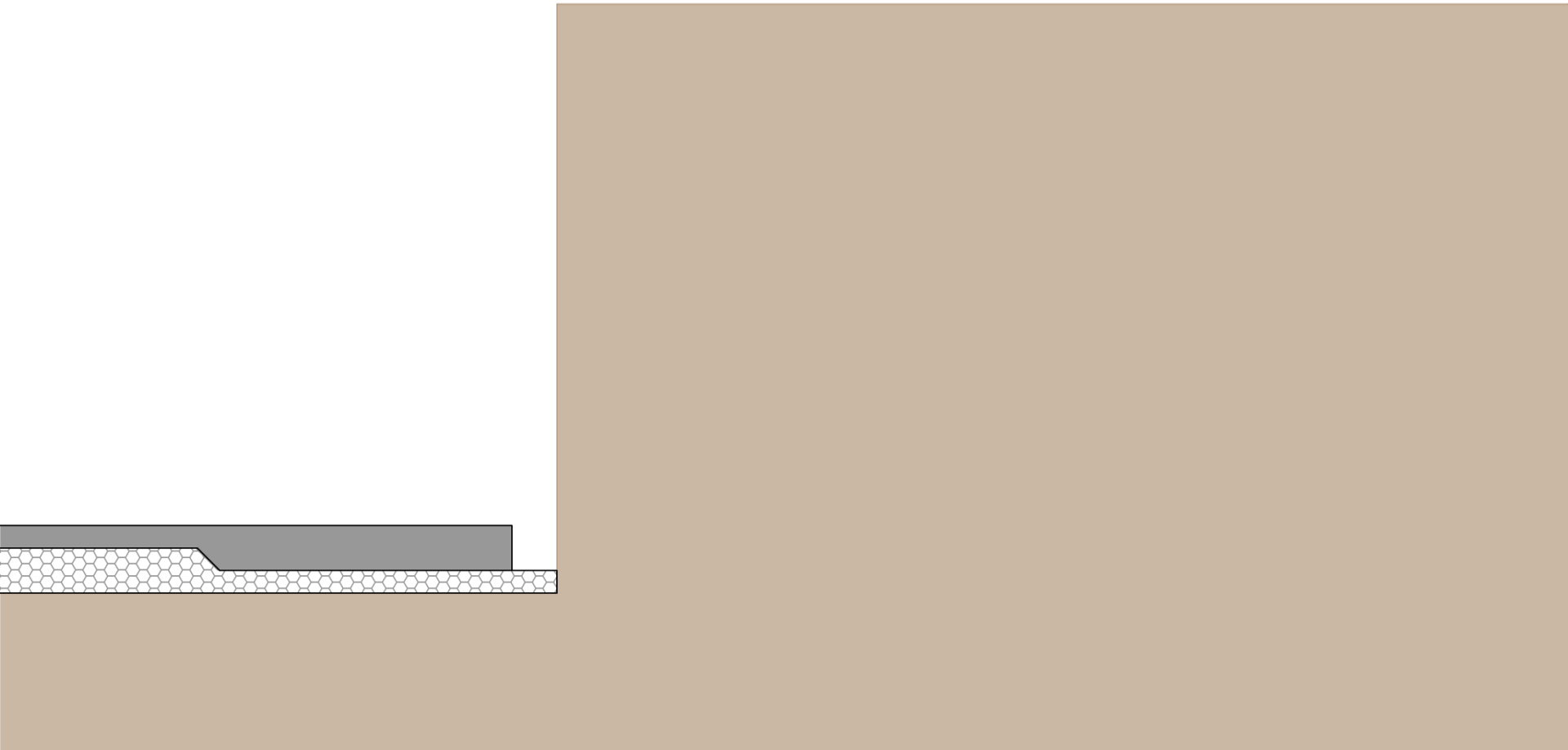
**CORTE
DO
TERRENO**



EXECUÇÃO DO LASTRO

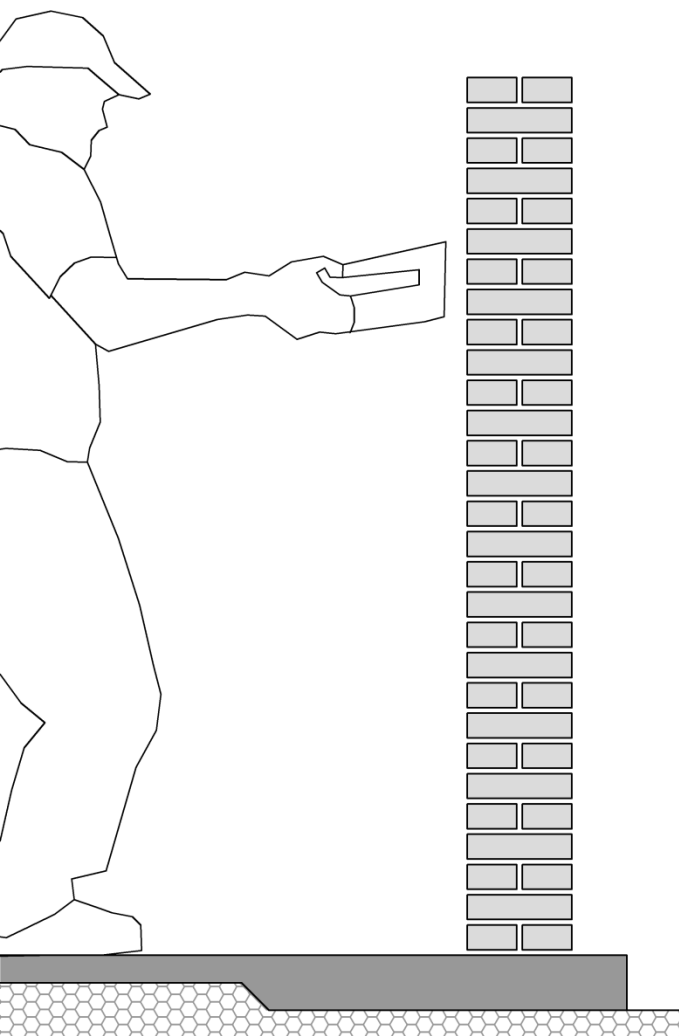


EXECUÇÃO DA FUNDAÇÃO

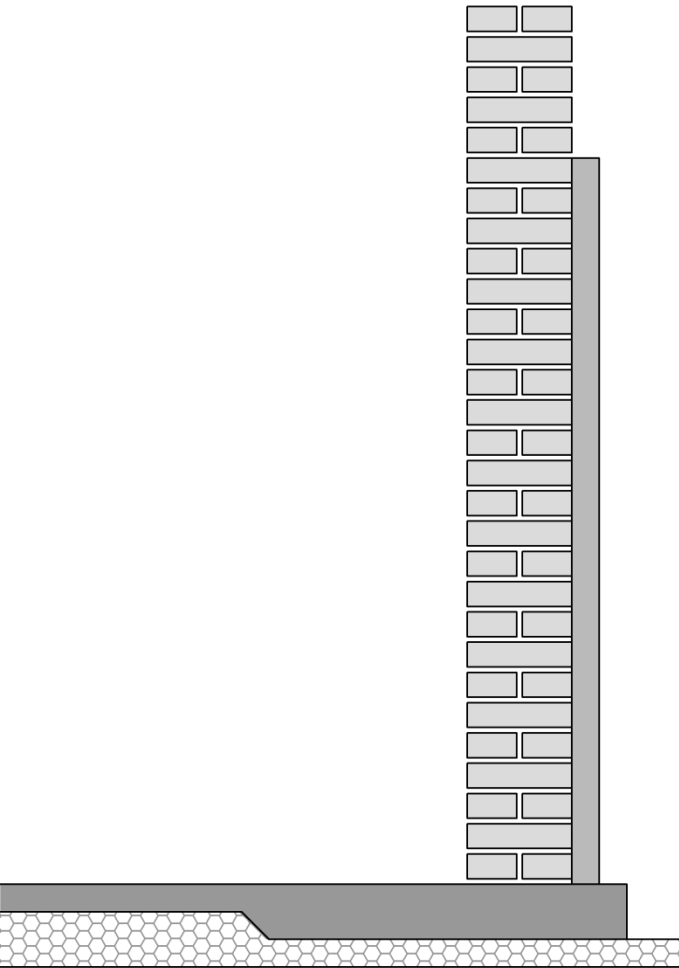


ASSENTAMENTO DA ALVENARIA

?



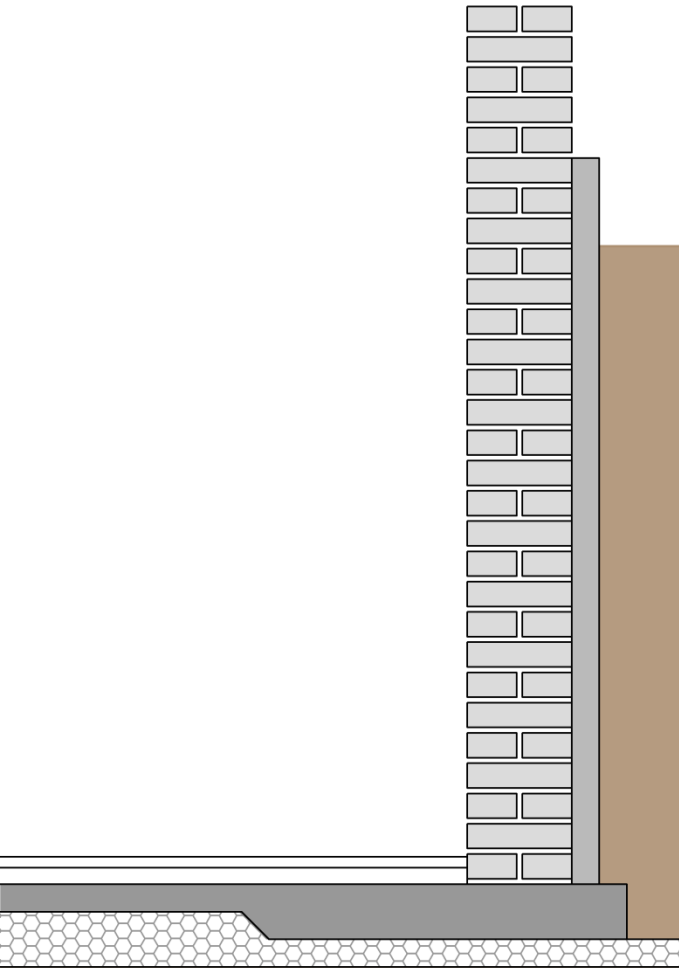
IMPERMEABILIZAÇÃO



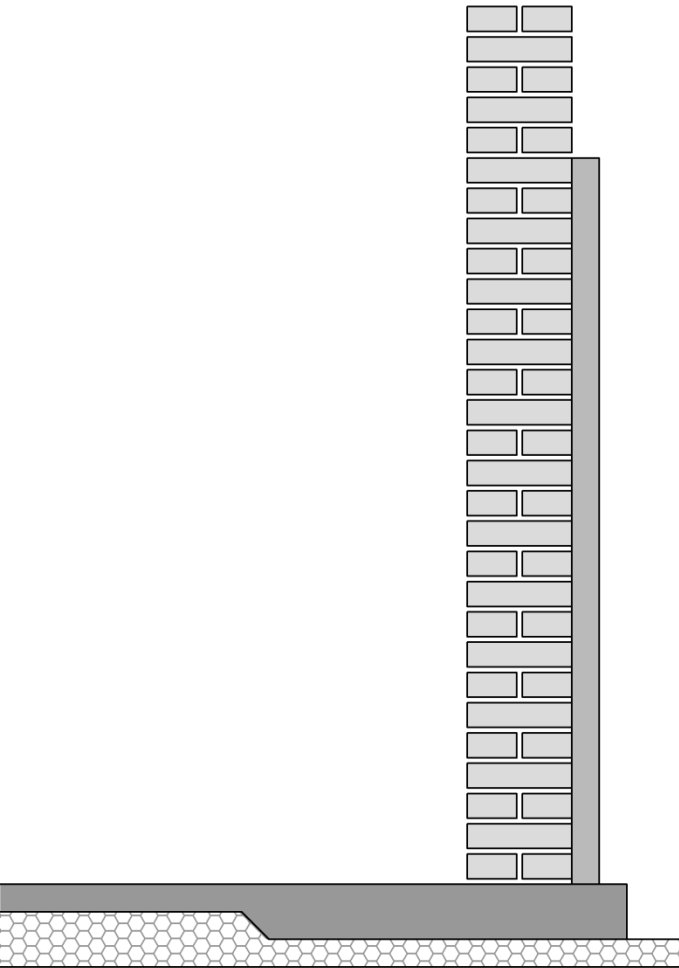
REATERRO

?

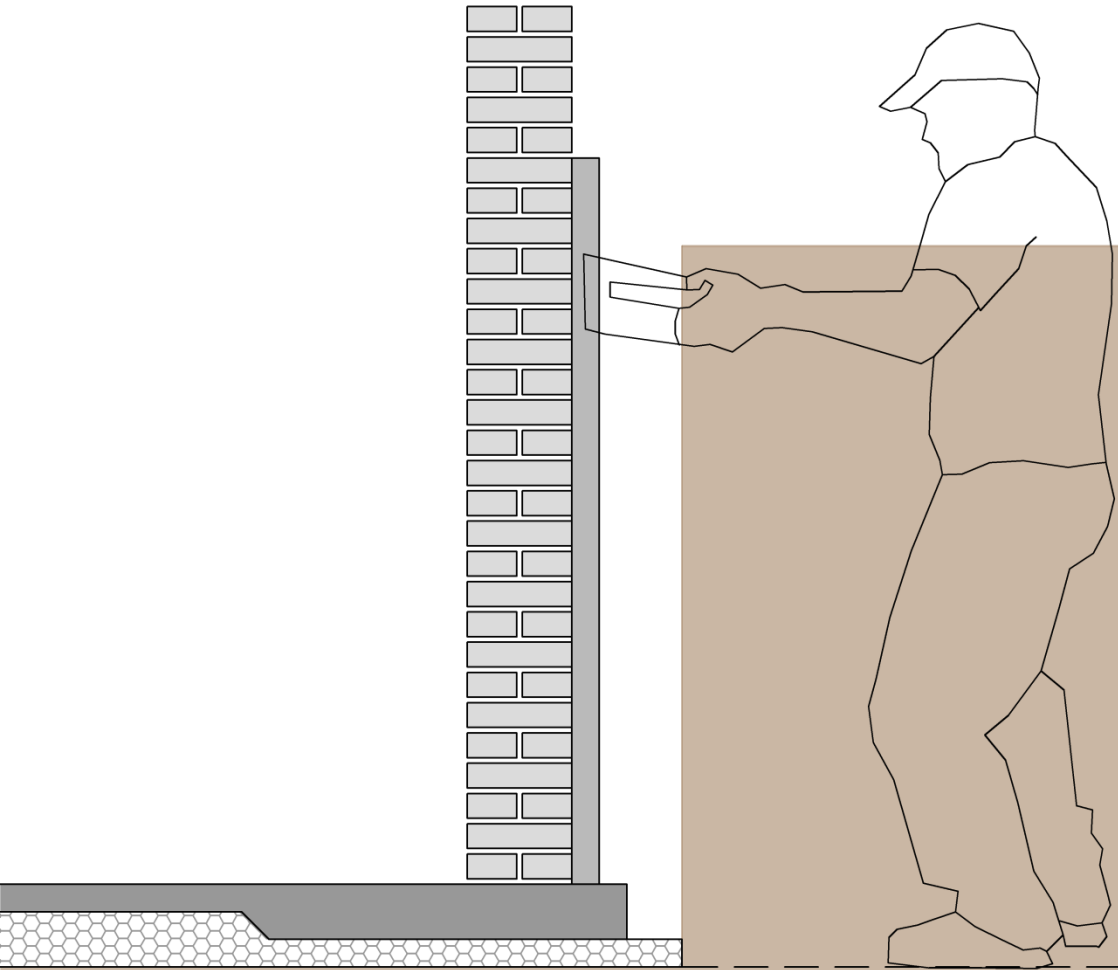
NÃO



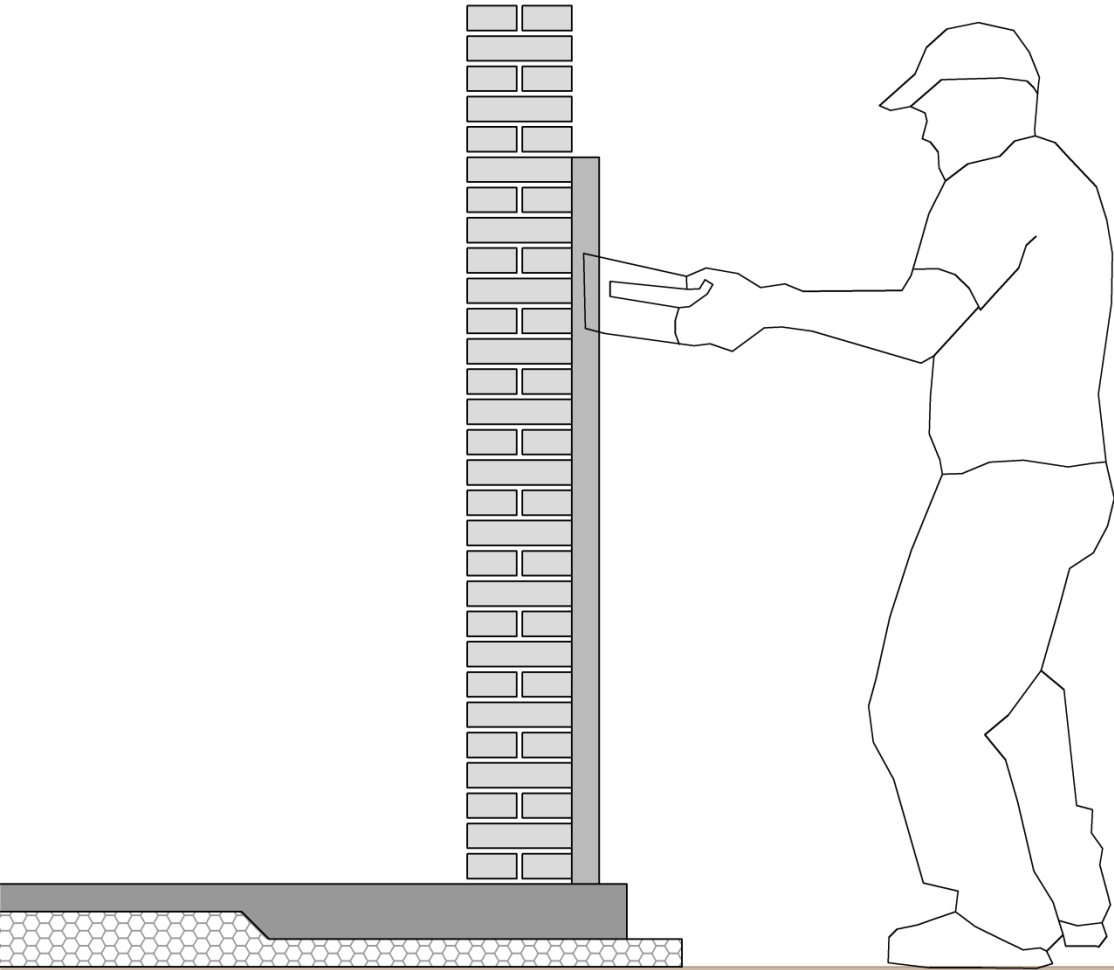
IMPERMEABILIZAÇÃO



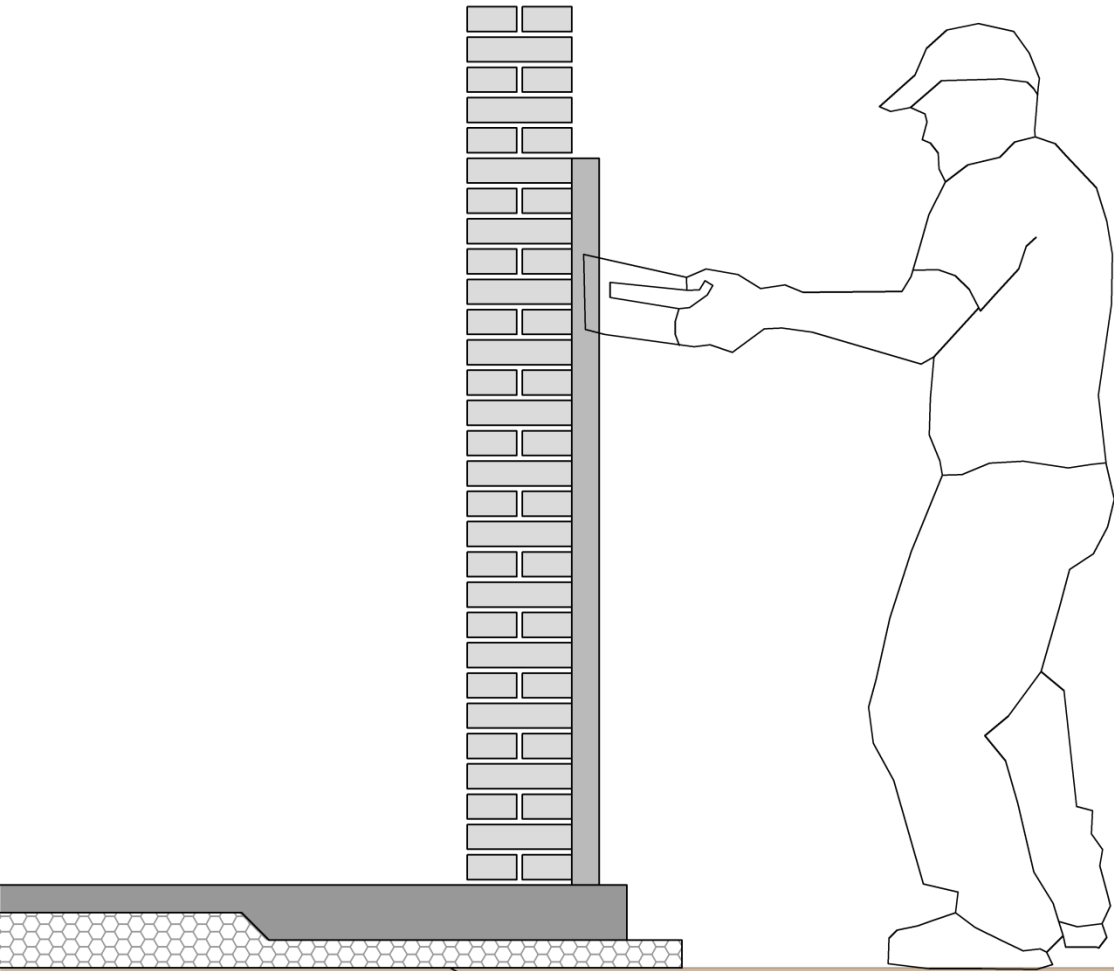
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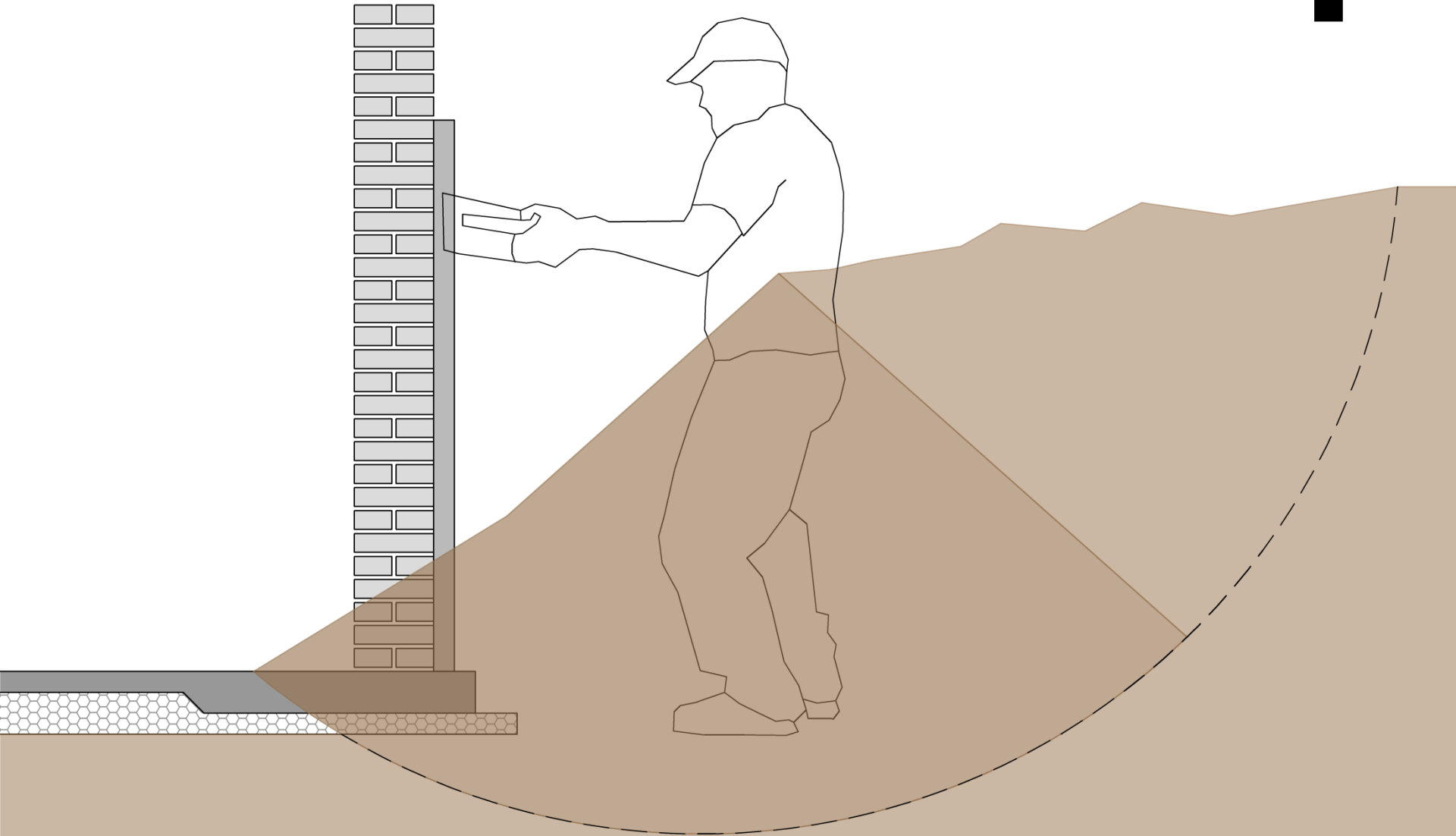
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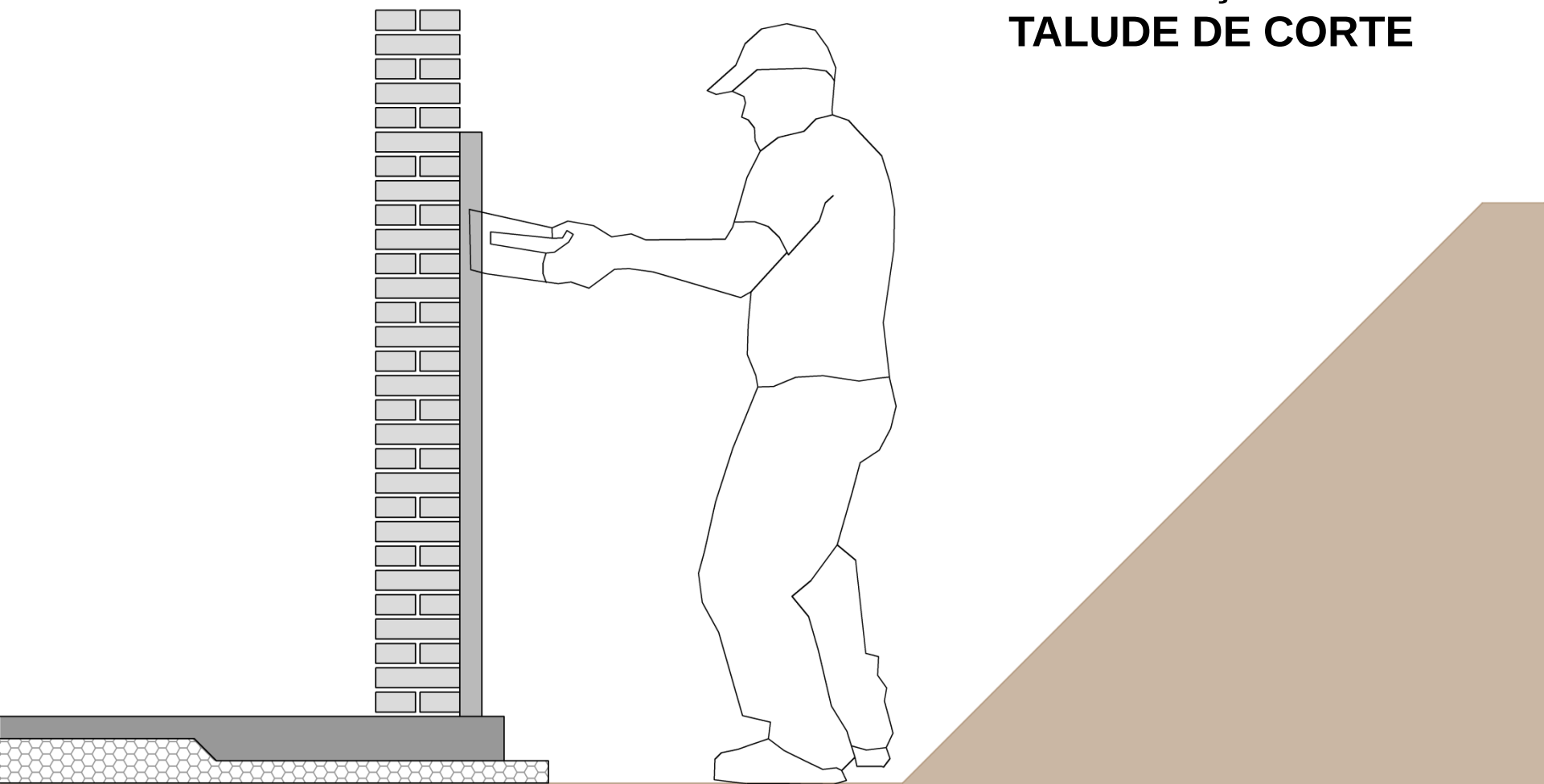
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INCLINAÇÃO DO TALUDE DE CORTE



REATERRO

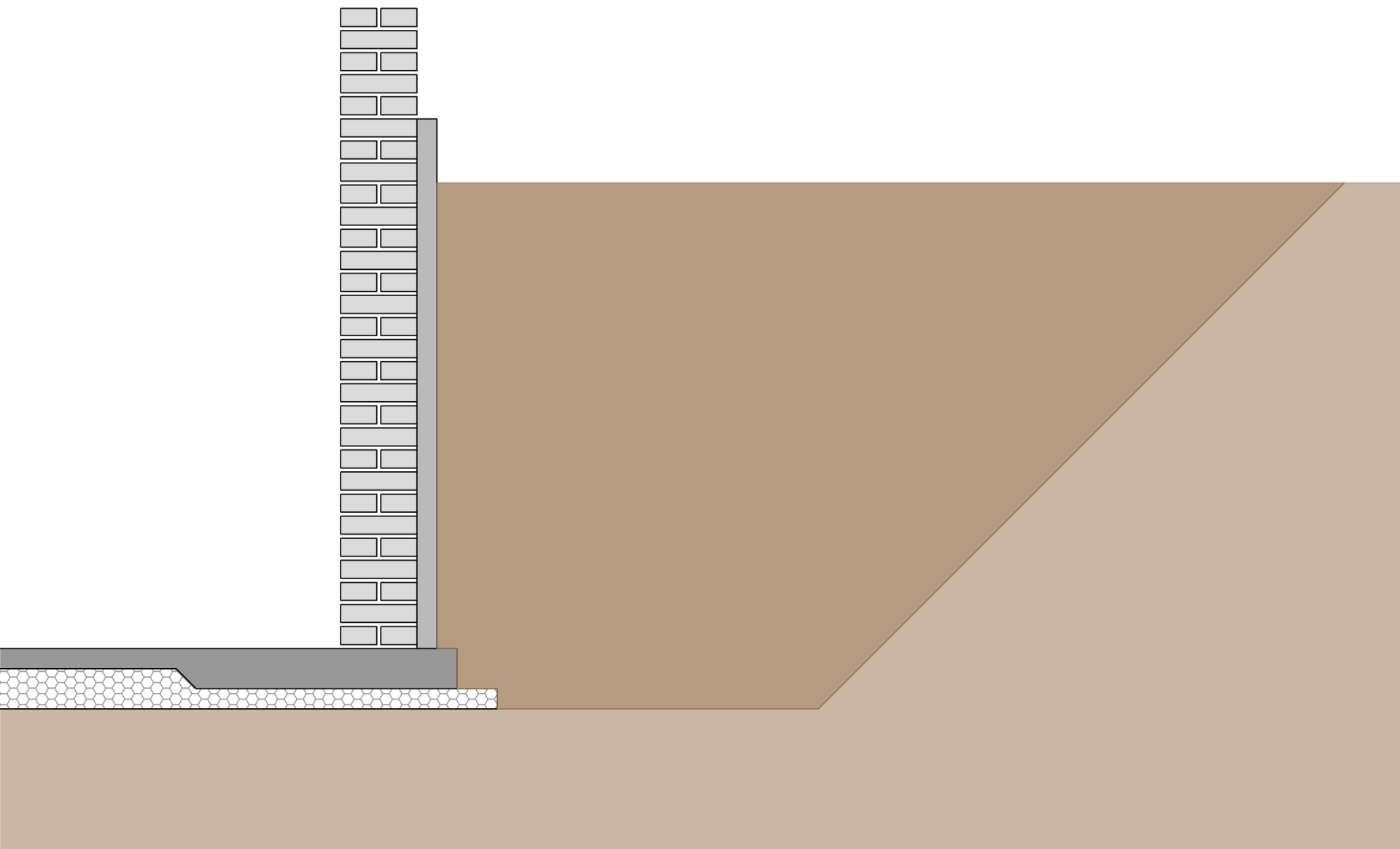
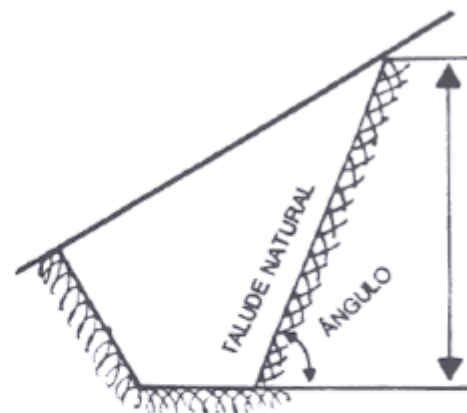
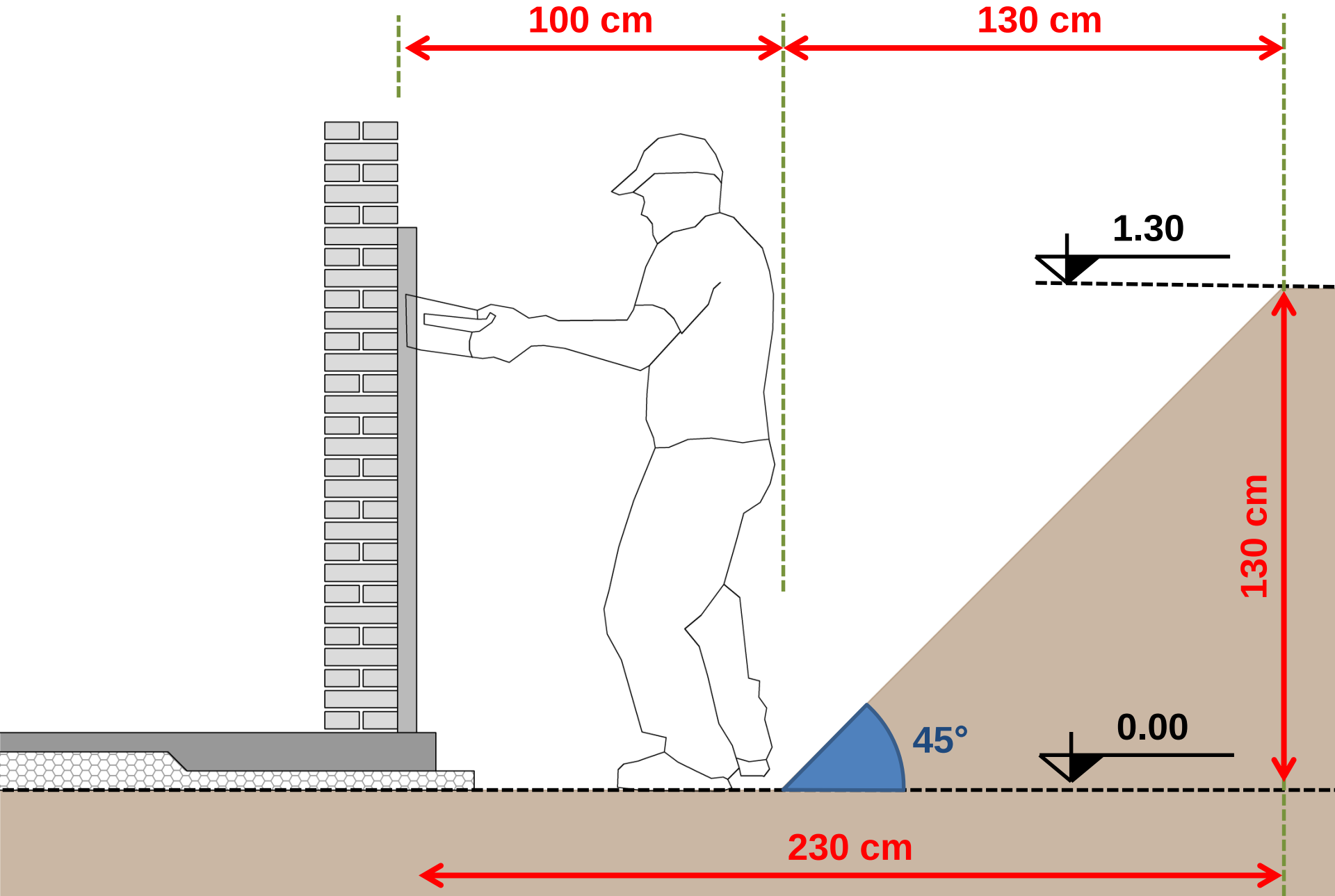


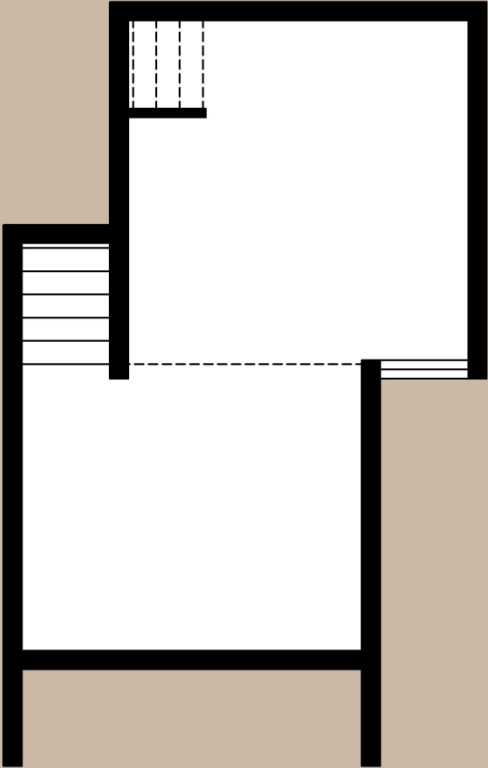
Tabela 1- Ângulo de talude natural para diferentes tipos de solos

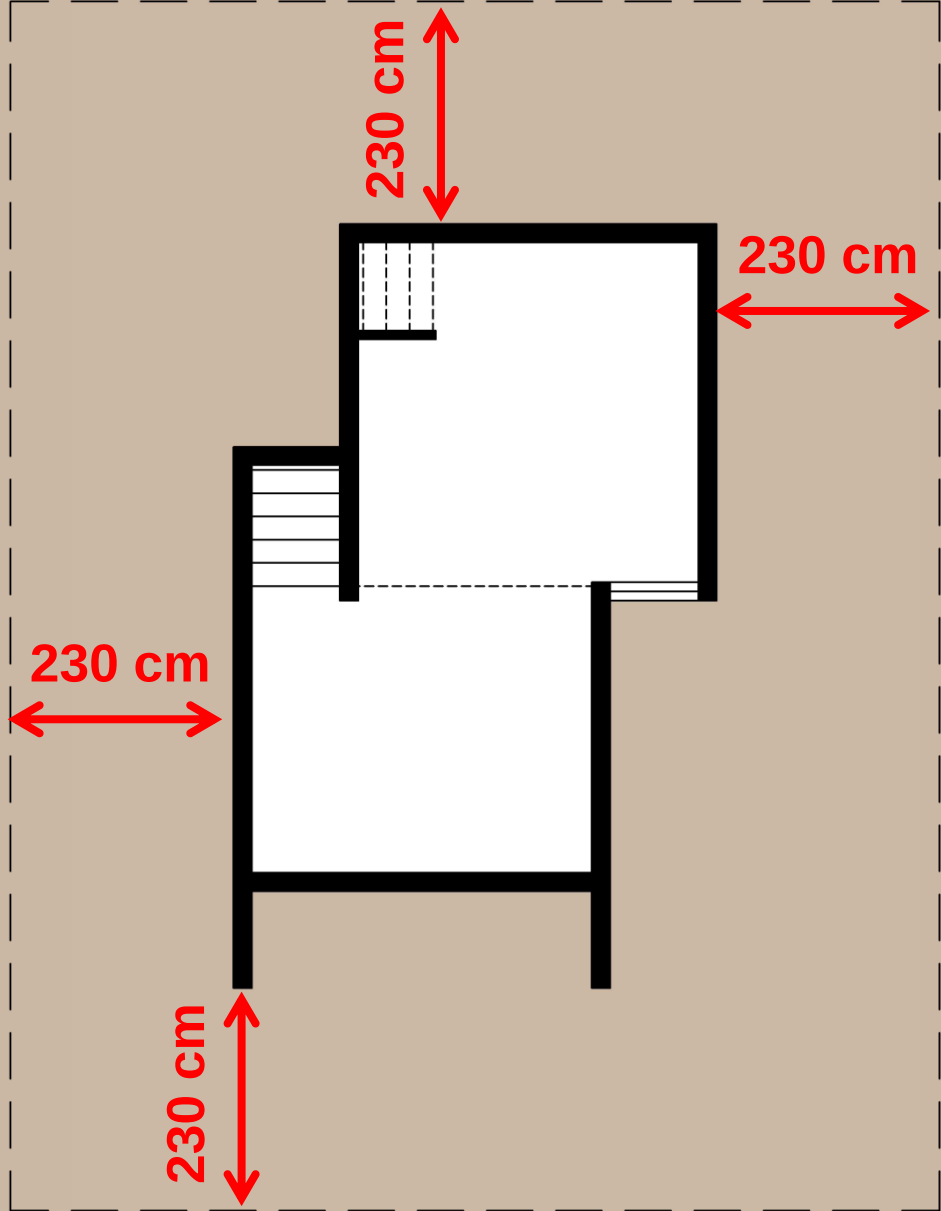
Tipo de terreno	Ângulo do talude natural das terras em relação a um plano horizontal	
	Terreno seco	Terreno submerso
Rocha dura	80° a 90°	80°
Rocha mole (podre)	55°	55°
Escombros rochosos, pedras	45°	40°
Terra vegetal	45°	30°
Terra forte (misto de areia e argila)	45°	30°
Argila	40°	20°
Pedregulho	35°	30°
Areia fina	30°	20°

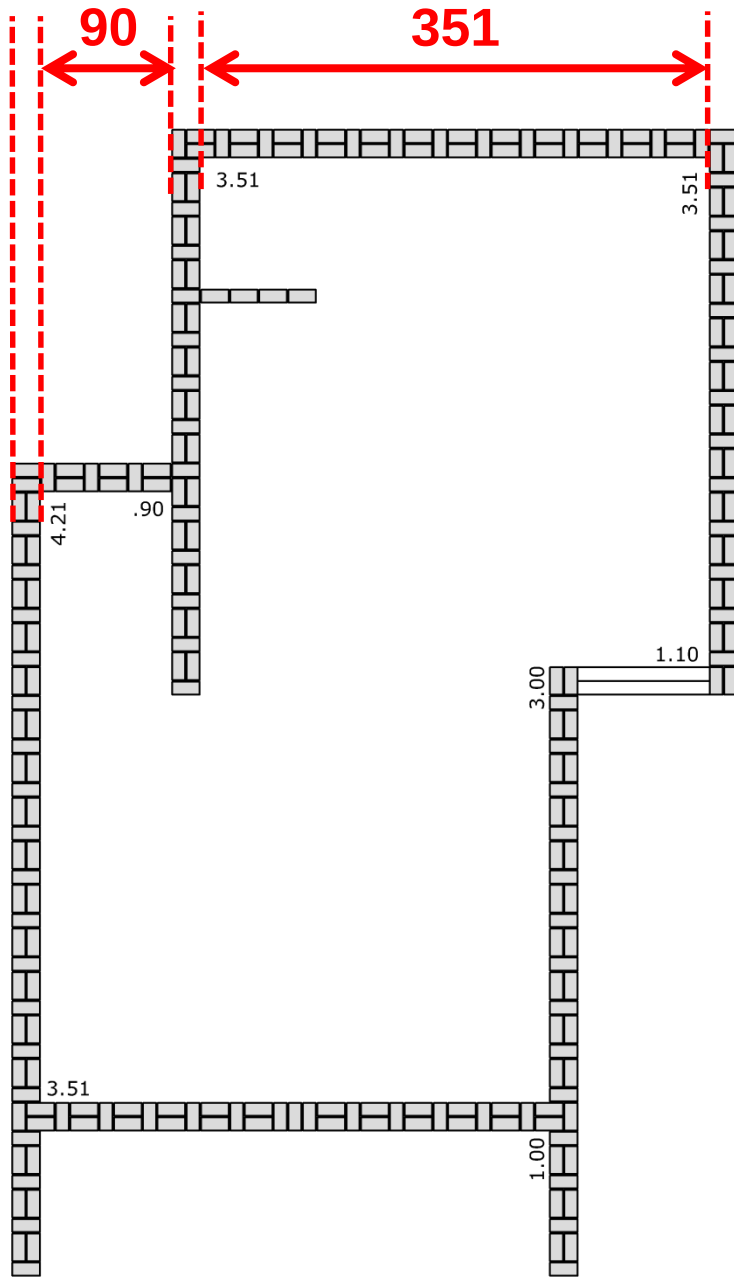
Fonte: Rousselet.











CERÂMICA

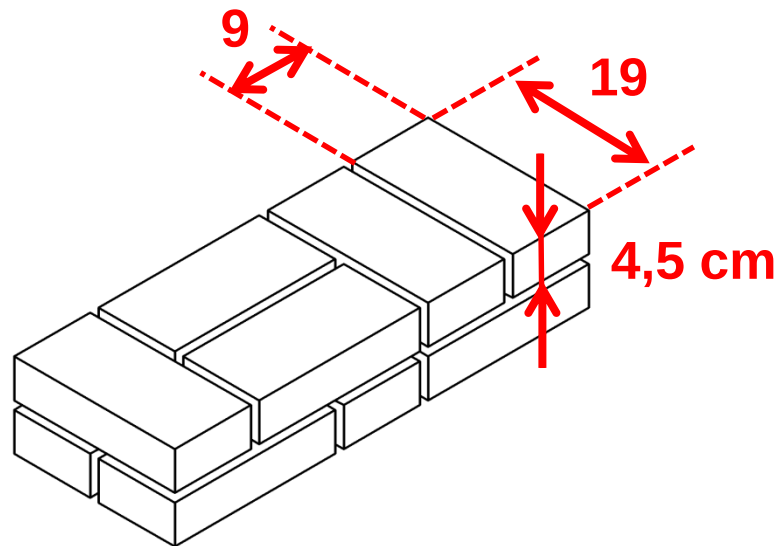
**MATERIAL DE
CONSTRUÇÃO**

**COMPONENTE
CONSTRUTIVO**

TIJOLO

9 x 19 x 4,5 cm

(L x C x H)

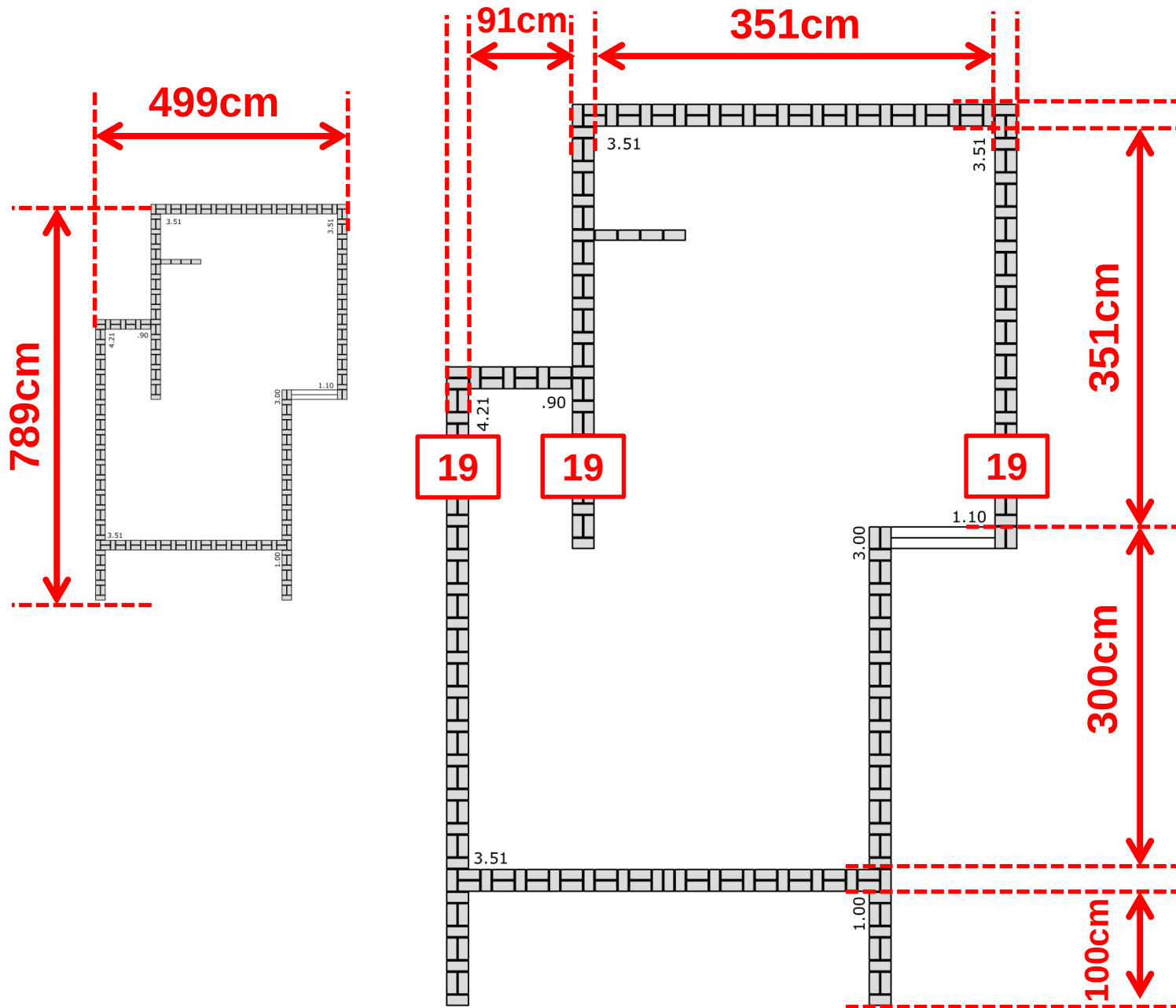


PAREDE

ELEMENTO CONSTRUTIVO

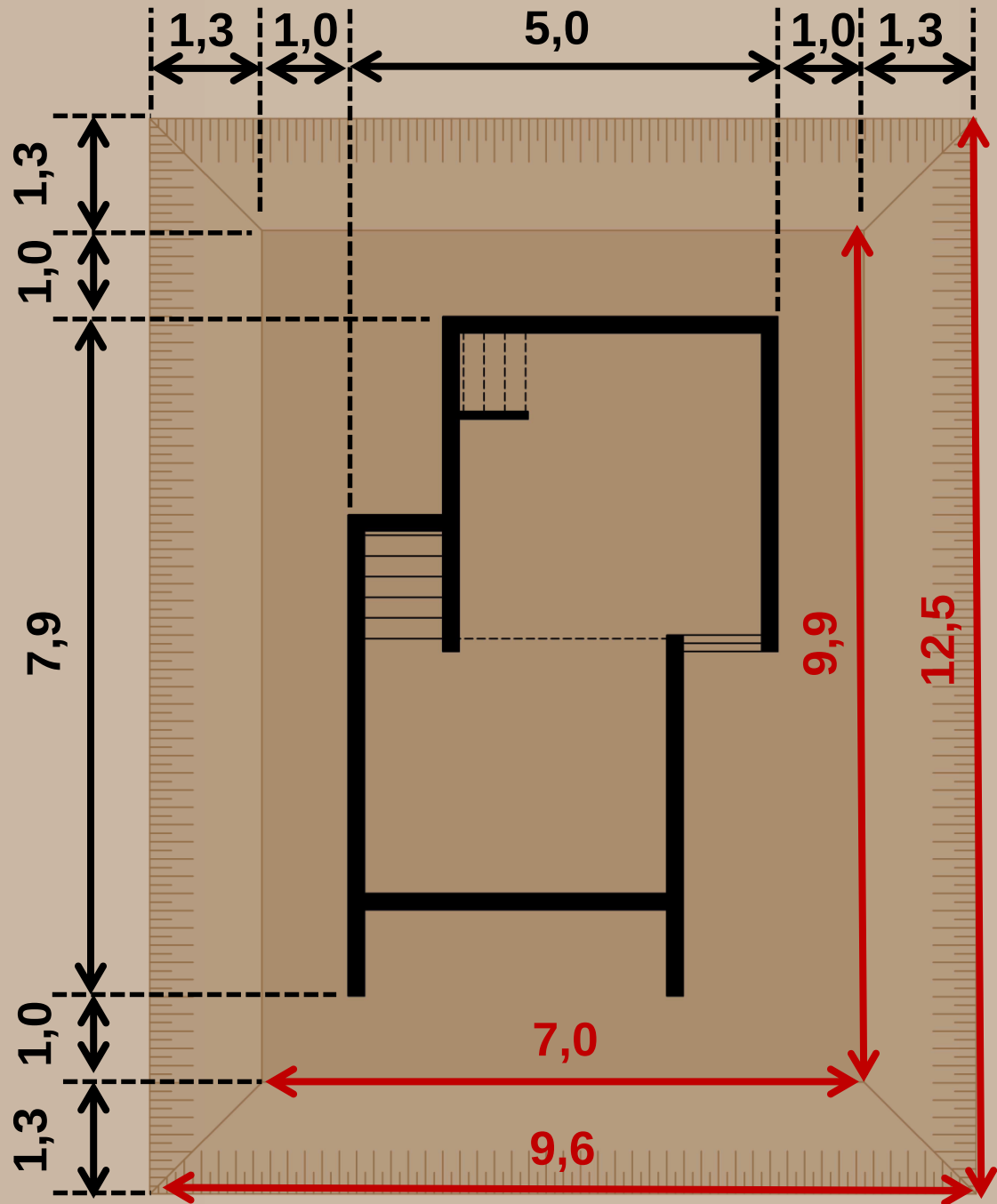
VEDAÇÃO VERTICAL

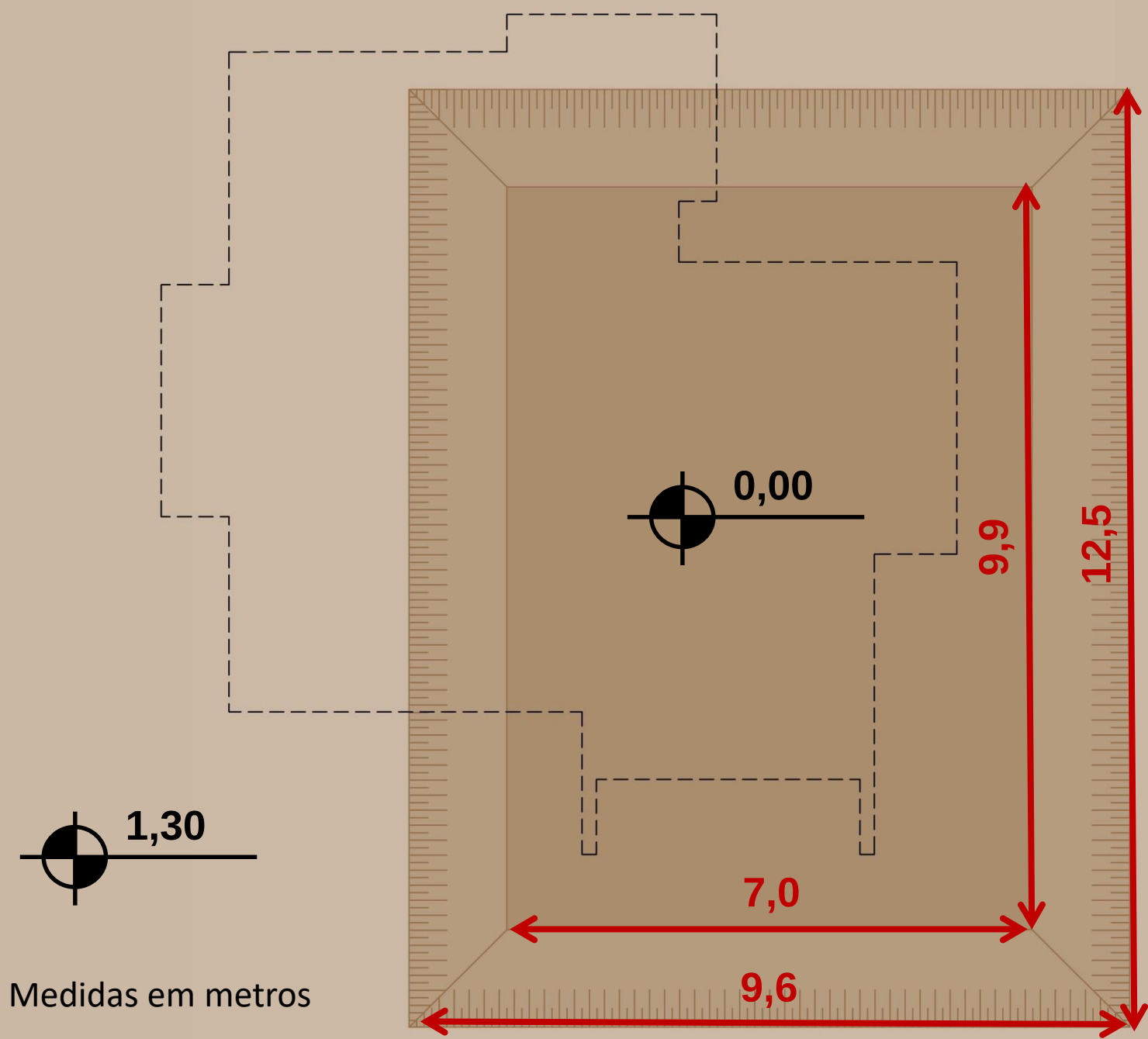
(SUB)SISTEMA DO EDIFÍCIO

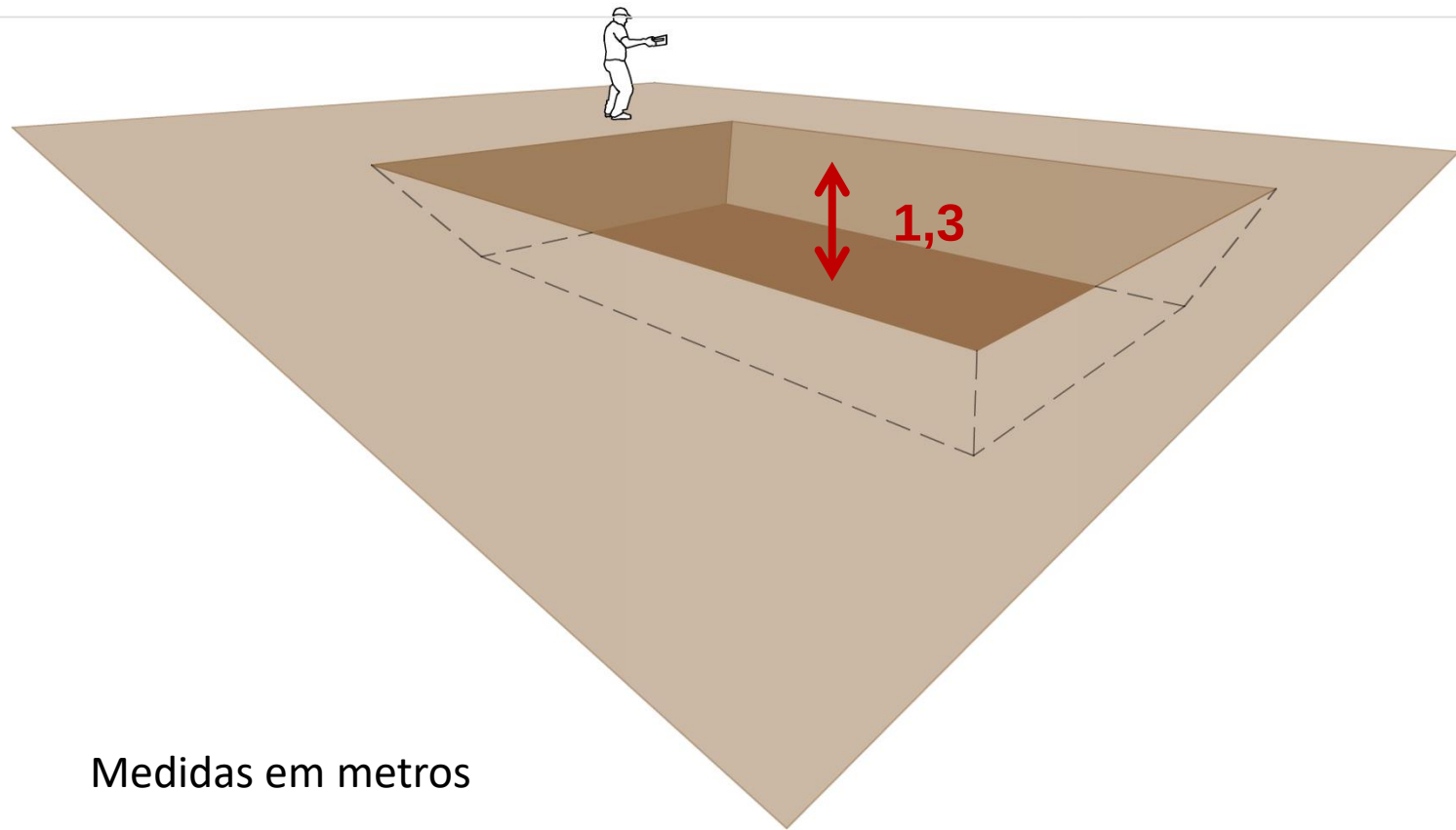
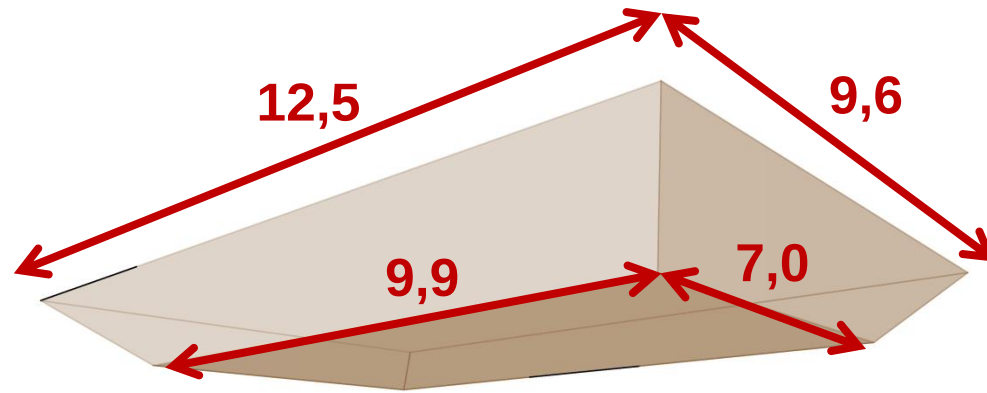


Largura da parede em centímetros

Medidas em metros

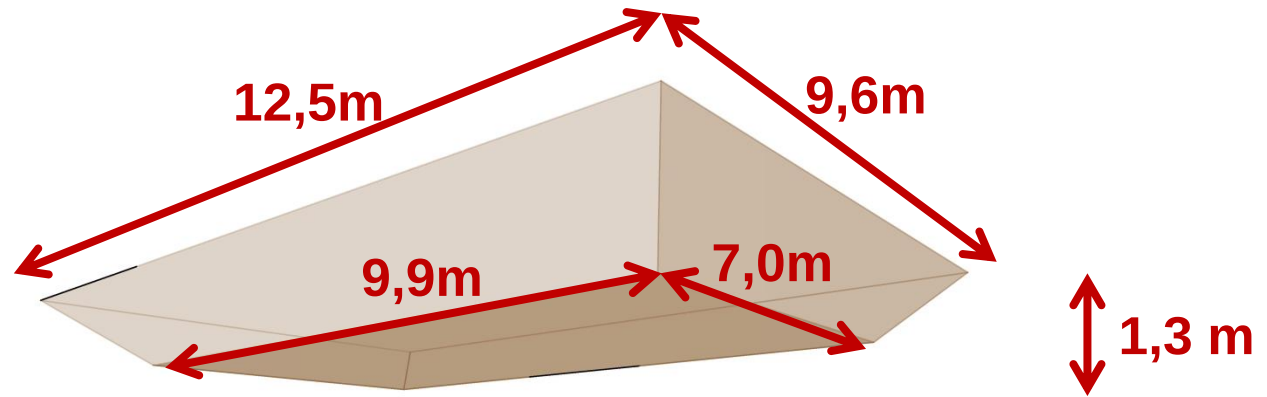






Medidas em metros

**TRONCO
DE PIRÂMIDE
DE BASE
RETANGULAR**



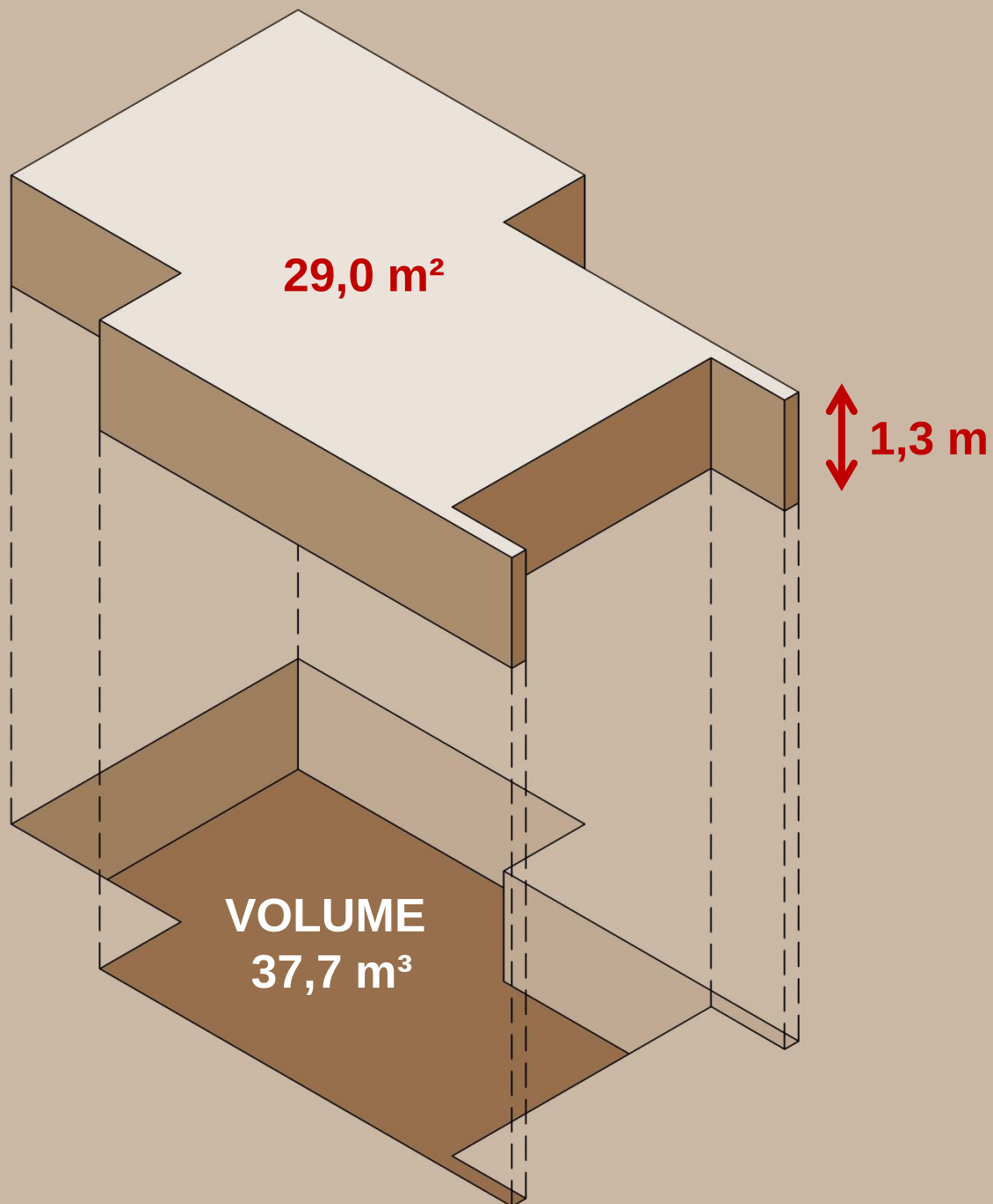
$$\text{VOLUME} = H \times (A + \sqrt{A \times a} + a) / 3$$

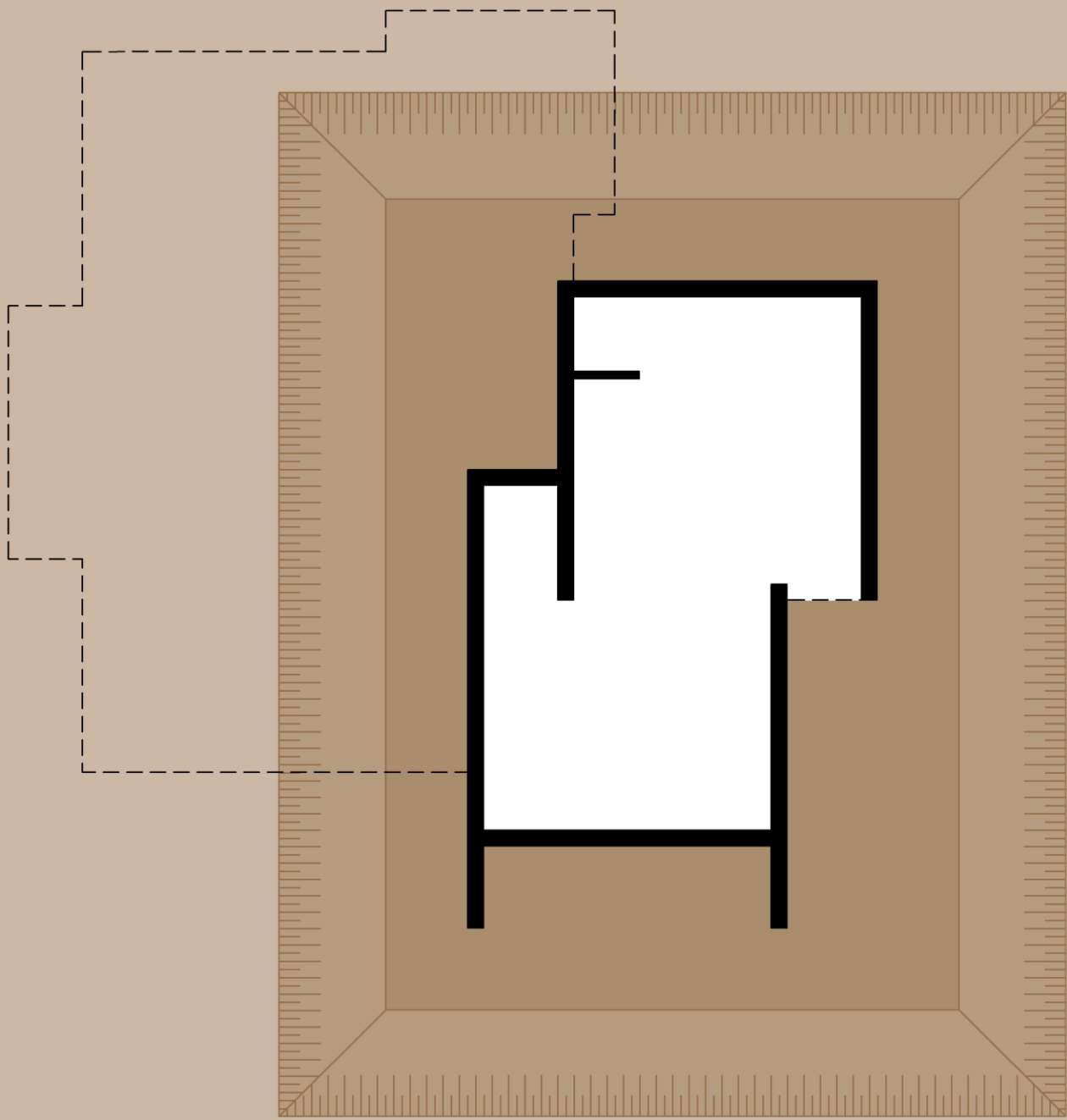
$$A = 9,6 \times 12,5 = 120,0 \text{ m}^2$$

$$a = 7,0 \times 9,9 = 69,3 \text{ m}^2$$

$$\text{VOLUME} = 1,30 \times (120 + \sqrt{120 \times 69,3} + 69,3) / 3$$

$$\text{VOLUME} = 121,5 \text{ m}^3$$

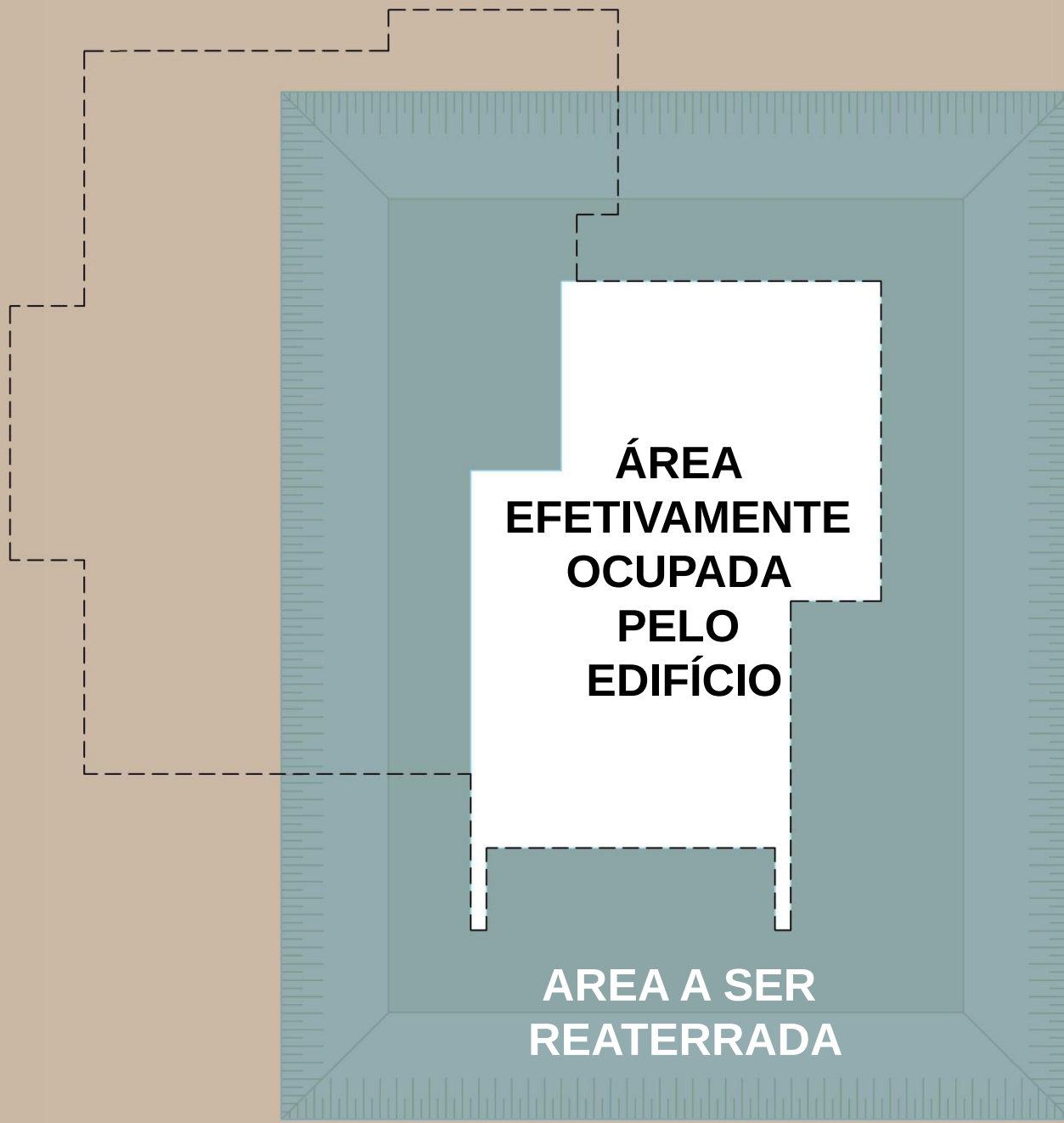






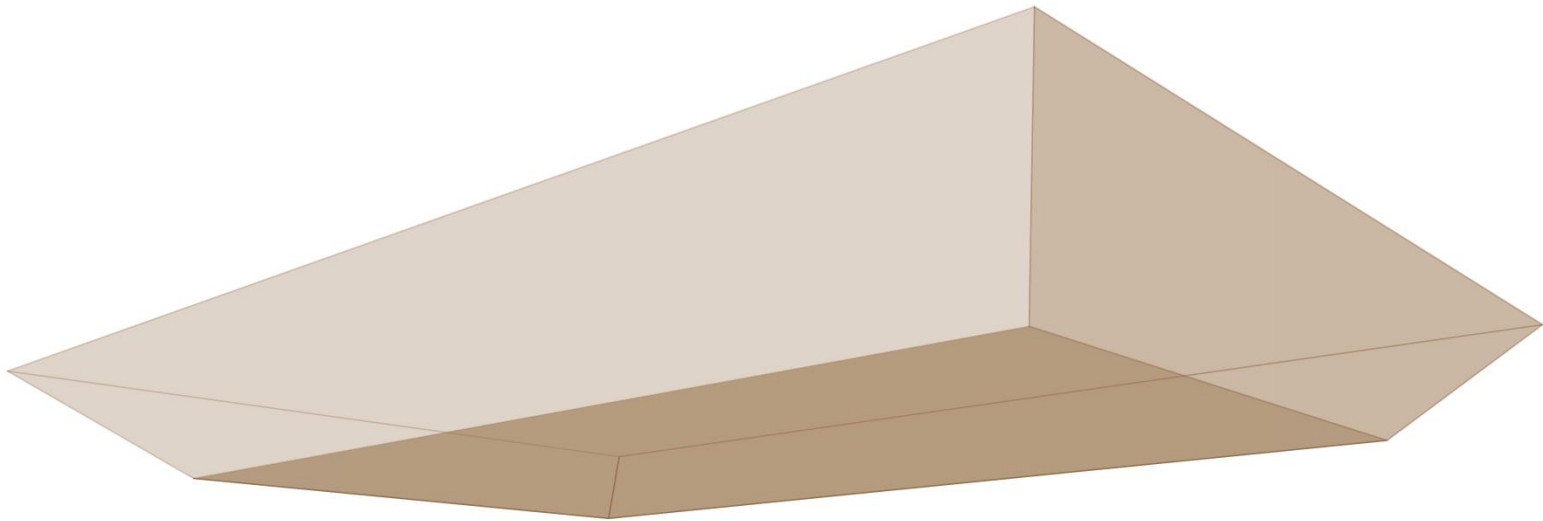
The diagram illustrates a building's footprint within a larger rectangular boundary. The building footprint is a dark brown shape with a white rectangular area in the center. This white area is labeled 'ÁREA EFETIVAMENTE OCUPADA PELO EDIFÍCIO'. The building footprint is surrounded by a light brown area, which is further enclosed by a dashed line. The dashed line follows the building's footprint but extends to the left and top edges of the diagram, indicating a larger area of interest or a specific measurement context.

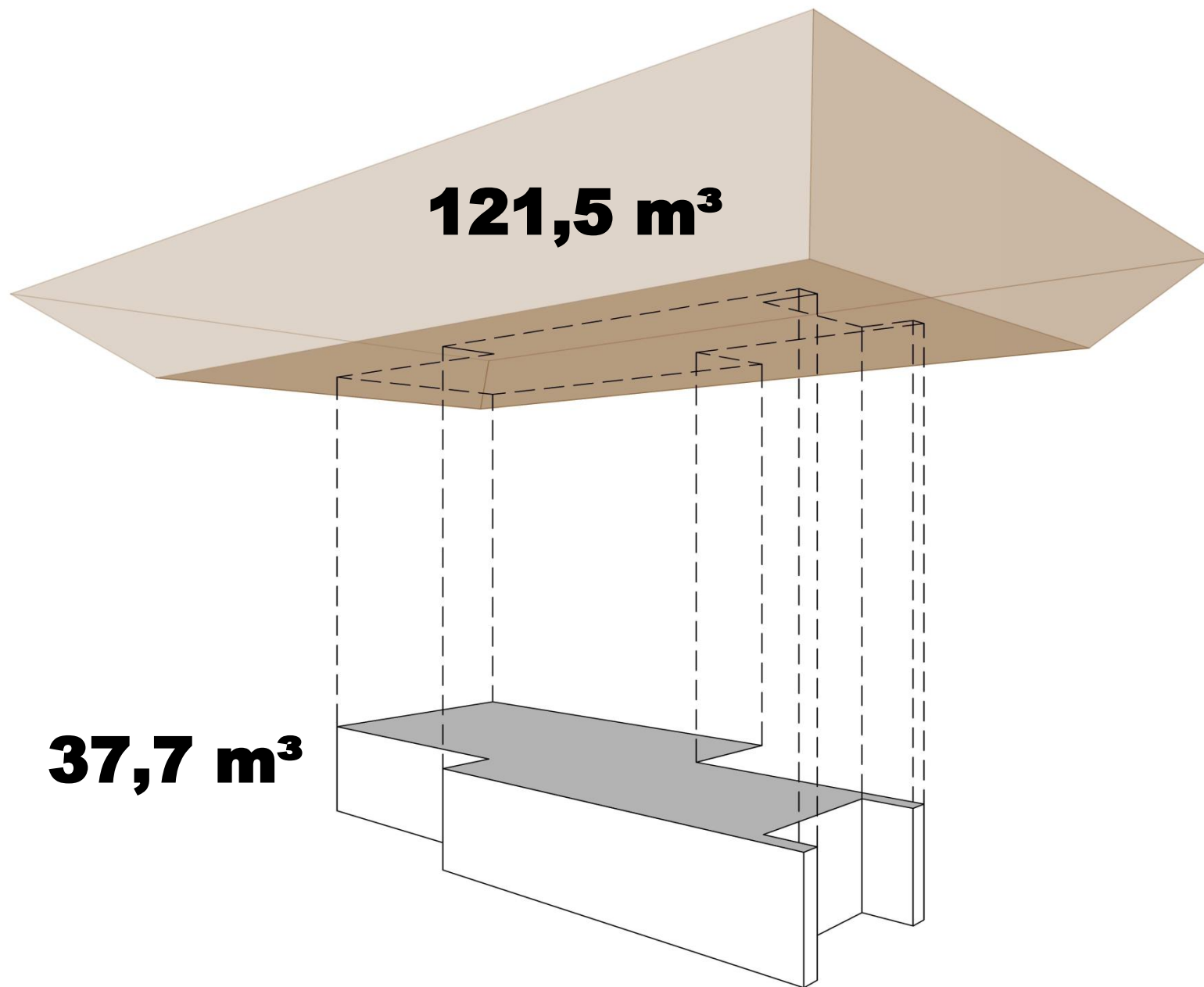
**ÁREA
EFETIVAMENTE
OCUPADA
PELO
EDIFÍCIO**



**ÁREA
EFETIVAMENTE
OCUPADA
PELO
EDIFÍCIO**

**ÁREA A SER
REATERRADA**





Então:

Solo em ESTADO NATURAL a ser escavado: **121,5 m³**

MENOS

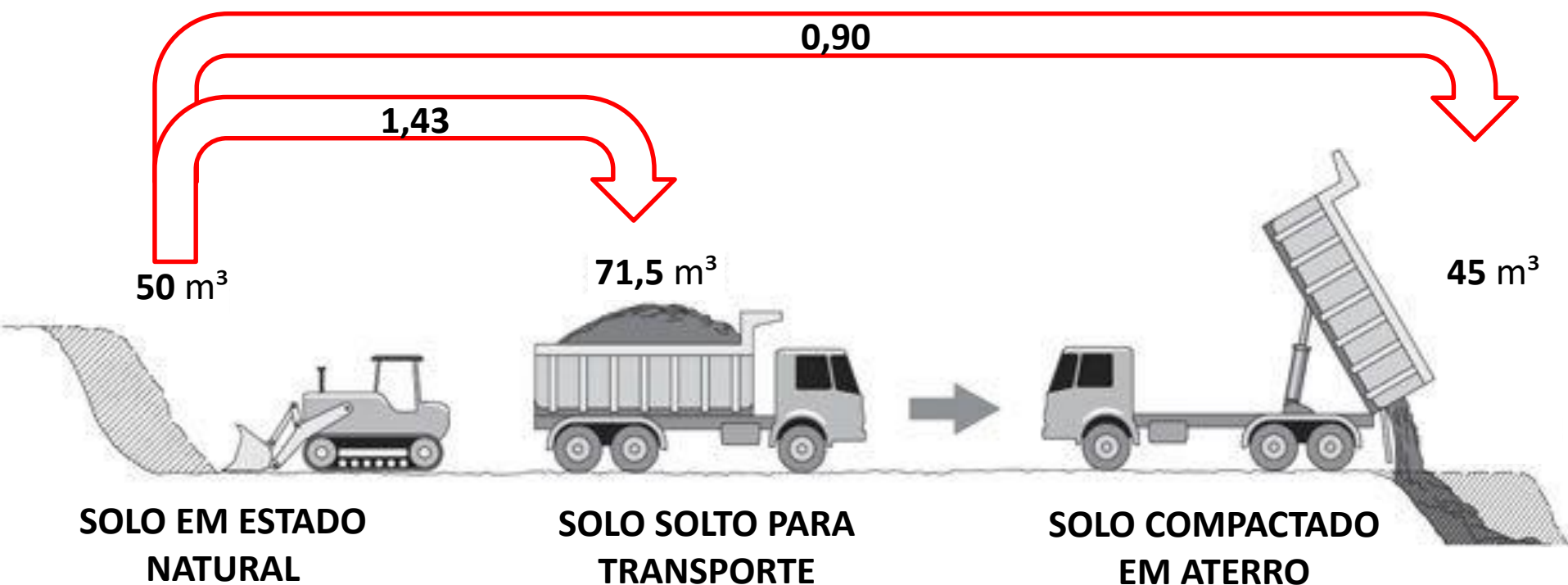
Solo em ESTADO NATURAL sem reutilização: **37,7 m³**

IGUAL

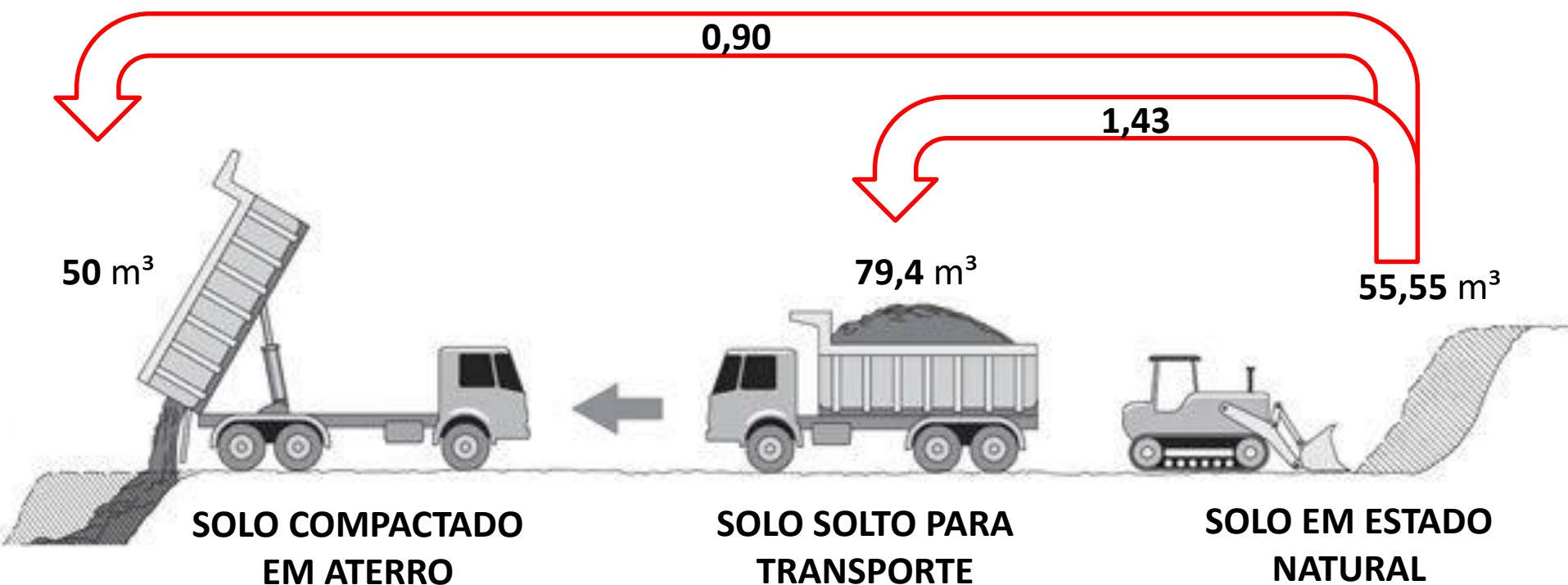
Volume A SER REATERRADO: **83,8 m³**

ESTE É O VOLUME VAZIO A SER REATERRADO
NÃO É O VOLUME DE SOLO A SER REATERRADO

Solo	Condição em que está	Convertido em solo		
		natural	solta	compactada
Areia	natural	1,00	1,11	0,95
	solta	0,90	1,00	0,86
	compactada	1,05	1,17	1,00
Argila	natural	1,00	1,43	0,90
	solta	0,70	1,00	0,63
	compactada	1,11	1,59	1,00



Solo	Condição em que está	Convertido em solo		
		natural	solta	compactada
Areia	natural	1,00	1,11	0,95
	solta	0,90	1,00	0,86
	compactada	1,05	1,17	1,00
Argila	natural	1,00	1,43	0,90
	solta	0,70	1,00	0,63
	compactada	1,11	1,59	1,00



Material	Massa unitária (kg/m³)	Fator de empolamento	Ângulo deposição
Areia	1300	10% (1,10)	10 – 20°
Argila	1600	40% (1,40)	30 – 50°
Piçarra	2600	65% (1,65)	30 – 45°
Terra comum	1000	15% (1,15)	30 – 40°

Então:

Se o volume a SER REATERRADO é 83,9 m³

ELE CORRESPONDE A

90% do volume de solo argiloso em ESTADO NATURAL

PORTANTO

O volume de solo em ESTADO NATURAL necessário ao reaterro é

$$83,8 / 0,90 = 93,11$$

Então:

Se o volume de SOLO NATURAL necessário ao reaterro é 93,1 m³

ELE CORRESPONDE A

Um volume de SOLO SOLTO que se expande em 40% por empolamento

PORTANTO

O volume de SOLO SOLTO a ser guardado para o reaterro é

$$93,11 * 1,40 = 130,35 \text{ m}^3$$

Relembrando:

Solo em ESTADO NATURAL a ser escavado: **121,5 m³**

MENOS

Solo em ESTADO NATURAL sem reutilização: **37,7 m³**

IGUAL

Volume A SER REATERRADO: **83,8 m³**

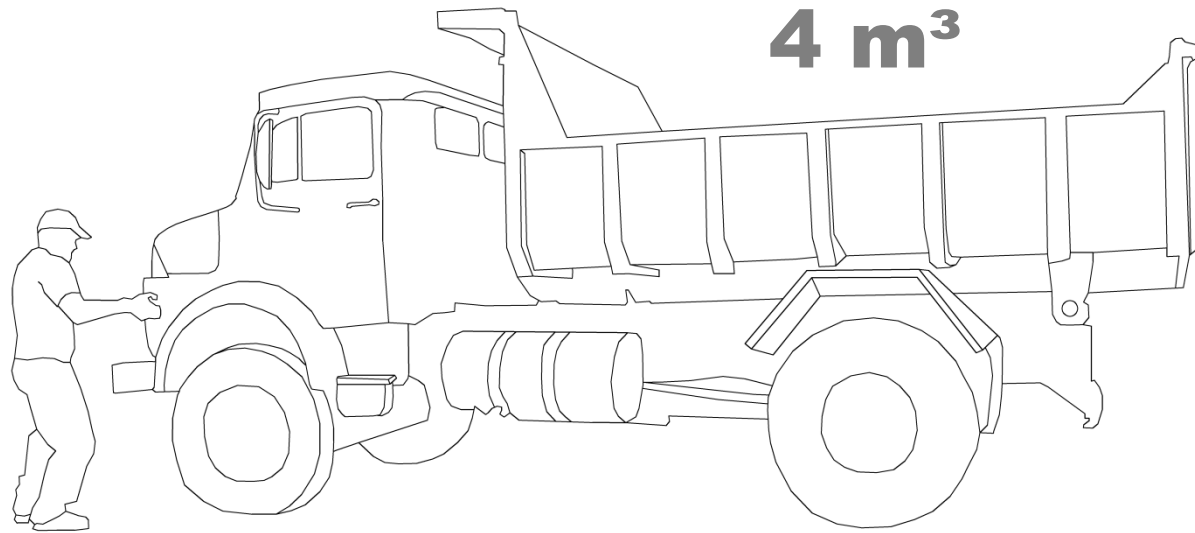
PARA O PLANEJAMENTO DA OBRA, IMPORTA SABER QUANTO DO VOLUME DE SOLO ESCAVADO DEVE PERMANECER NO CANTEIRO COMO “SOLO SOLTO”, SEJA PARA SER REATERRADO SEJA PARA SER TRANSPORTADO PARA “BOTA-FORA”

Então:

Solo em ESTADO NATURAL a ser escavado:	121,5 m³
CONVERTIDO EM SOLO SOLTO	~170 m³

Solo em ESTADO NATURAL sem reutilização:	37,7 m³
CONVERTIDO EM SOLO SOLTO	~40 m³

Volume A SER REATERRADO:	83,8 m³
CONVERTIDO EM SOLO SOLTO	~130 m³



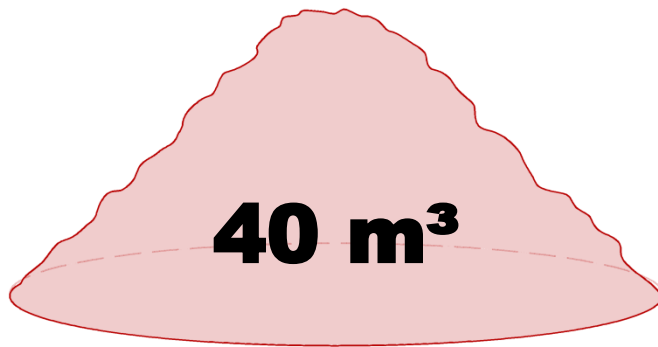
Volume sem reutilização:

37,7 m³ ~ 40 m³

40 / 4

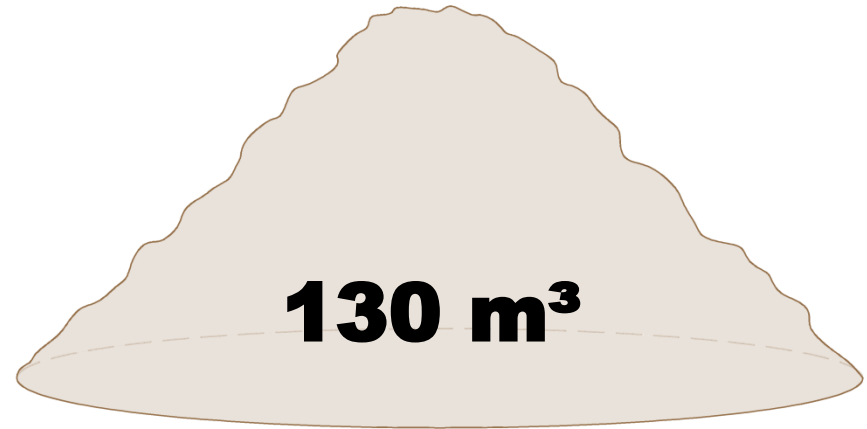


10 CAMINHÕES



A SER DESCARTADO

10 CAMINHÕES



A SER GUARDADO

Volume a ser reutilizado:

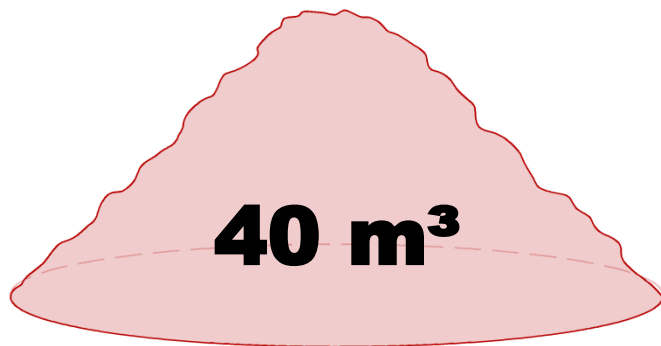
93,1 m³

**SOLO
NATURAL**

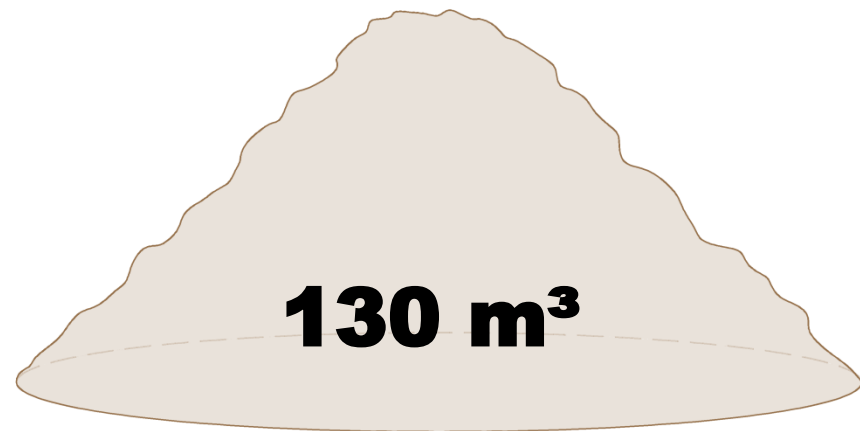
~ 130 m³

**SOLO
SOLTO**

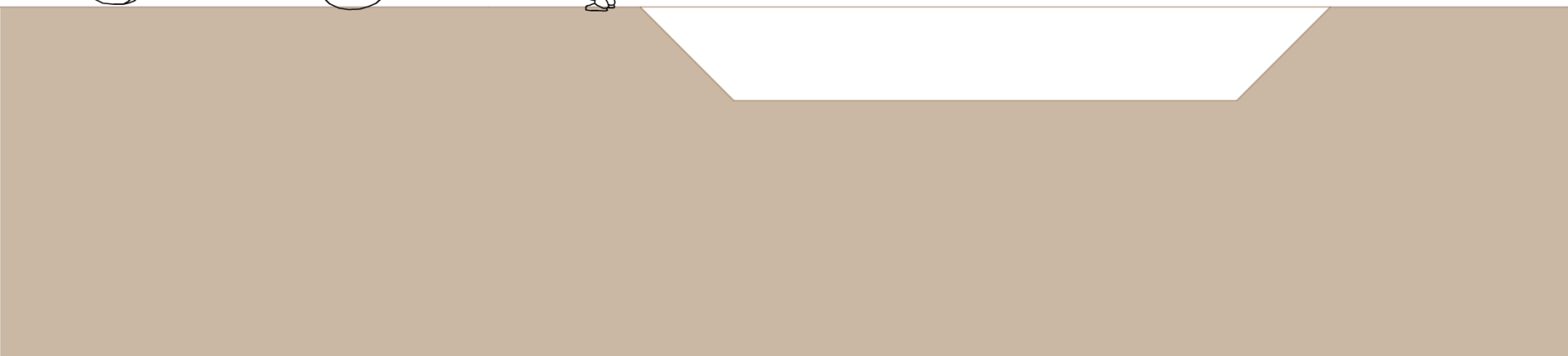
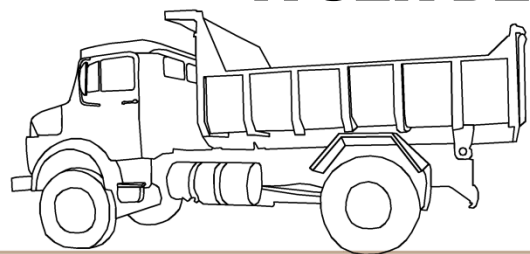
COMO PLANEJAR ?



A SER DESCARTADO



A SER GUARDADO



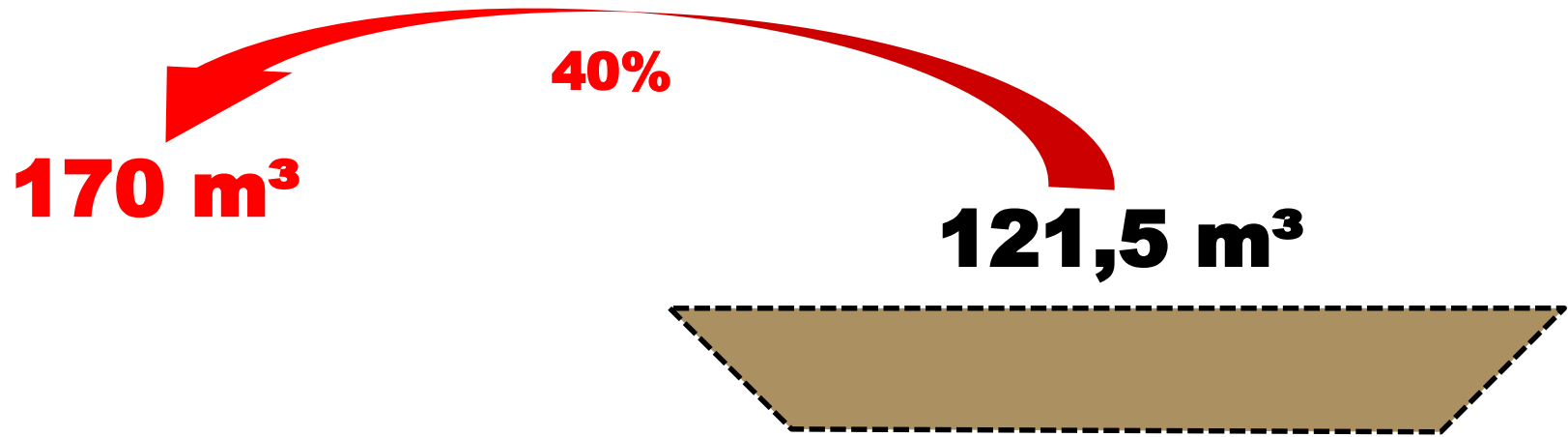
COMO PLANEJAR ?

FAZER **TODA** A ESCAVAÇÃO E
POSTERIORMENTE
CONTRATAR O
SERVIÇO DE **TRANSPORTE?**

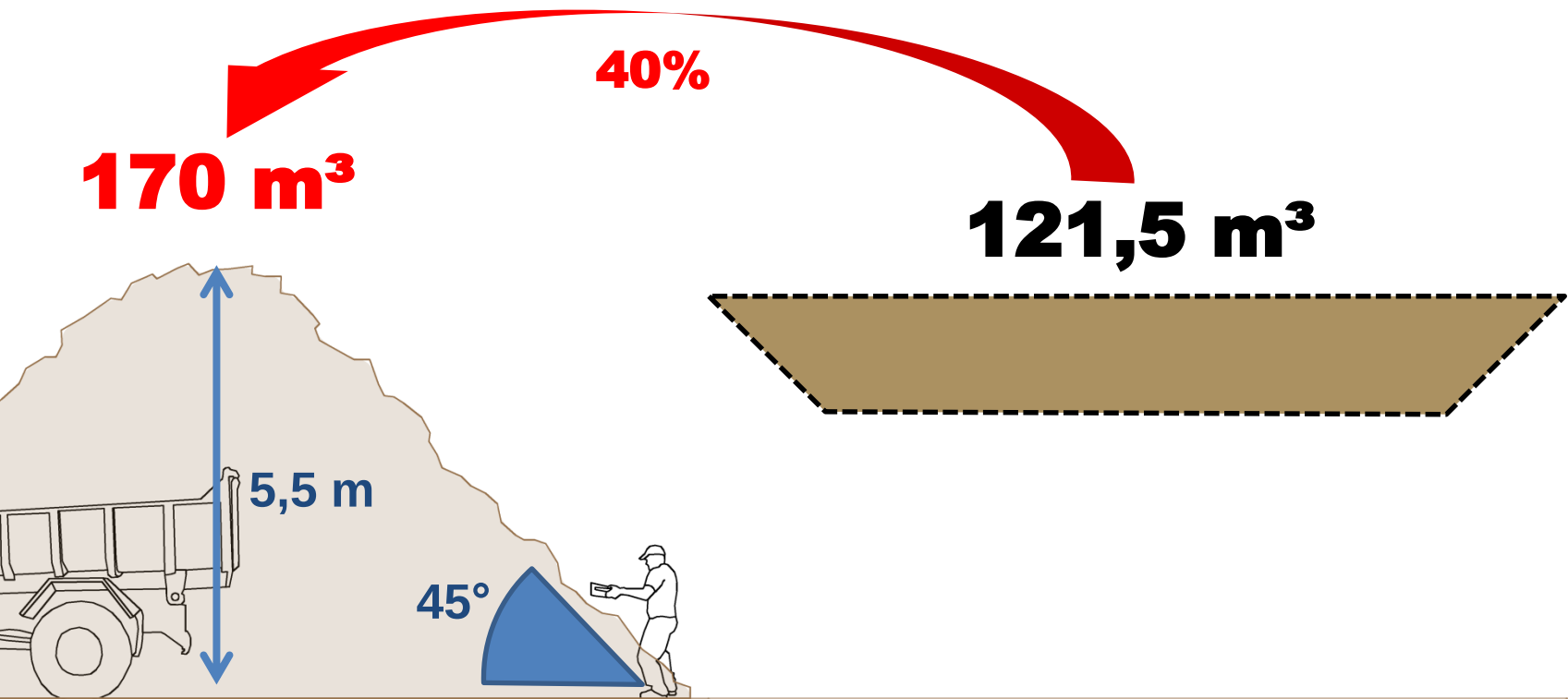
COMO PLANEJAR ?



COMO PLANEJAR ?



COMO PLANEJAR ?

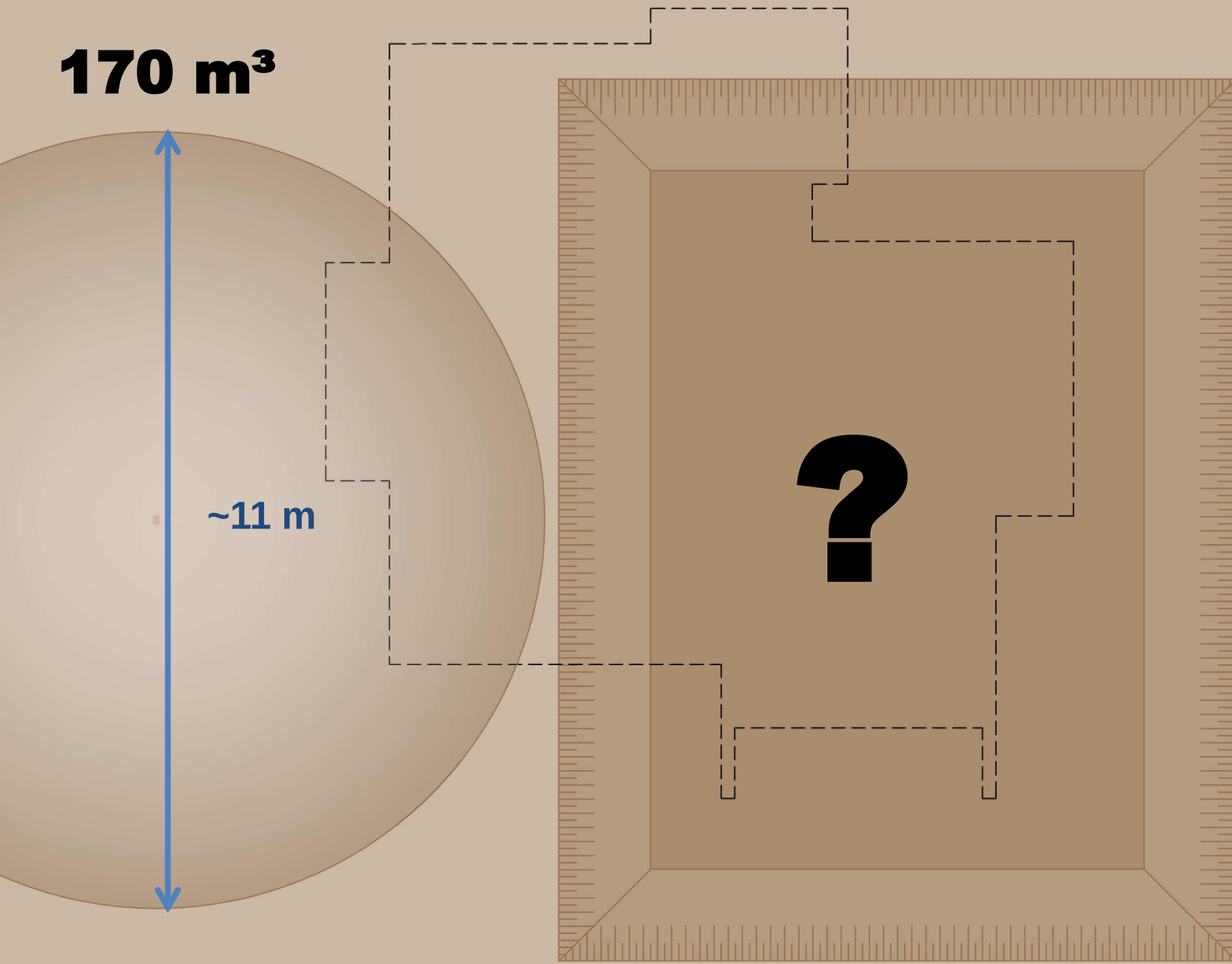


$$Volume_{cone} = \frac{1}{3} (\pi \cdot r^2 \cdot h)$$

170 m³

~11 m

?



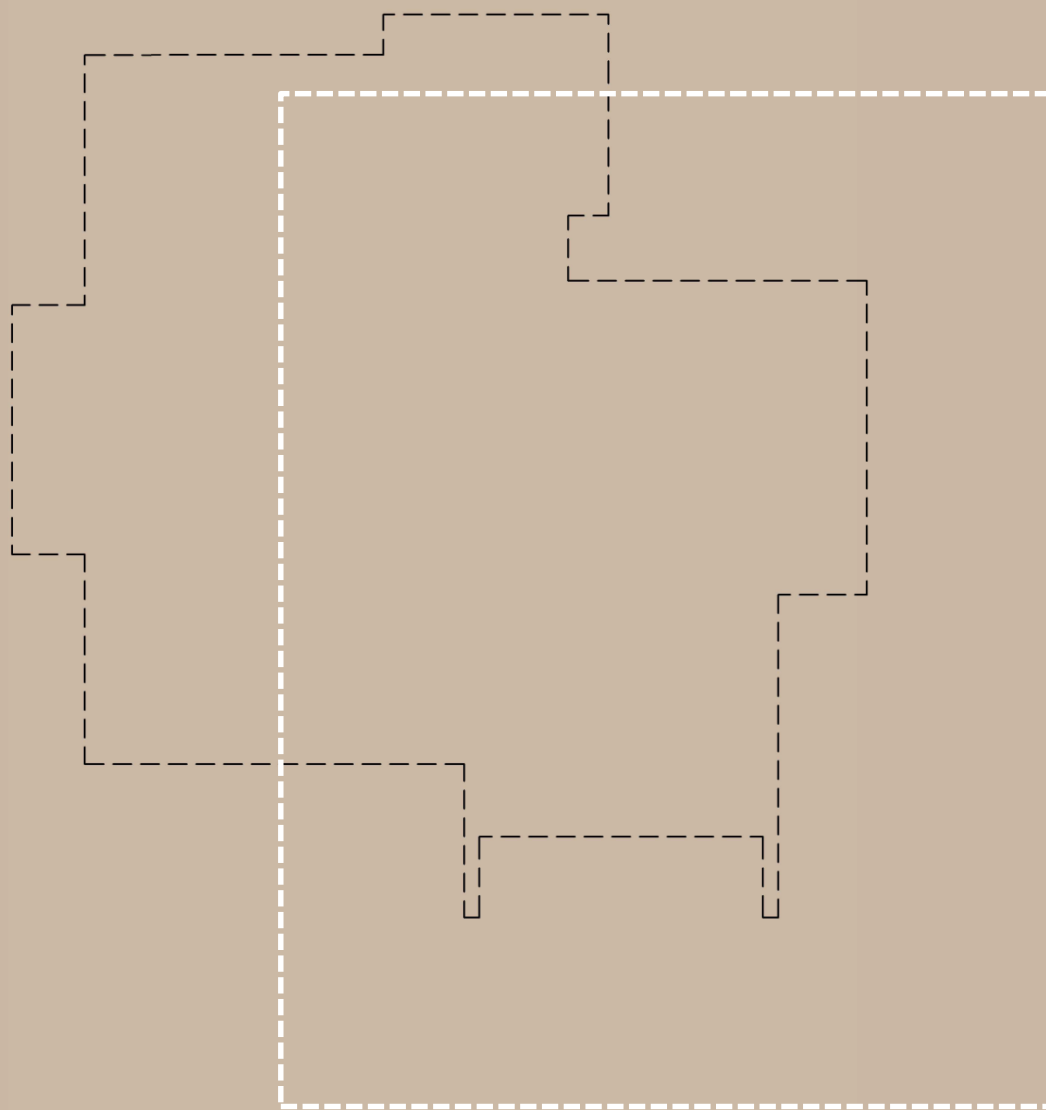
COMO PLANEJAR ?

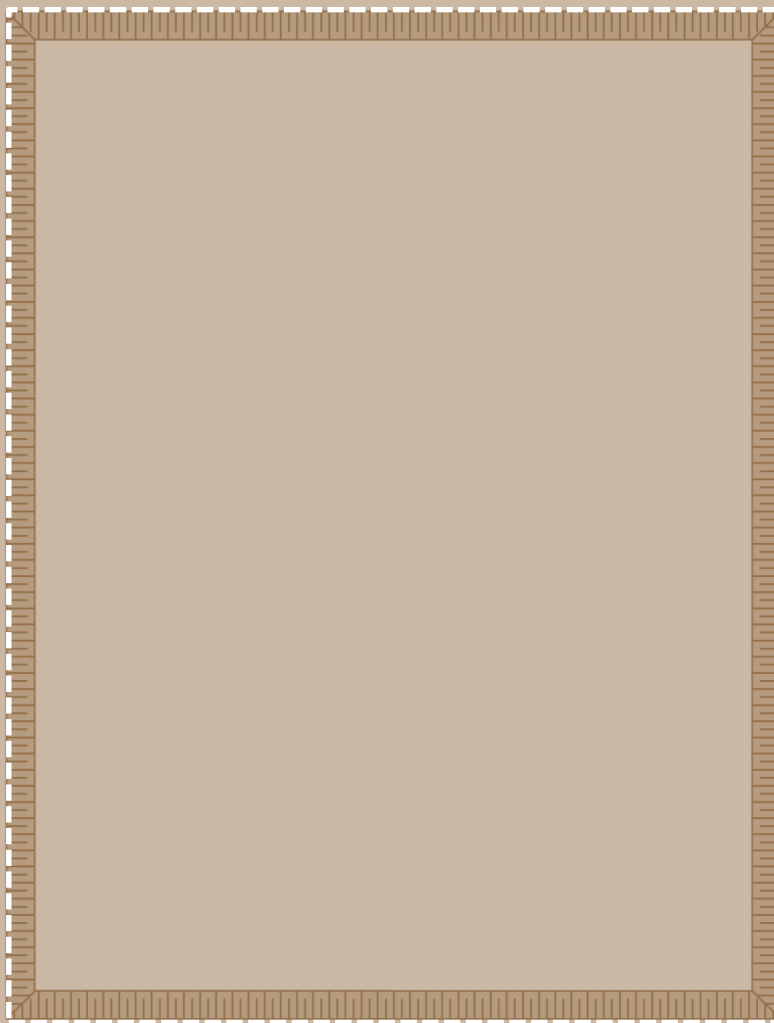
FAZER A ESCAVAÇÃO EM 2 ETAPAS

1 – ESCAVAR O VOLUME SEM REUTILIZAÇÃO

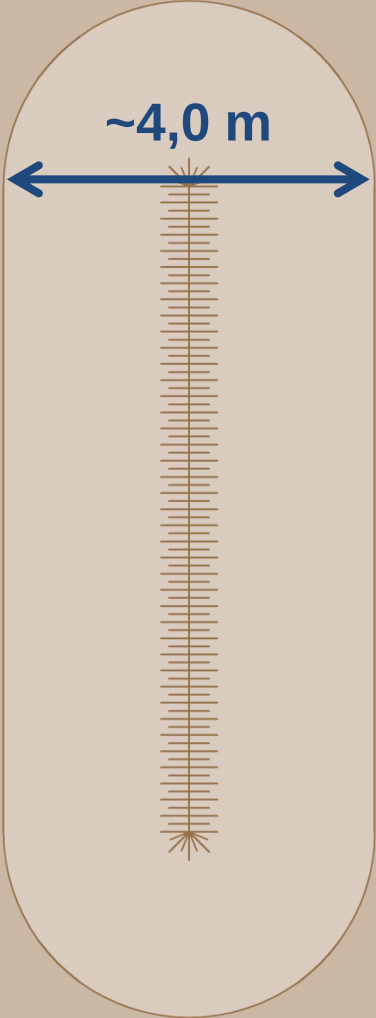
CONTRATAR O TRANSPORTE

2 – ESCAVAR O RESTANTE DO VOLUME

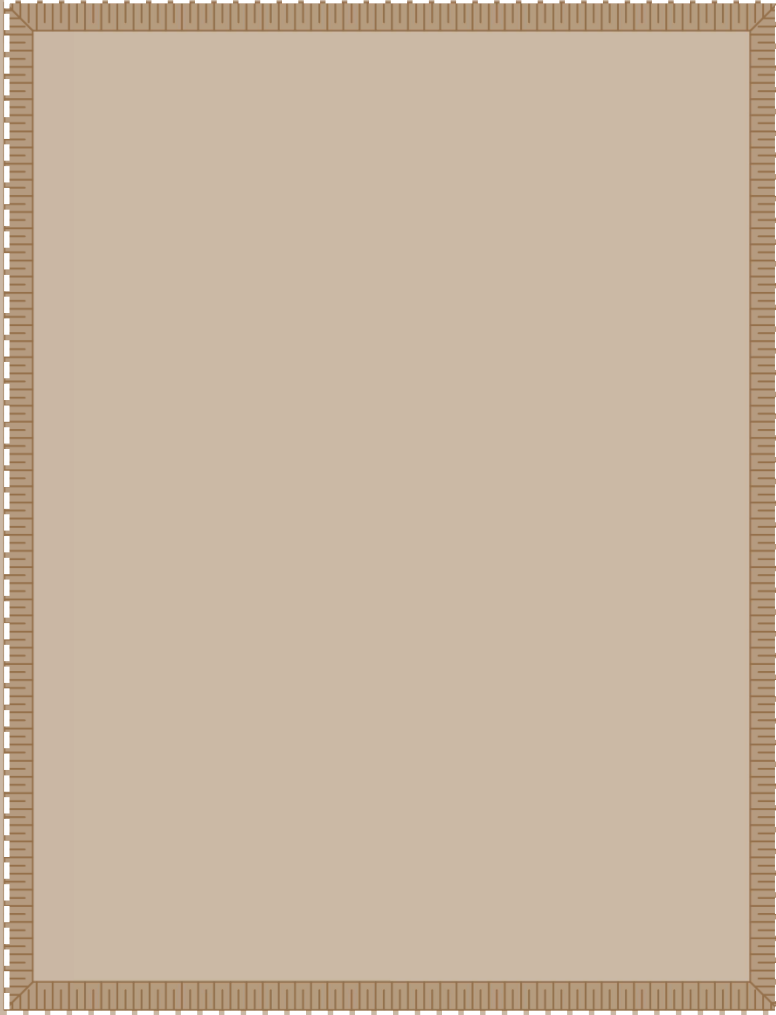


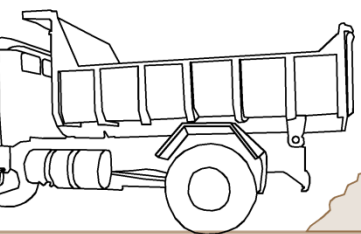


~10,0 m



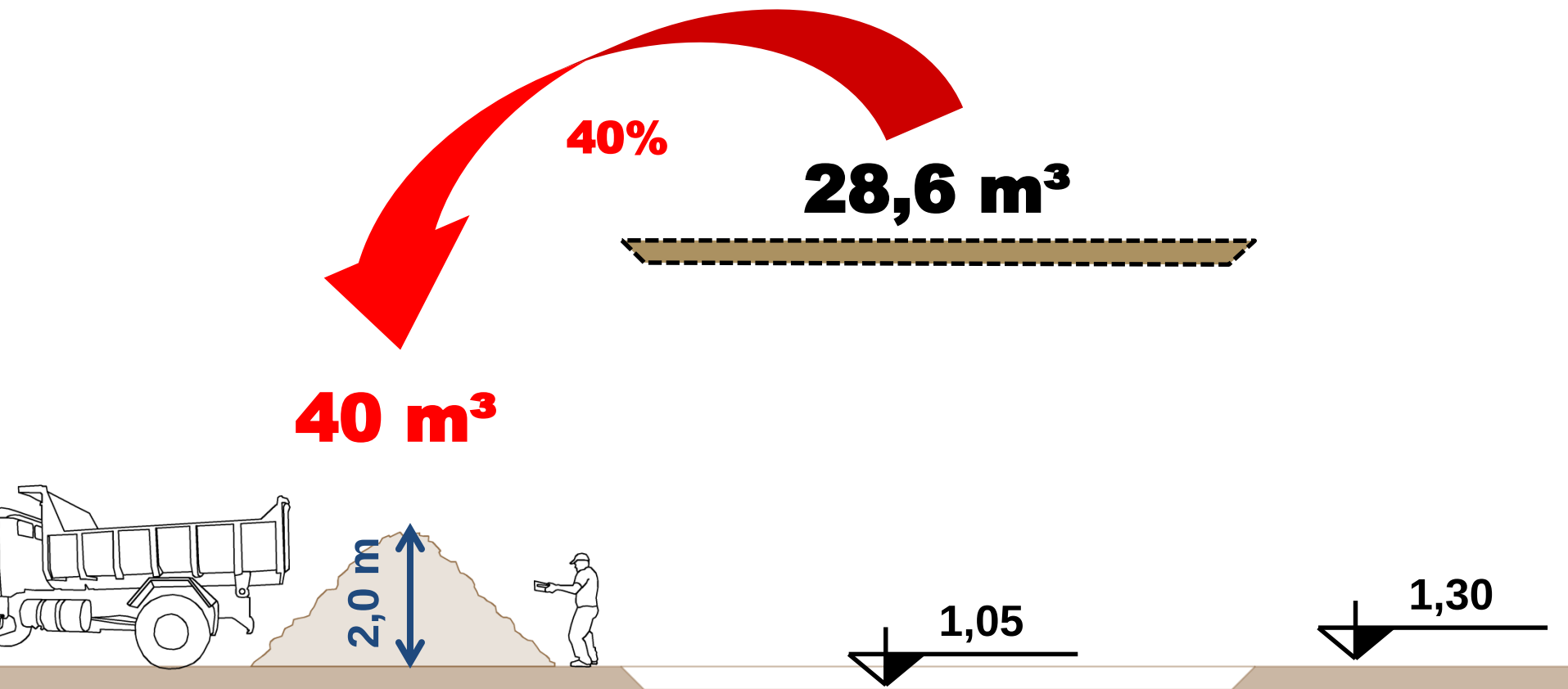
~4,0 m

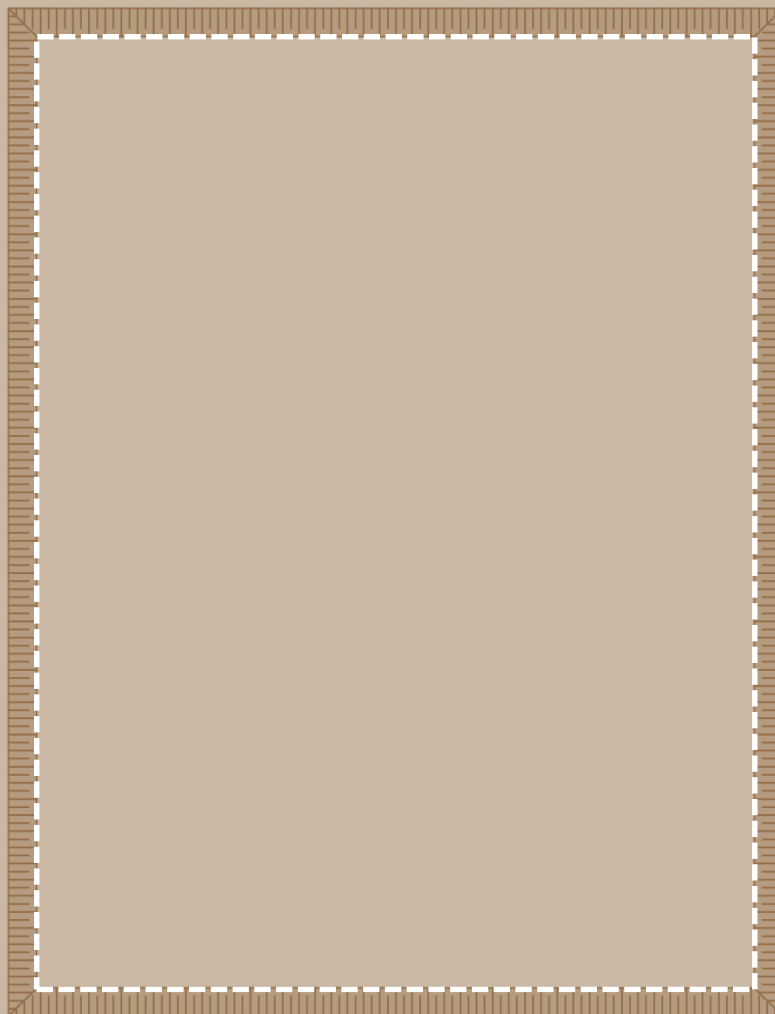


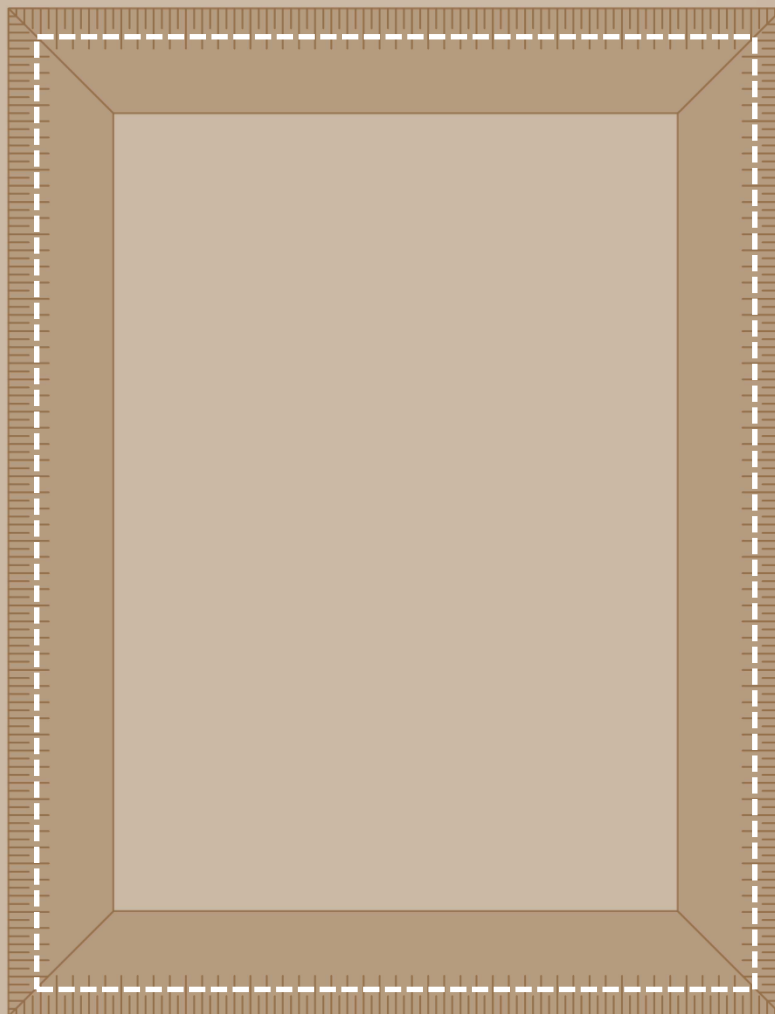


25 cm





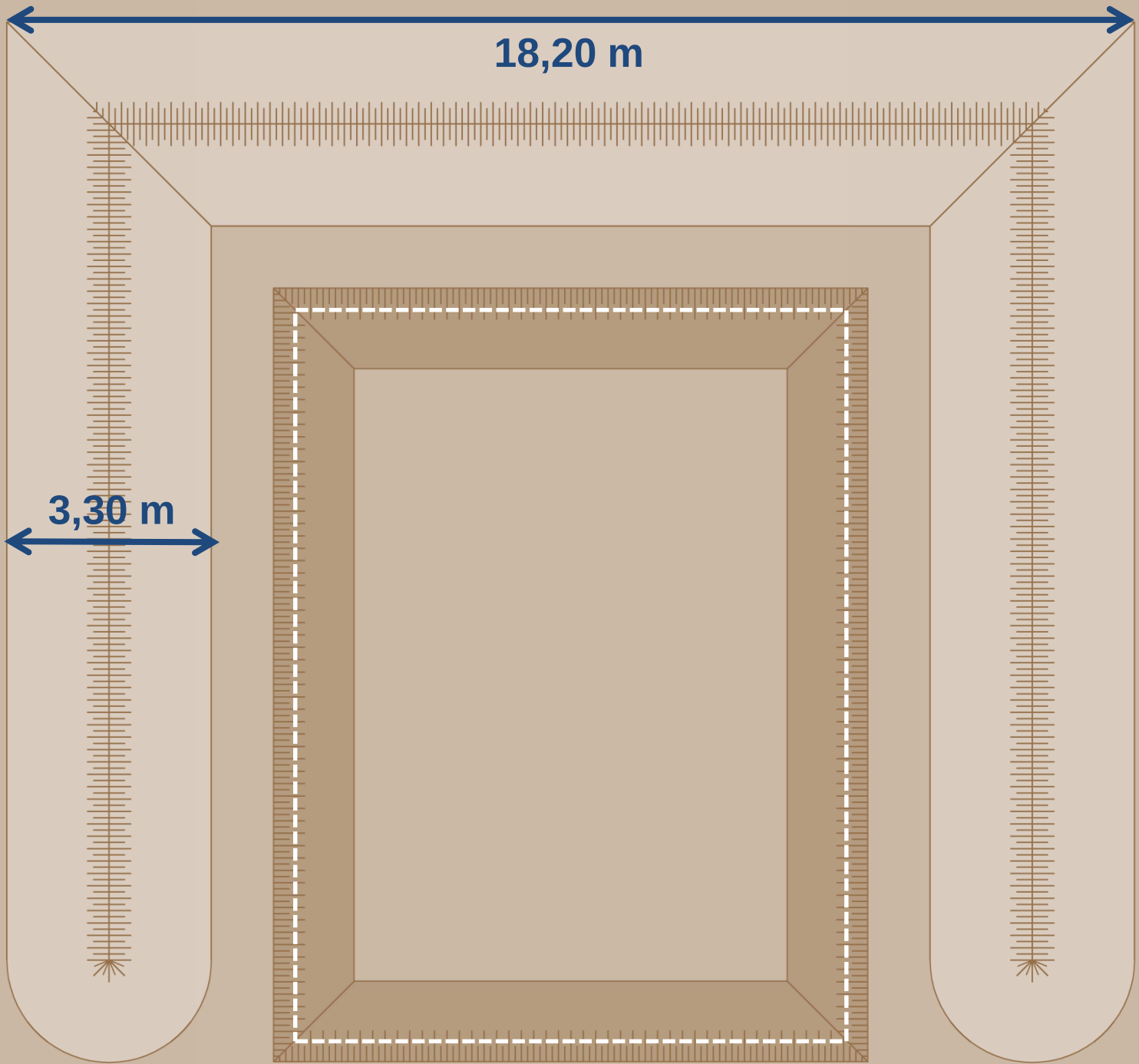


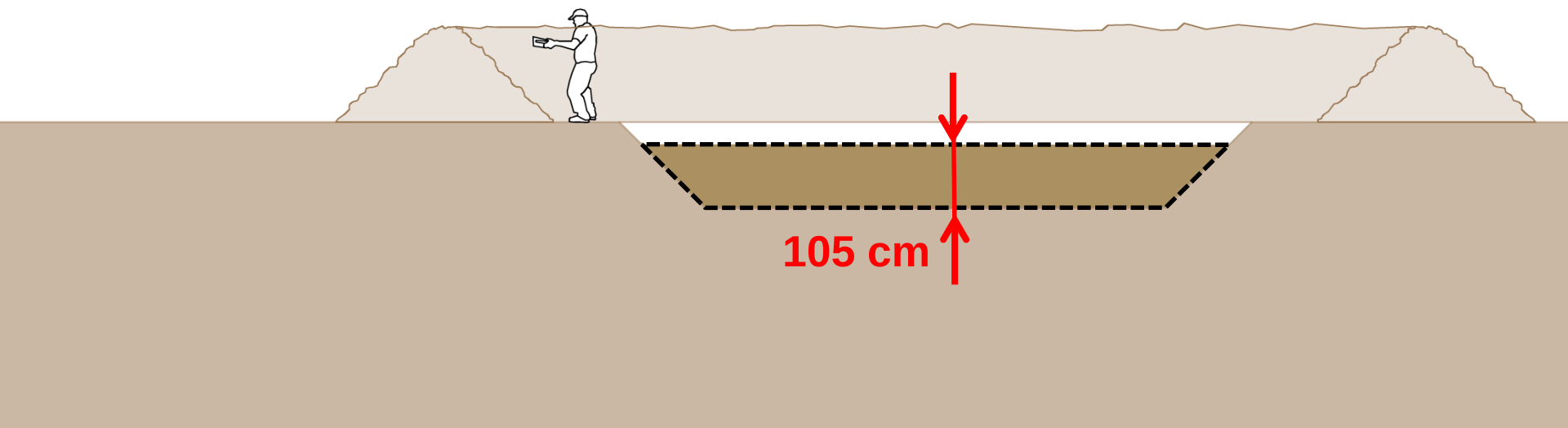


16,80 m

18,20 m

3,30 m





93,1 m³

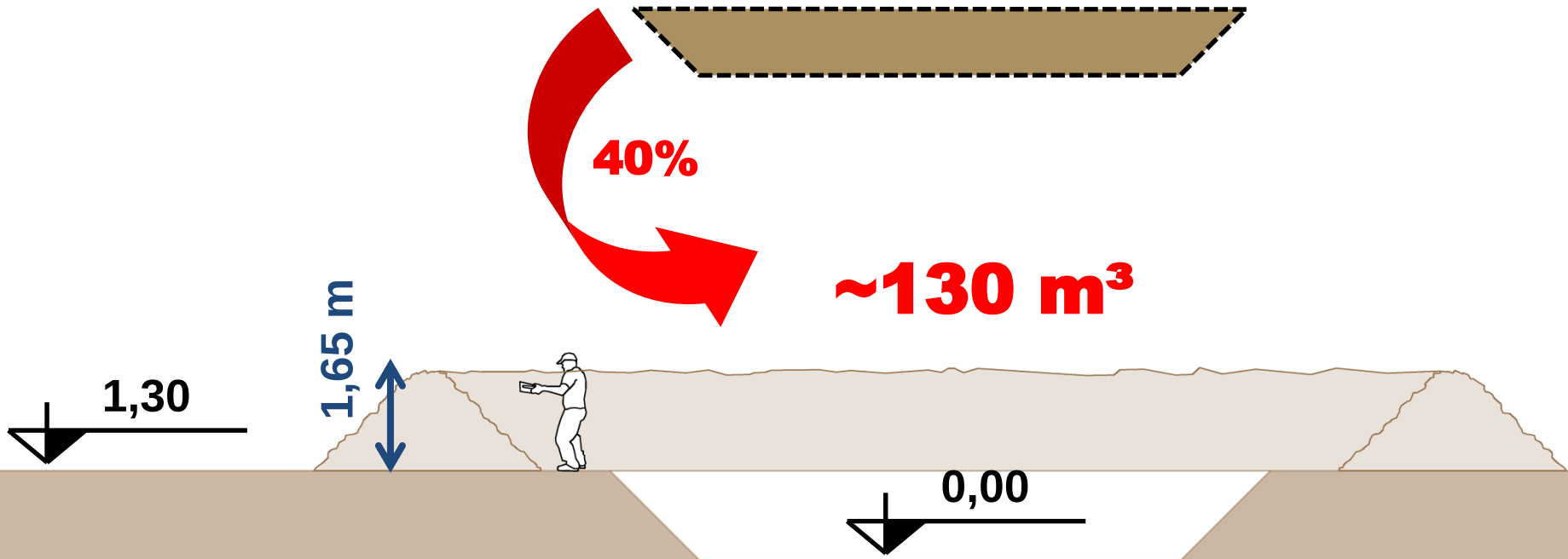
40%

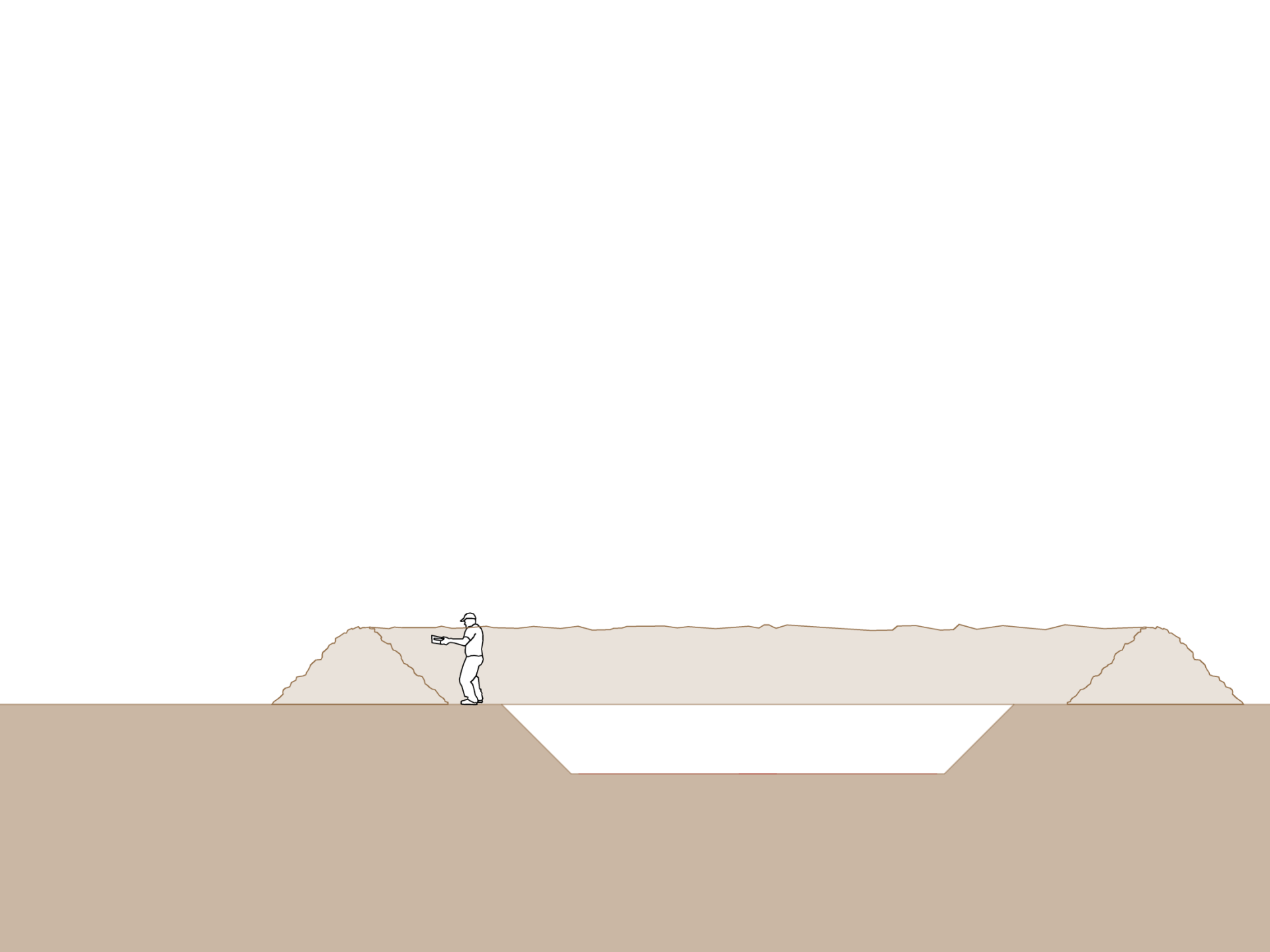
~130 m³

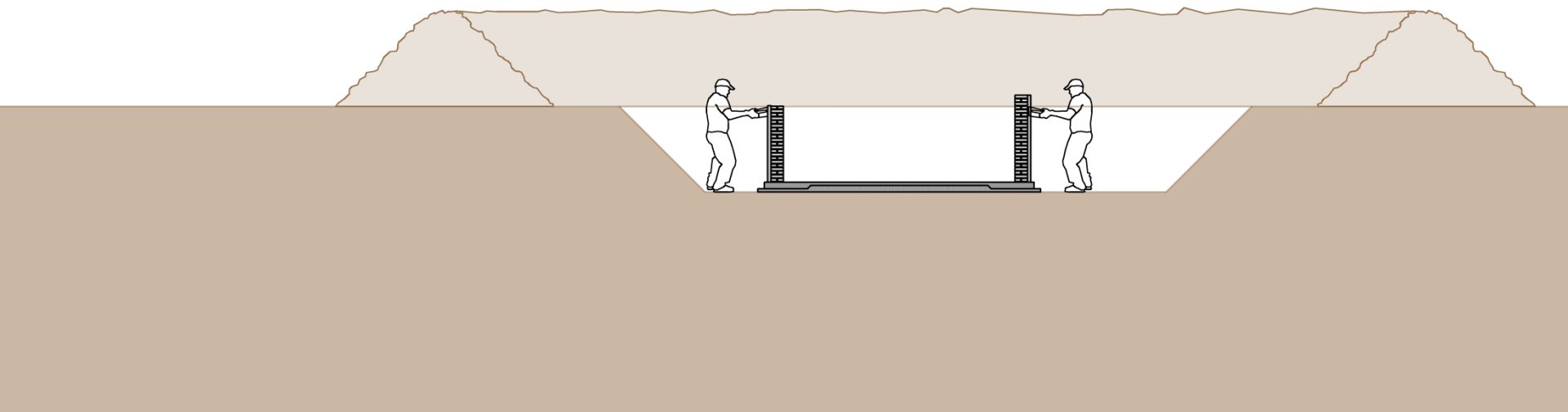
1,65 m

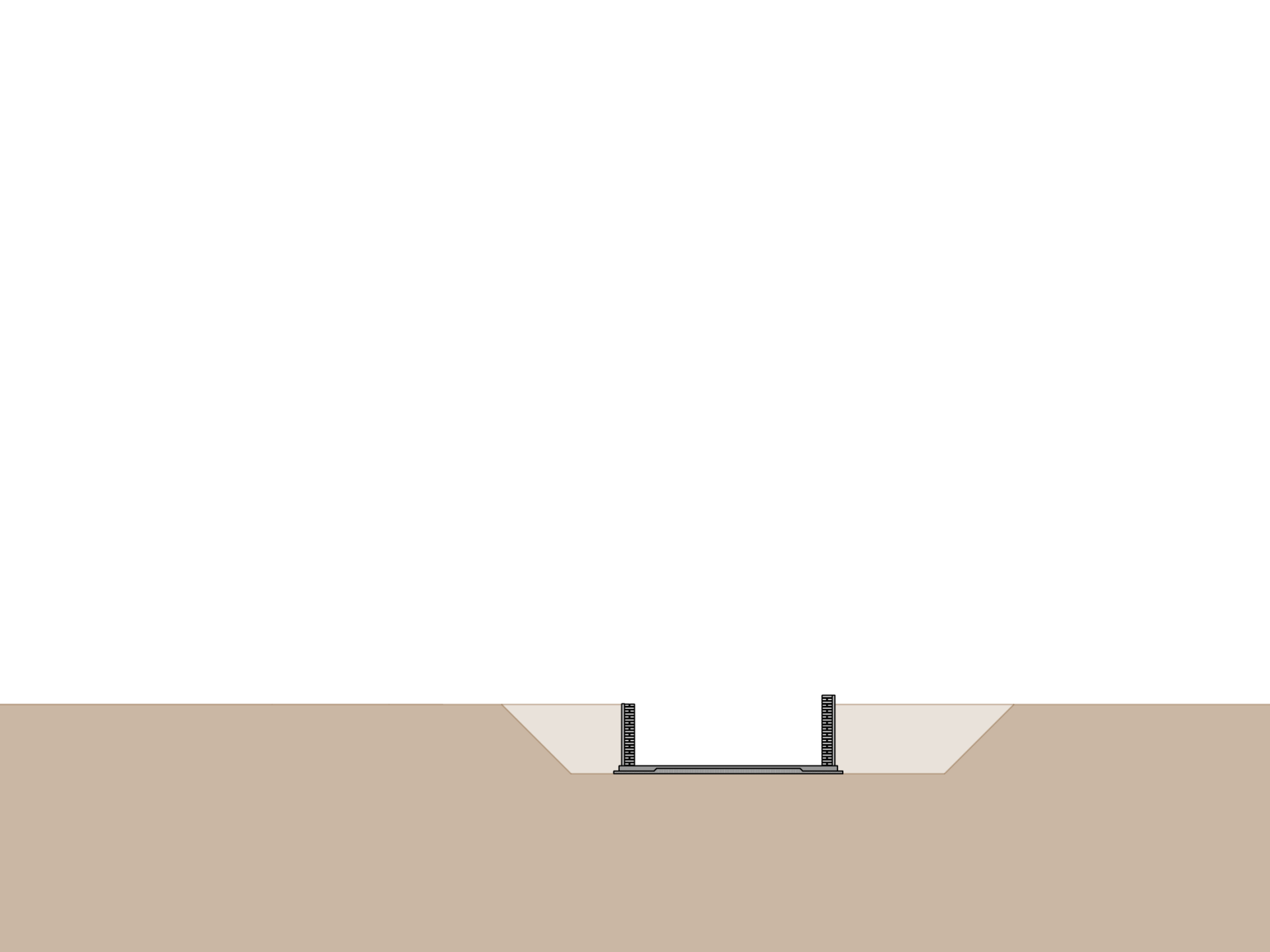
1,30

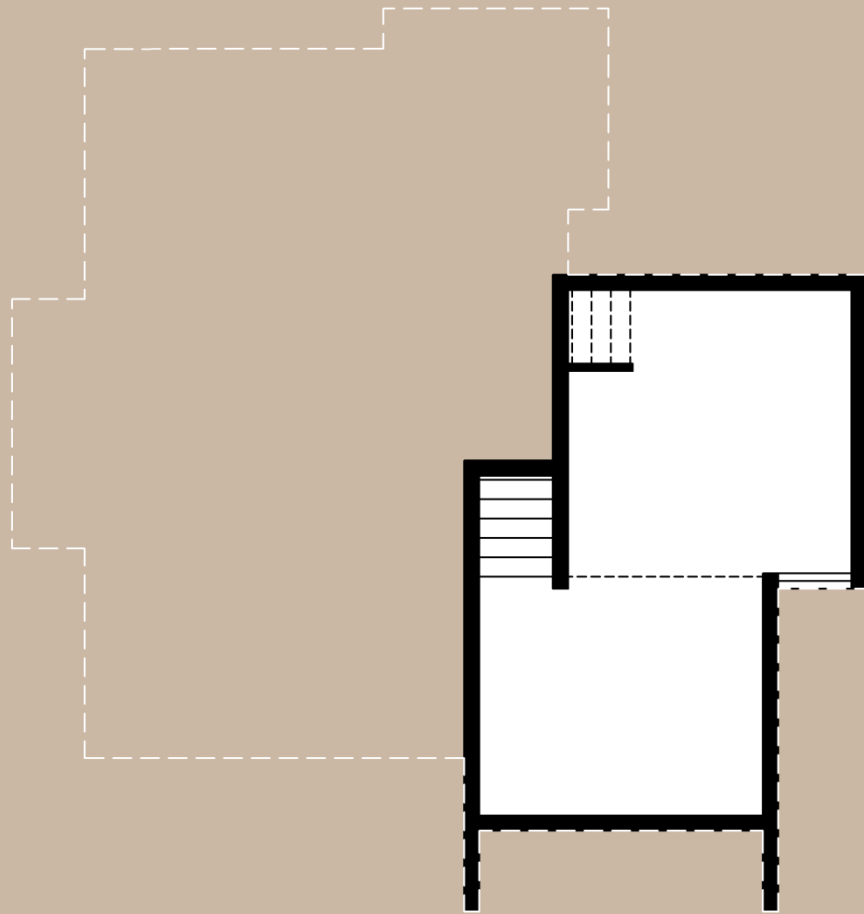
0,00

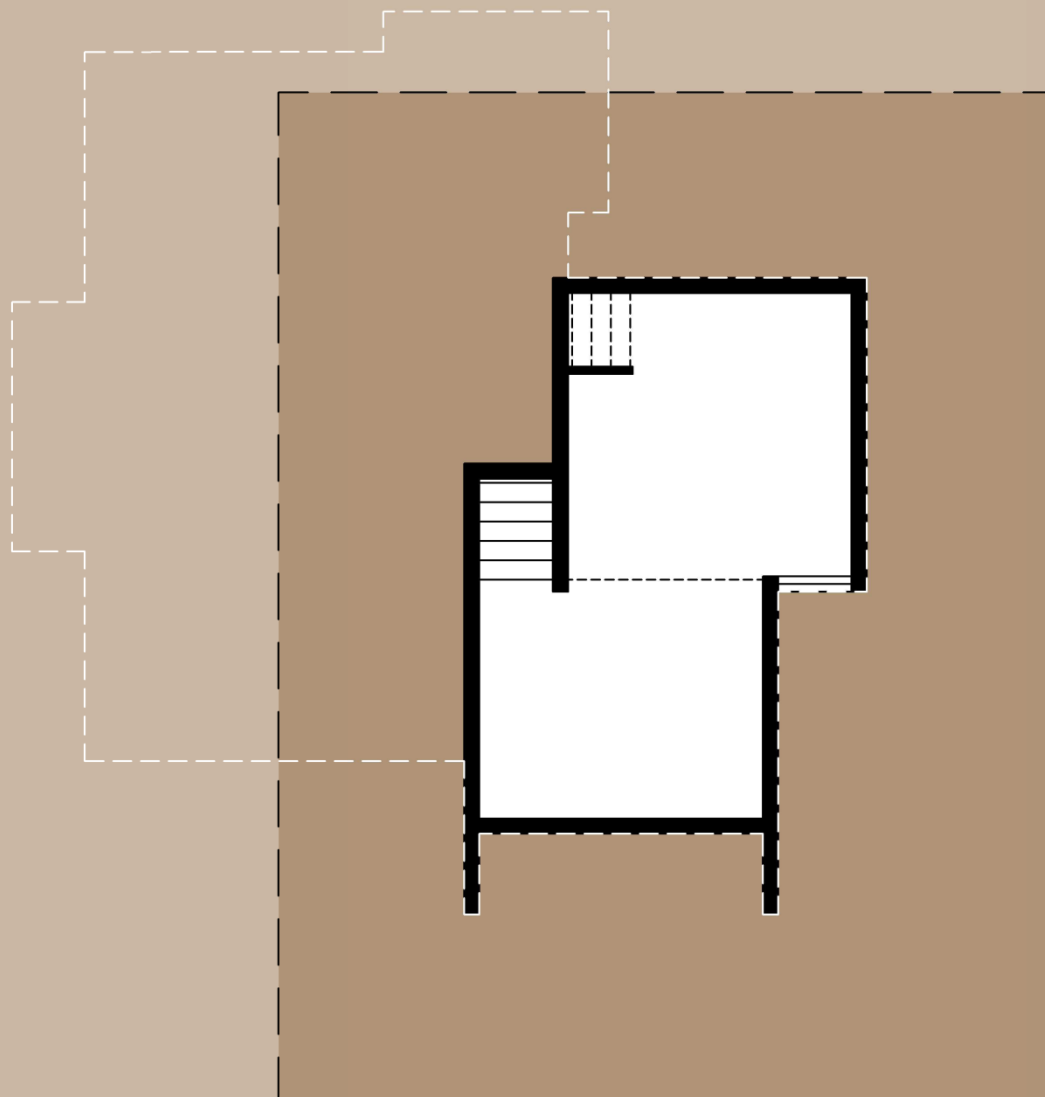


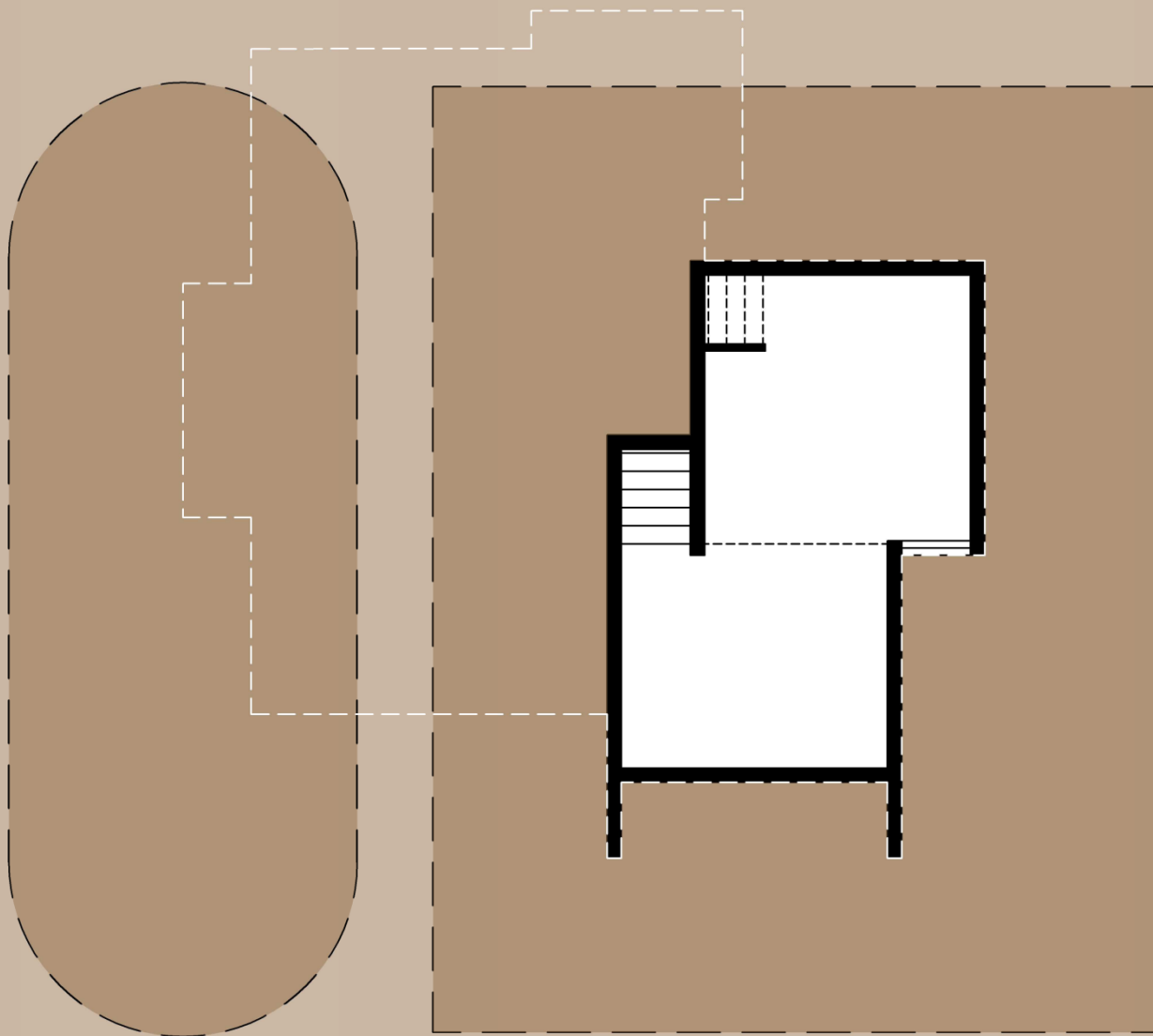


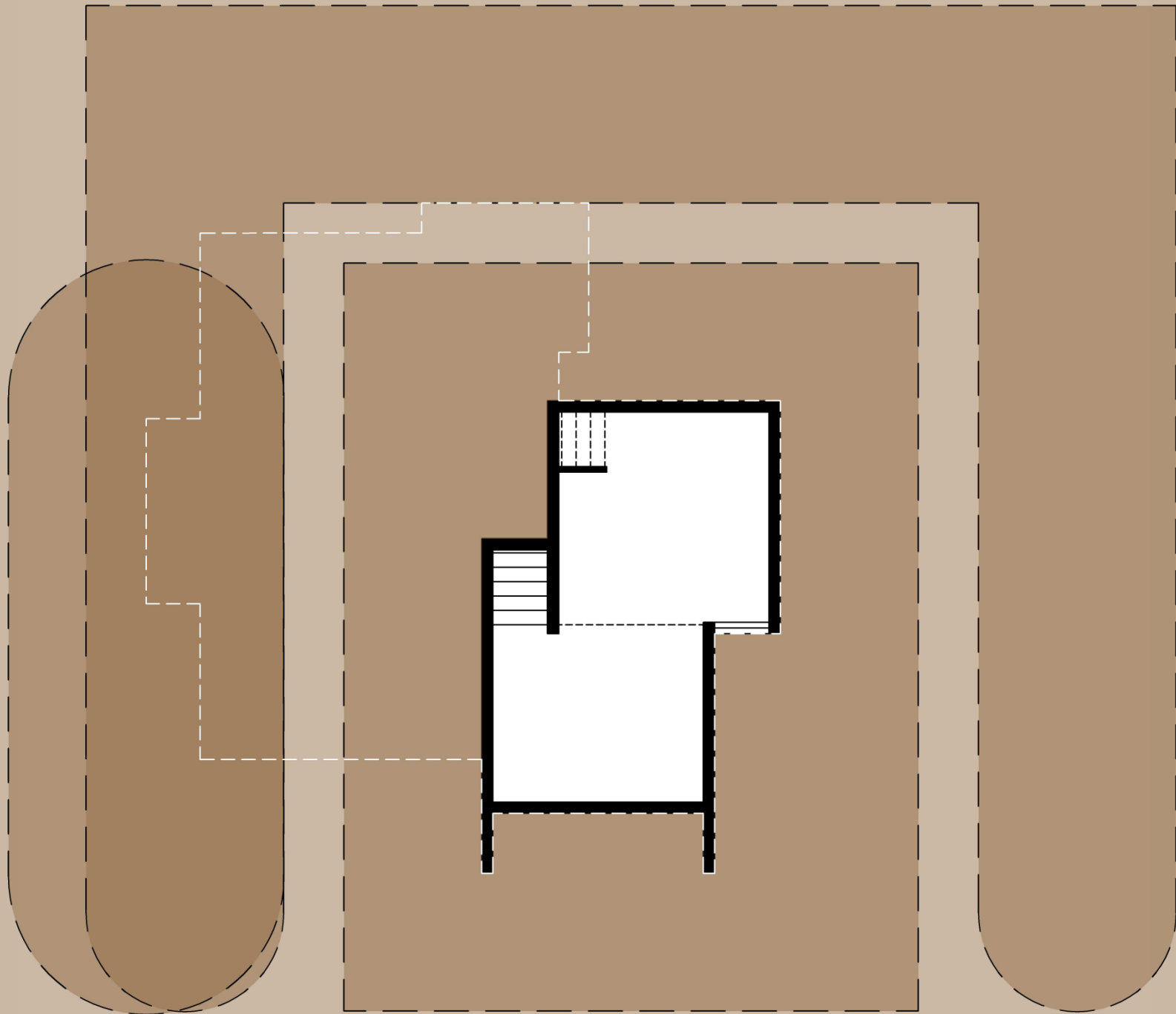


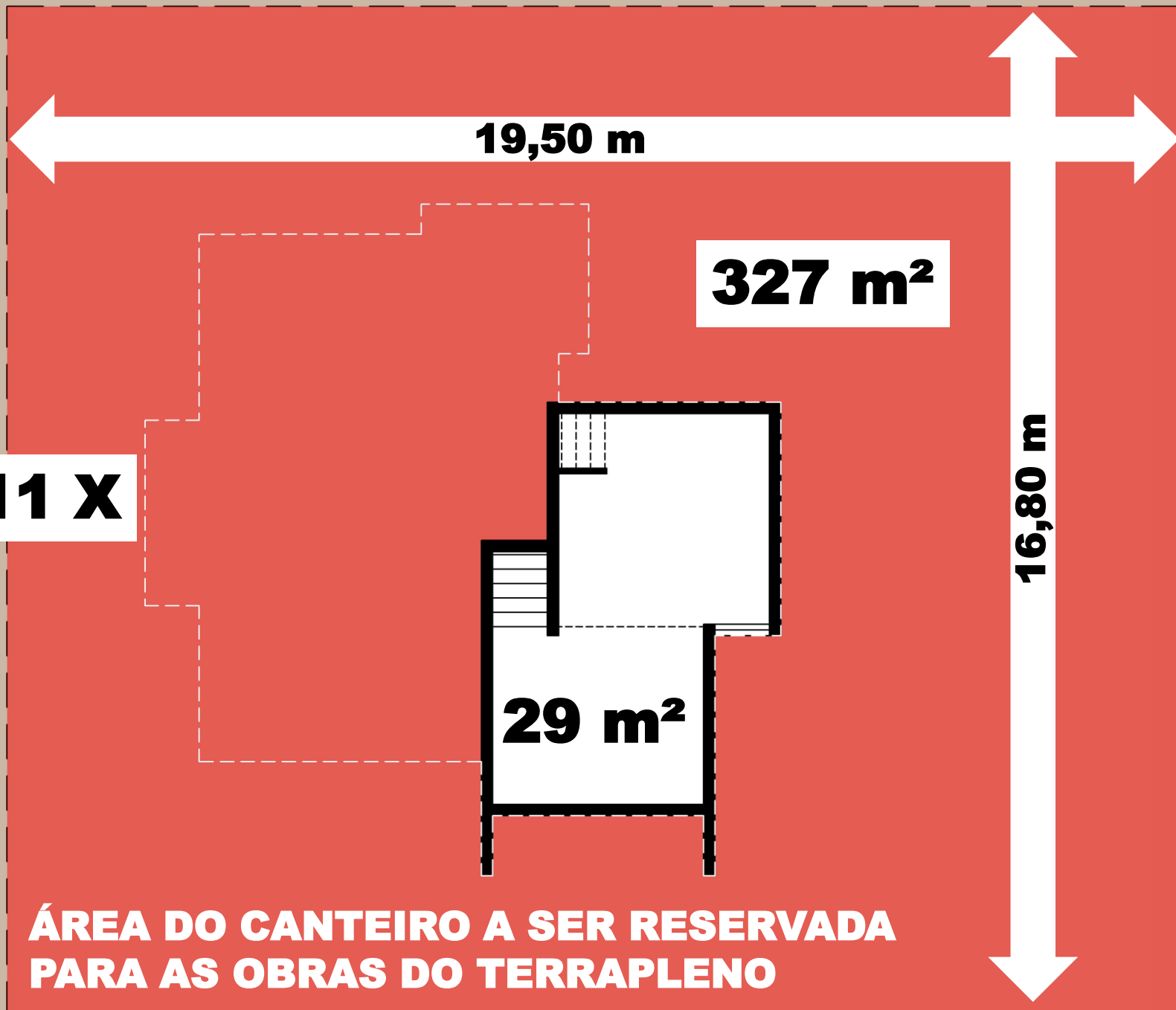




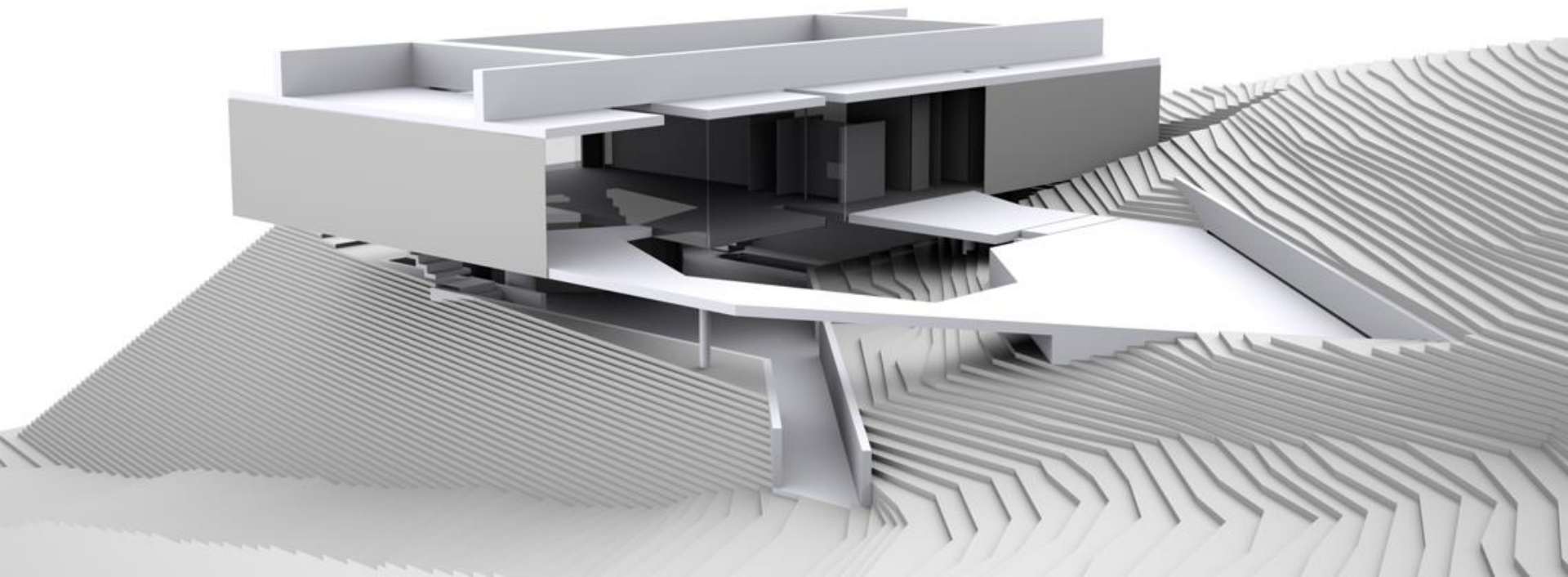


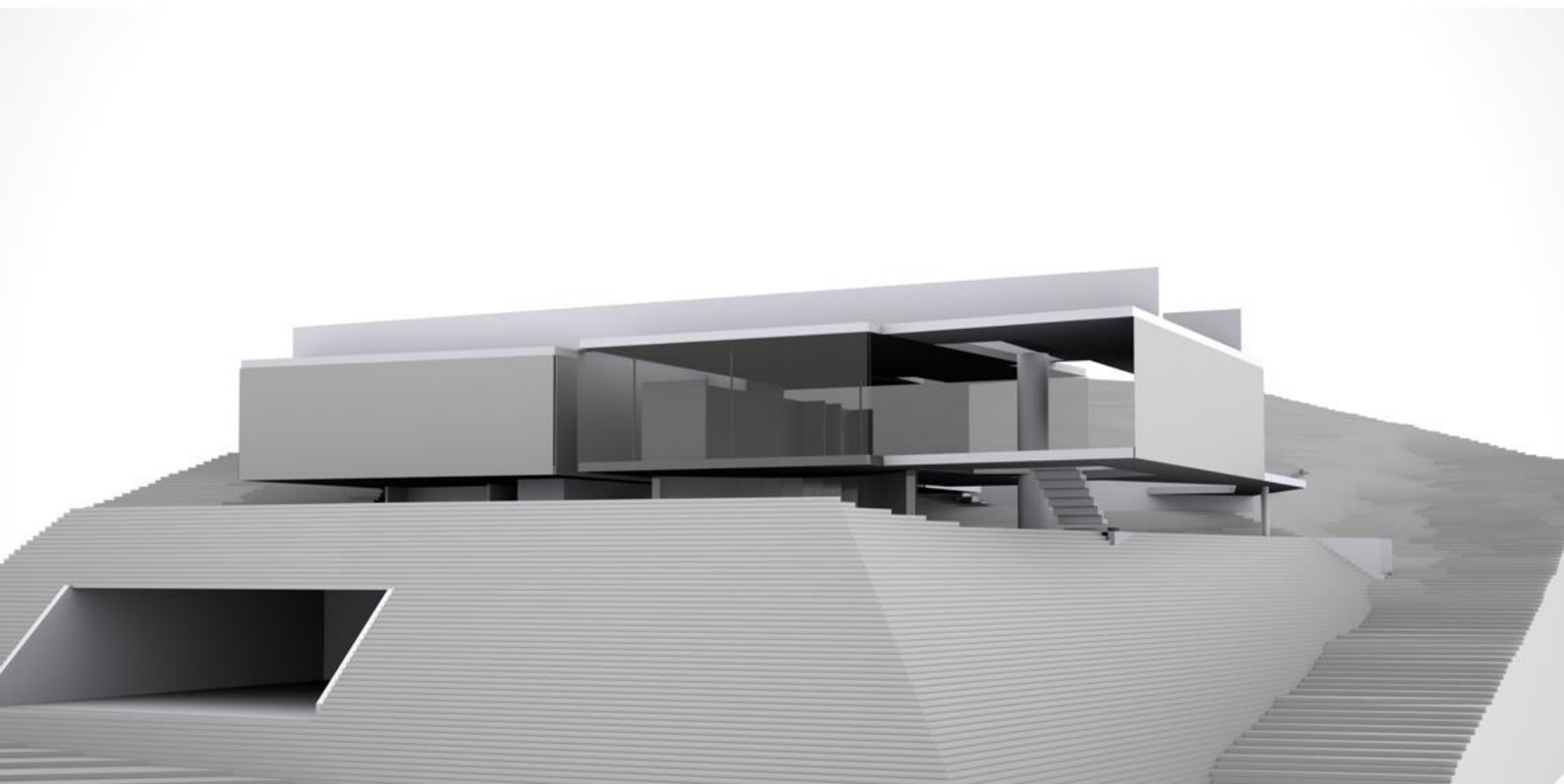


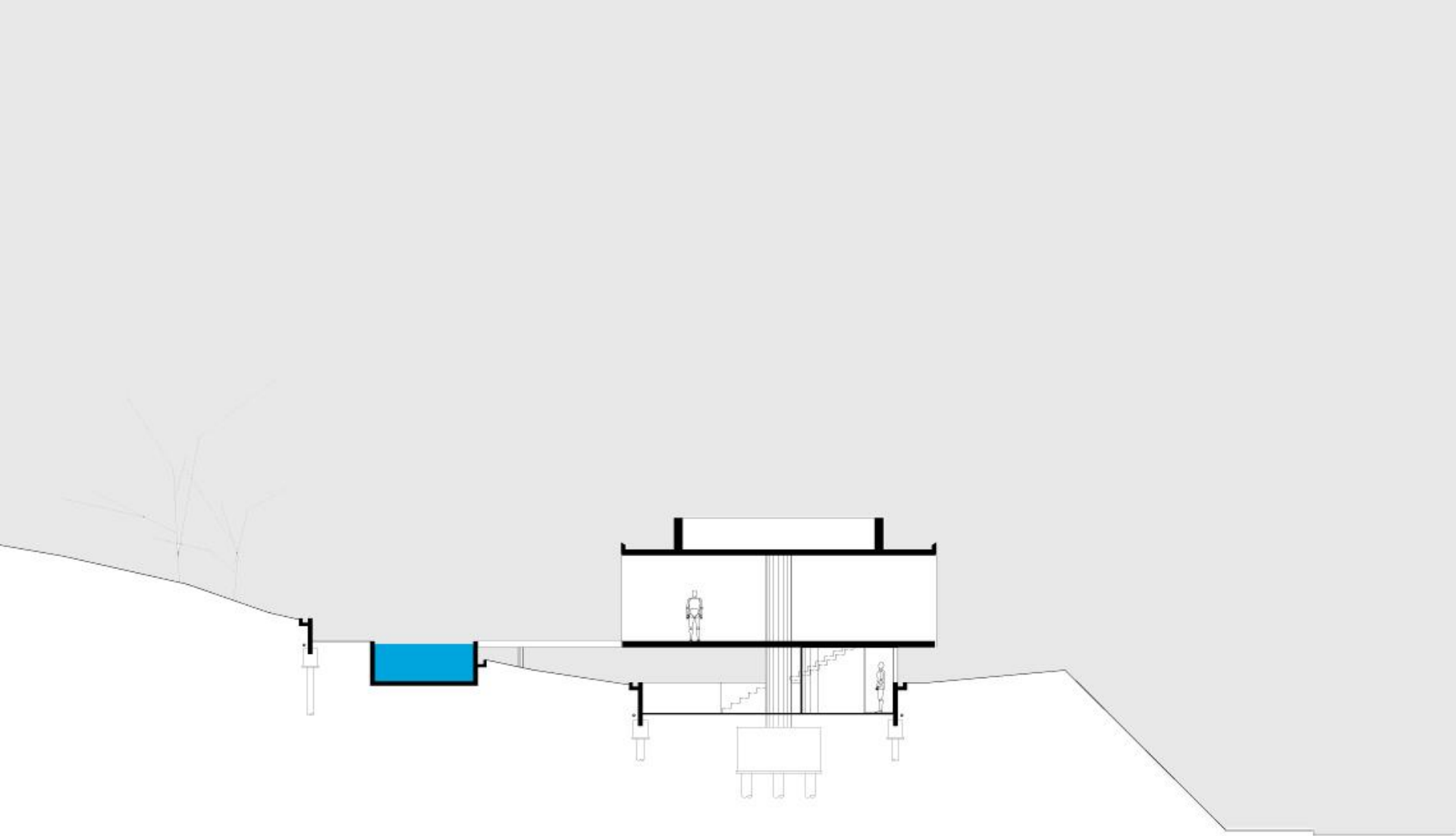


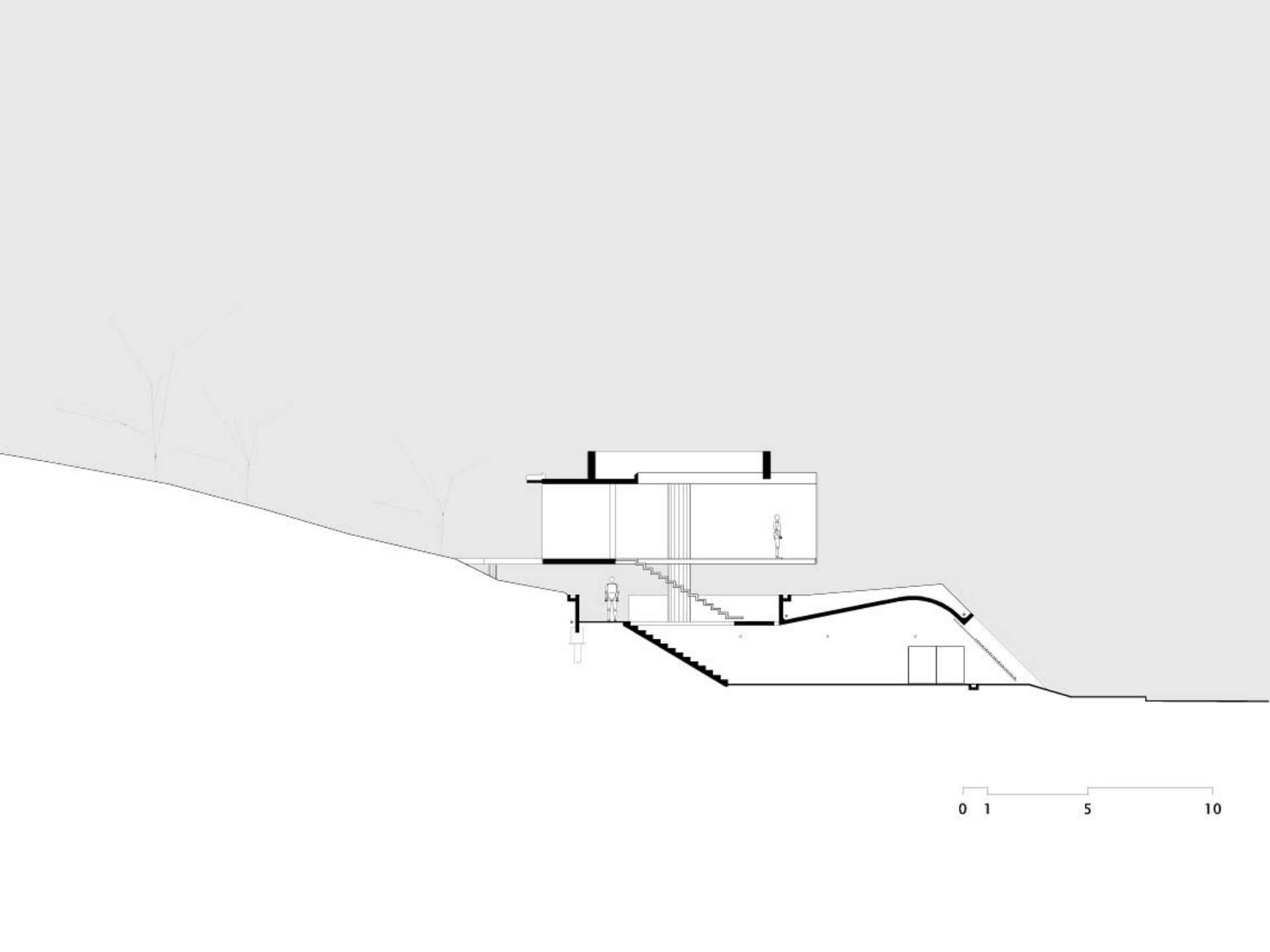


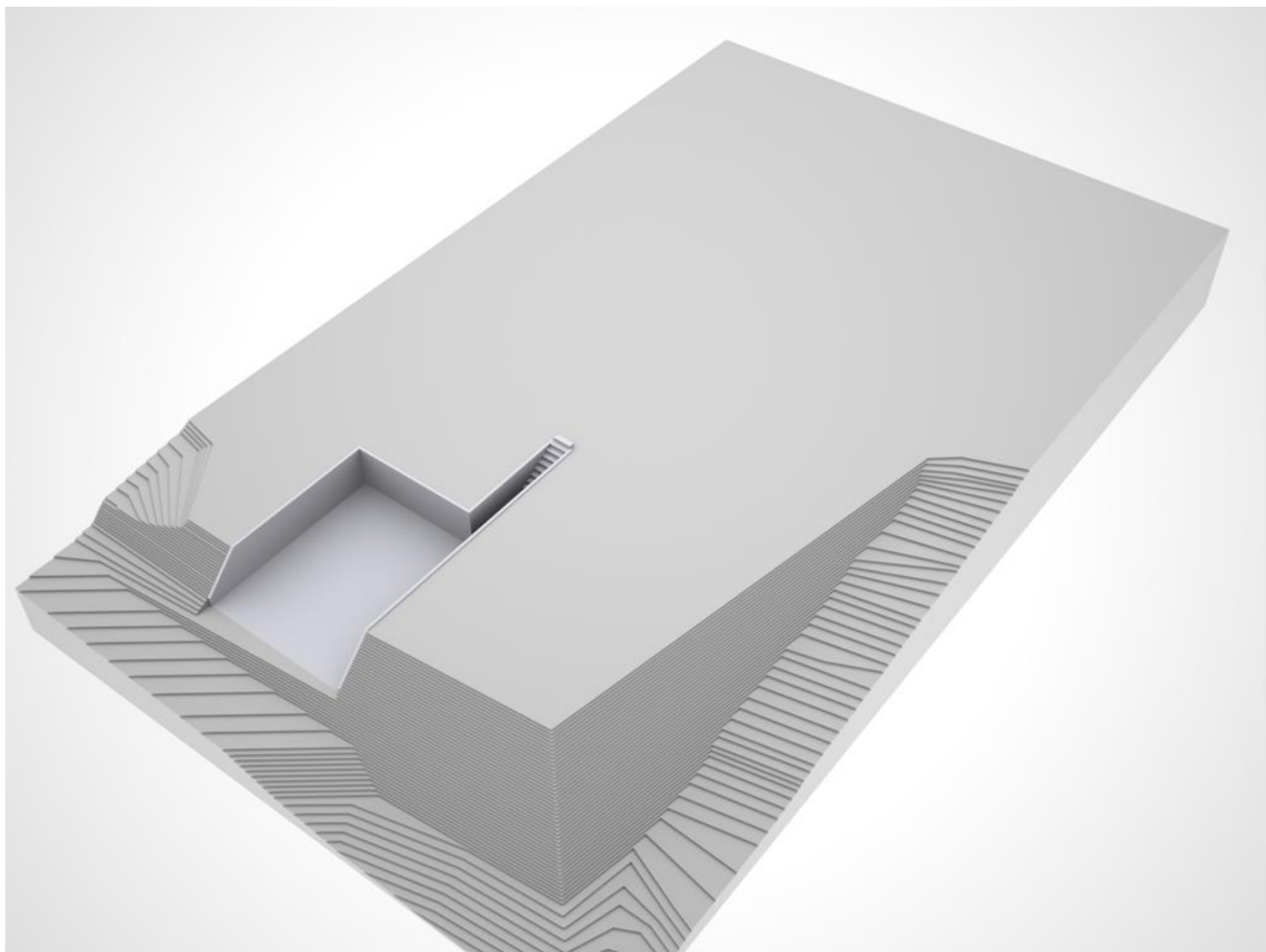
“Casa em Cotia”- Angelo Bucci

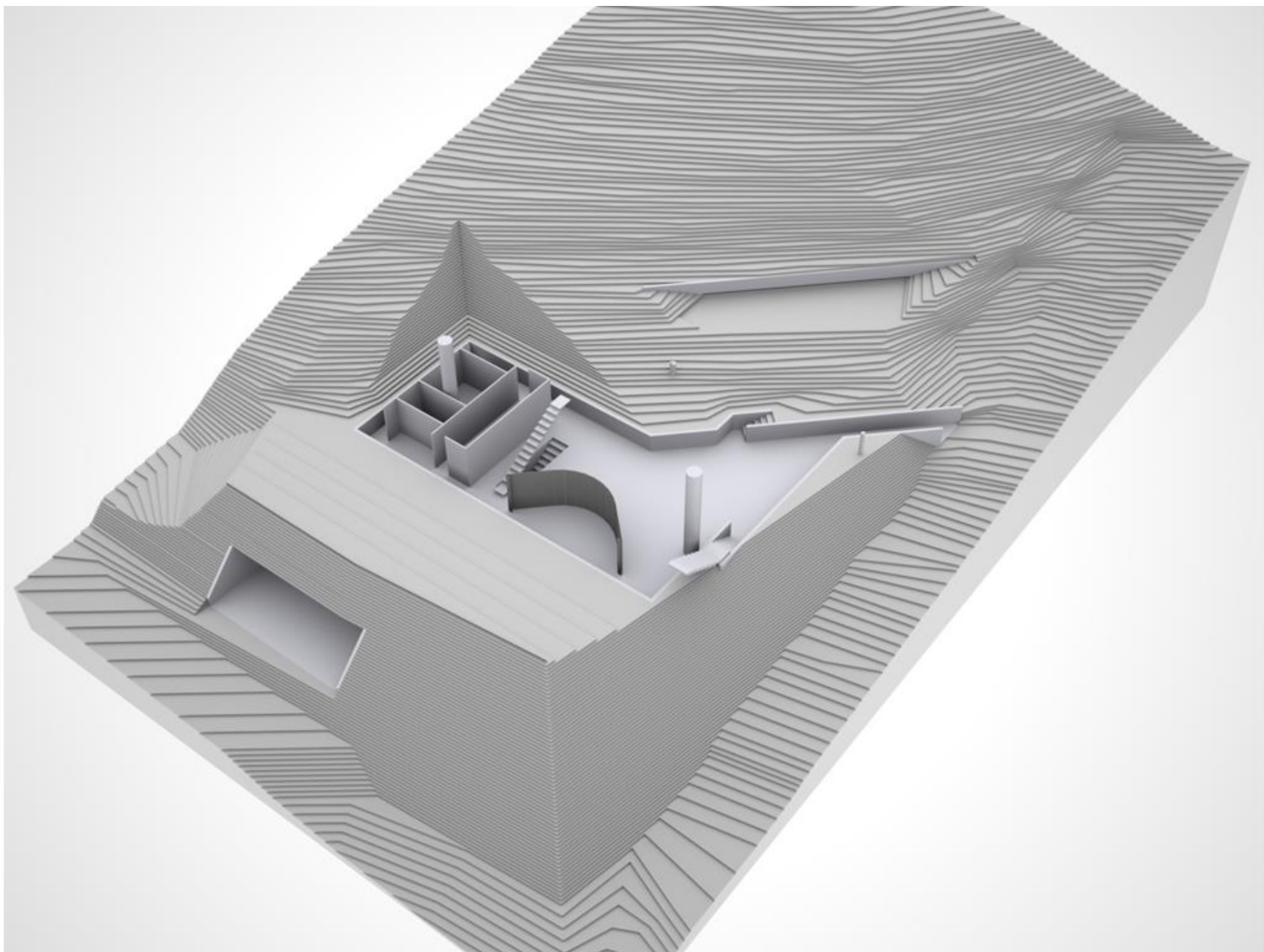


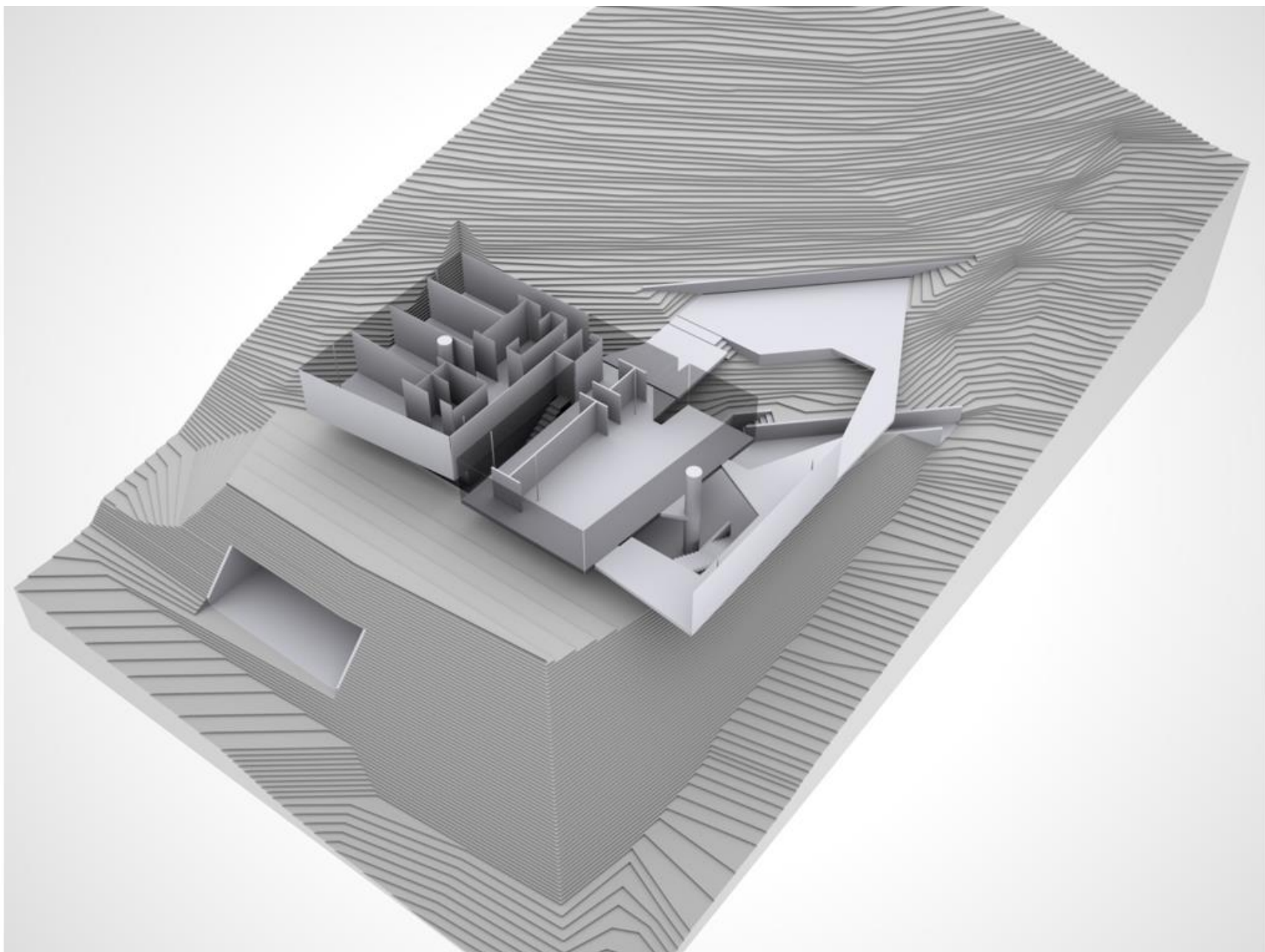


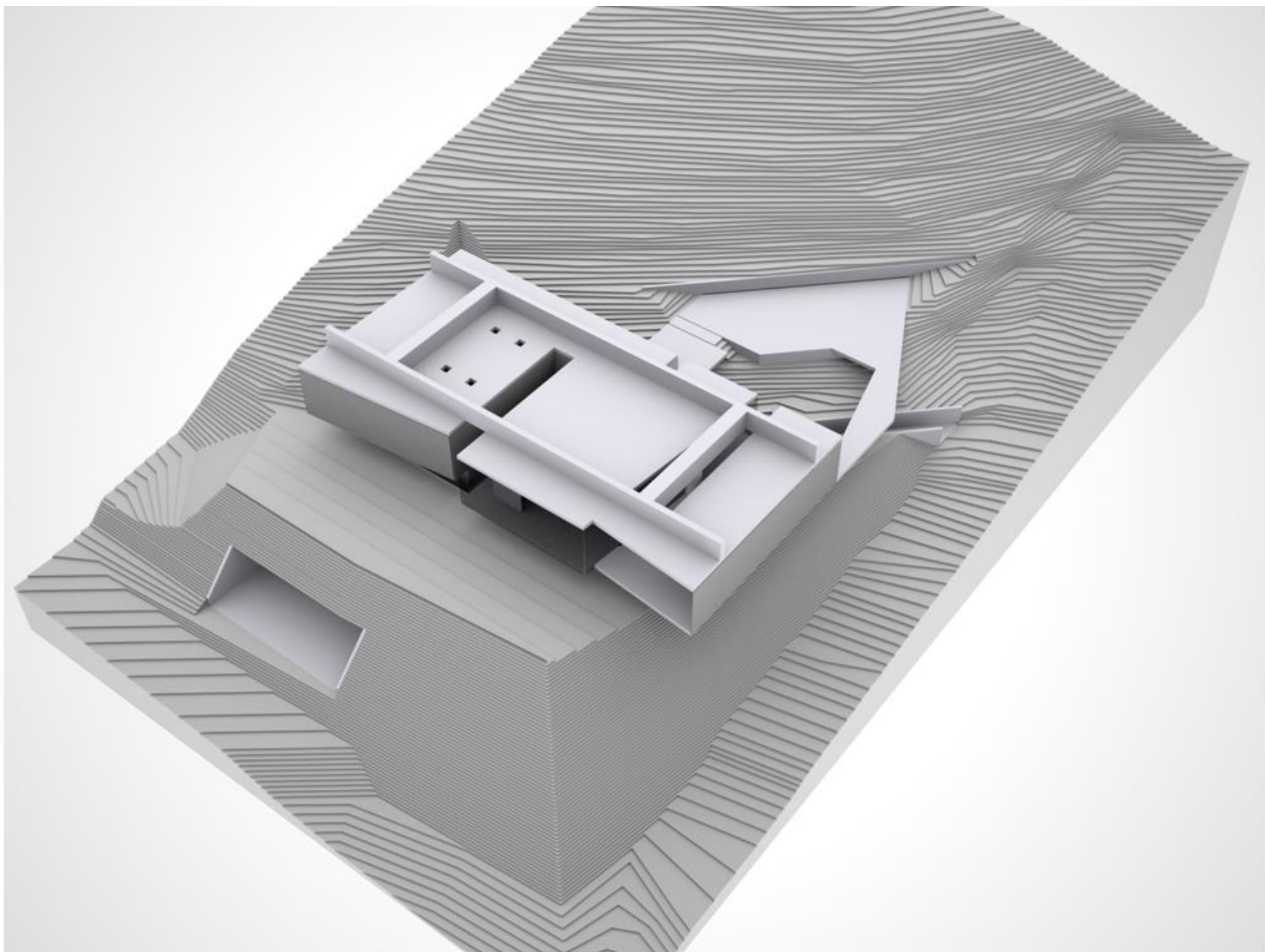












“Elemental Chile”- Angelo Bucci e Álvaro Puntoni

