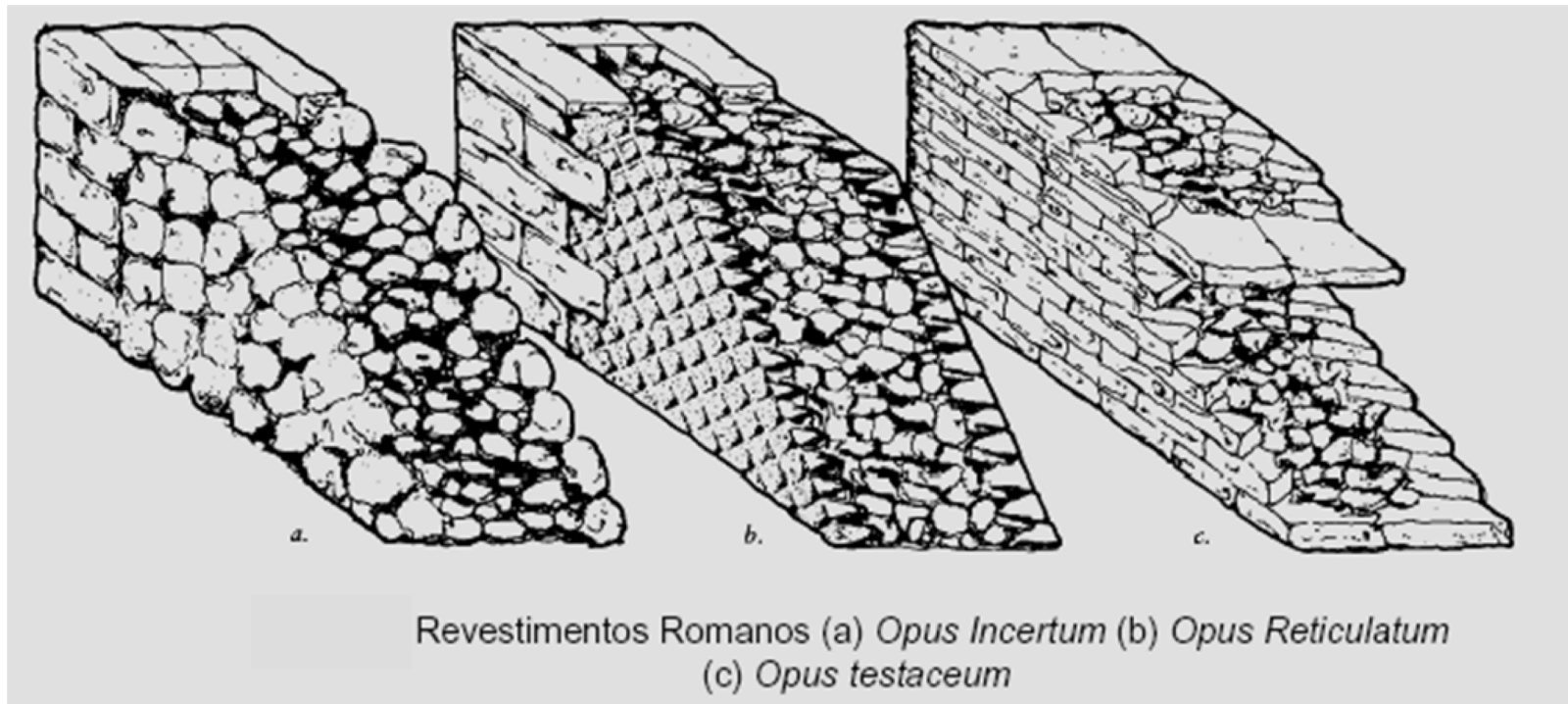
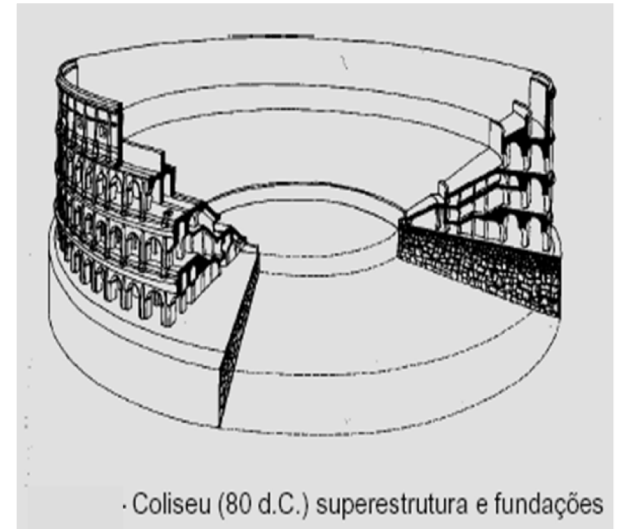


*alvenaria
estrutural*

*ZEB1045 – Construções Rurais
João Adriano Rossignolo*

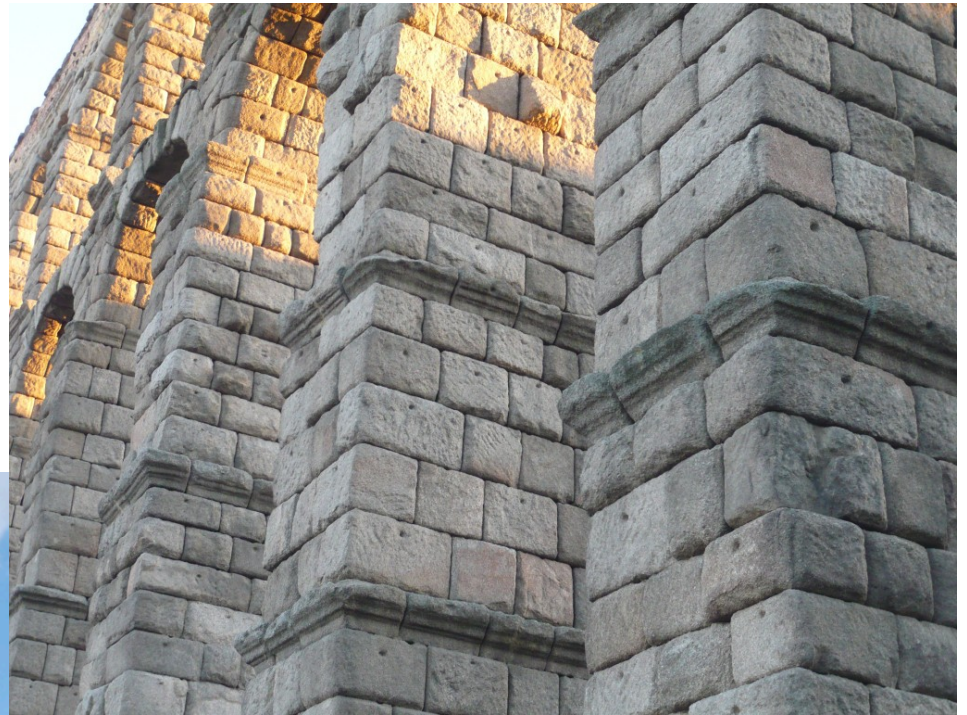
alvenaria estrutural



*alvenaria
estrutural*



*alvenaria
estrutural*



*alvenaria
estrutural*

vedação/estrutura



*alvenaria
estrutural*



*sistema construtivo
racionalizado*



*alvenaria
estrutural*



alvenaria estrutural



alvenaria estrutural

restrições que devem ser consideradas

o número de pavimentos depende da resistência dos blocos

o arranjo espacial das paredes e a necessidade de amarração entre os elementos

as limitações quanto a existência de transição para estruturas em pilotis no térreo ou subsolos

a impossibilidade de remoção de paredes estruturais

limitação na dimensão das aberturas e sacadas



materiais

blocos

argamassa

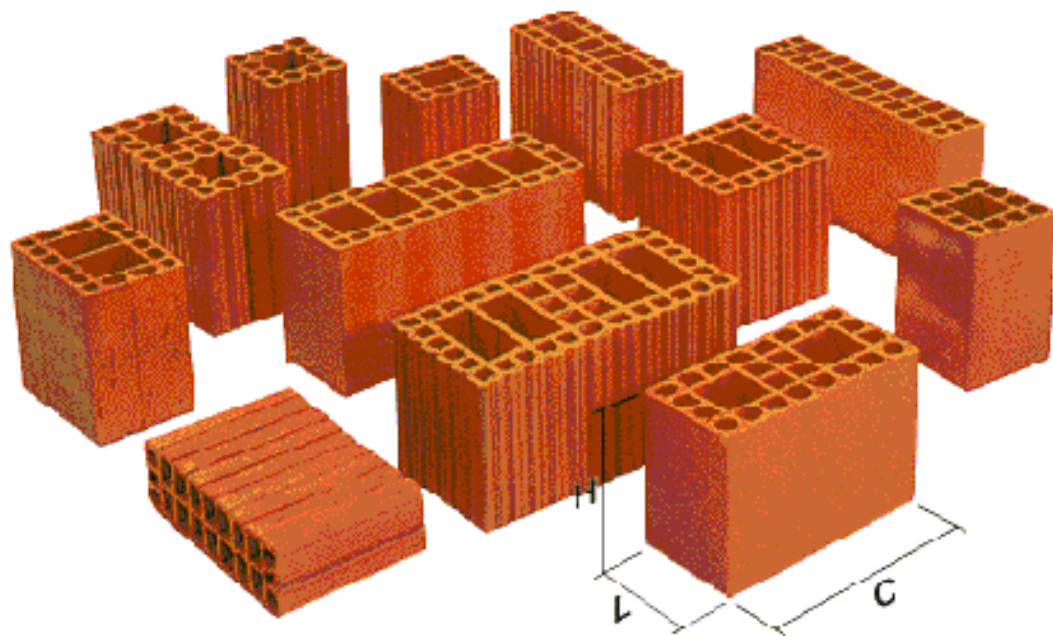
microconcreto

(graute)

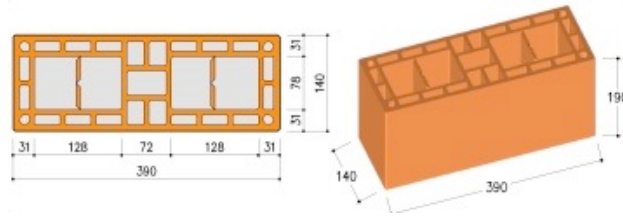
*blocos
cerâmicos
tradicionais*



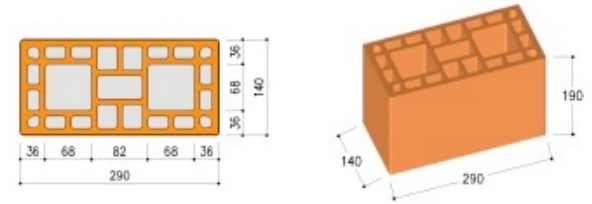
*blocos
cerâmicos
estruturais*



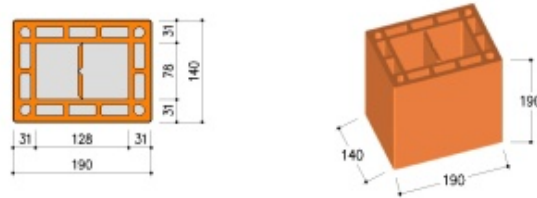
blocos cerâmicos



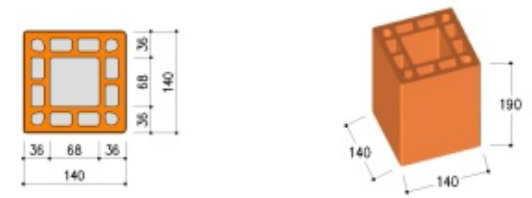
Bloco inteiro - 14x19x39 cm



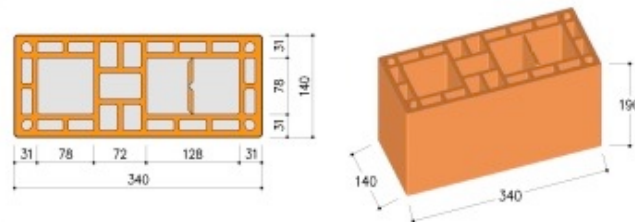
Bloco inteiro - 14x19x29 cm



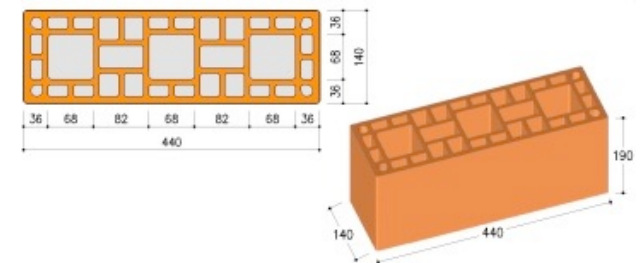
Meio bloco - 14x19x19 cm



Meio bloco - 14x19x14 cm

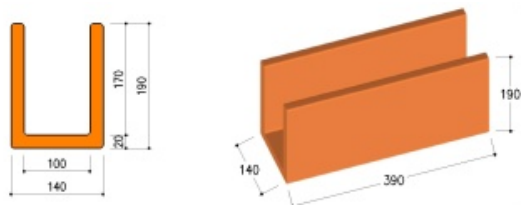


Bloco de amarração - 14x19x34 cm

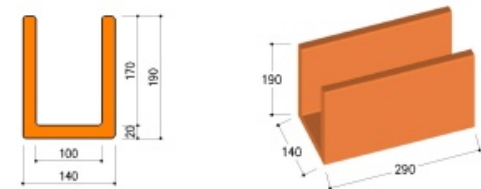


Bloco de amarração - 14x19x44 cm

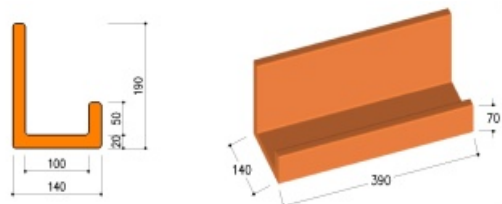
blocos cerâmicos



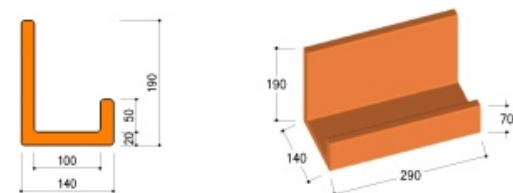
Bloco canaleta - 14x19x39 cm



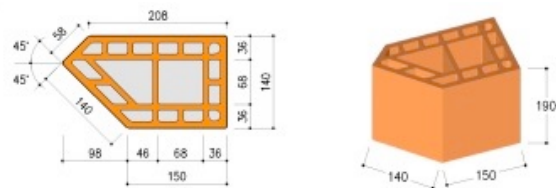
Bloco canaleta - 14x19x29 cm



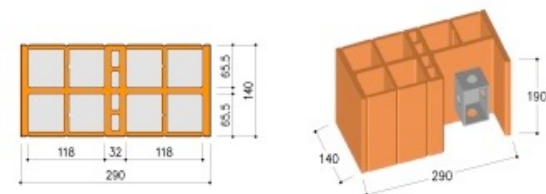
Bloco J - 14x19-07x39 cm



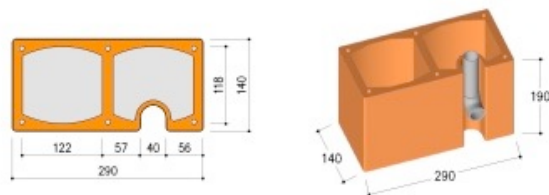
Bloco J - 14x19-07x29 cm



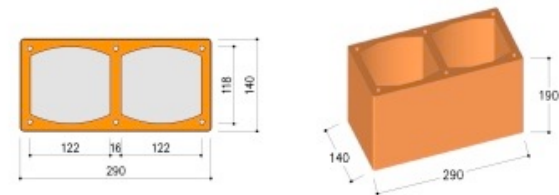
Bloco canto 45° - 14x19x15 cm



Bloco elétrico - 19x19x29 cm

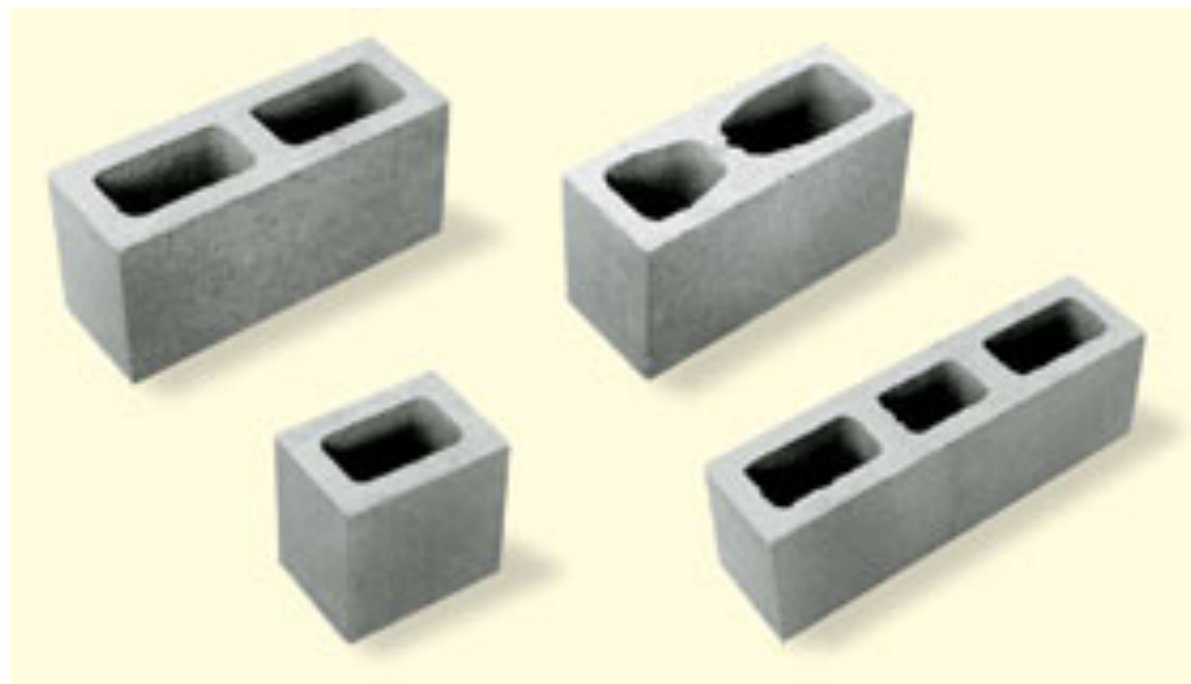


Bloco hidráulico - 19x19x29 cm

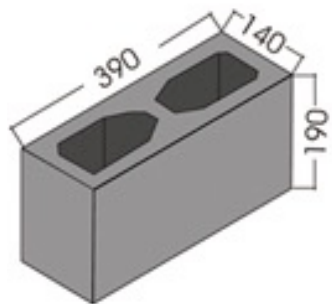


Bloco hidráulico 2 - 19x19x29 cm

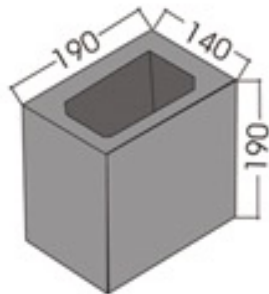
*blocos de
concreto*



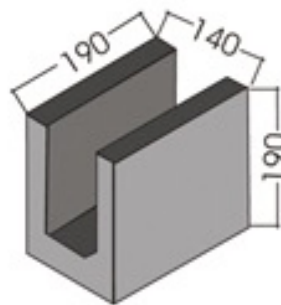
blocos de concreto



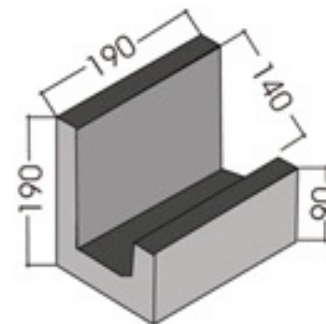
Bloco (M-15)



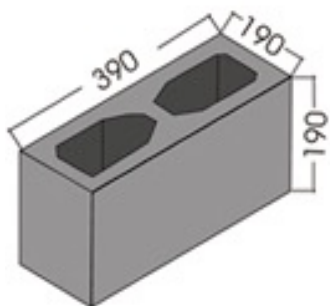
Meio bloco (M-15)



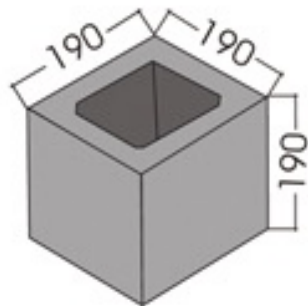
Canaleta (14x19x19) cm



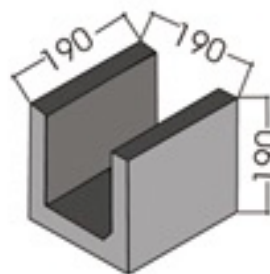
Bloco J (14x19-09x19) cm



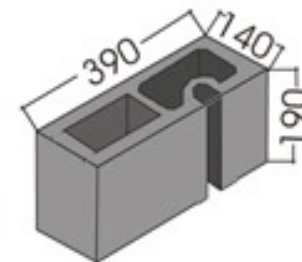
Bloco (M-20)



Meio bloco (M-20)



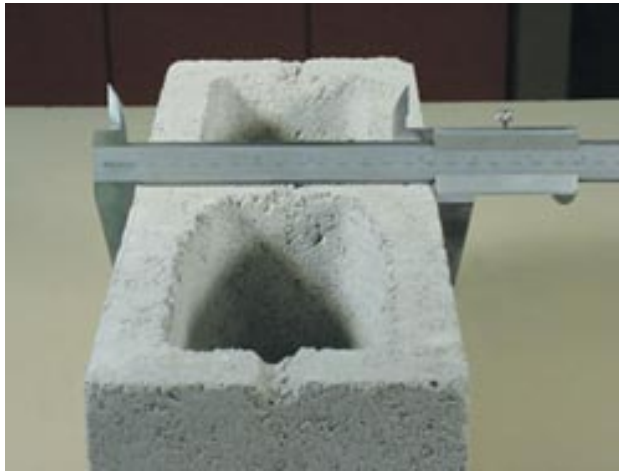
Canaleta (19x19x19) cm



Bloco hidráulico

blocos

controle tecnológico



	Resistência à compressão	Absorção de água
BLOCO ESTRUTURAL	fbk superior a 4,5MPa , dividido em classes de resistência	menor ou igual a 10%
BLOCO DE VEDAÇÃO	Média de 2,5 MPa, mínima individual de 2,0 MPa	Média menor ou igual a 10% máxima individual de 15%

f_{ck} : 4,5 → 20 MPa * > 20MPa
(cerâmico/concreto/sil-cal)

argamassa

trabalhabilidade

retenção de água

tempo de endurecimento

aderência

durabilidade e resistência à compressão



projeto

projeto

modulação

simetria

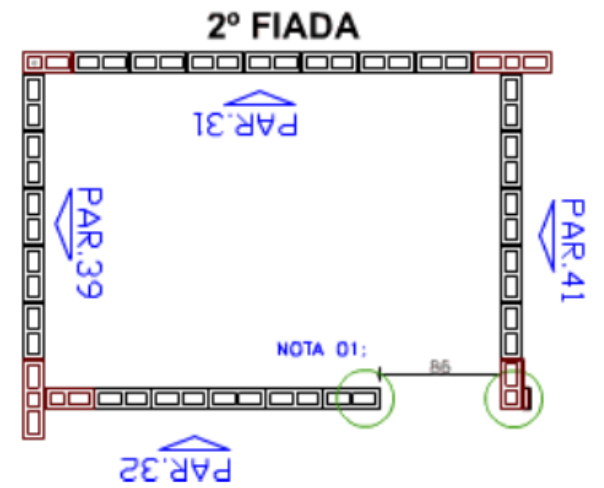
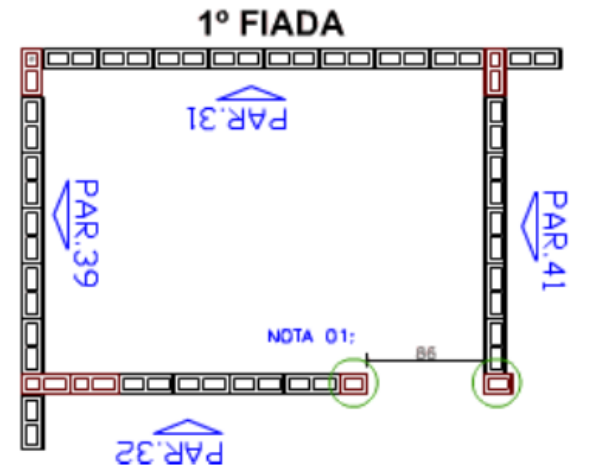
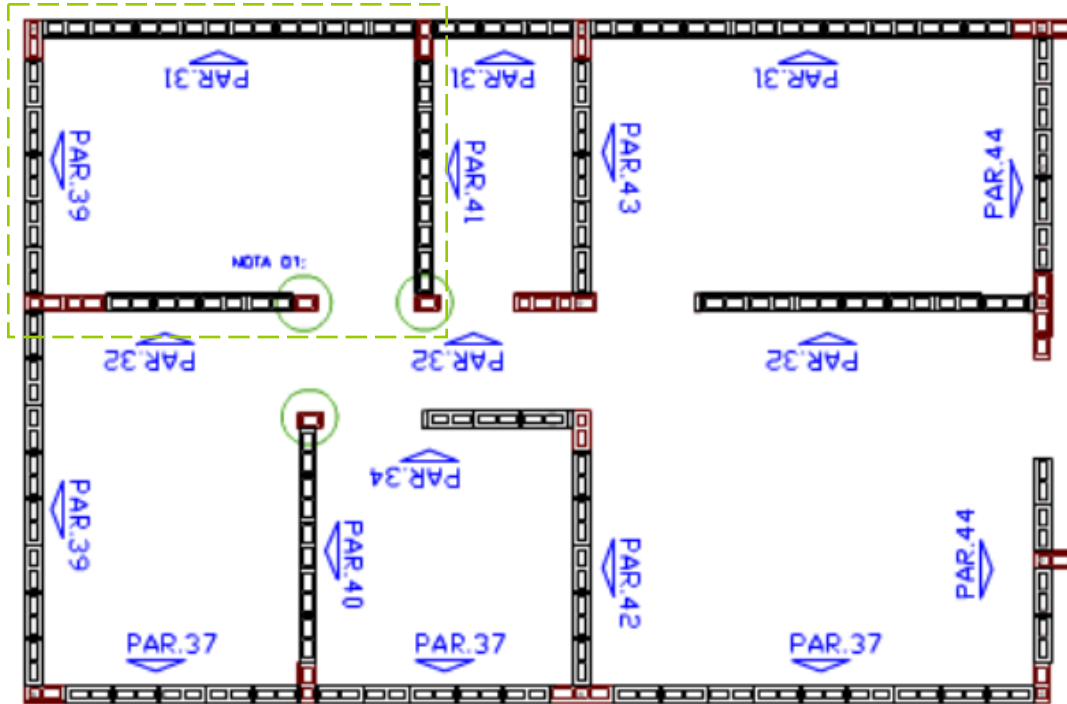
integração entre projetos

arquitetônico

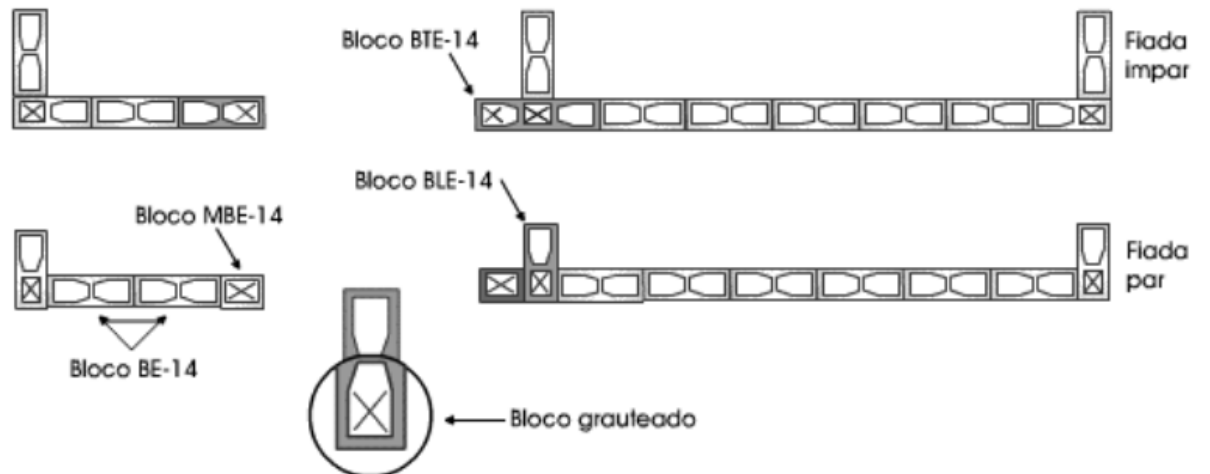
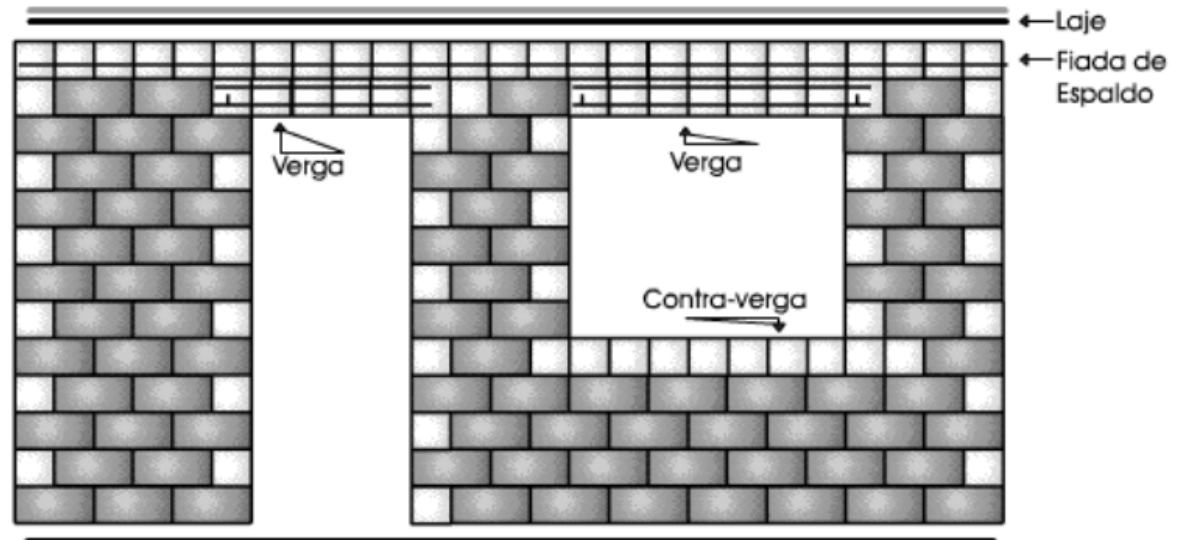
estrutural

sistemas prediais

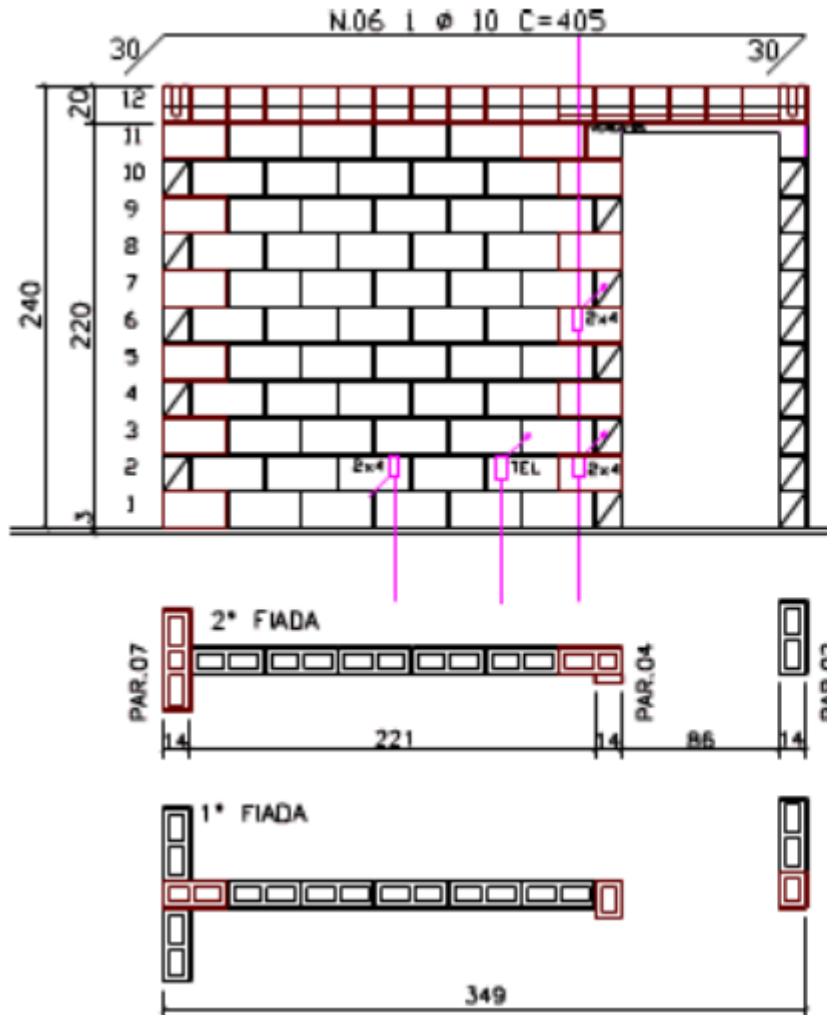
projeto



projeto



projeto



DESENHO	DIM	QUANT
BLOCOS COM BASE 14 m		
		39 x 14 x 19 54
		34 x 14 x 19 12
		54 x 14 x 19
		19 x 14 x 19
		C(19 x 14 x 19) 16
		C(31 x 14 x 19)
		H(39 x 14 x 19)
		H(19 x 14 x 19)
		04 x 14 x 19
		09 x 14 x 19
PAREDE 10		

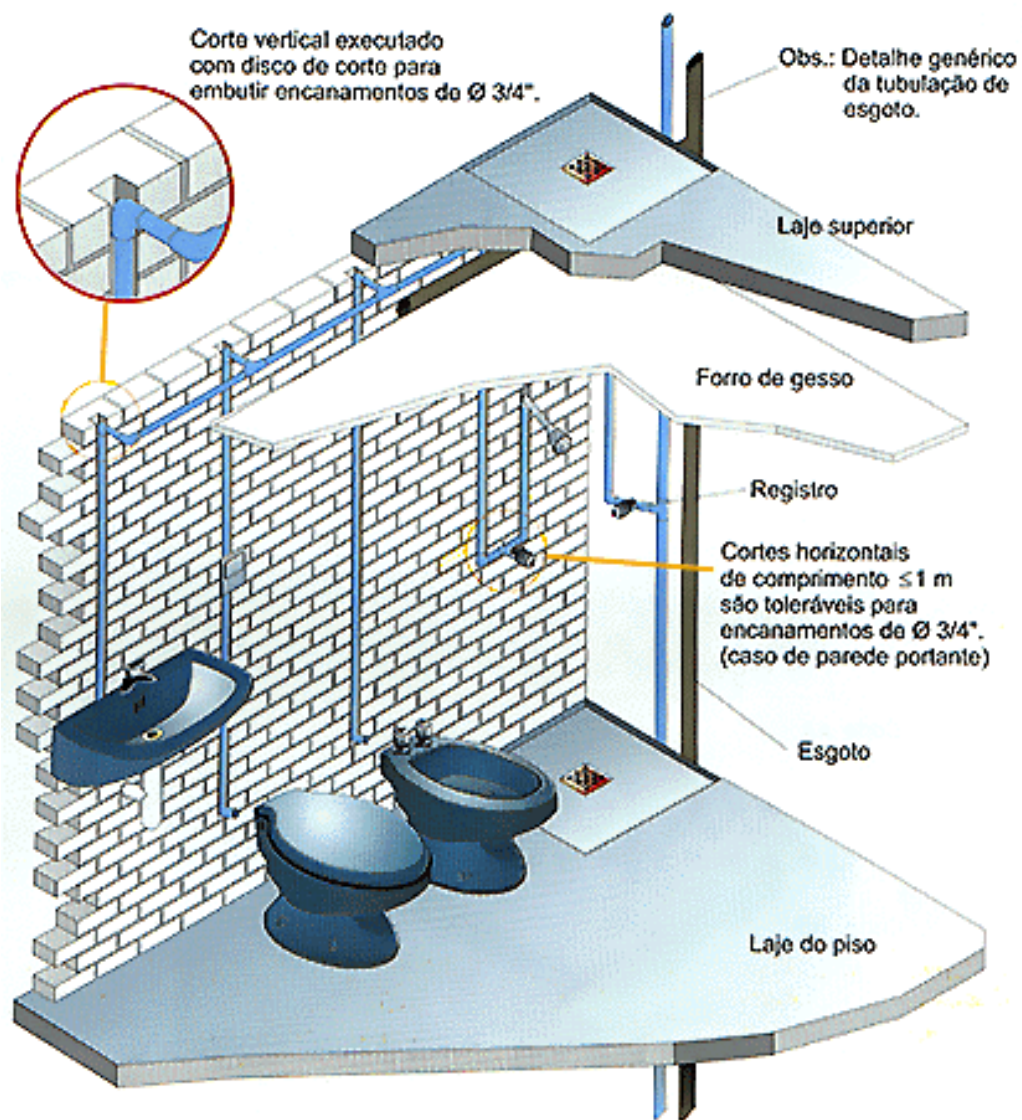
BLOCOS ESTRUTURAIS f_{lk}=4.5 MPA



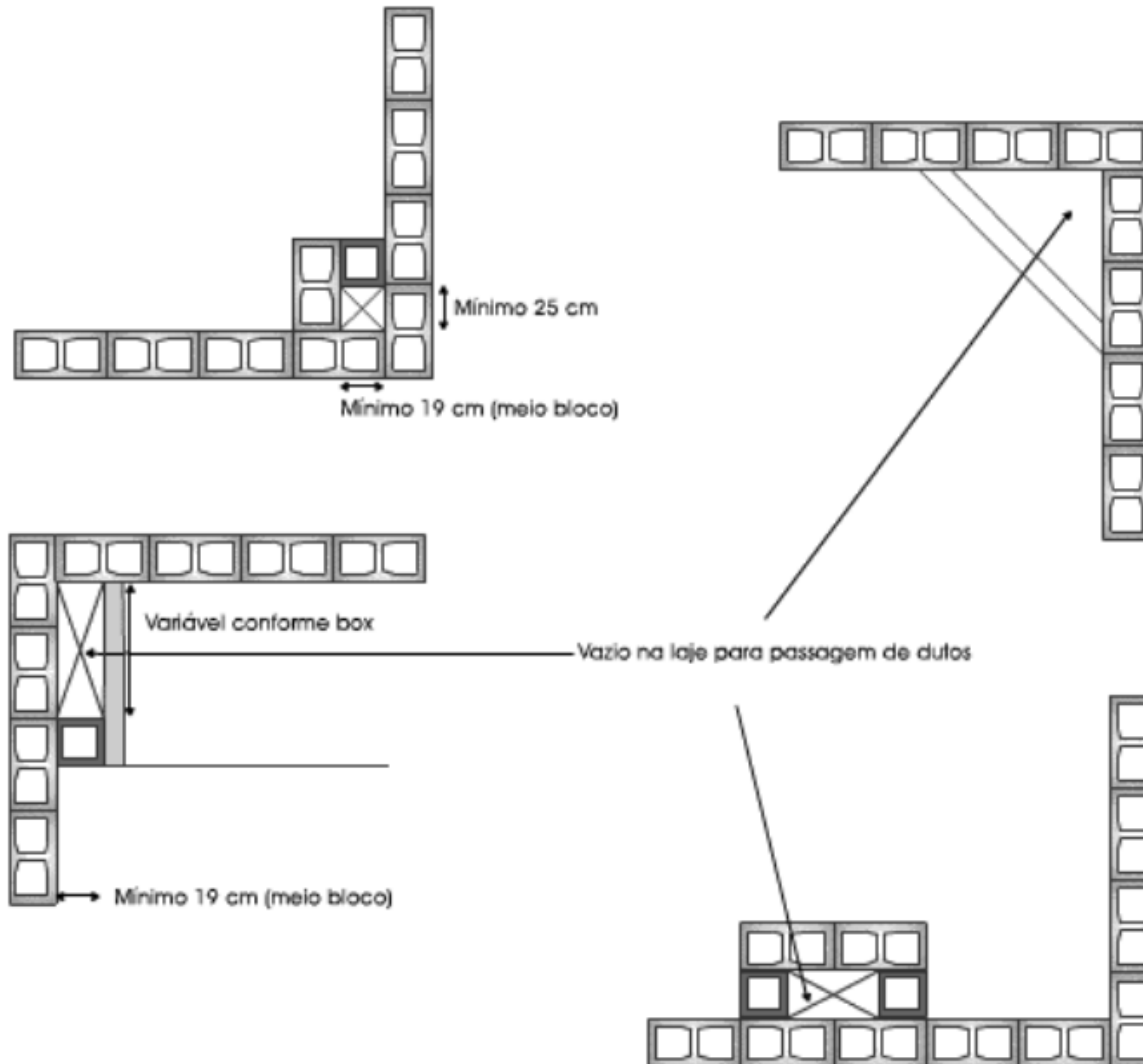
sistemas prediais

sistema hidráulico

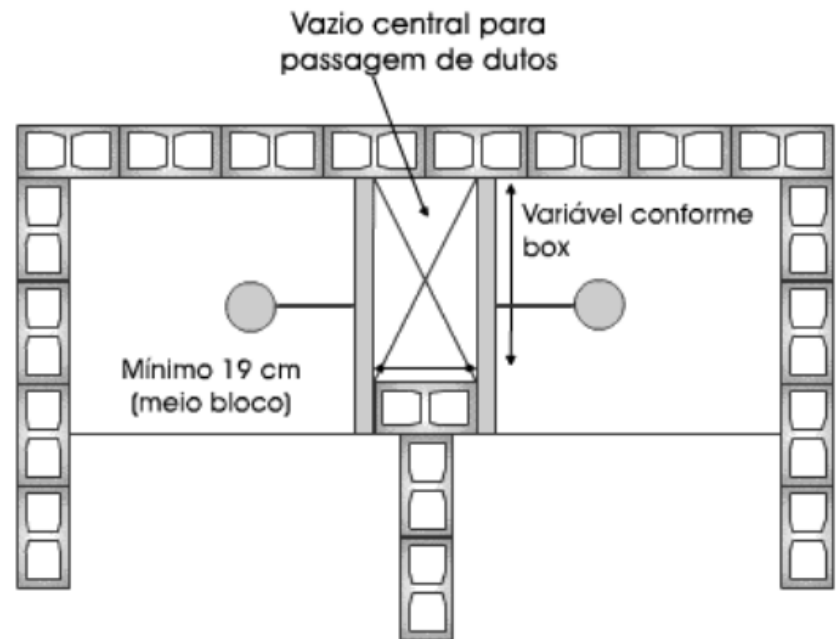
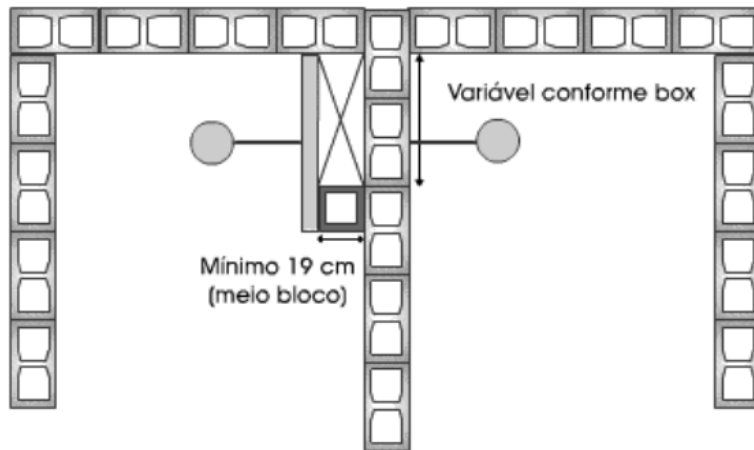
DETALHE DA INSTALAÇÃO HIDRÁULICA



shafts



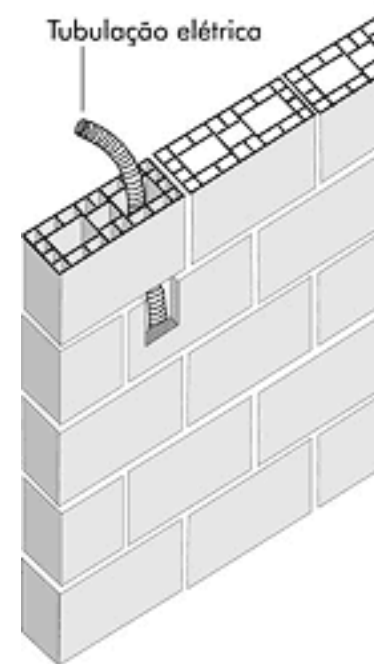
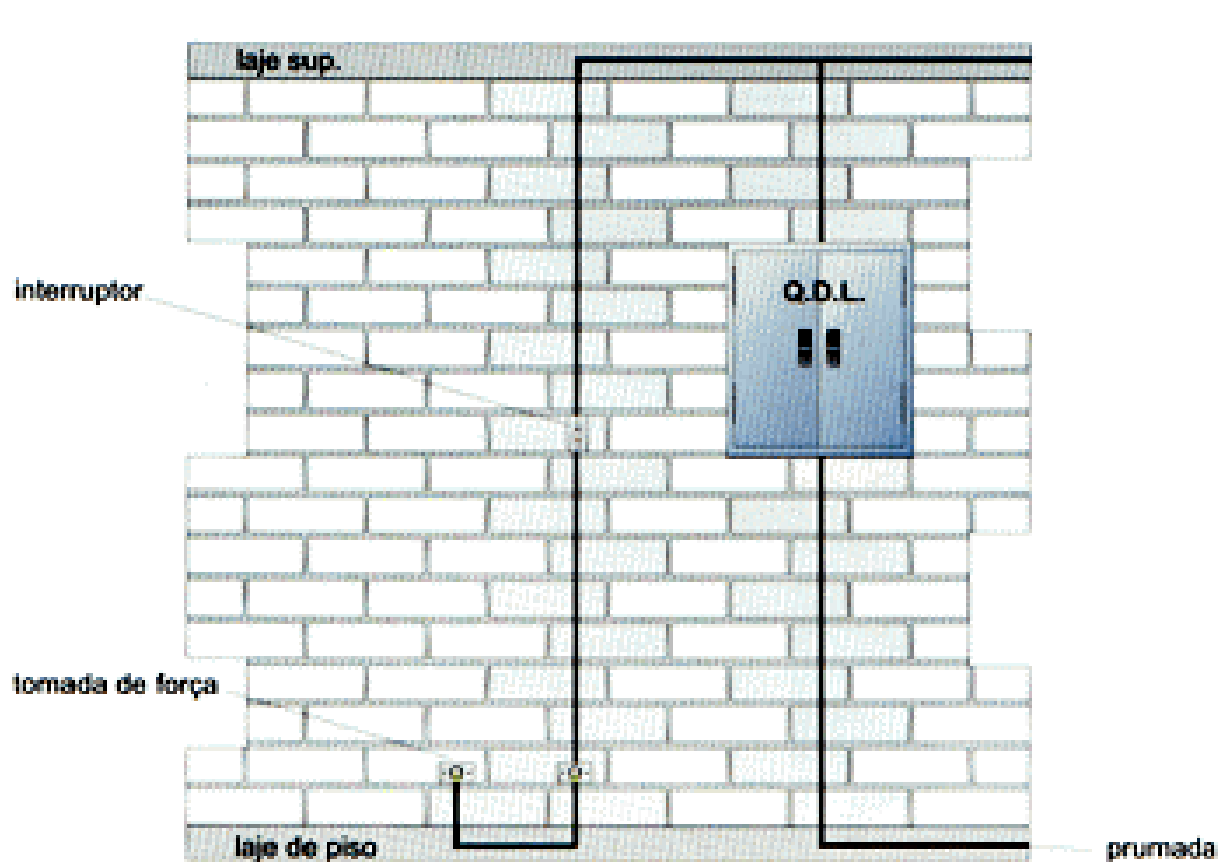
shafts



shafts



sistema elétrico



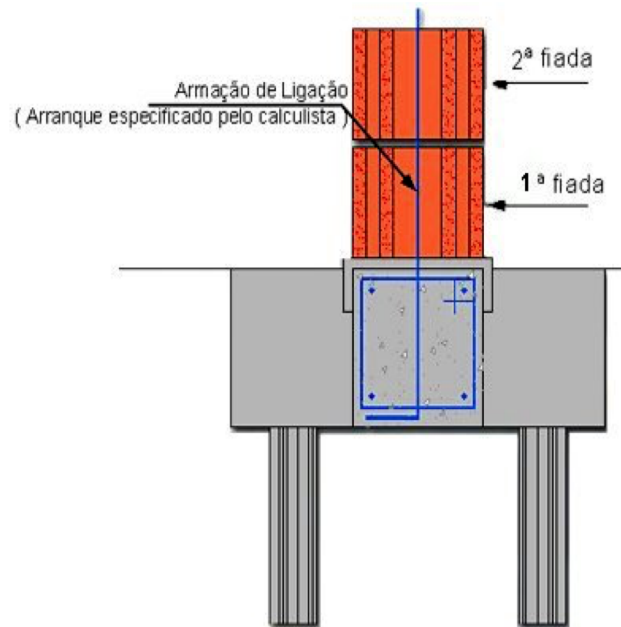
*sistema
eléctrico*



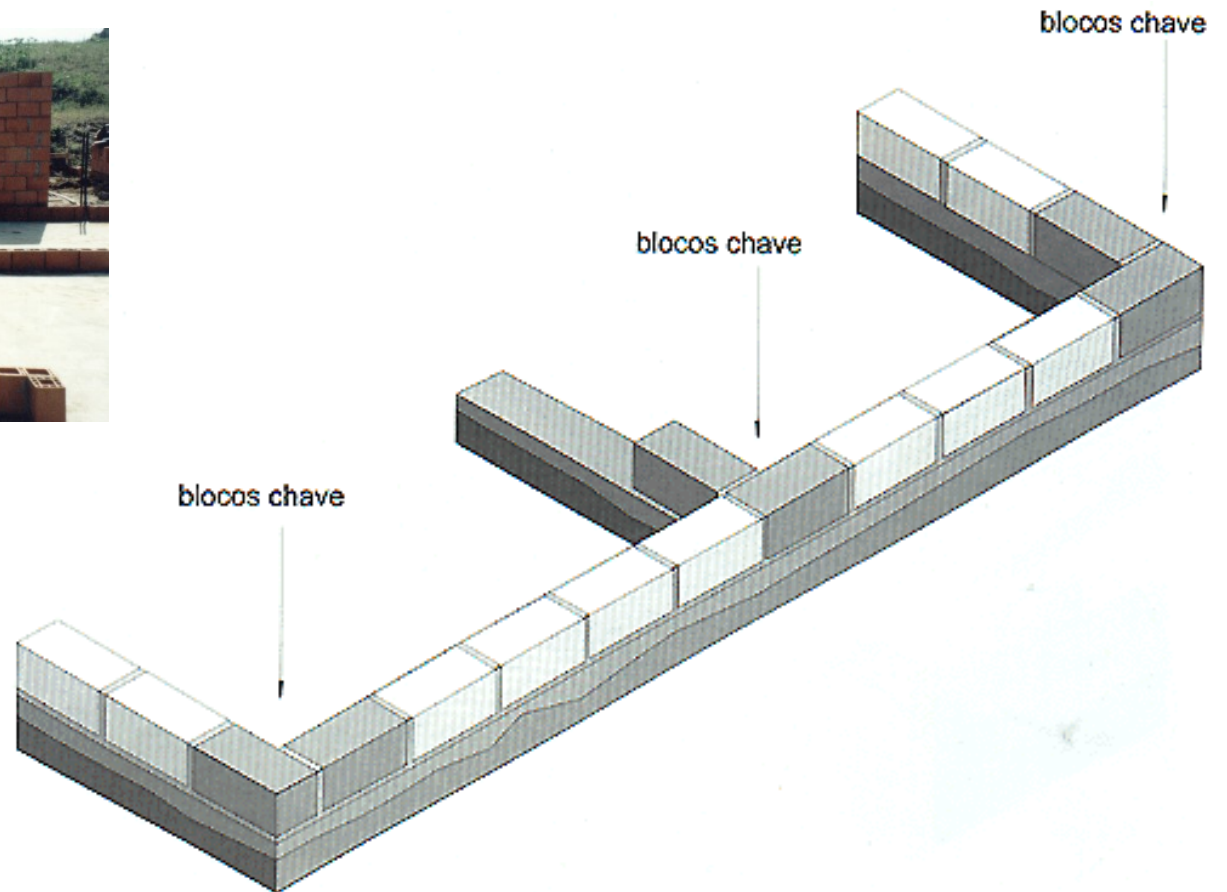


*procedimientos
construtivos*

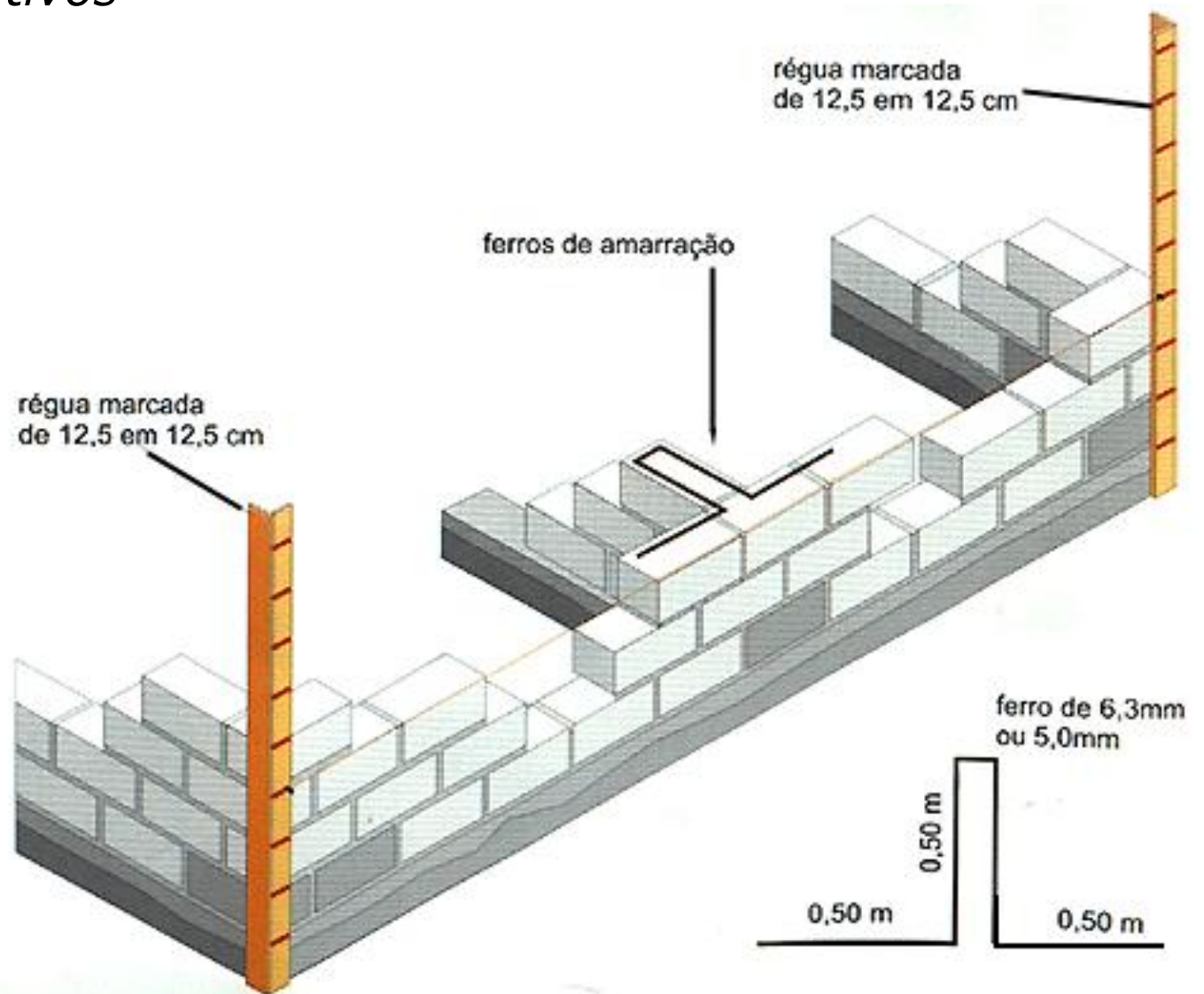
procedimentos construtivos



procedimentos construtivos



*procedimentos
construtivos*



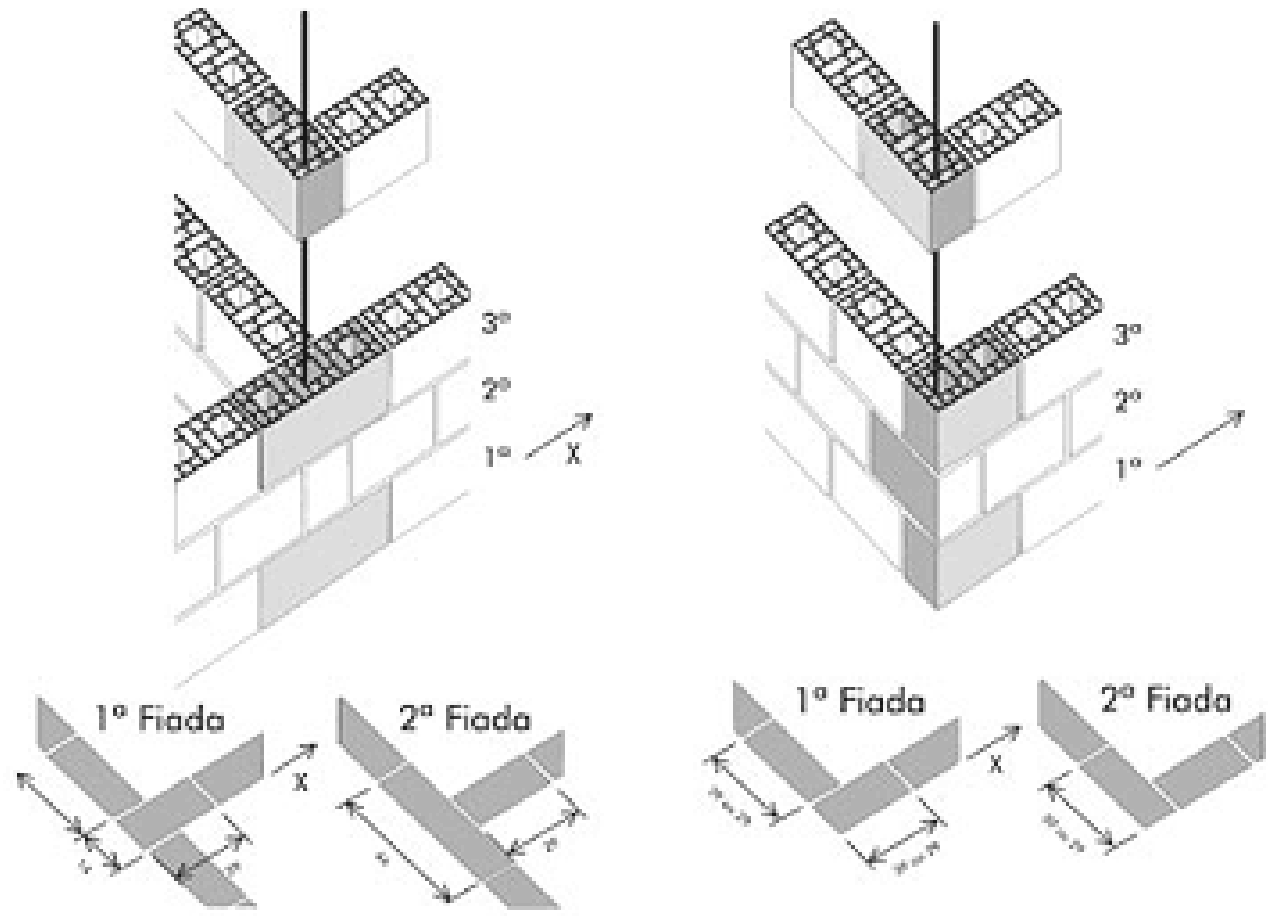
*procedimientos
construtivos*



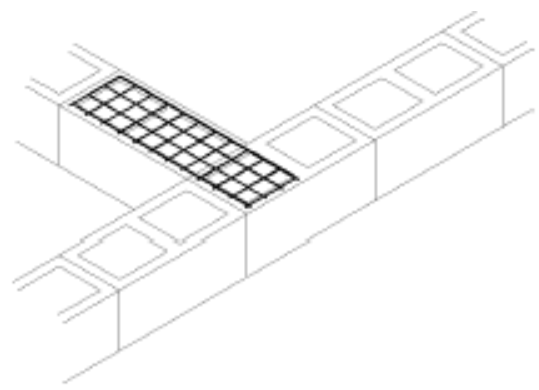
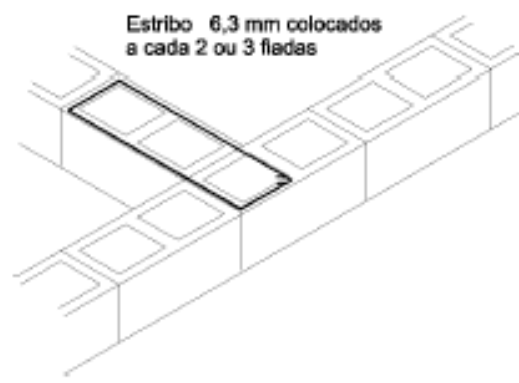
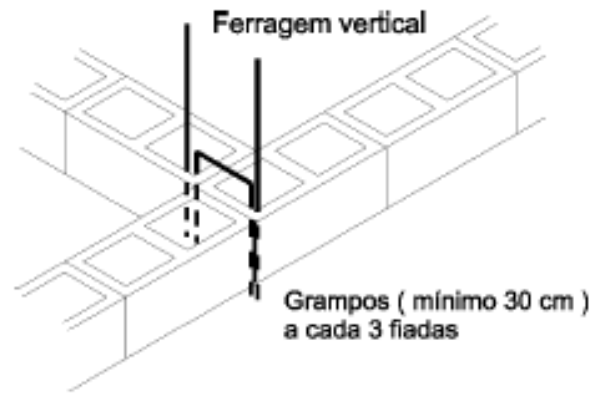
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construtivos*



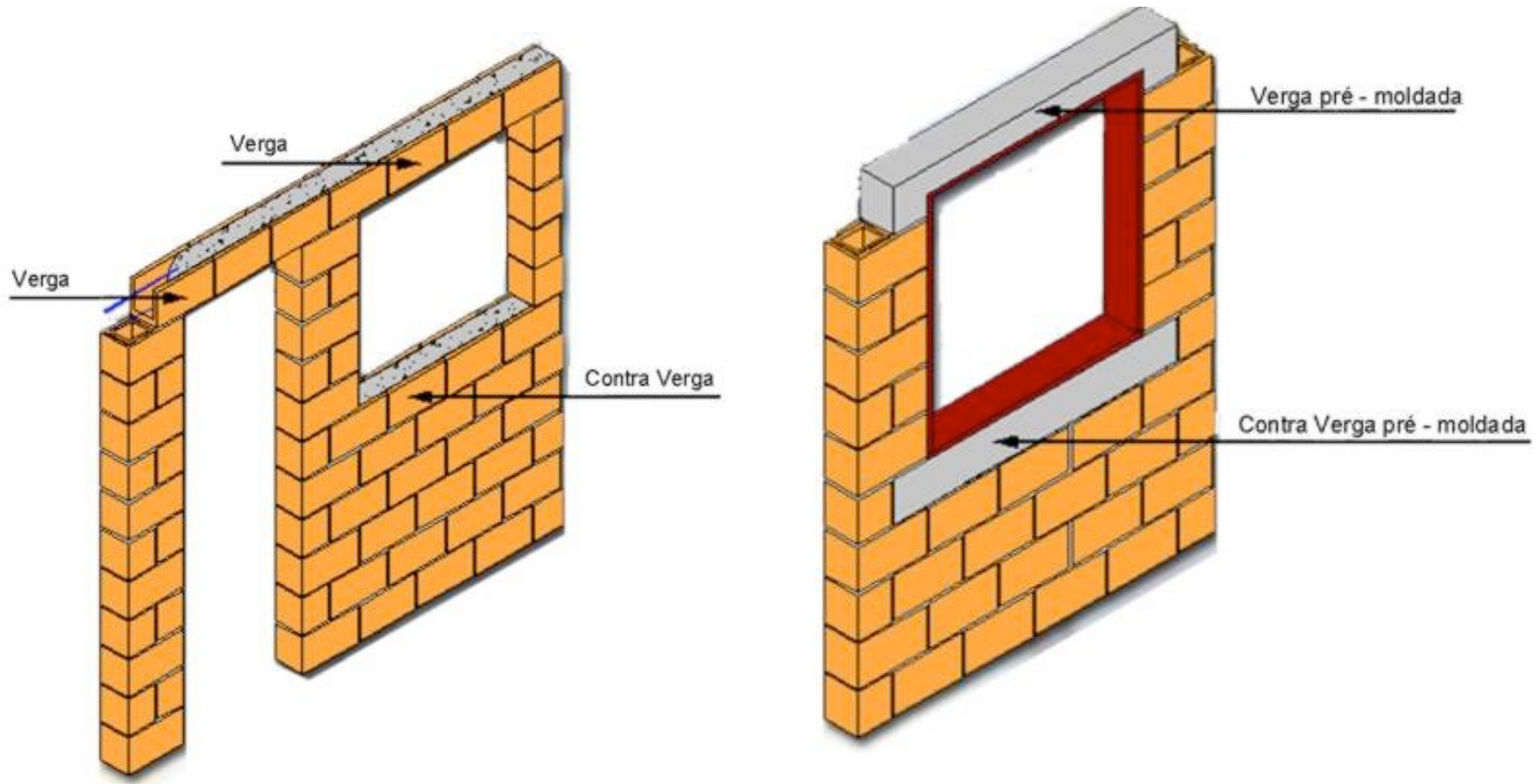
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construtivos*



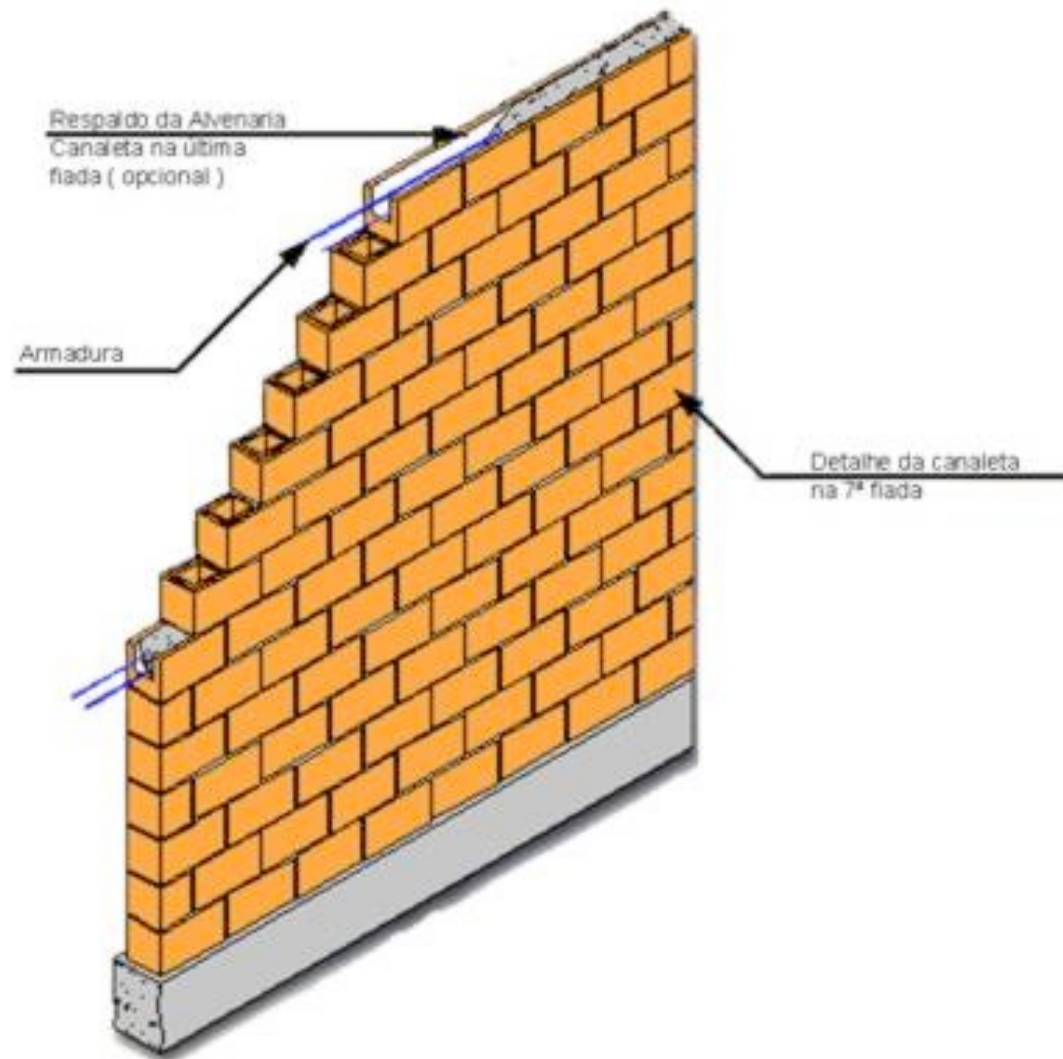
procedimentos construtivos



procedimentos construtivos



*procedimentos
construtivos*



*procedimientos
construtivos*



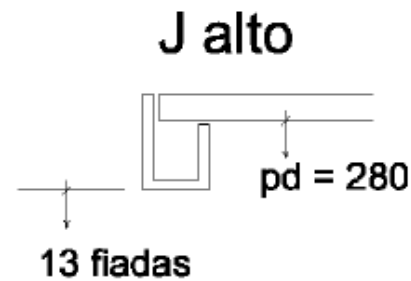
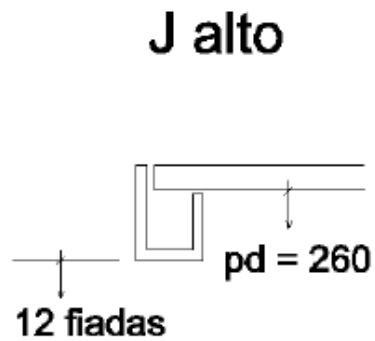
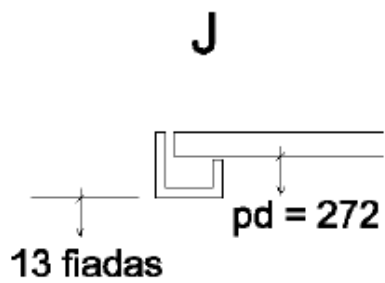
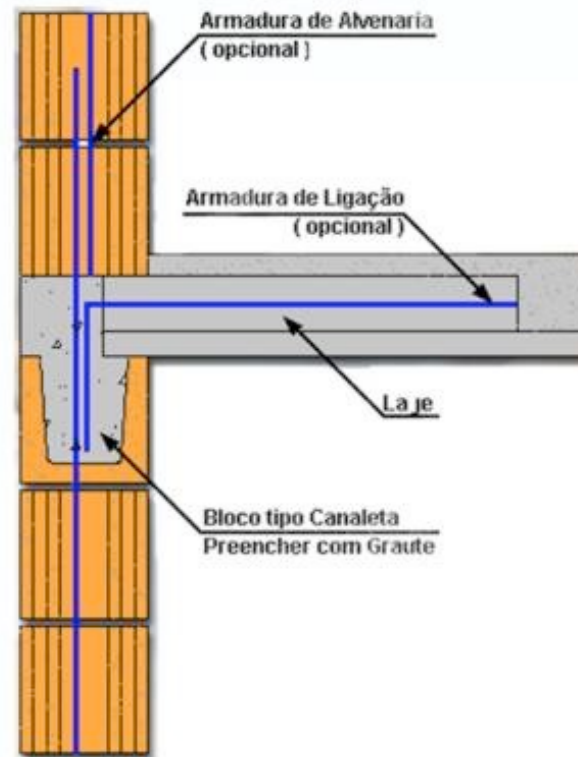
*procedimientos
construtivos*



*procedimientos
construtivos*



*procedimentos
construtivos*



*procedimientos
construtivos*

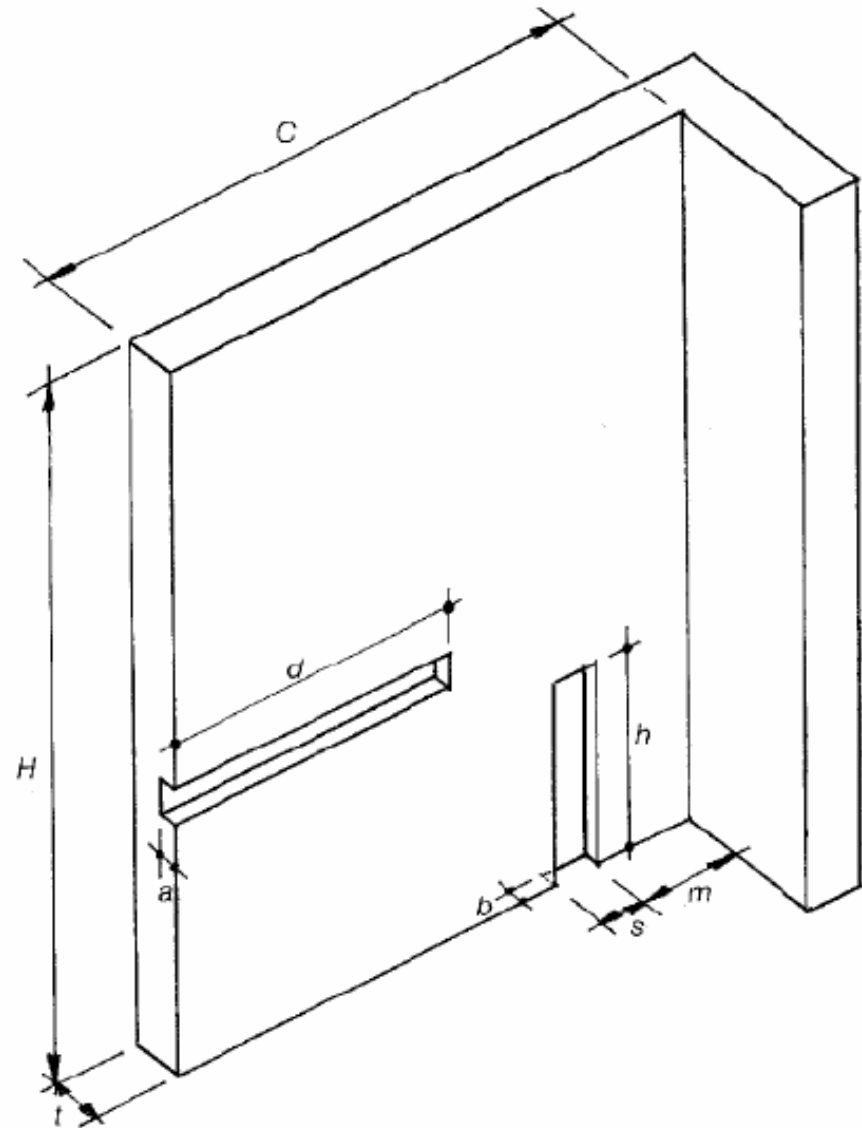


*procedimientos
construtivos*



aberturas

medida	dimensão
a	$\leq 3 \text{ cm}$
b	$\leq t / 3$
d	$\leq C / 5$
h	$\leq H / 3$
s	$\leq t$
m	$\geq 20 \text{ cm}$





exemplos

*exemplos
casa popular*



*exemplos
casa popular*



*exemplos
casa popular*



*exemplos
casa popular*



*exemplos
casa popular*



*exemplos
edifício*



*exemplos
edifício*



*exemplos
edifício*



*exemplos
edifício*



*exemplos
edifício*



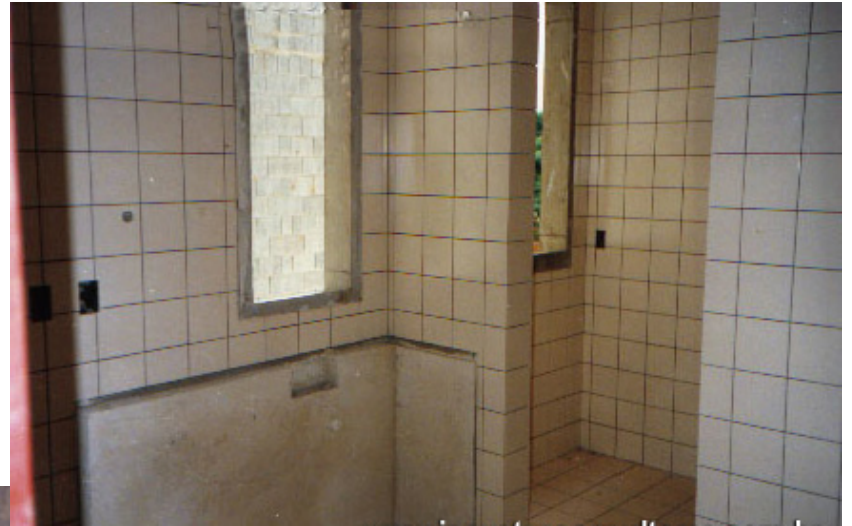
*exemplos
edifício*



*exemplos
edifício*

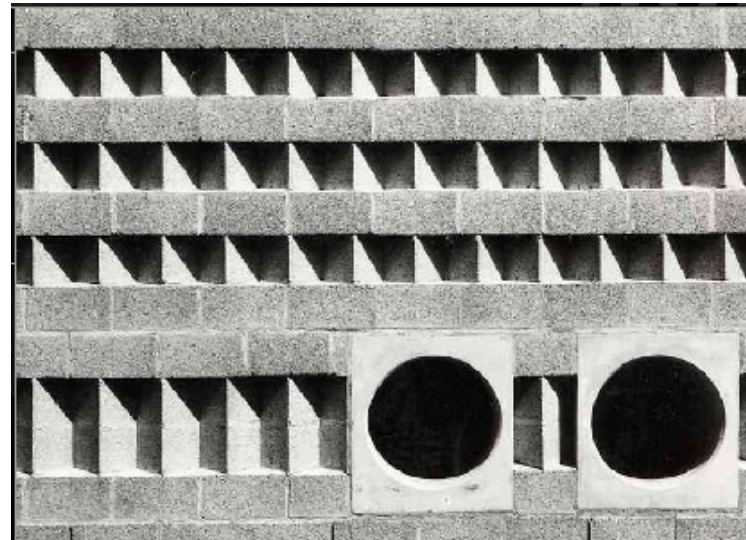


*exemplos
edifício*



exemplos

Single Family House in Morbio Superior Suíça - 1983



exemplos

Universidade Metodista
São Bernardo do Campo-SP



normas

ASSOCIAÇÃO BRASILEIRA DE NORMAS TÉCNICAS, Rio de Janeiro. Bloco

Cerâmico para Alvenaria – Especificação: NBR 7171/92.

_____ Bloco Cerâmico para Alvenaria - Formas e Dimensões – Padronização: NBR8042/92.

_____ Bloco Cerâmico para Alvenaria - Verificação da Resistência à Compressão: NBR 6461/83.v

_____ Bloco Cerâmico Portante para Alvenaria - Determinação da Área Líquida: NBR8043/93.

_____ Bloco vazado de concreto simples para alvenaria estrutural: NBR 6136/94.

_____ Blocos vazados de concreto simples para alvenaria – Determinação da resistência à compressão: NBR 7184/92.

_____ Blocos vazados de concreto para alvenaria – Retração por secagem: NBR12117/92.

_____ Blocos vazados de concreto para alvenaria – Determinação da absorção de água, do teor de umidade e da área líquida: NBR 12118/92.

_____ Bloco vazado modular de concreto: NBR 5712/82.

_____ Cálculo de alvenaria estrutural de blocos vazados de concreto: NBR 10837/89.

_____ Execução e controle de obras em alvenaria estrutural de blocos vazados de concreto: NBR 8798/85.

_____ Prismas de blocos vazados de concreto simples para alvenaria estrutural – Preparo de ensaio à compressão: NBR 8215/83.