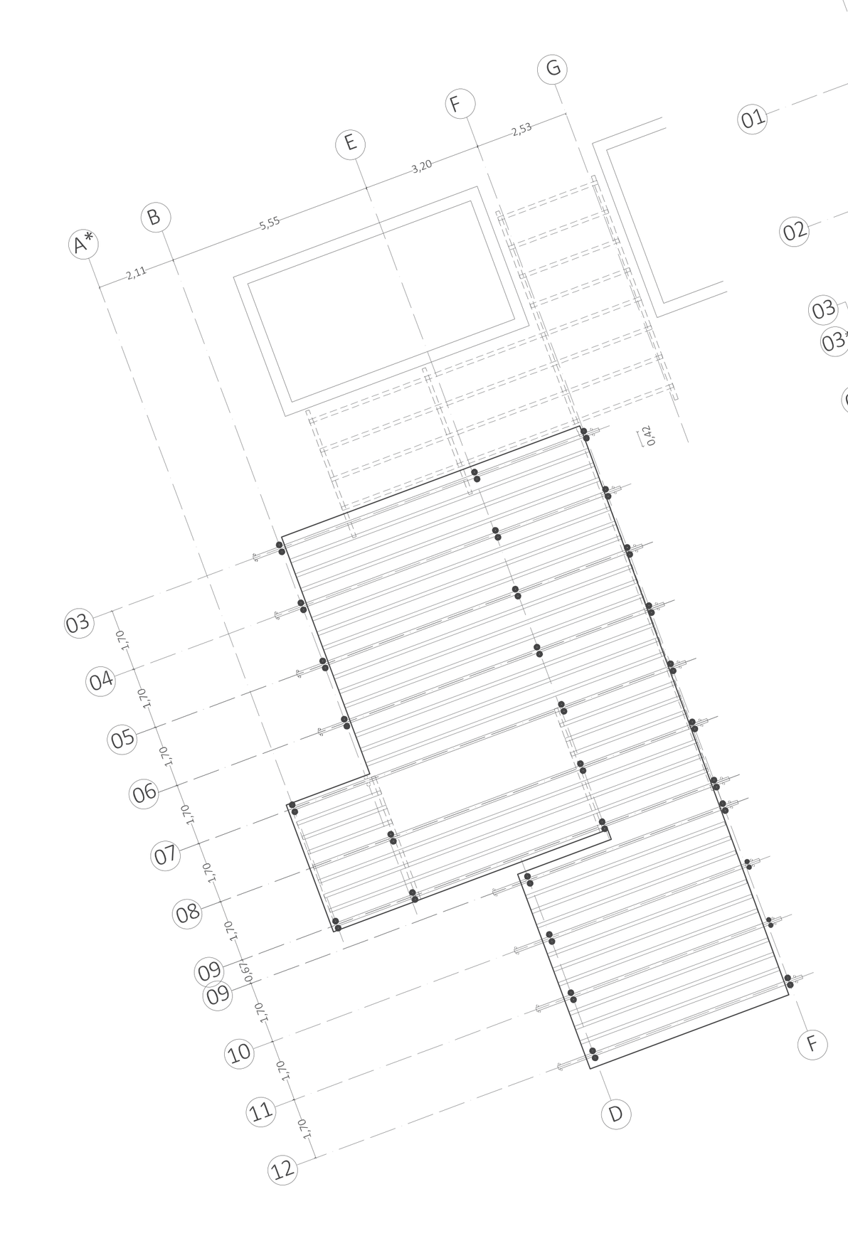
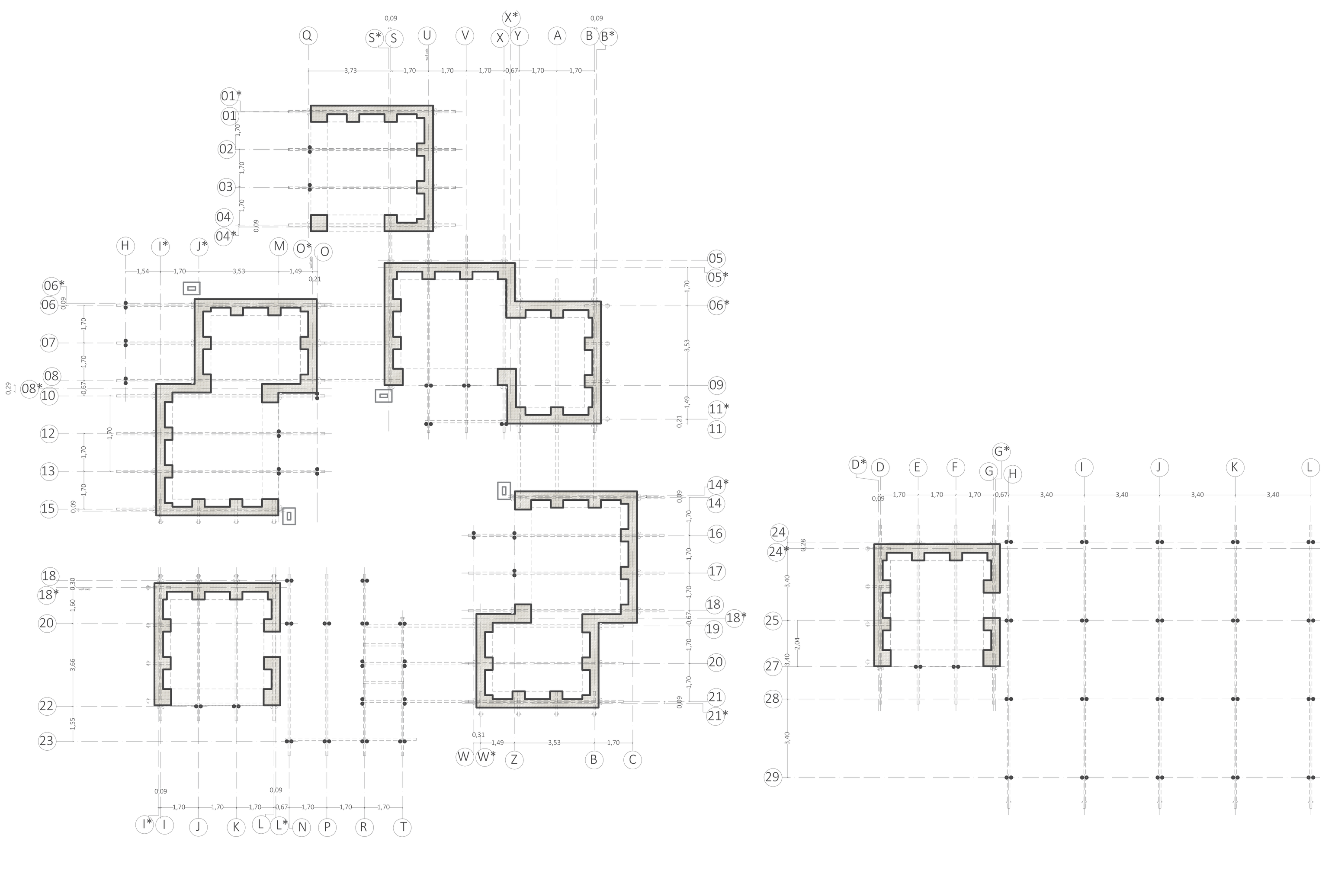
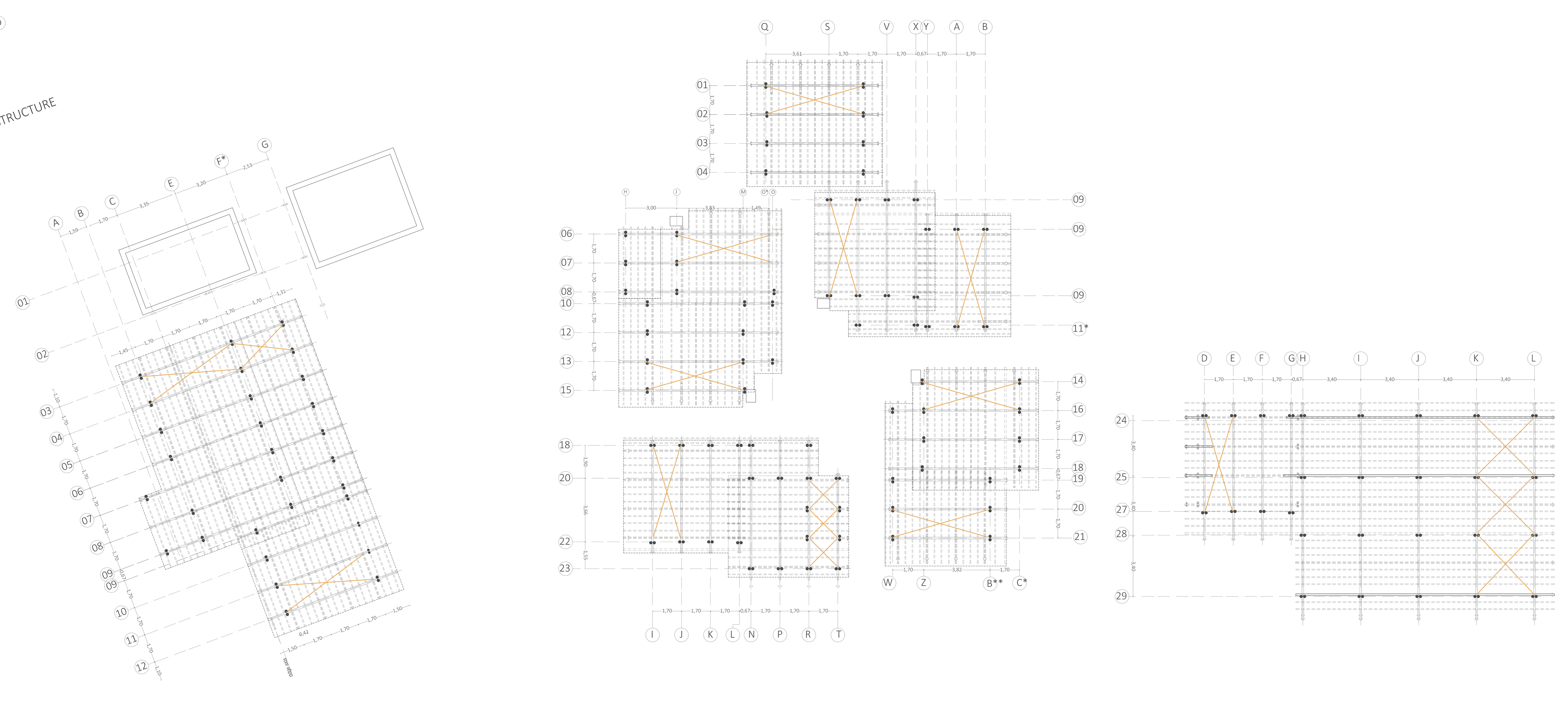


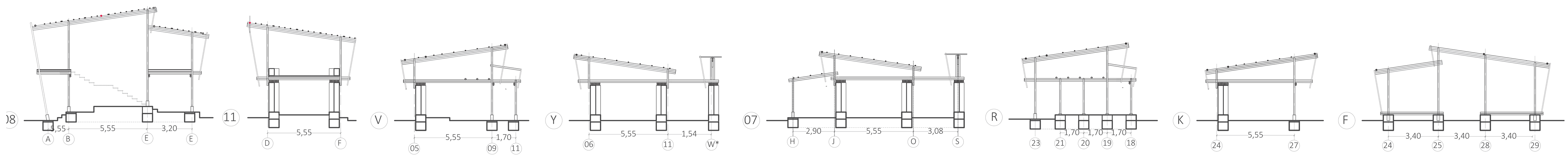
SLAB PLAN STRUCTURE
E: 1/200



WALLS ANS PILLARS PLAN STRUCTURE
E: 1/200

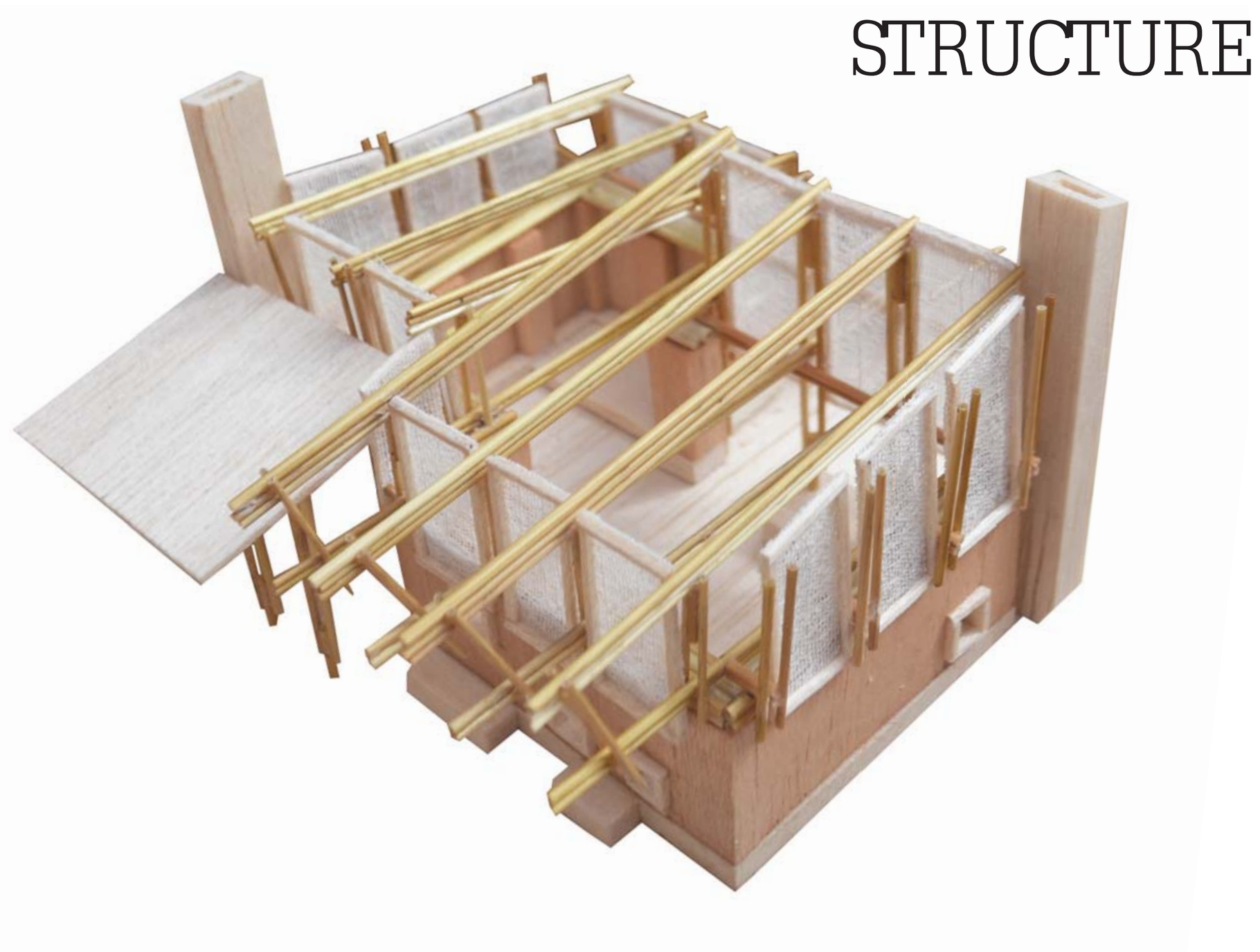


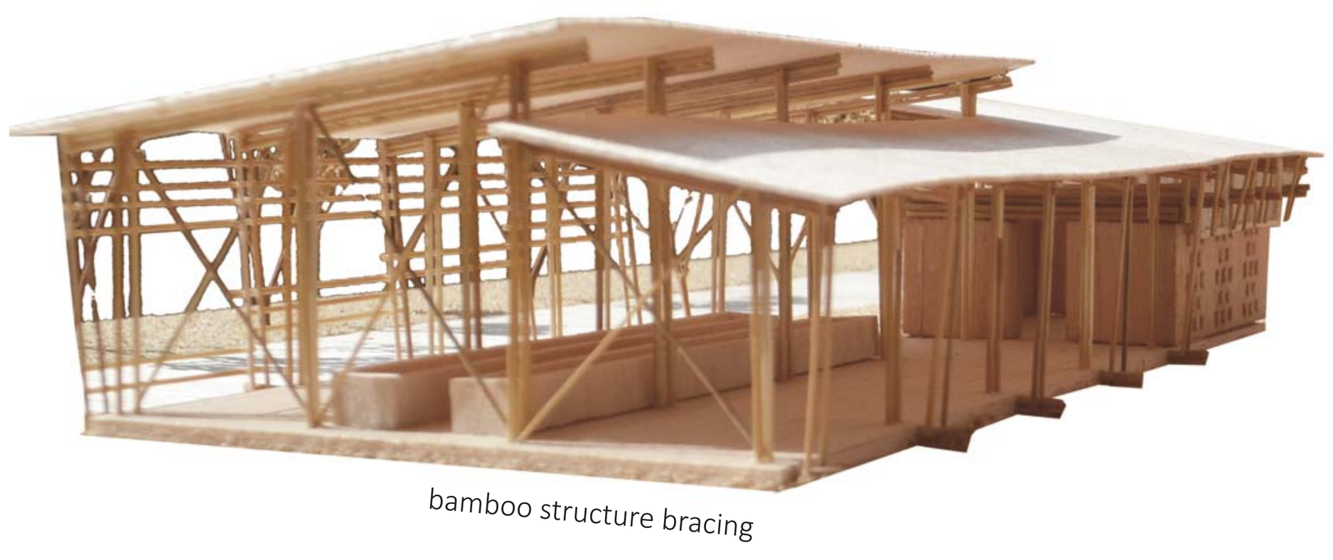
ROOF PLAN STRUCTURE
E: 1/200



SECTIONS
E: 1/200

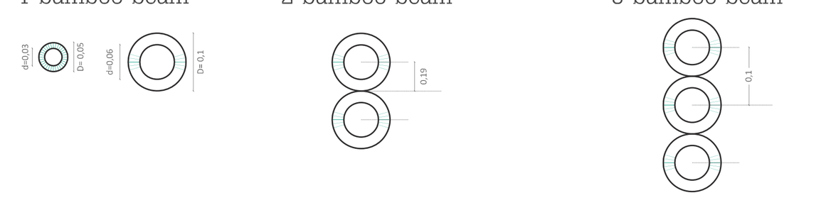
STRUCTURE





bamboo structure bracing

1 bamboo beam | 2 bamboo beam | 3 bamboo beam



W_k; resisting bending moment
mòdul resistent

$W_k = \Pi(D^4 - d^4)/32D$
$W_{k(0,1)} = 8,54 \times 10_{-5}\ m^3$
$W_{k(0,05)} = 1,70 \times 10_{-5}\ m^3$

$W_k = \Pi(5D^4 - 4D^2d^2 - d^4)/32D$
$W_k = 3,37 \times 10_{-4}\ m^3$

$W_k = \Pi(35D^4 - 4D^2d^2 - d^4)/96D$
$W_k = 1,09\ e_{-3}\ m^3$

I; inertia
inèrcia

$I = \sum(A_i \cdot d_i) + \sum I_i$
$I = 4,27 \times 10_{-6}\ m^4$

$A = \Pi/4(D^2 - d^2)$
$A_{(0,1)} = 0,005\ m^2$
$A_{(0,05)} = 0,001\ m^2$

$I = \sum(A_i \cdot d_i) + \sum I_i$
$I = 2,93 \times 10_{-5}\ m^4$

$I = \sum(A_i \cdot d_i) + \sum I_i$
$I = 1,04 \times 10_{-4}\ m^4$

adobe

Basic data:

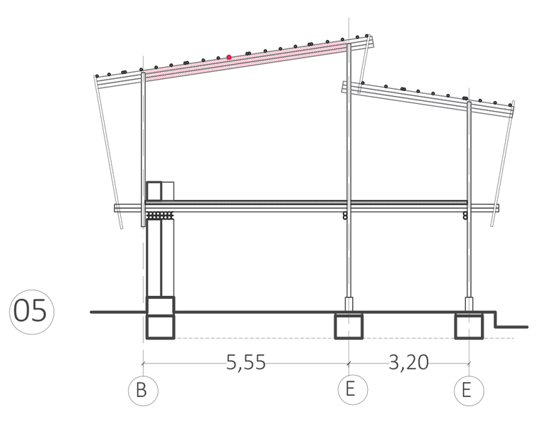
Compressive strength	σc= 4500 kN/m²
Adobe density	δ =7 kN/m³
Consuctivity	λ= 0,81 W/mk

bamboo

Basic data:

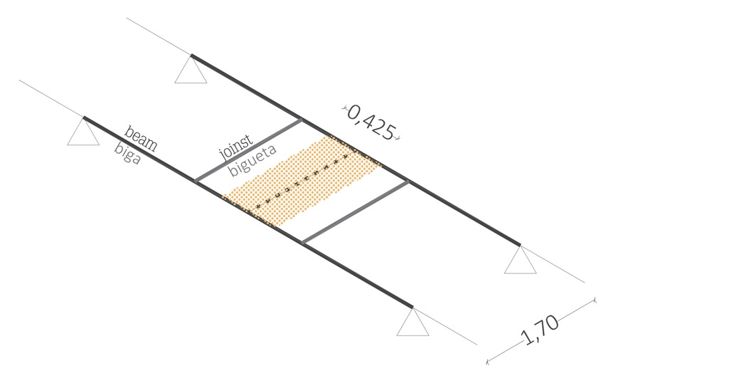
Inertia	I= π·64·(D^4-d^4)/64
Resisting Bending moment	W= π/(D^4-d^4)/32D
Bending strength	σb = 80000kN/m²
Compressive strength	σc= 65000 kN/m²
Elasticity's modulus	E= 17000000 kN/m²
Density	δ=7 kN/m³

roof
coberta



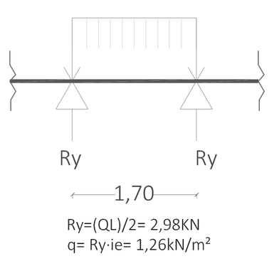
ESTAT DE CÀRREGUES; Q

Pes propi	1 kN/m²
Sobrecàrrega dús	1 kN/m²
Càrregues mortes	0,5 kN/m²
acabat bambú	0,35 kN/m²
encanyissat	0,15 kN/m²
TOTAL	2,5 kN/m²



CALCUL BIGUETA

q= Q·ie
q= 2,78 KN/m



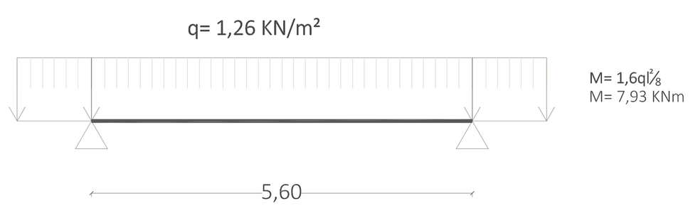
Ry=(QL)/2= 2,98KN
q= Ry·ie= 1,26kN/m²

M= 1,6ql²/8
M= 0,86 KNm

dimensionament a flexió
$M < W_{k(0,05)}\sigma_b$
0,86 KNm < 1,36 KNm
compleix!

CALCUL BIGA

q= 1,26 KN/m²



M= 1,6ql²/8
M= 7,93 KNm

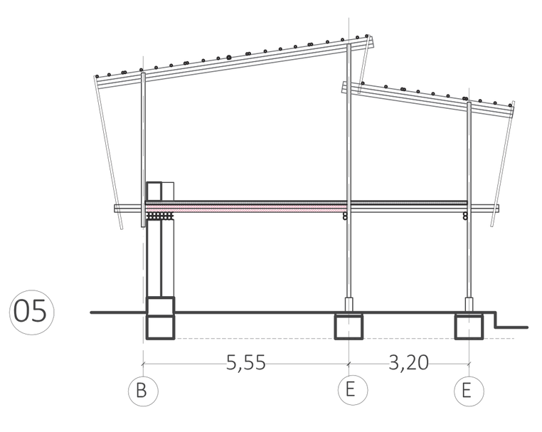
dimensionament a flexió
$M < W_{k(0,1)}\sigma_b$
7,93 KNm < 27 KNm
compleix!

comprovació de la deformació a flexió
$F_{tot} \leq L/250$
$F_{tot} = 2,5\ f_{ins}$
$F_{ins} = 5ql^4/384EI$

$F_{ins} = 0,0325$
$F_{tot} = 0,081$
0,081≤ 0,0224
no compleix!

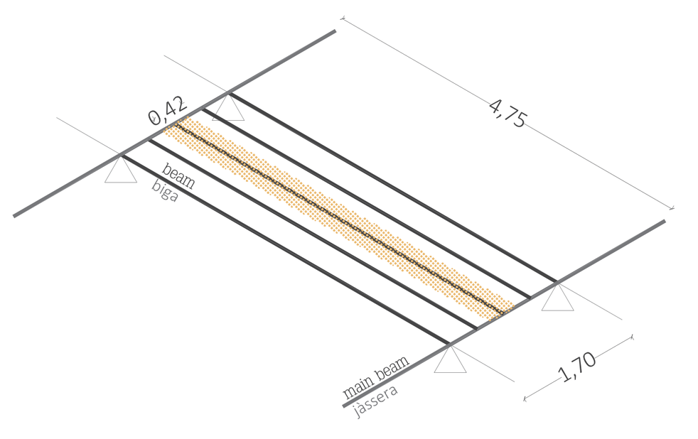
$F_{ins} = 0,00916$
$F_{tot} = 0,00220$
0,00220≤ 0,0224
compleix!

slab
forjat



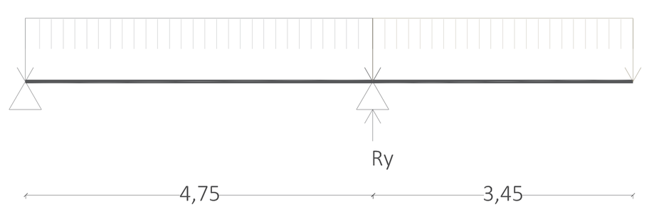
ESTAT DE CÀRREGUES; Q

Pes propi	1 kN/m²
Sobrecàrrega dús	3 kN/m²
Càrregues mortes	1,13 kN/m²
encanyissat	δe=5x0,03= 0,15 kN/m²
terra comprimirda	δe=14x0,07= 0,98 kN/m²
TOTAL	5,13 kN/m²



CALCUL BIGA

q= Q·ie
q= 2,15 KN/m



Ry=(QL₁ + QL₂)/2= 20,90KN
q= Ry·ie= 8,78 kN/m²

M= 1,6ql²/8
M= 9,72 KNm

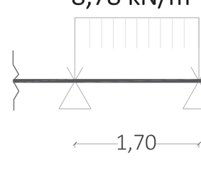
dimensionament a flexió
$M < W_{k(0,05)}\sigma_b$
9,72 KNm < 27 KNm
compleix!

comprovació de la deformació flexió
$F_{tot} \leq L/250$
$F_{tot} = 2,5\ f_{ins}$
$F_{ins} = 5ql^4/384EI$

$F_{ins} = 0,0078$
$F_{tot} = 0,018$
0,018≤ 0,019
compleix!

CALCUL JÀSSERA

8,78 kN/m²

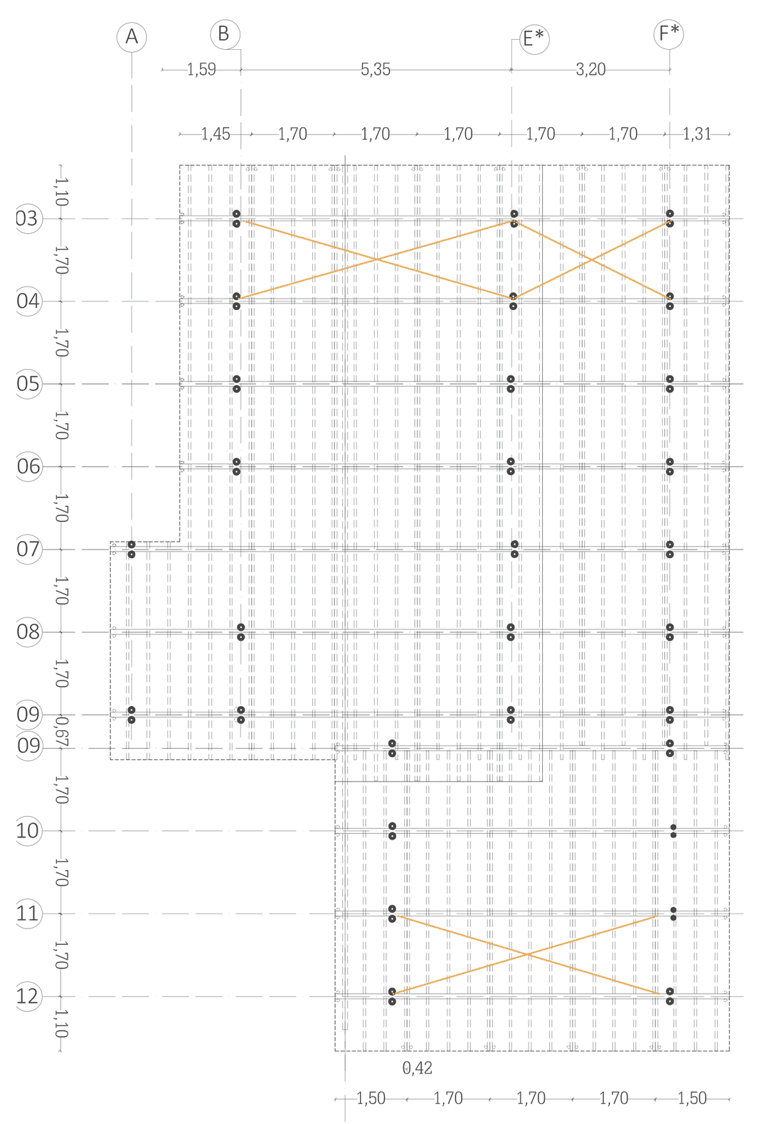


M= 1,6ql²/8
M= 5,07 KNm

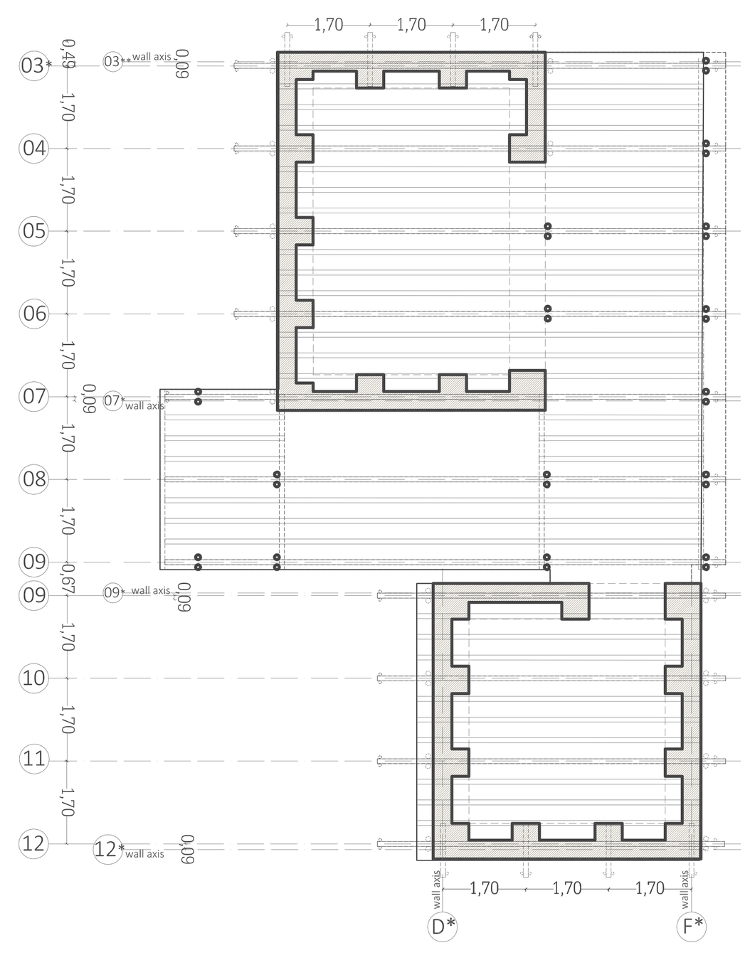
dimensionament a flexió
$M < W_{k(0,1)}\sigma_b$
5,07 KNm < 27 KNm
compleix!

comprovació de la deformació flexió
$F_{tot} \leq L/250$
$F_{tot} = 2,5\ f_{ins}$
$F_{ins} = 5ql^4/384EI$

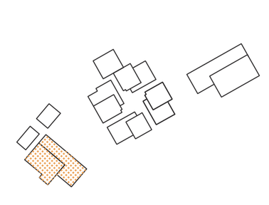
$F_{ins} = 0,00192$
$F_{tot} = 0,0048$
0,0048≤ 0,007
compleix!



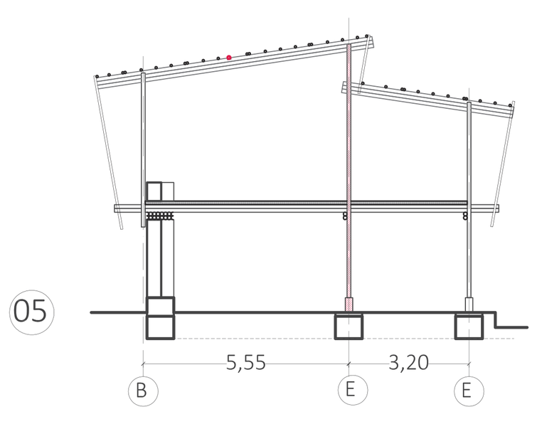
ROOF PLAN STRUCTURE
E: 1/150



SLAB PLAN STRUCTURE
E: 1/150



pillar
pilar



Es tracta de comprobar que:

$f_{cd} > N_d/A$
$f_{cd} = 1,3\sigma c$
$N_d = N_1 + N_2$

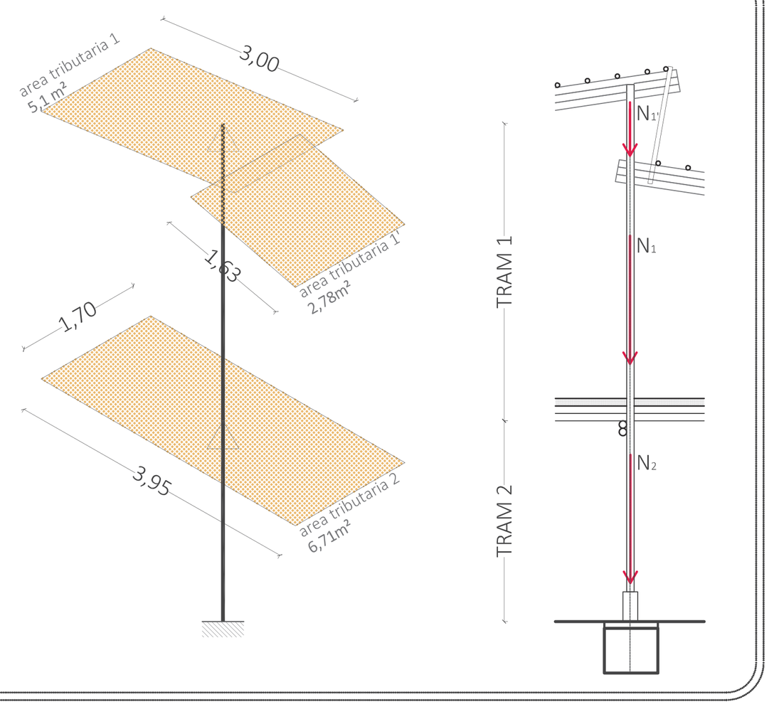
CALCUL PILAR

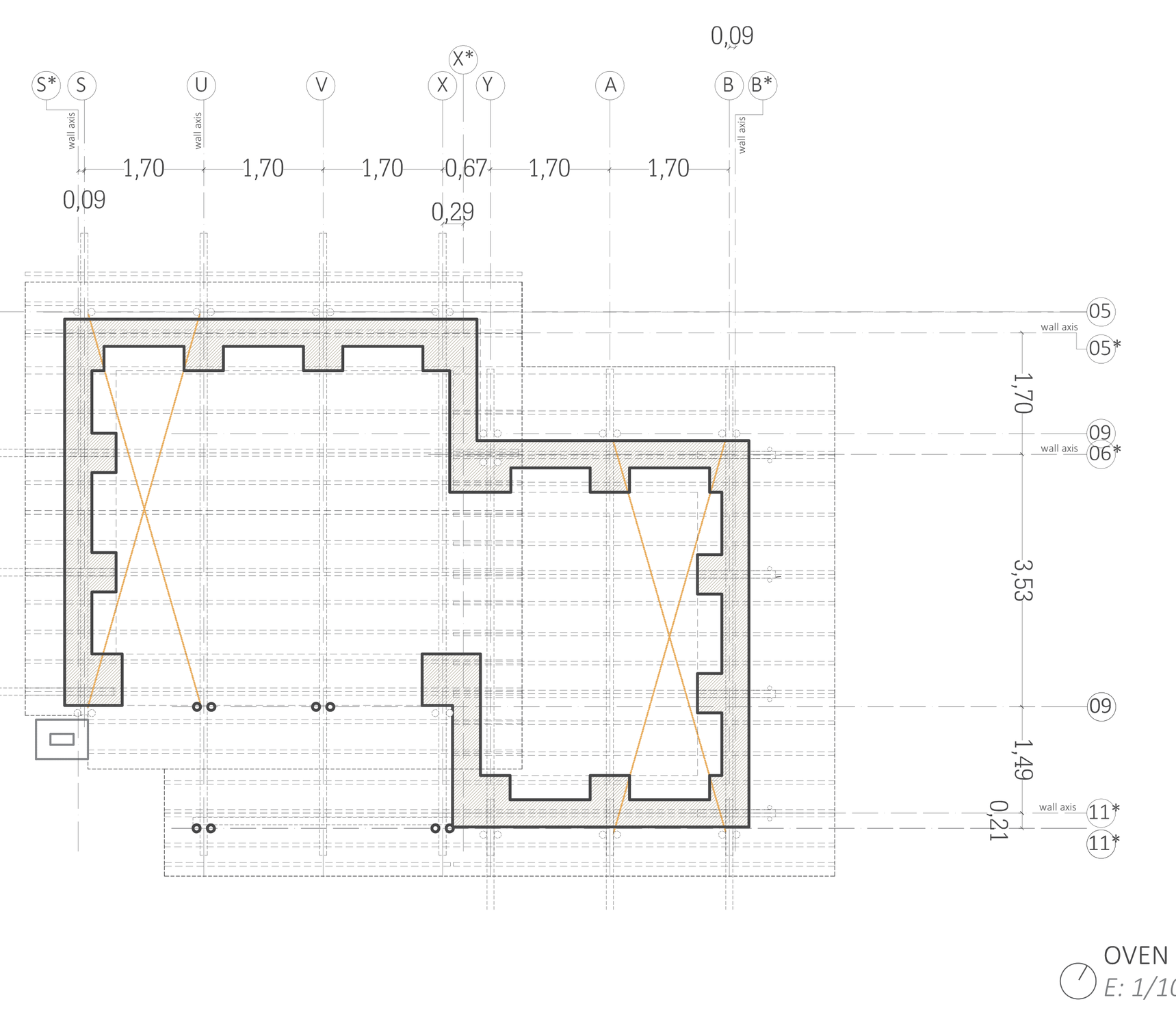
Q1 coberta	3,5 KN/m²
Q2 forjat	5,13 kN/m²
A	0,005 m²

$N_1 = Q_1 \cdot At_1$
N1= 27,55 KN

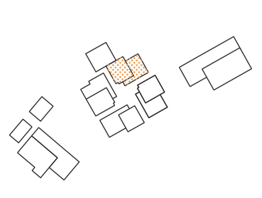
$N_2 = Q_2 \cdot At_2$
N2= 34,45 KN

Nd= 62 KN
84.500 > 12.334 kN/m²
compleix!

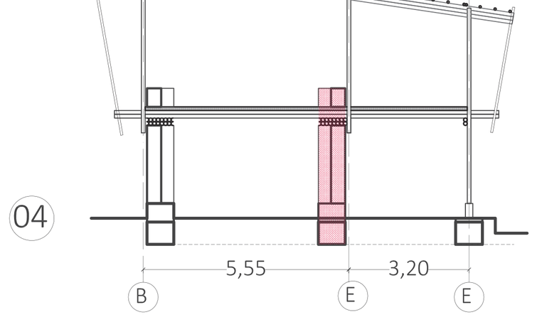




OVEN UNITS STRUCTURE
E: 1/100



wall
mur



Es tracta de comprobar que:

$Nd/A < \sigma c$
$Nd = \Sigma Nn$

CALCUL MUR

Q1 coberta	3,5 KN/m²
Q2 forjat	5,13 kN/m²
A	0,38 m²

$N_1 = Q_1 \cdot At_1$
N1= 17,85 KN

$N_2 = Q_2 \cdot At_2$
N2= 8,31 KN

N3= 0,25 KN
pes bambu δeh= 7·0,01·3,5

N4= 5,12 KN
pes forjat/m²

N5= 6,93 KN
pes mur δeh= 14·0,38·3,1·0,42

Nd= 38,45 KN
101,19< 1.200 kN/m²
compleix!