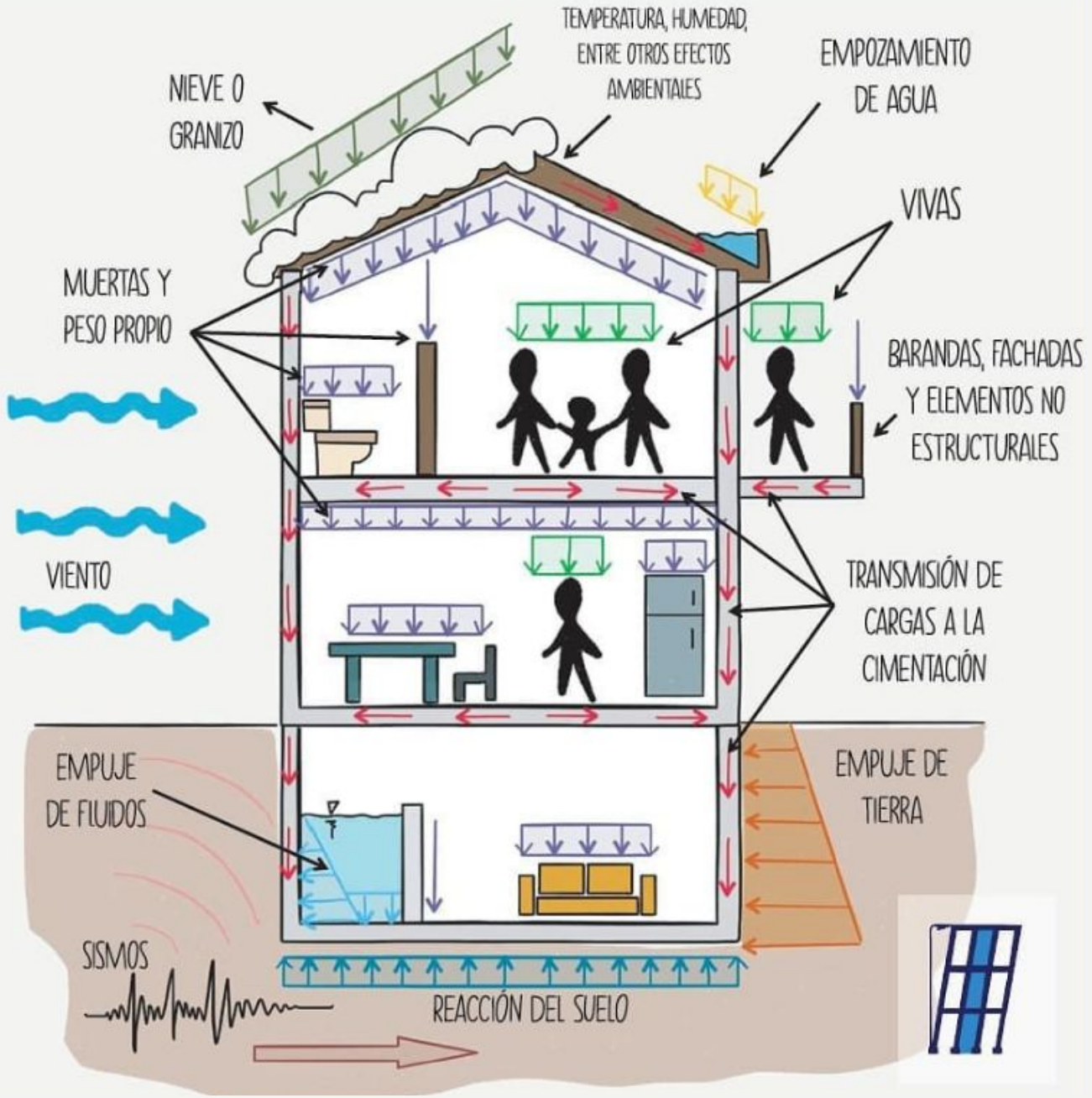
# Unidad Nº3:

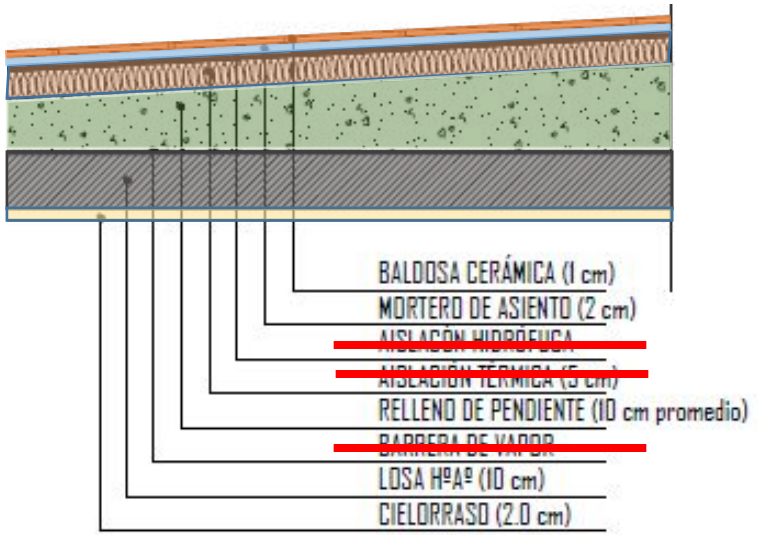
## Análisis de Cargas

## Trasmisión de cargas



# ANÁLISIS DE CARGAS DEL PLANO SUPERIOR

| | | |
|---|---|---|
| Losa maciza | 0,10 m x 2400 kg/m$^3$ | 240 kg/m$^2$ |
| Hormigón de relleno | 0,10 m x 1800 kg/m$^3$ | 180 kgm$^2$ |
| Mortero de asiento | 0.02 m x 2100 kg/m$^3$ | 42 kg/m$^2$ |
| Baldosa Cerámica | 28 kg/m$^2$ | 28 kg/m$^2$ |
| Cielorraso | 0.02 m x 1700 kg/m$^3$ | 34 kg/m$^2$ |
| Carga permanente ó muerta | | D = 524 kg/m$^2$ |
| Carga variable ó viva (azotea inaccesible, tabla | + | L = 100 kg/m$^2$ |
| | | $q_{losa}$ = 624 kg/m$^2$ |




**DETALLE DE LOS MATERIALES**

**CARGA DE SERVICIO ($q_s$ )**

**$q_s = q_D + q_L$ = 524 kg/m$^2$ + 100 kg/m$^2$ = 624 kg/m$^2$**

**CARGA ÚLTIMA ( $q_u$)**

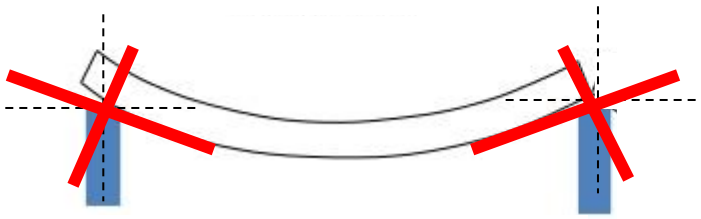
**qu1 = 1.4 x 524 kg/m2 = 734 kg/m$^2$**
**qu2 = 1.2 x 524 kg/m2 + 1.6 x 100 Kg/m2 = 789 kg/m$^2$**

**SE ADOPTA CARGA ULTIMA $q_u$ = 790 kg/m$^2$**

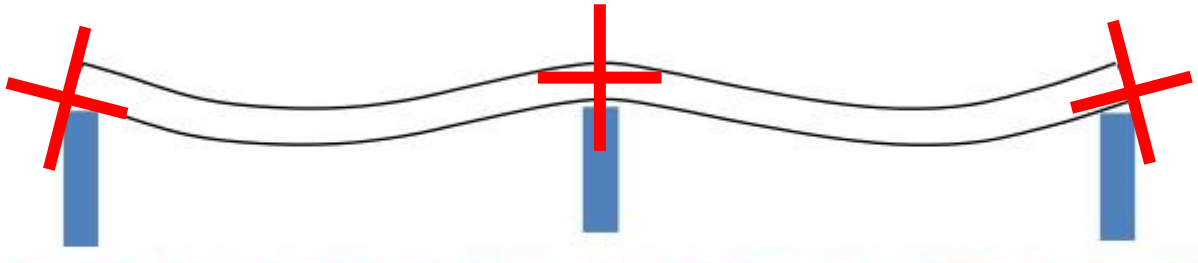
Considerando sólo **acciones gravitatorias** deberá adoptarse la de mayor valor entre:
U1 = 1.4 x $q_D$
U2 = 1.2 $q_D$ + 1.6 $q_L$

# DEFORMACION DE LOSAS DE Hº Aº

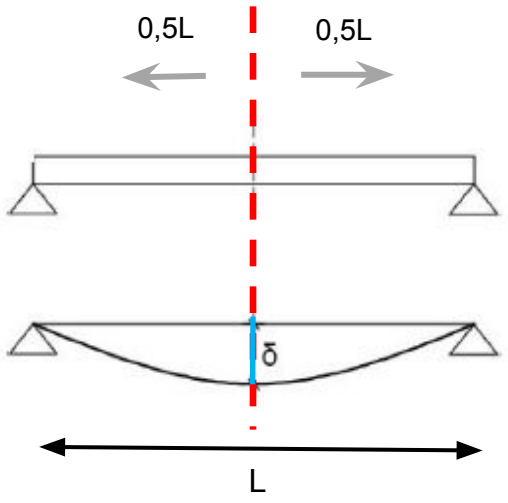
## LOSA SIN CONTINUIDAD



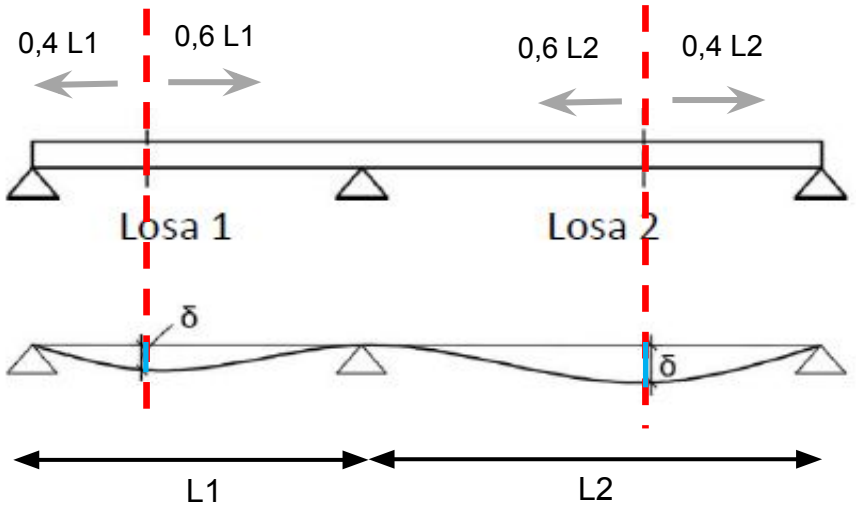
## LOSAS CONTINUAS



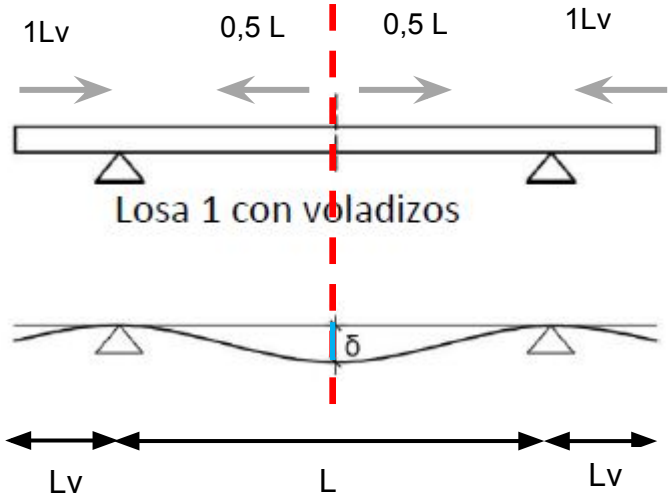
## LINEAS DE ROTURA




**(sin continuidad)**

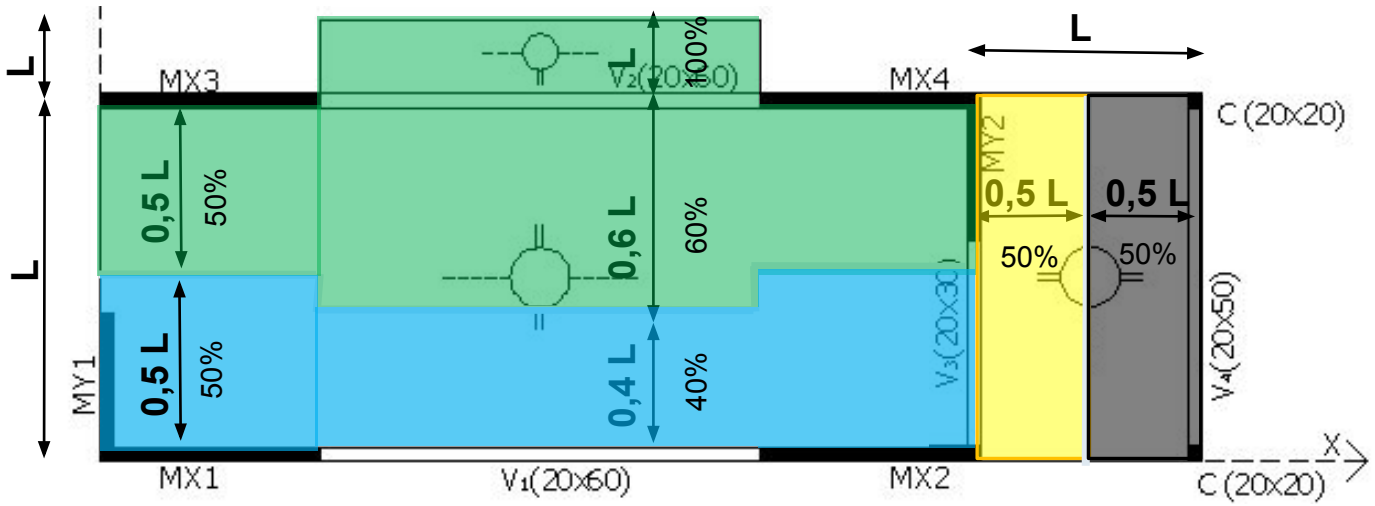



**(una continuidad)**

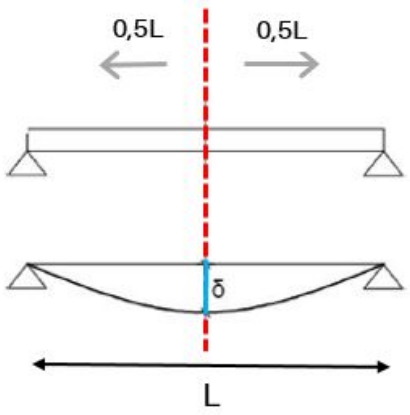



**(dos continuidades)**

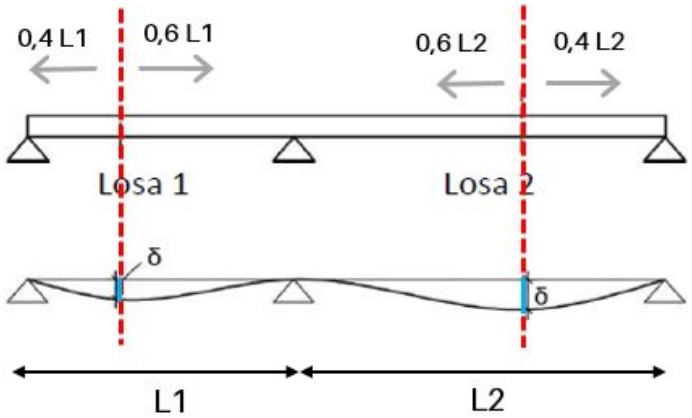
# ÁREAS TRIBUTARIAS



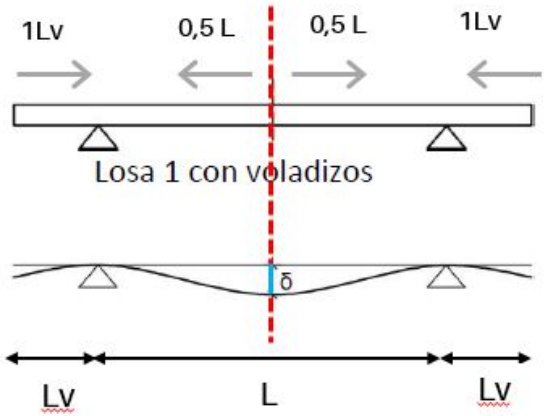

- Son las **SUPERFICIES DE LOSAS** que apoyan sobre los **PLANOS VERTICALES PORTANTES**.
- Se marcan según las líneas de rotura de los planos superiores, que se definen según el armado y la continuidad que tengan.




(sin continuidad)

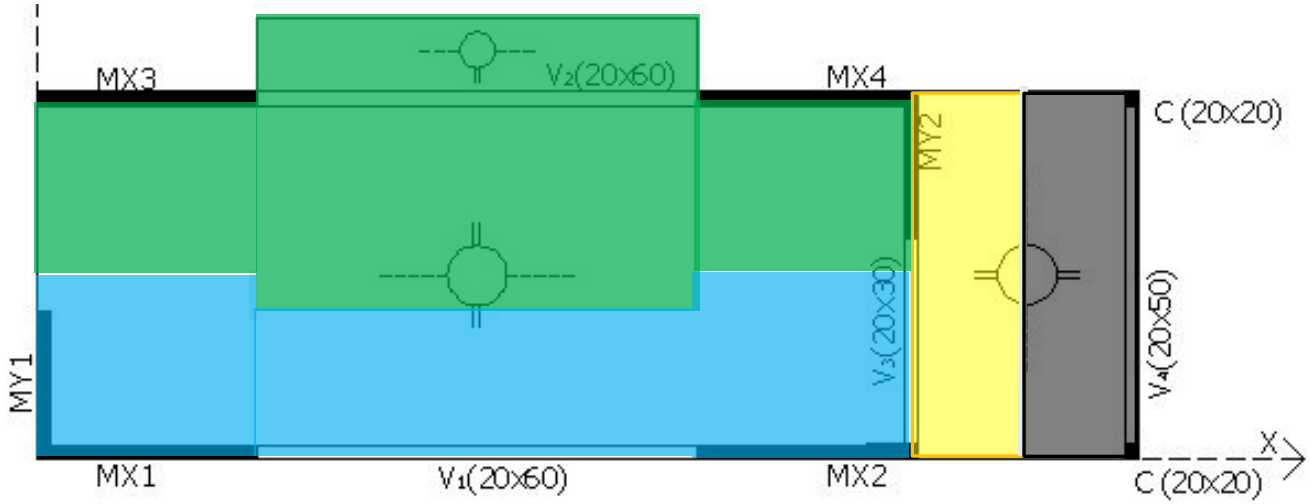



(una continuidad)

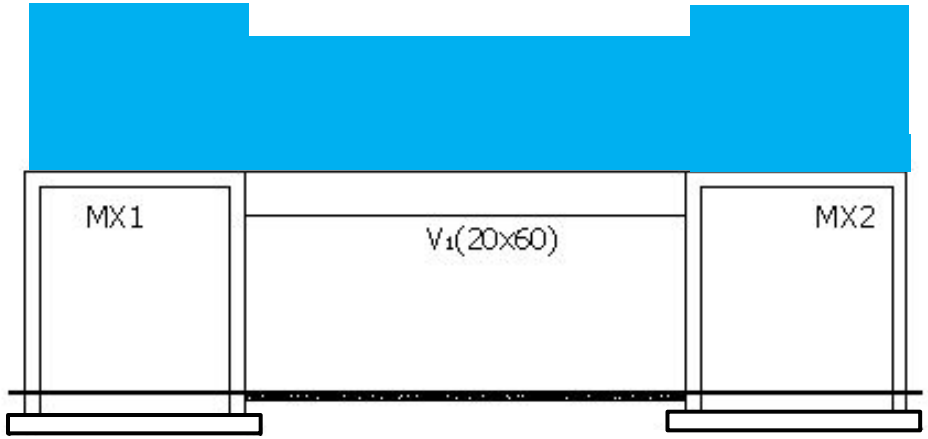



(dos continuidades)

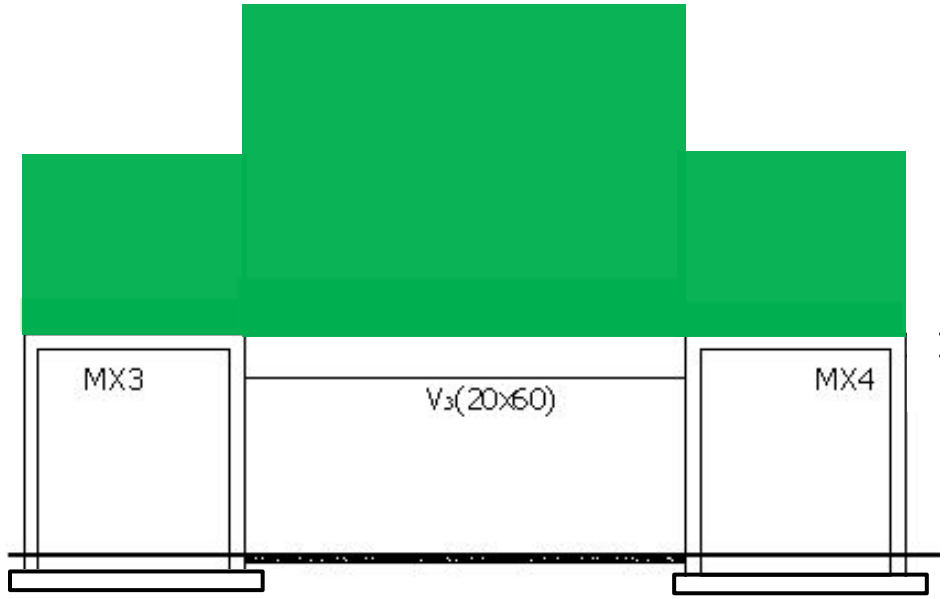
# VISTA DE LOS PLANOS RESISTENTES




## ESQUEMA DE CARGAS

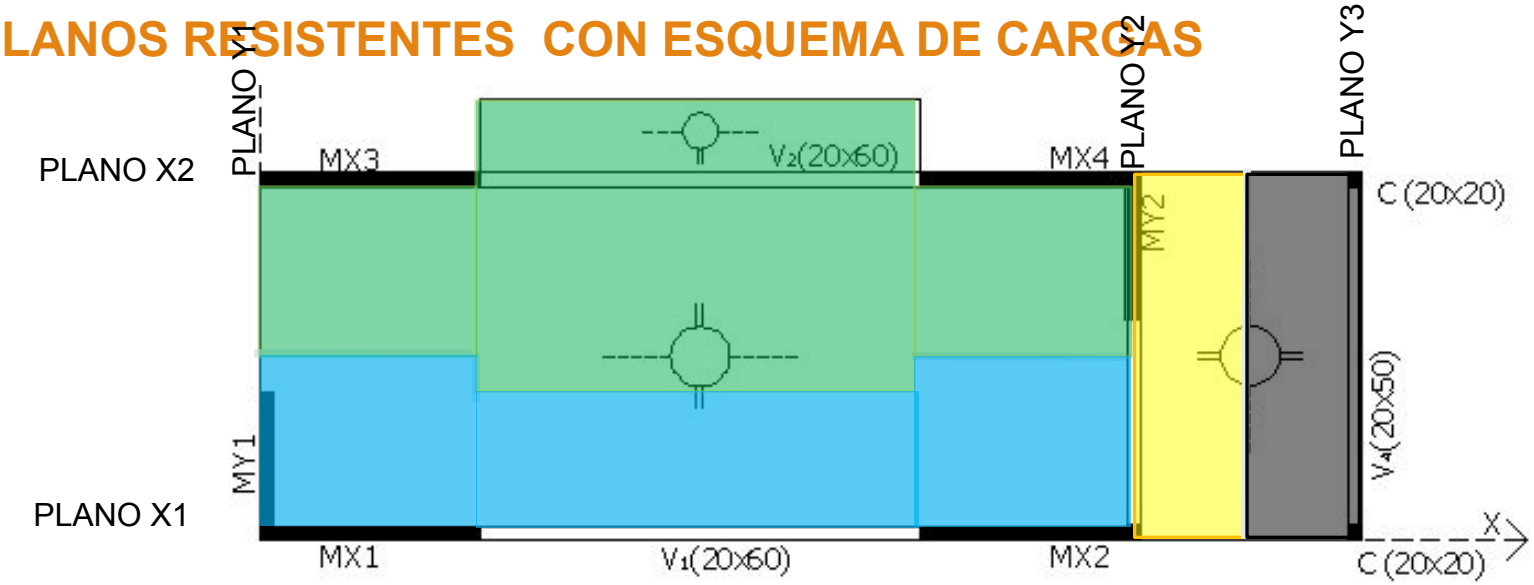


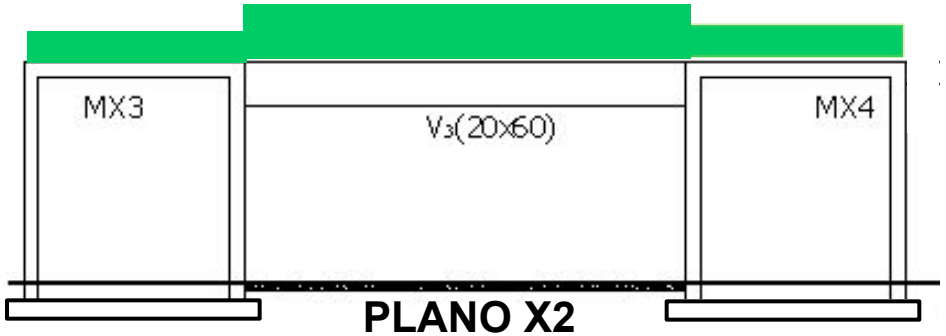

PLANO



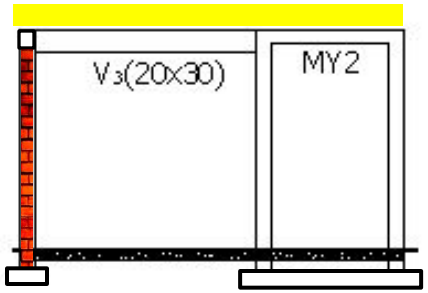

PLANO

# VISTA DE LOS PLANOS RESISTENTES CON ESQUEMA DE CARGAS

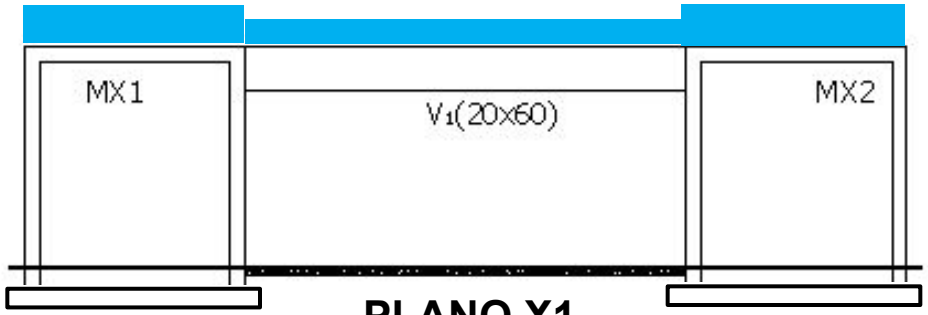


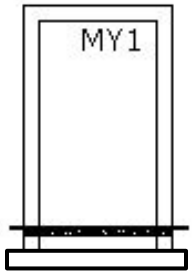

**PLANO X2**




**PLANO Y2**




**PLANO X1**



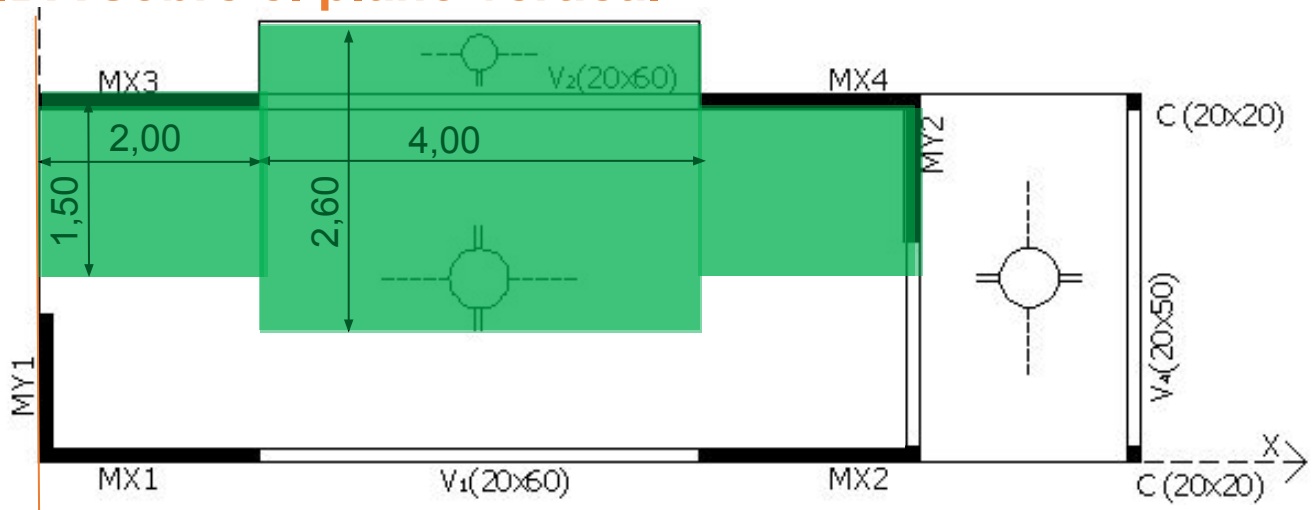

**PLANO Y1**

**PLANO Y3**

# CARGA DISTRIBUIDA sobre el plano vertical

$q_u$=790 kg/m²

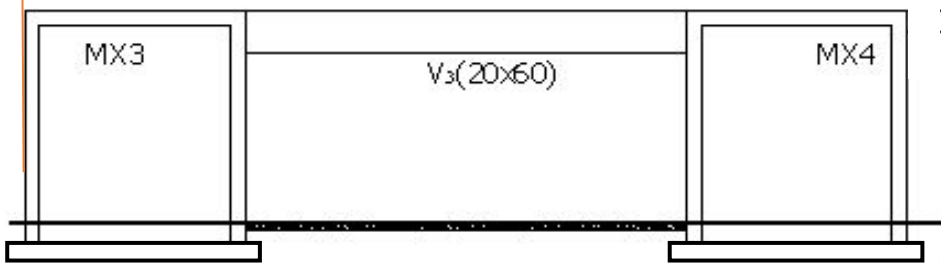
$q_u$=0,79 t/m²




## CARGA DISTRIBUIDA

**Kg/m**

**tn/m**




$q_1 = \frac{0.79\ t/m^2 \times (2m \times 1.50m)}{2\ m} = 1.185\ t/m$

$q_1$= 0.79 t/m² x 1.50m = 1.185 t/m

$q_2 = \frac{0.79\ t/m^2 \times 4m \times 2,60m}{4m} = 2,054\ t/m$

$q_2$= 0.79 t/m² x 2,60m = 2,054 t/m

**PESO PROPIO VIGA**

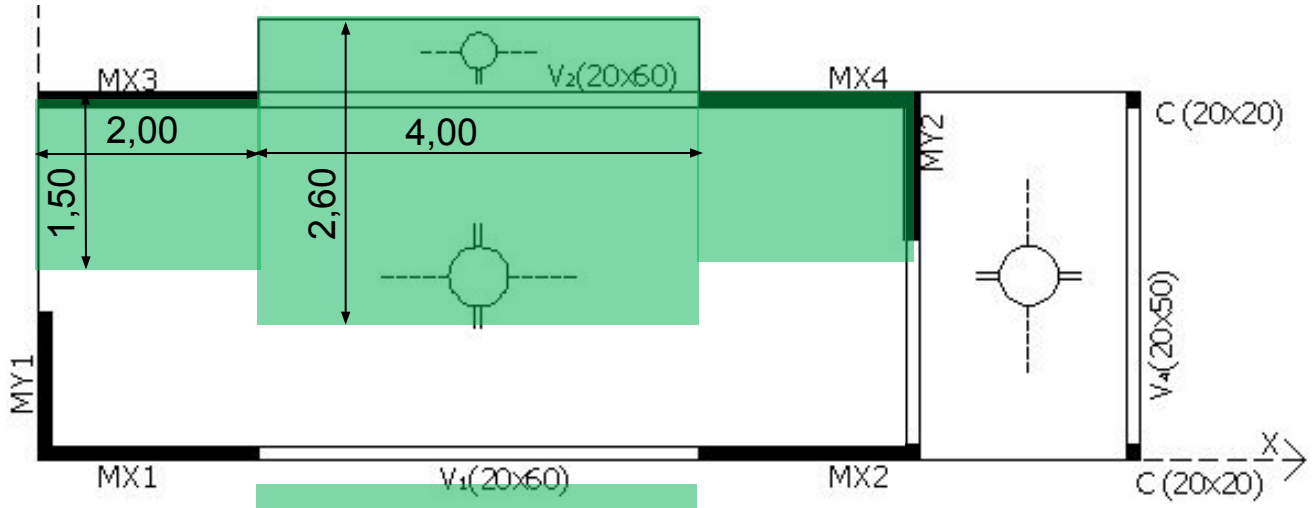
$q_{pp}$= 2.4 t/m³ x 0,2m x 0,60m = 0,288 t/m

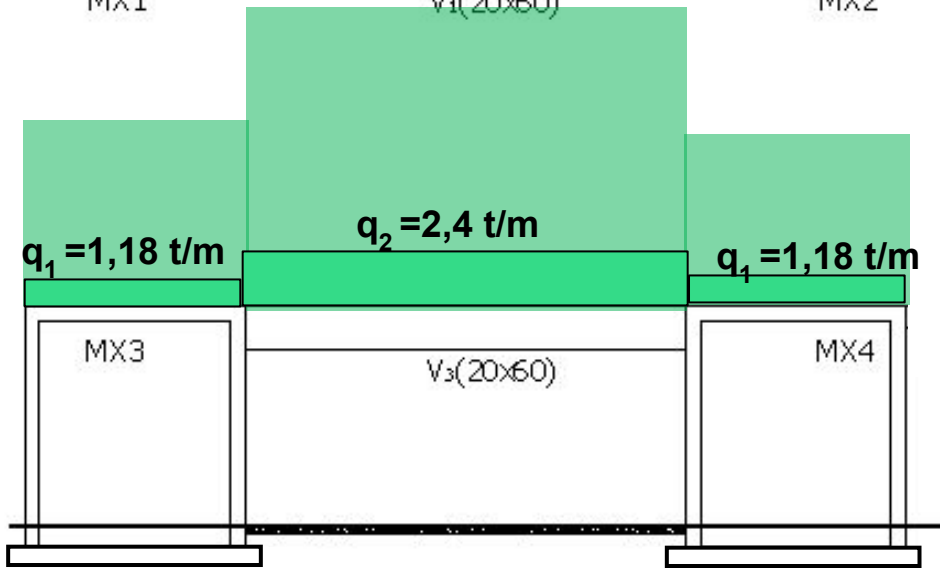
$q_2$= 2,054 t/m + 1,2 x 0,288 t/m= 2,4 t/m

# CARGA DISTRIBUIDA sobre el plano vertical

$q_u$=790 kg/m$^2$

$q_u$=0,79 T/m$^2$




**CARGA DISTRIBUIDA**

**Kg/m**

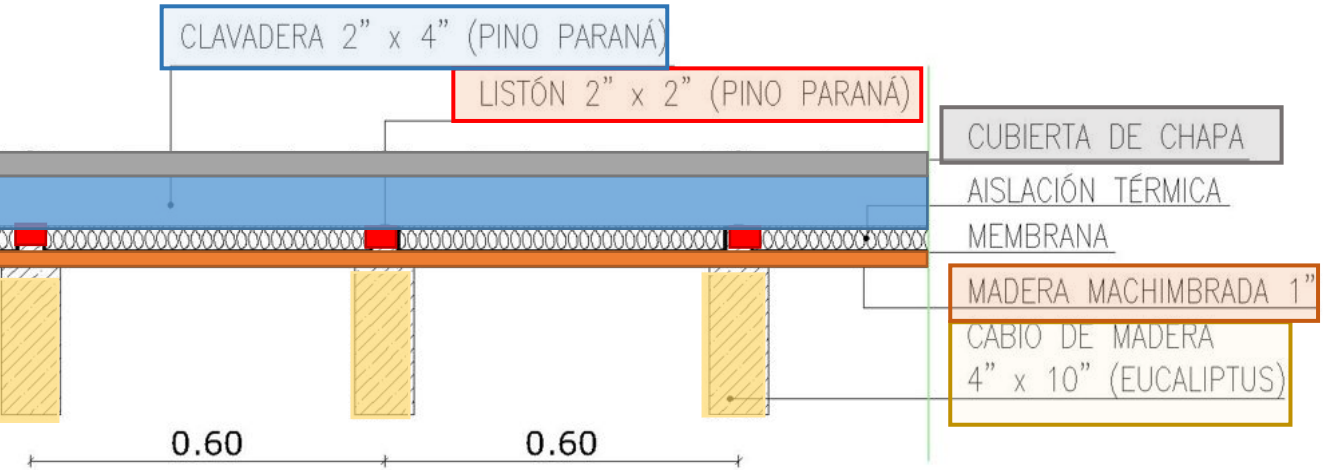
**tn/m**

# Análisis de cargas del plano superior

- En losas
- En entramados de **madera** y acero

Casa Zavadisca/
Napadensky Arquitectos

# Cálculo de la carga del plano superior




Cabios de Eucaliptus $\frac{(0{,}10m \times 0{,}25m) \times 430\ kg/m^3}{0{,}60m}$ 18,0 kg/m²

Machimbre de Eucaliptus 0,025 m x 430 kg/m³ 10,8 kg/m²

Listones de pino $\frac{(0{,}05m \times 0{,}05m) \times 390\ kg/m^3}{0{,}60m}$ 1,6 kg/m²

Clavadera de pino $\frac{(0{,}05m \times 0{,}1m) \times 390\ kg/m^3}{0{,}50m}$ 3,9 kg/m²

Cubierta de chapa acanalada 5,0 kg/m²

Carga permanente ó muerta D = 39,3 kg/m²

Carga variable ó viva L = 100,0 kg/m²

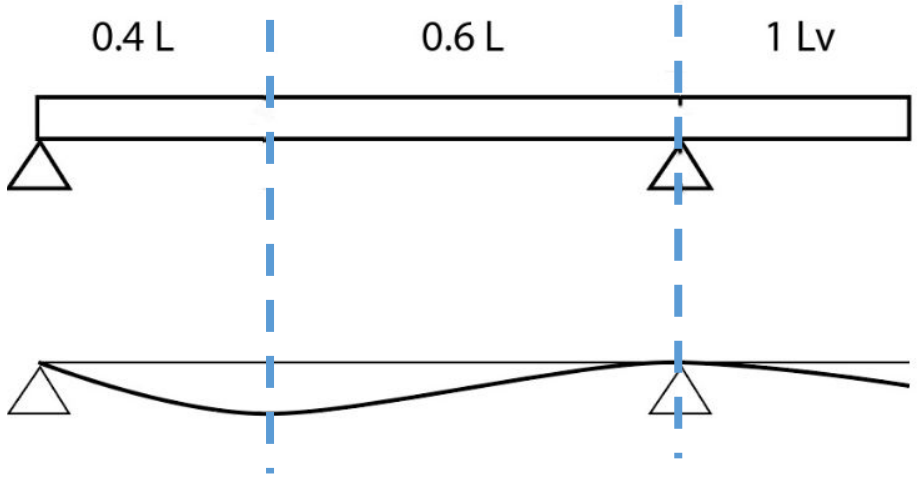
Carga de servicio $q_s$ = 139,3 kg/m²

Carga ultima: 1,2 x 39,3 kg/m² +1,6 x 100 kg/m² = 207,16 kg/m²

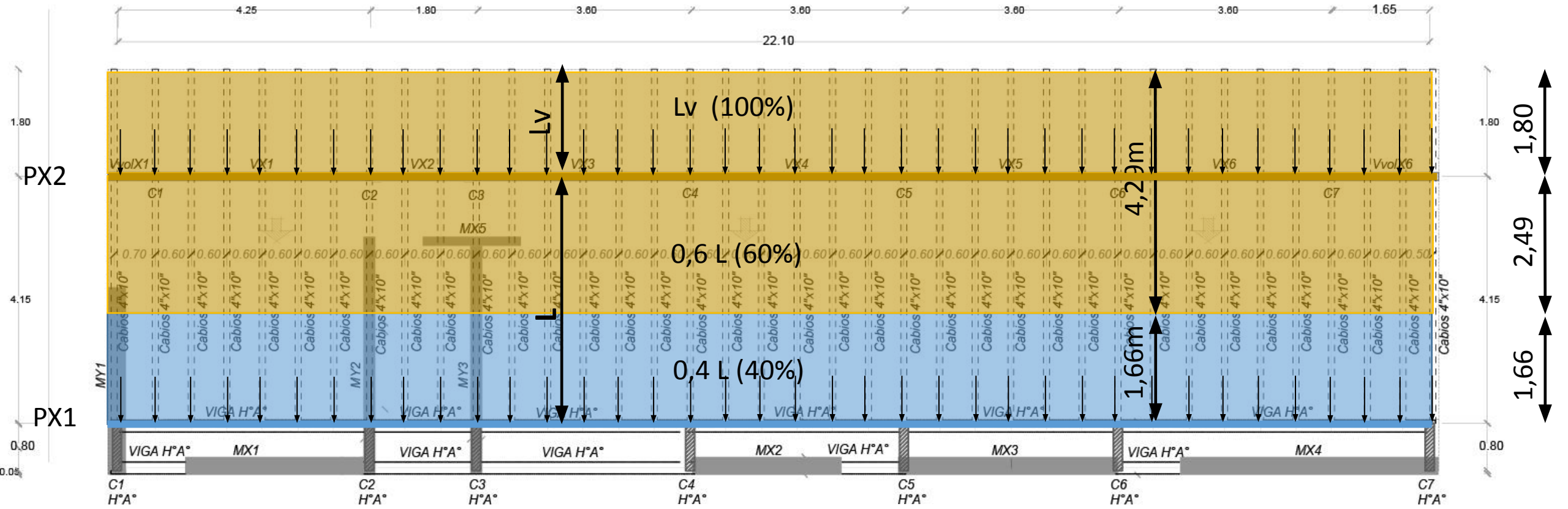

**Peso por m² de elementos lineales:**

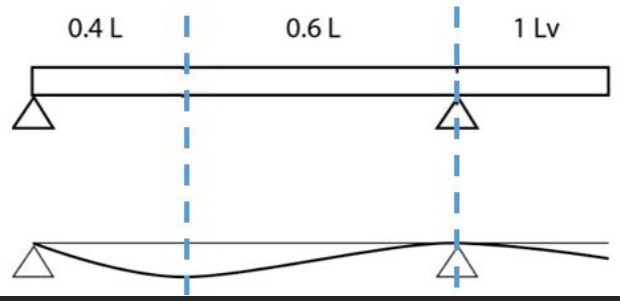
$$\frac{(b \times h) \times Pesp}{separación}$$

Casa Zavadisca/
Napadensky Arquitectos



# AREAS TRIBUTARIAS



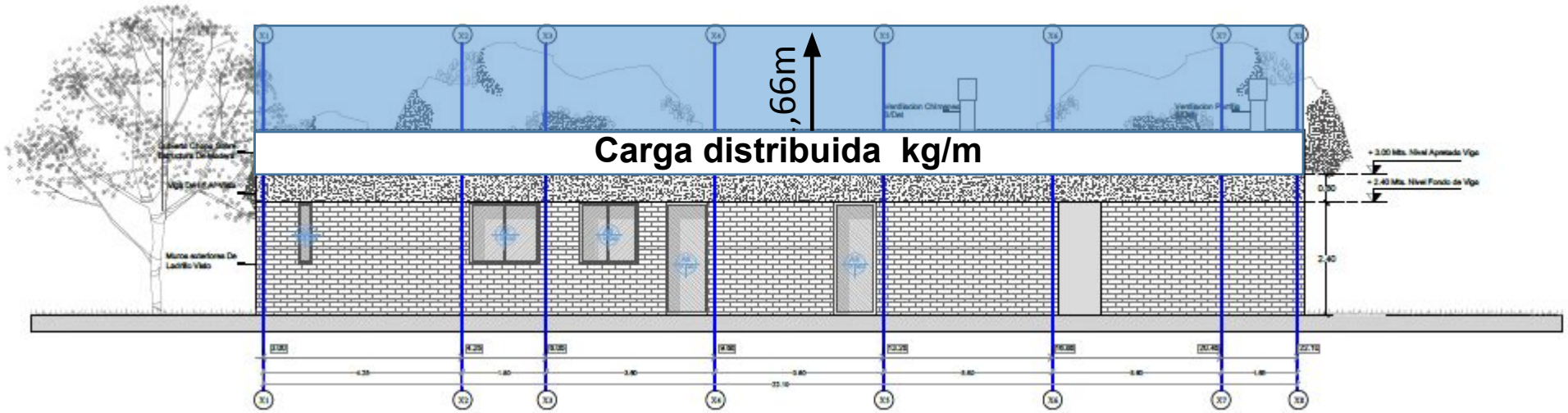




**Casa Zavadisca/**
**Napadensky Arquitectos**

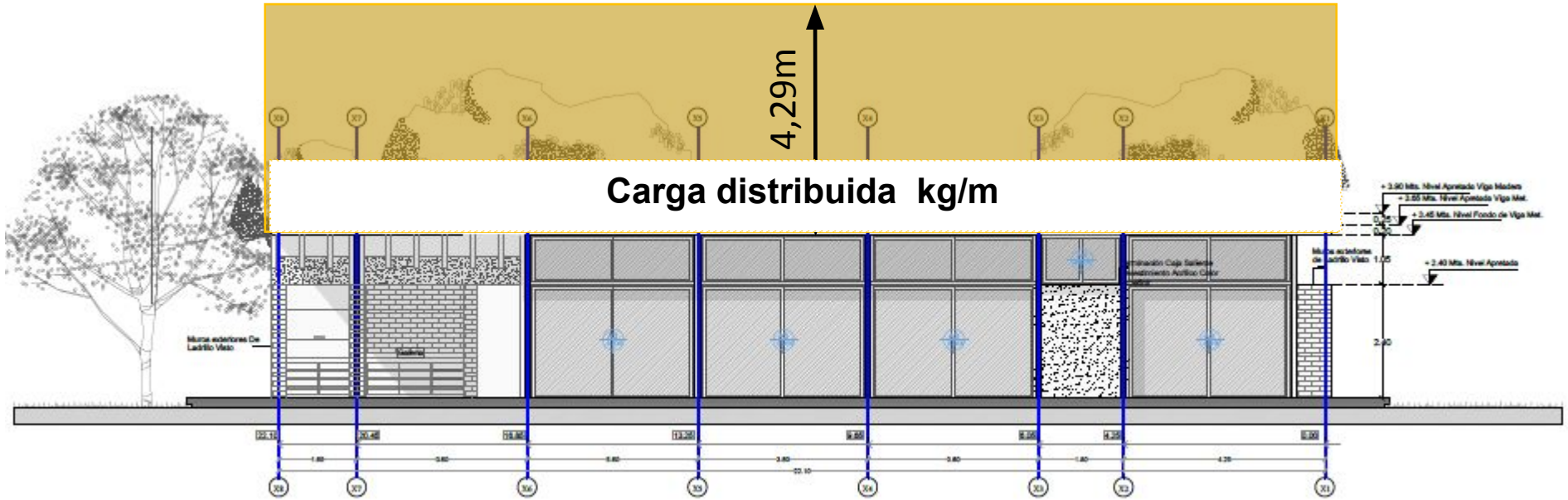
**Cuando la separación es menor a 1m se considera como carga distribuida**

# CARGA DISTRIBUIDA sobre el plano vertical

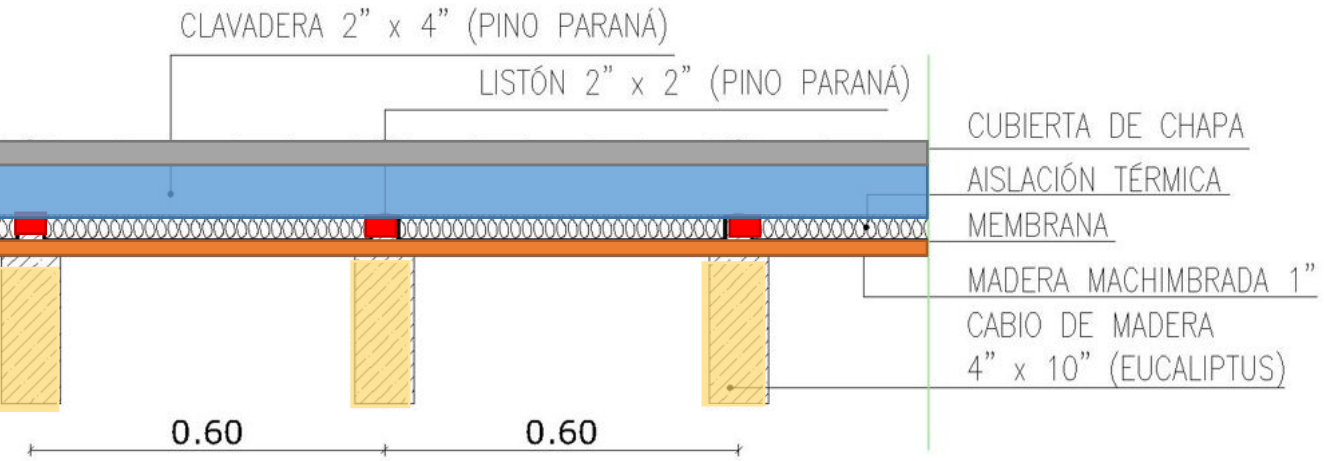
PX1




PX2



# Cálculo de la carga del plano superior




Cabios de Eucaliptus $\frac{(0{,}10m \times 0{,}25m) \times 430\ kg/m^3}{0{,}60m}$ 18,0 kg/m²

Machimbre de Eucaliptus 0,025 m x 430 kg/m³ 10,8 kg/m²

Listones de pino $\frac{(0{,}05m \times 0{,}05m) \times 390\ kg/m^3}{0{,}60m}$ 1,6 kg/m²

Clavadera de pino $\frac{(0{,}05m \times 0{,}1m) \times 390\ kg/m^3}{0{,}50m}$ 3,9 kg/m²

Cubierta de chapa acanalada 5,0 kg/m²

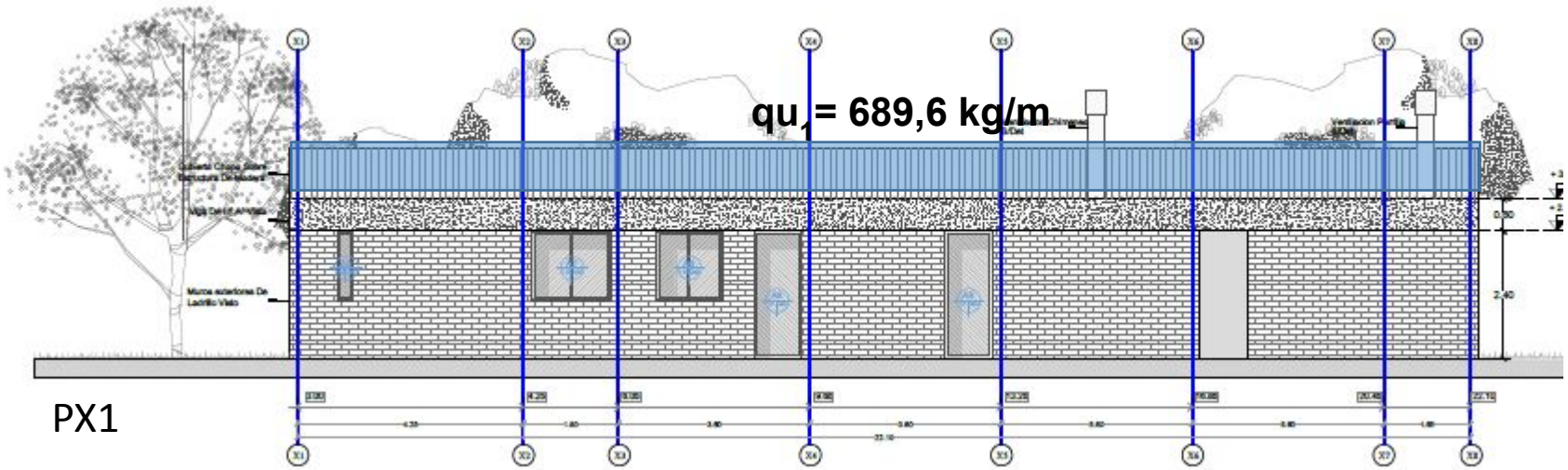
Carga permanente ó muerta D = 39,3 kg/m²

Carga variable ó viva L = 100,0 kg/m²

Carga de servicio $q_s$ = 139,3 kg/m²

Carga ultima: 1,2 x 39,3 kg/m² +1,6 x 100 kg/m² = 207,16 kg/m²

# CARGA DISTRIBUIDA sobre el plano vertical

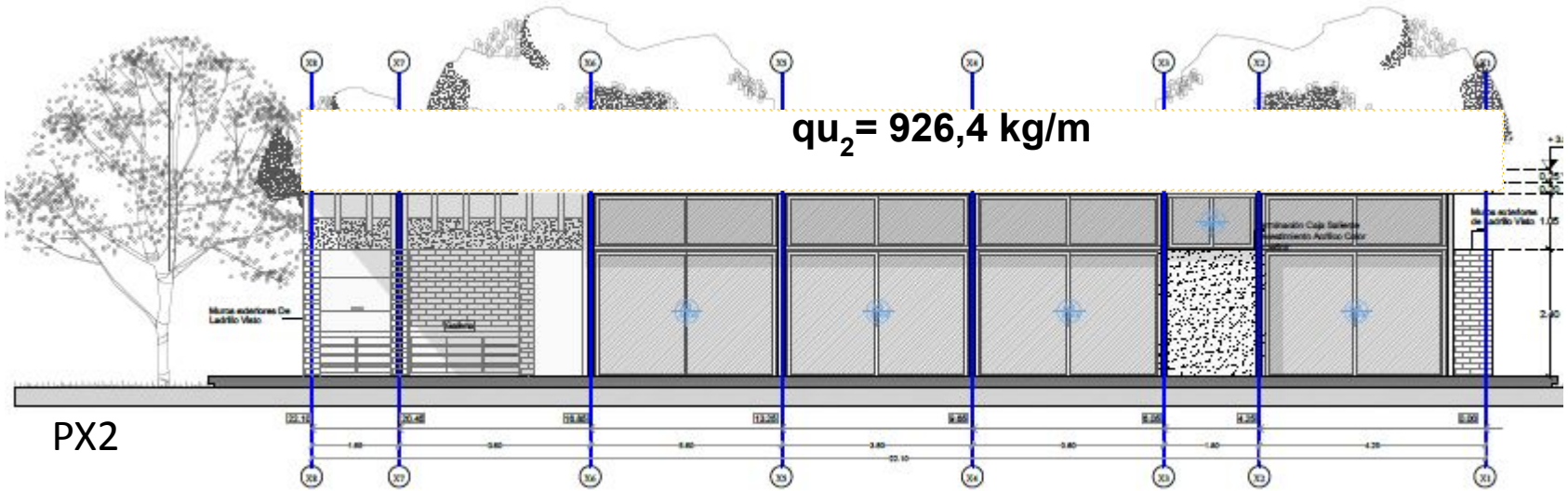



**Carga de cubierta:**
$q_u$= 207 kg/m$^2$

$qu_1$= 207 kg/m$^2$ x 1,66 m = 344 kg/m

**PESO PROPIO VIGA**
$q_{pp}$= 2400 Kg/m$^3$ x 0,2m x 0,60m =288 Kg/m

$qu_1$= 344 kg/m + 1,2 x 288 Kg/m = 689,6Kg/m




$qu_2$= 207 kg/m$^2$ x 4,29 m = 888 kg/m

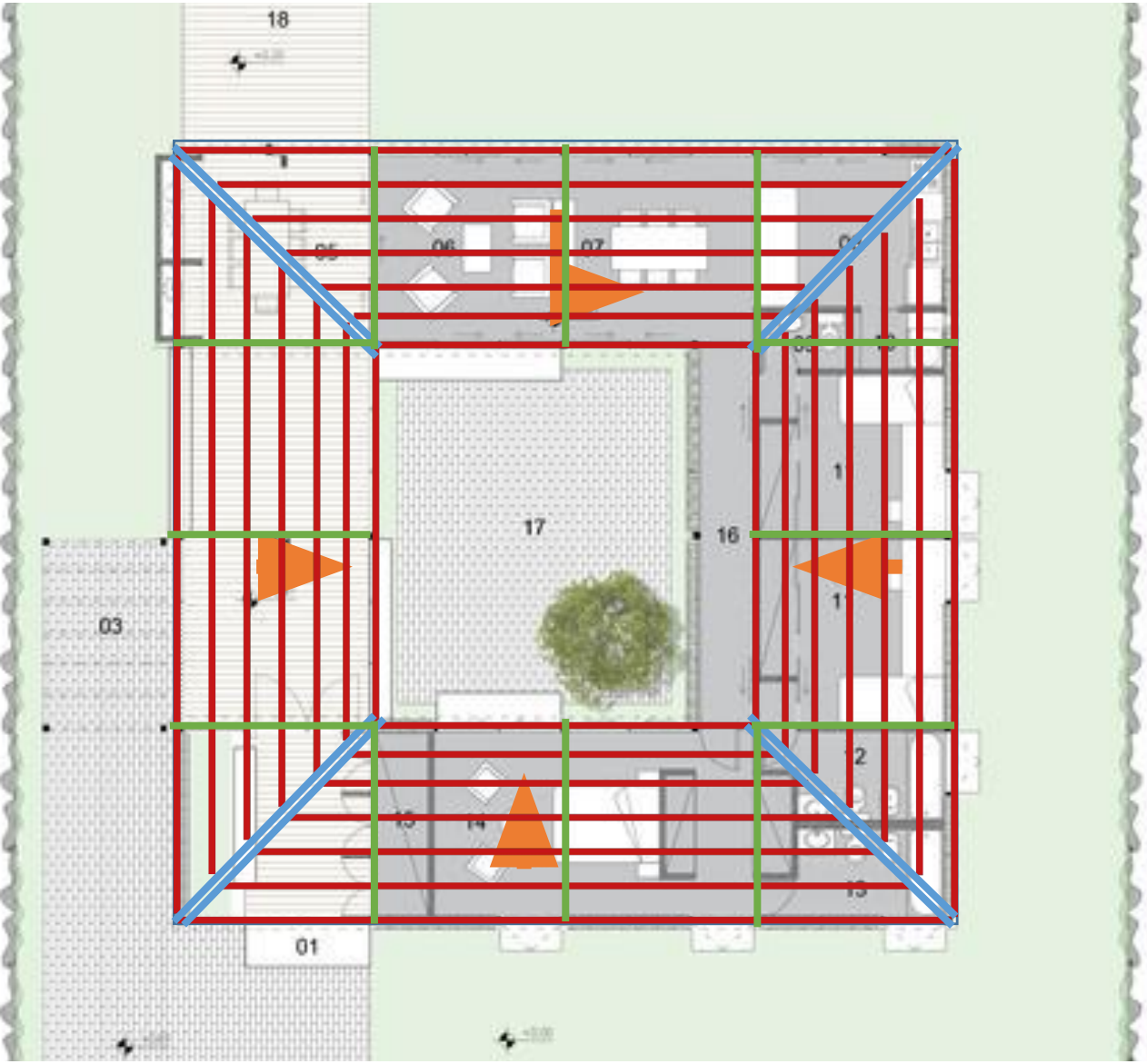
**PESO PROPIO VIGA (2UPN 140)**
$q_{pp}$= 2 x 16 Kg/m= 32 Kg/m

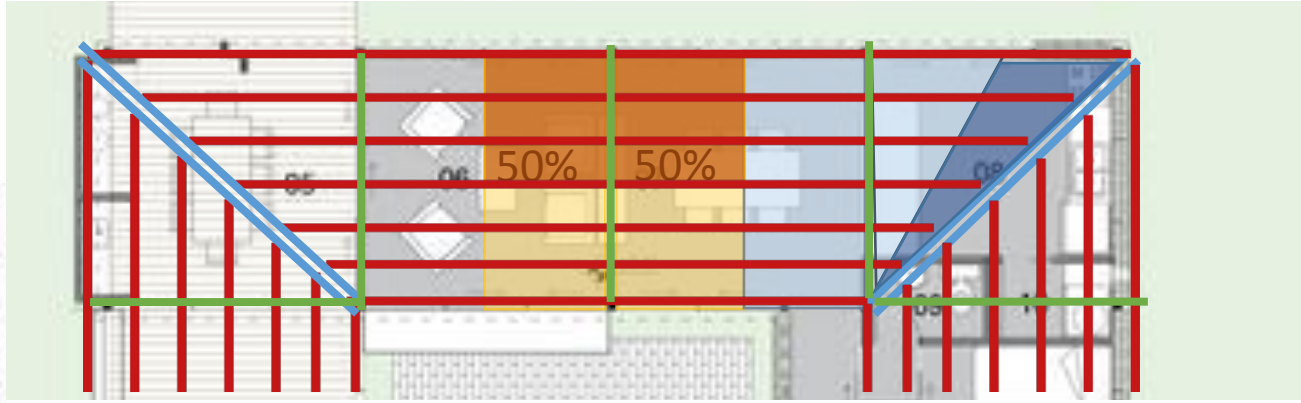
$qu_2$= 888 kg/m + 1,2 x 32 Kg/m = 926,4 Kg/m

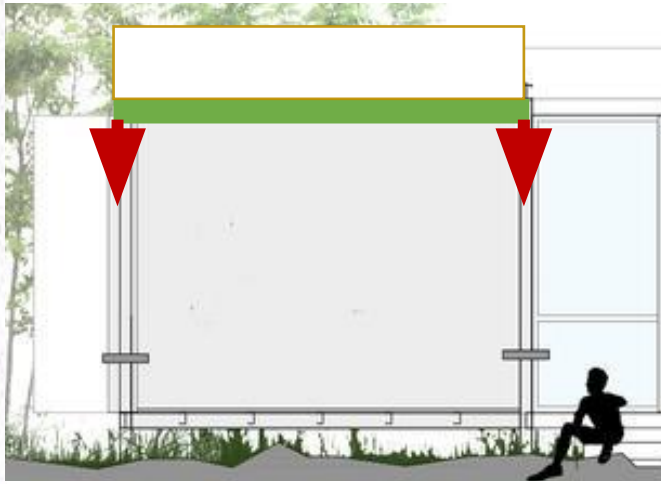
## Análisis de cargas del plano superior

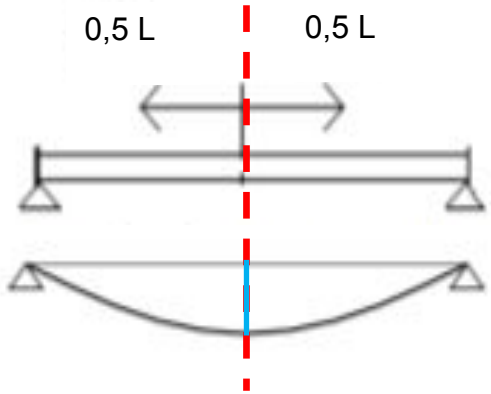
- En losas
- En entramados de madera y **acero**

**Casa Canning/**
**Estudio Borrachia**

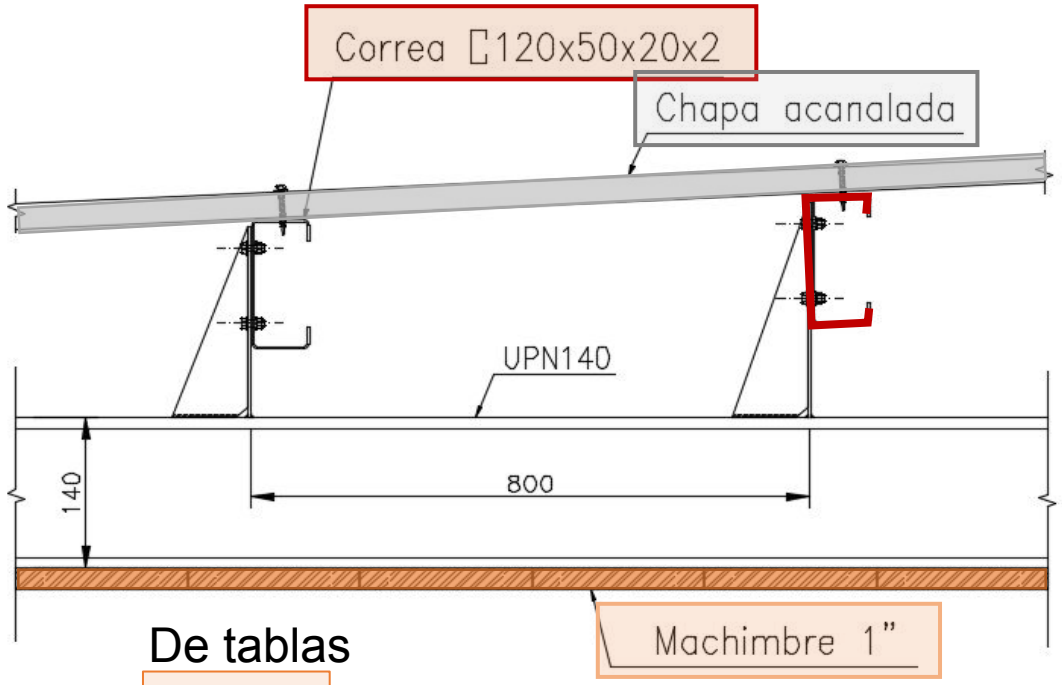

18
17
16
03
01

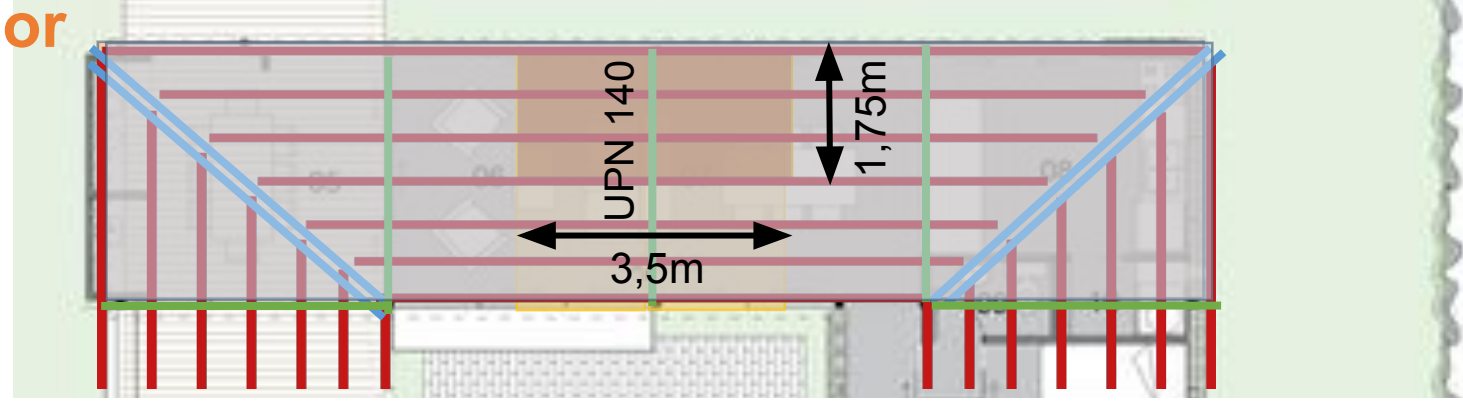

50%
50%




0,5 L
0,5 L

# Cálculo de la carga del plano superior




De tablas

Correas 4 kg/m / 0,80m = 5,0 kg/m²

Machimbre de Pino 0,025 m x 390 kg/m³ = 9,8 kg/m²

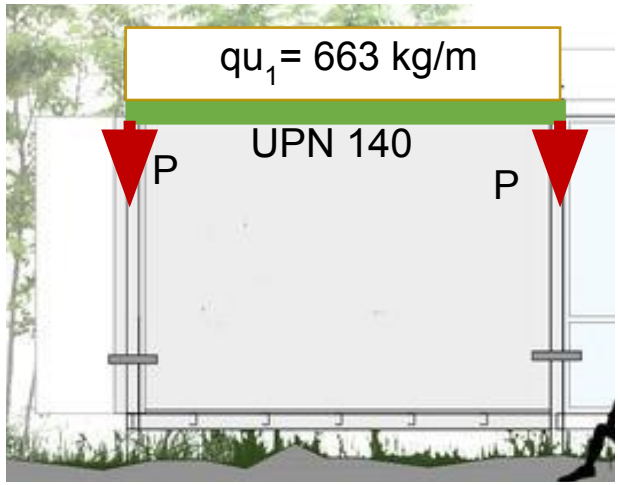
Cubierta de chapa acanalada = 5,0 kg/m²

Carga permanente ó muerta D = 19,8 kg/m²

Carga variable ó viva L = 100,0 kg/m²

Carga de servicio $q_s$ = 119,8 kg/m²

Carga ultima $q_u$ = 1,2 x 19,8kg/m² + 1,6 x 100kg/m² = 183,8 kg/m²




$qu_1$= 184 kg/m² x 3,5 m = 644 kg/m

**PESO PROPIO VIGA (UPN 140)**

$q_{pp}$= 16 Kg/m

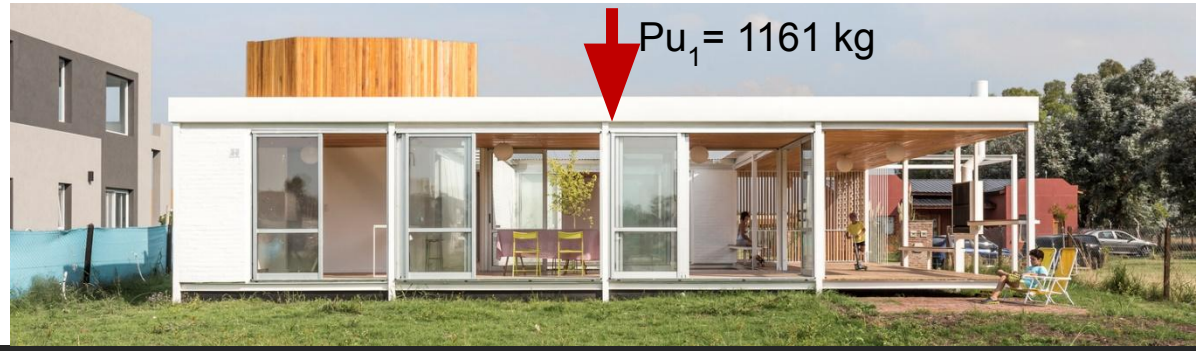
$qu_1$= 644 kg/m + 1,2 x 16 Kg/m= 663 Kg/m

$Pu_1$= 184 kg/m² x 3,5 m x 1,75 m= 1127 kg

**PESO PROPIO VIGA (UPN 140)**

$P_{pp}$= 1,2 x 16 Kg/m x 1,75m= 34 Kg

$Pu_1$= 1127 kg + 34 Kg= 1161 kg



# Vamos al taller !!!!!!