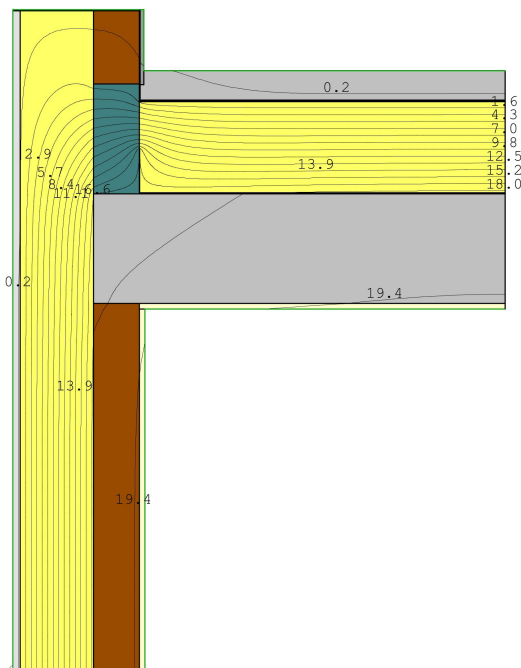
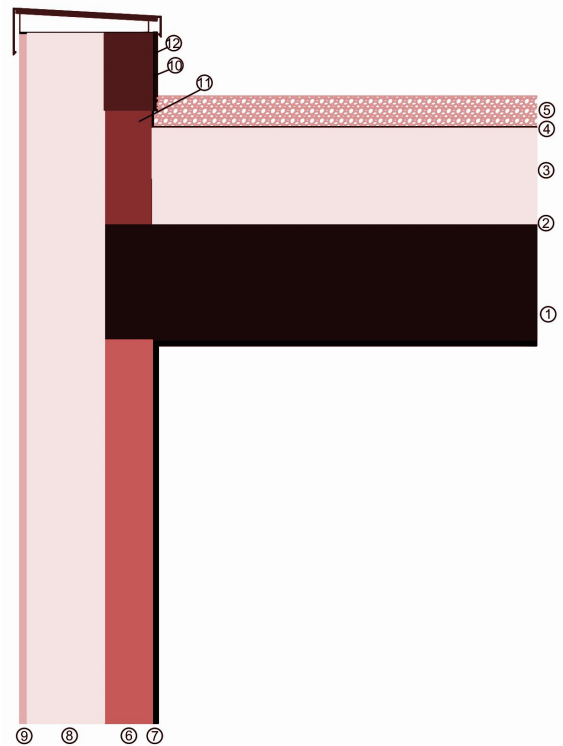


FACHADA CON AISLAMIENTO TÉRMICO EXTERIOR (SATE) -- CUBIERTA PLANA

EXTERNAL THERMAL INSULATION COMPOSITE SYSTEM
(ETICS) WALL - FLAT ROOF

DESCRIPCIÓN DE CAPAS / LAYER DESCRIPTION:

- ① Forjado de hormigón / *In-situ reinforced concrete slab* (d=300mm; $\lambda=1.1540$ W/m·K)
- ② Barrera de vapor / *Vapour barrier* (d=1mm; $\lambda=230$ W/m·K)
- ③ XPS (d=250mm; $\lambda=0.038$ W/m·K)
- ④ Lámina impermeable bituminosa / *Bituminous waterproofing membrane* (d=3mm; $\lambda=0.23$ W/m·K)
- ⑤ Grava / *Gravel* (d=80mm; $\lambda=2$ W/m·K)
- ⑥ Ladrillo cerámico perforado / *Clay perforated brick* (d=125mm; $\lambda=0.6944$ W/m·K)
- ⑦ Enlucido de yeso / *Gypsum plaster* (d=15mm; $\lambda=0.57$ W/m·K)
- ⑧ EPS (d=200mm; $\lambda=0.0375$ W/m·K)
- ⑨ Mortero de cemento / *Cement mortar* (d=20mm; $\lambda=0.80$ W/m·K)
- ⑩ Ladrillo cerámico perforado / *Clay perforated brick* (d=125mm; $\lambda=0.6940$ W/m·K)
- ⑪ Bloque de hormigón celular / *Porous concrete stone* (d=125mm; $\lambda=0.1$ W/m·K)
- ⑫ Baldosa de cemento / *Cement tile* (d=10mm; $\lambda=1.5$ W/m·K)



RIESGO DE CONDENSACIÓN SUPERFICIAL / CONDENSATION RISK ON THE INNER SURFACE (C.T.E / UNE-EN ISO 13788):

$$F_{rsi} = (\theta_{si} - \theta_{ext}) / (\theta_{int} - \theta_{ext}) = (18.8^{\circ}\text{C} - 0^{\circ}\text{C}) / (20^{\circ}\text{C} - 0^{\circ}\text{C}) = \mathbf{0.94 > 0.61}$$

No existe riesgo de condensación / No risk of condensation [Madrid]

**FLUJO DE CALOR /
TRANSMISSION HEAT LOSSES (ISO 10211)**

$$QT = \Sigma(U \times A + \Psi \times l + \chi) \times \Delta T$$

- U** = Flujo de calor a través de componentes homogéneos / *Regular component flux* [W/m²K]
A = Área del componente homogéneo / *Area of the regular component* [m²]
Ψ = Coeficiente del puente térmico lineal / *Linear thermal bridge coefficient* [W/mK]
l = Longitud del puente térmico lineal / *Lenght of the Linear thermal bridge* [m]
χ = Puente térmico puntual / *Point thermal bridge* [W/K]
ΔT = Diferencia de temperatura del aire entre interior y exterior / *Temperature difference of the air between inside & outside* [°C]

$$Q_{1Da} = A_a \times U_a \times \Delta T_1 \quad [W]$$

$$Q_{1Db} = A_b \times U_b \times \Delta T_1 \quad [W]$$

$$Q_{2D} = Q_{1Da} + Q_{1Db} + \Psi \times l \times \Delta T_1 \quad [W]$$

$$\Psi = \frac{Q_{2D} - Q_{1Da} - Q_{1Db}}{l \times \Delta T_1} = \underline{\underline{-0.3085 \text{ W}/(\text{m} \cdot \text{K})}}$$

Q_{1D} = Flujo/s de calor unidimensional del elemento homogéneo (fachada / cubierta sin el puente térmico) / *Unidimensional heat flux of the regular component (façade / roof without the thermal bridge)* [W]

Q_{2D} = Flujo de calor bidimensional (fachada con el puente térmico) / *Bidimensional heat Flux (façade with the thermal bridge)* [W]

