

**Moreno-Vacca** Sebastian

**Willem** Julie

Architectes **A2M**

Président de la plateforme maison passive **pmp** asbl

Enseignant à la faculté universitaire d'architecture **ULB-[LaCambreHorta]**

Administrateur de l'agence d'architecture **A2M** sc sprl



**pmp**  
**ULB-LaCambreHorta**  
**A 2 M**



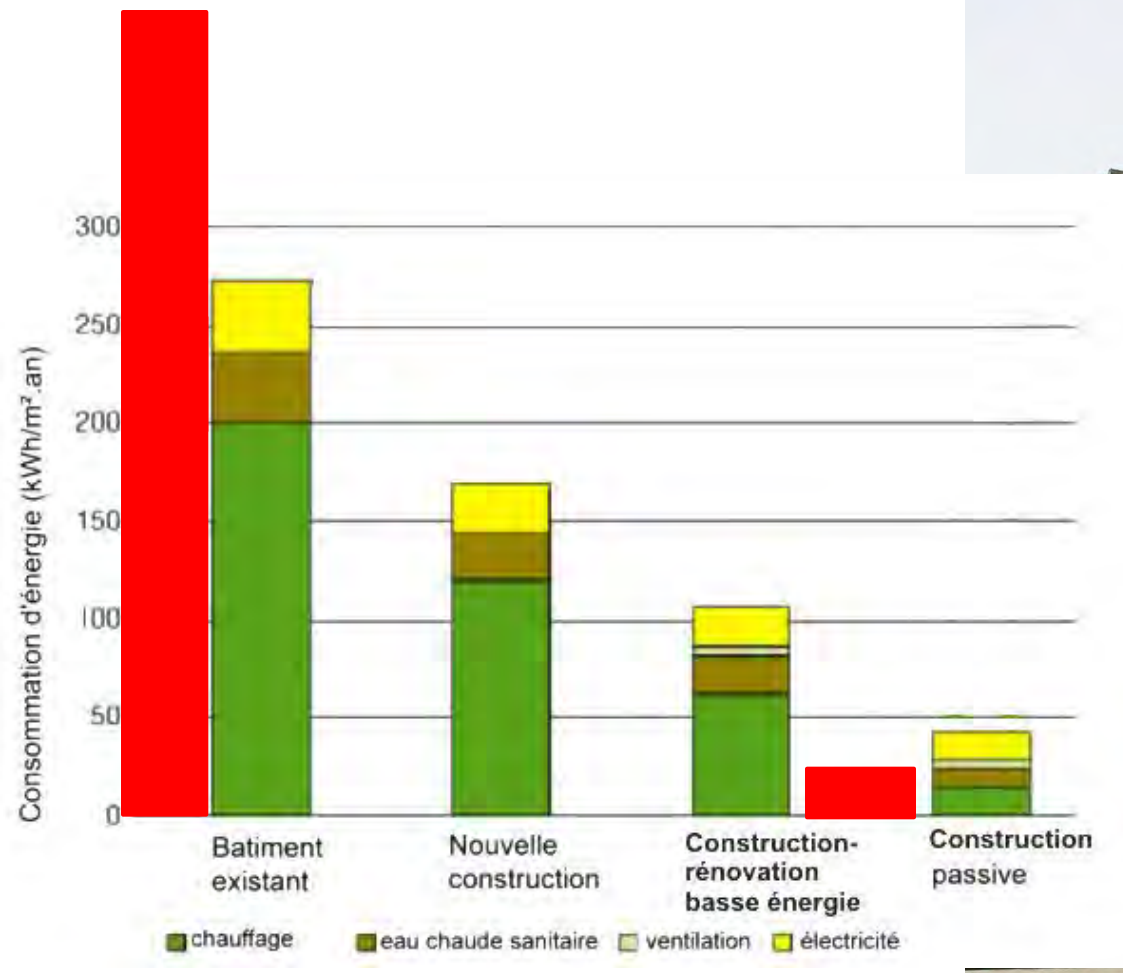
# Rénovation du CPAS de Forest

**Architecte: A2M**  
architecte du projet Julie Willem  
**Consultant énergie: Matriciel**  
**Stabilité : JZH**  
**CSS: Securisan**  
**Entreprise : Dherte**

**de 1934 à 2011**  
**de 263 kWh/m<sup>2</sup>.an**  
**à ...**  
**19 kWh/m<sup>2</sup>.an**









Le site

Le projet

Boulangerie  
Pâtisserie  
**Grenson**  
Bread-en-bakkerij  
bakkerij  
TEL



**Commune de Forest**

*Gemeenthuis Vorst*

**Abbaye de Forest**

*Vorst Abdij*

**Chaussée de Bruxelles**

*Brusselssteenweg*

**Rue de Liège**

*Luikstraat*

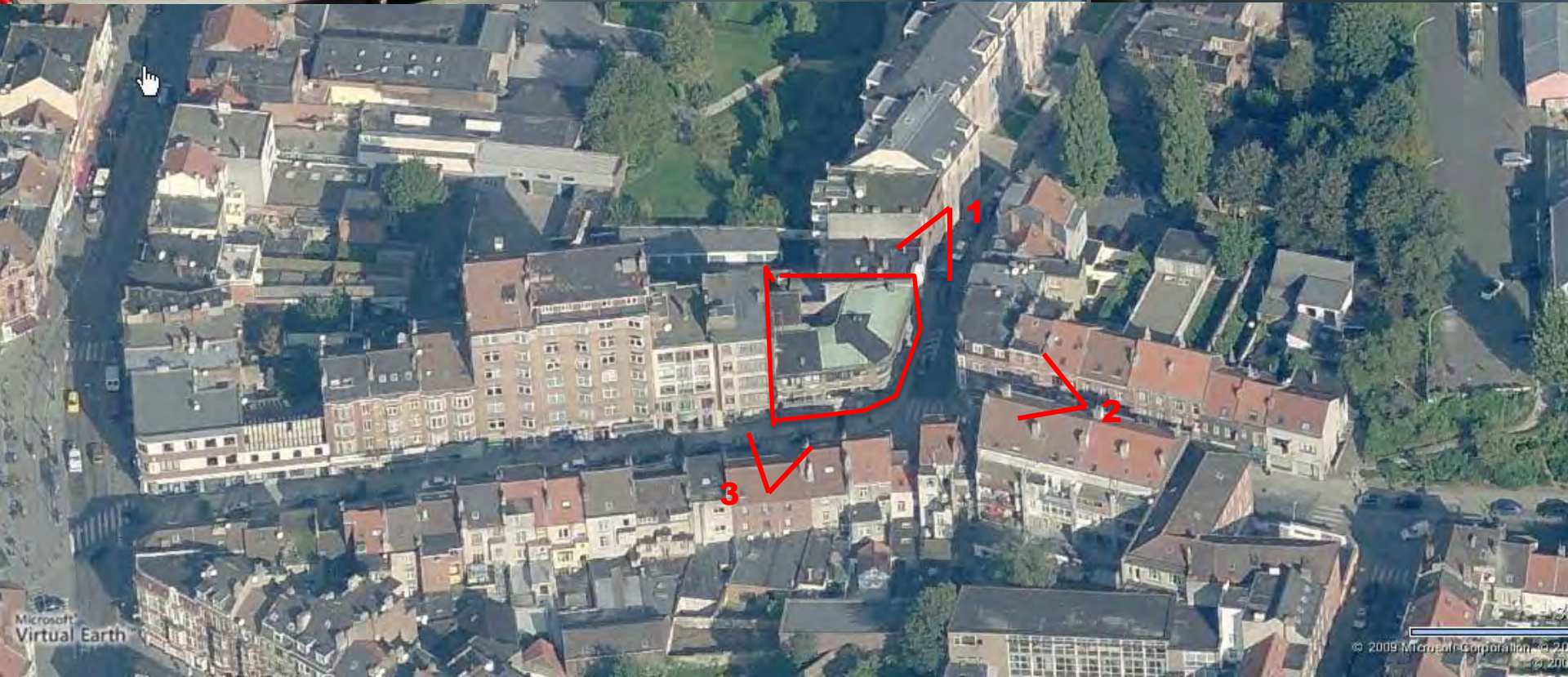
**CPAS de FOREST**

*OCMW Vorst*

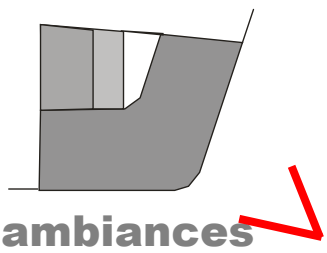
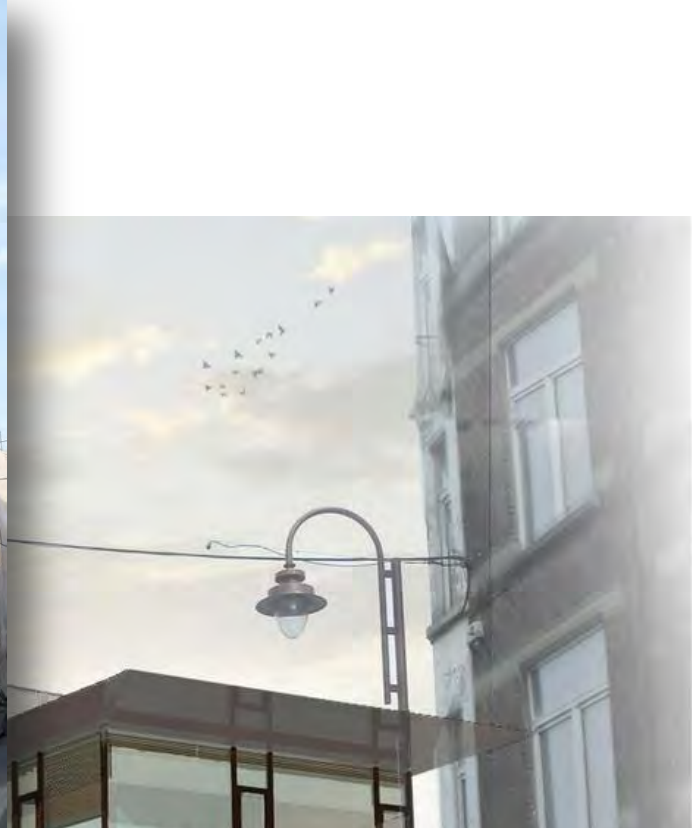
**Rue Vanpé straat**













ambiances




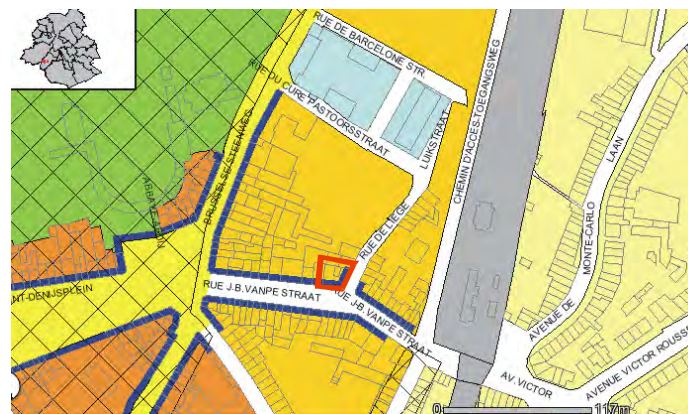
**SITUATION EXISTANTE DE DROIT**  
*BESTAANDE RECHTSTOESTAND*

-  **Ensemble classé**  
*Beschermd monument of geheel*
-  **Zone de protection**  
*Vrijwaringszone*




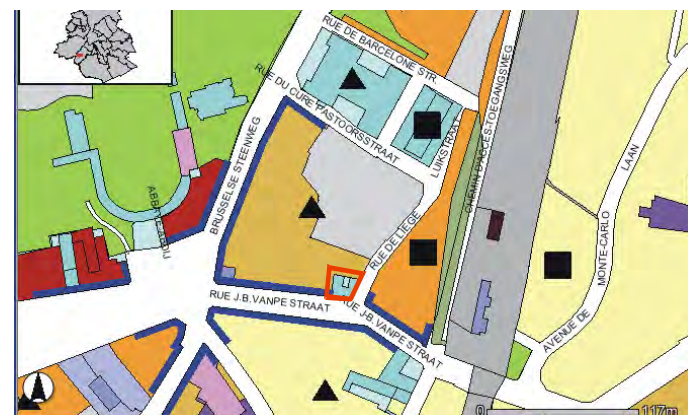
**AFFECTATION SUR SOL**  
*BESTEMMINGSPLAN*

-  **Zone d'habitation**  
*Woongebieden met residentieel karakter*



**SITUATION EXISTANTE DE FAIT**  
*BESTAANDE FIJTELIJKE TOESTAND*

-  **équipement collectif**  
*uitrusting van collectief belang*





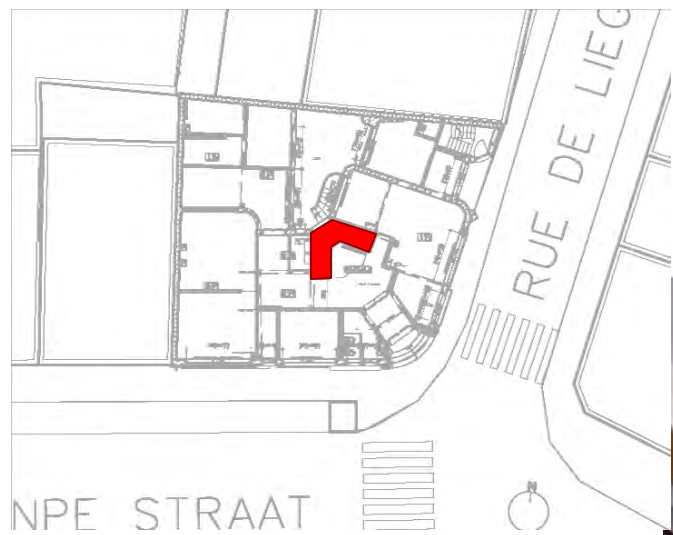
Le site

Le projet



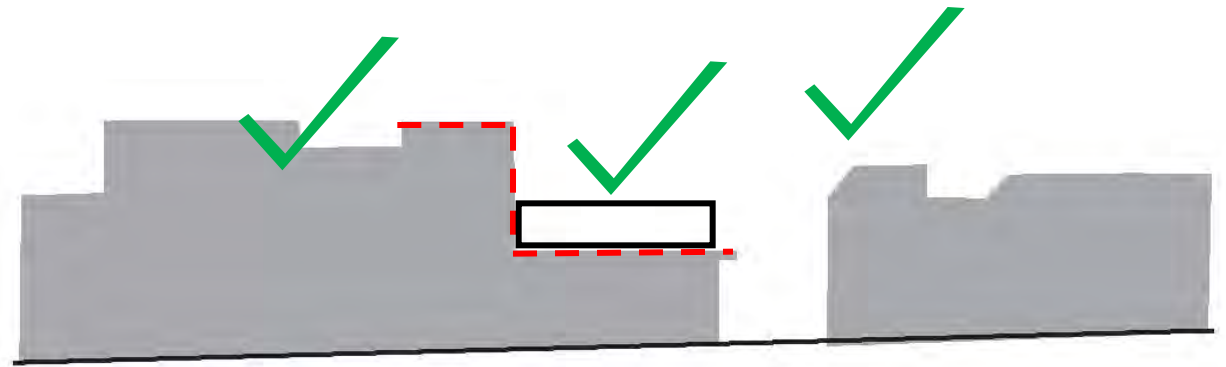
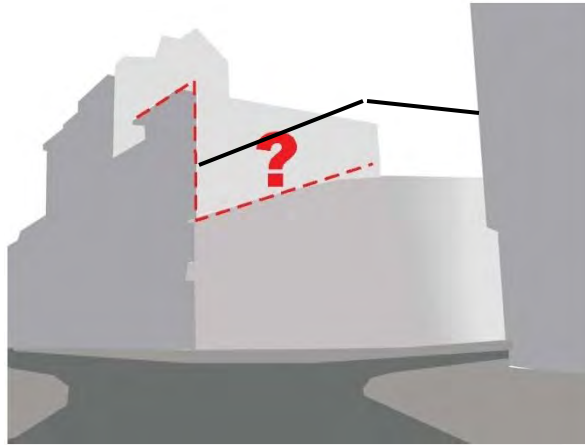


**Maintien de la façade**  
*Gevel te behouden*  
Conceptsarchitecturaux



**Maintien de l'escalier**  
*Trappen te behouden*  
Conceptsarchitecturaux





**Réhausse légère**

*Lichte verhoging*

Concepts architecturaux  
*concepten*

**Le site**

*Ligging en omgeving*

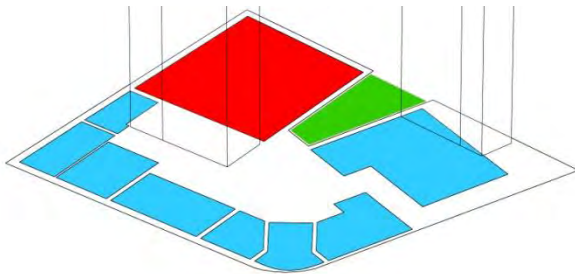
**Le projet**

*Het project*

**le programme/plans**  
*programma/ plannen*





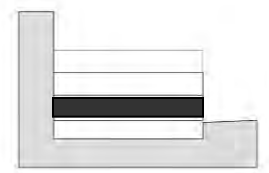
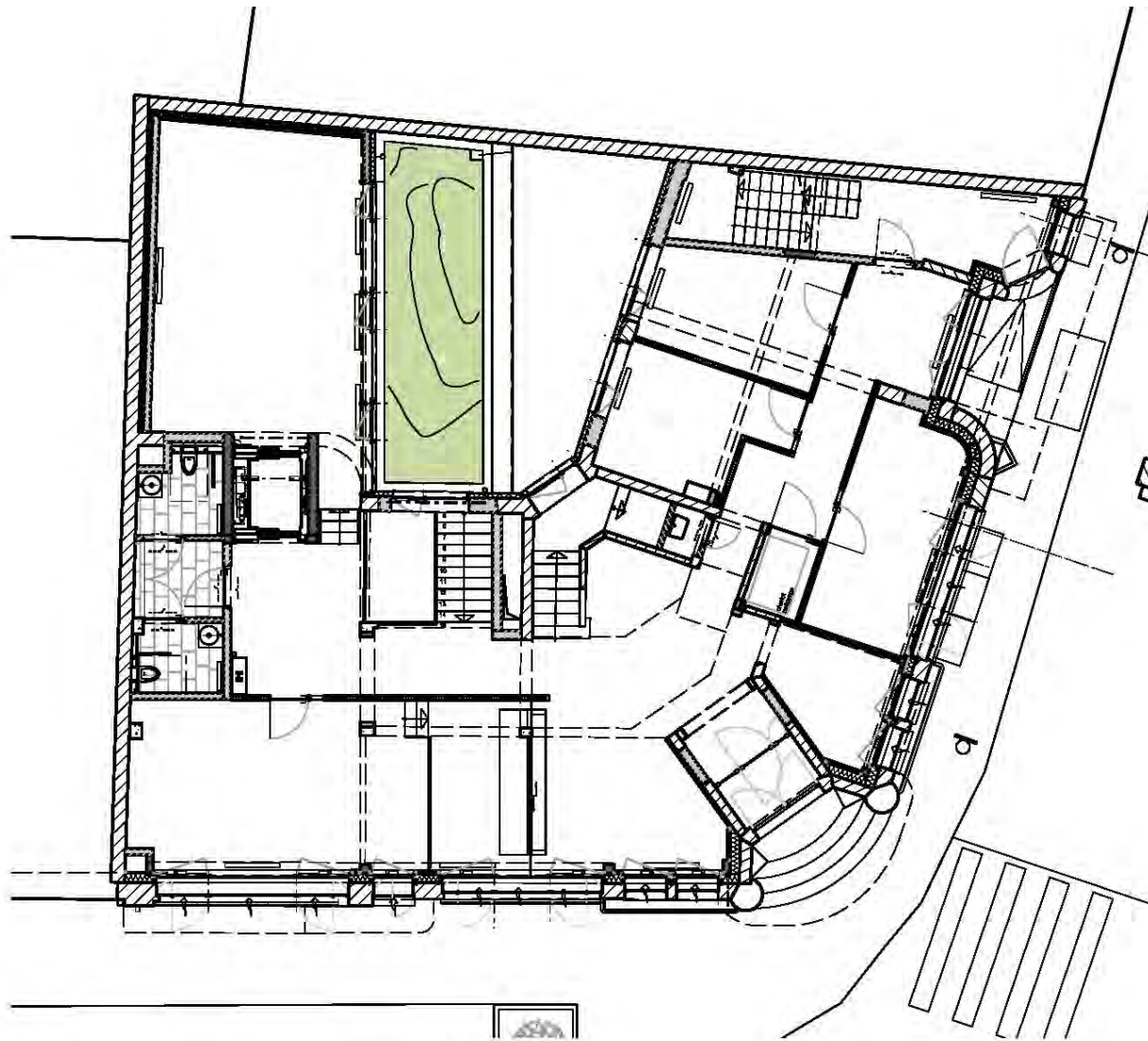


**SOUS-SOL**

Salle polyvalente

Cuisinette technique  
réservation archives

Jardin

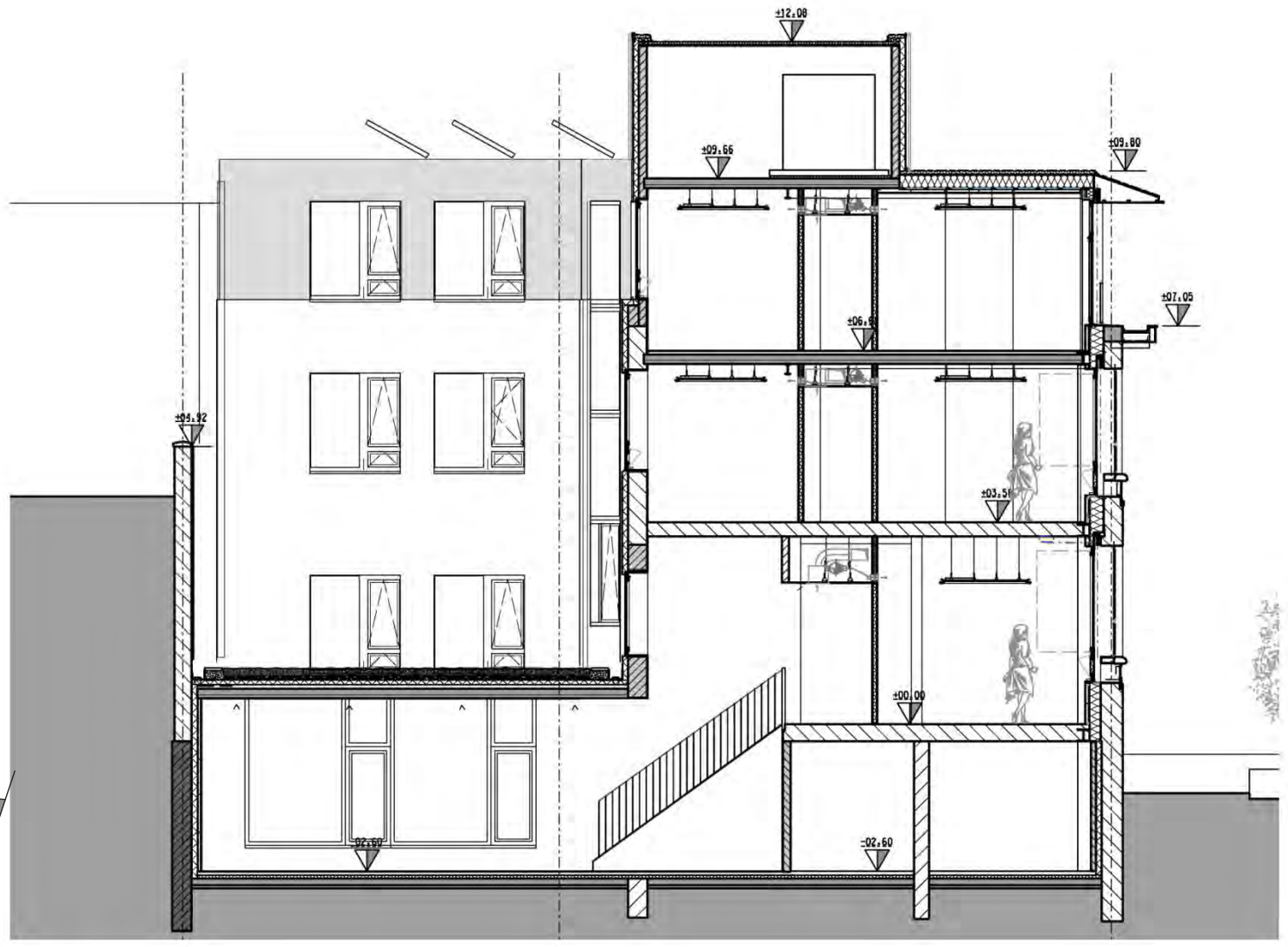


Plan rez-de-chaussée  
gelijkvoer





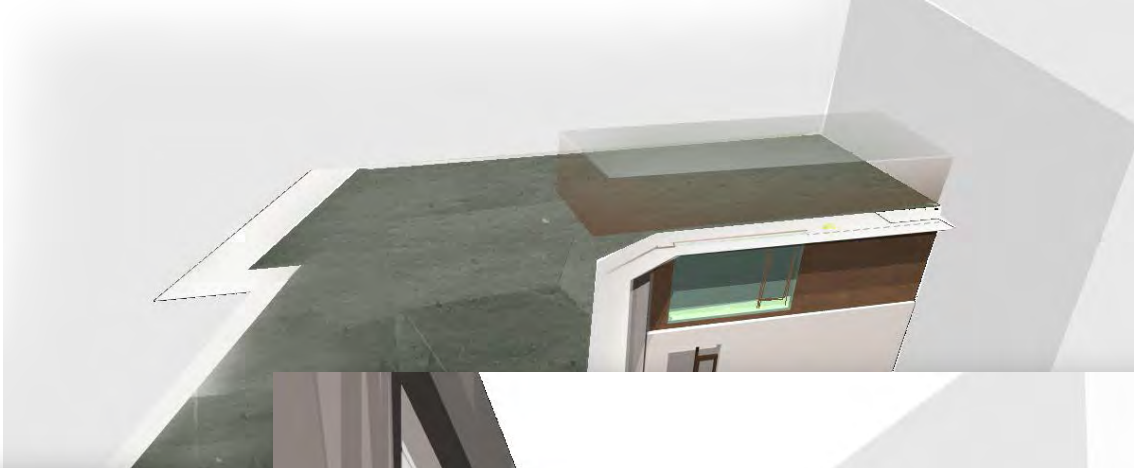
Élévation rueVANPE  
voorgevel



**Coupes**  
*doorsneden*



A 2 M



# CENTRE PUBLIC D'AIDE SOCIALE DE FOREST

## Hiver

- 1 Enveloppe isolée continue
- 2 chauffage par échangeur HR

## Eté

- 3 maîtrise des charges externes et internes
- 4 night cooling
- 5 place pour éventu adiabatique

## Le site

*Ligging en omgeving*

## winter

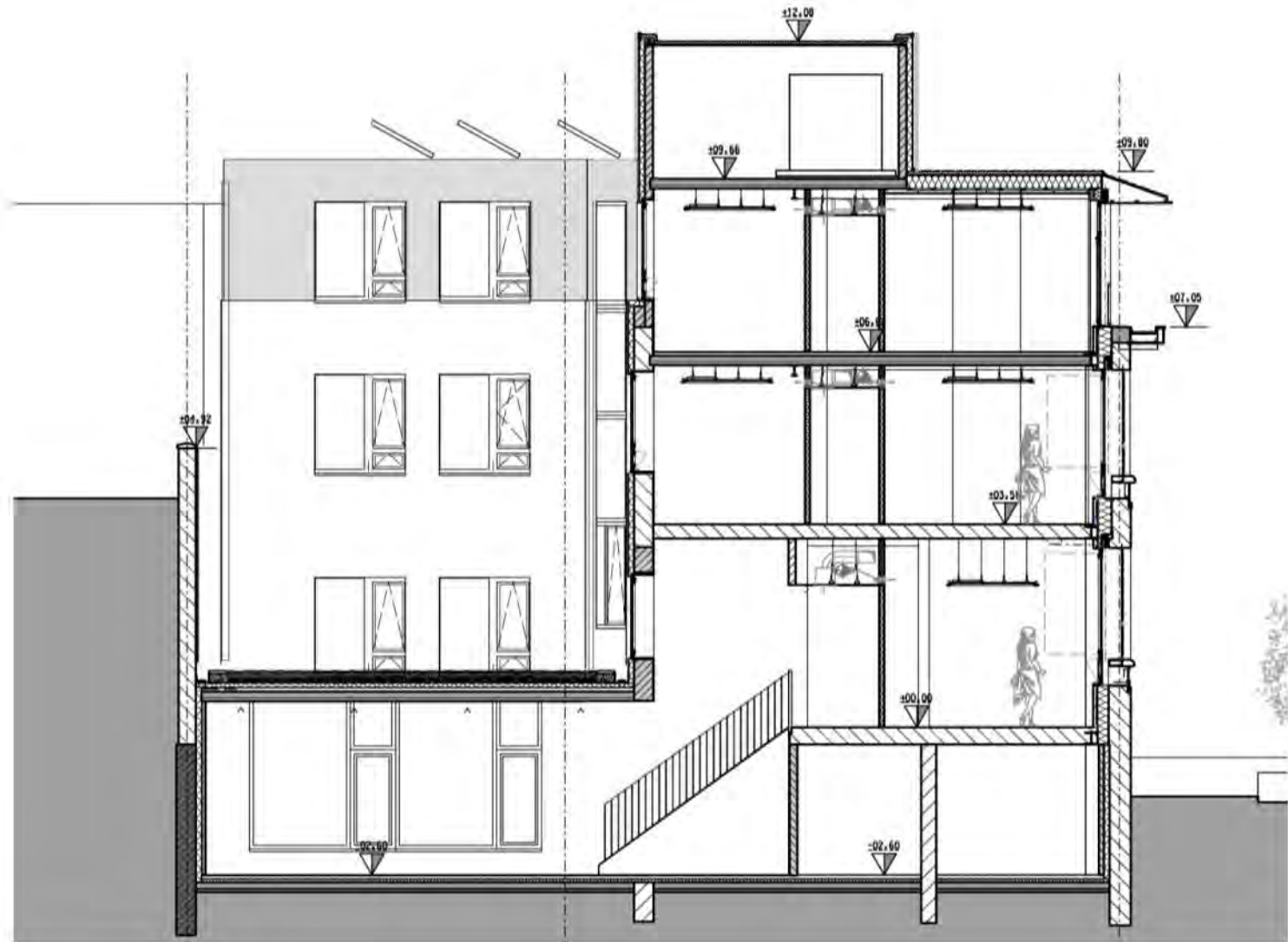
## Le projet

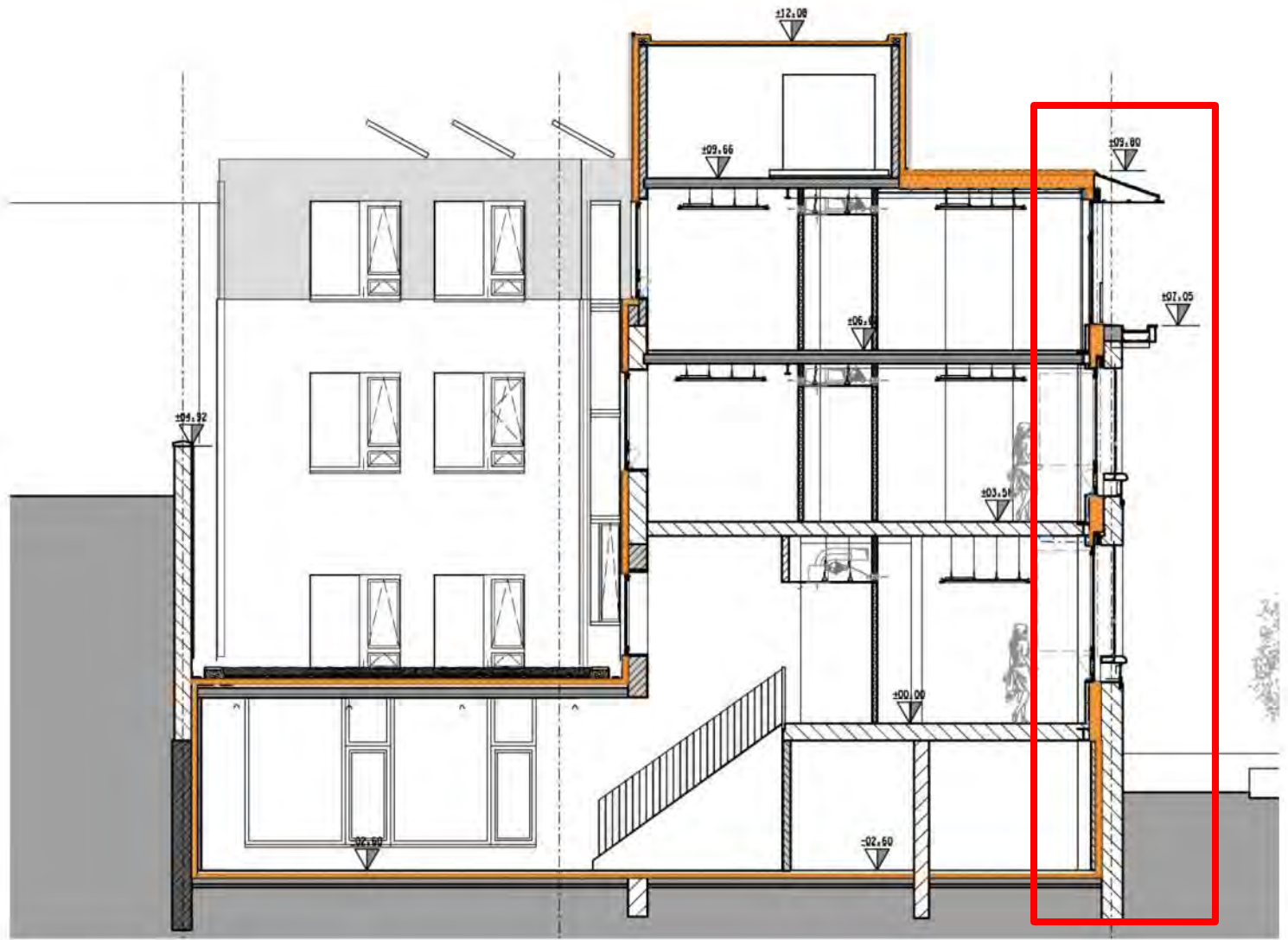
*Het project*

## Zomer

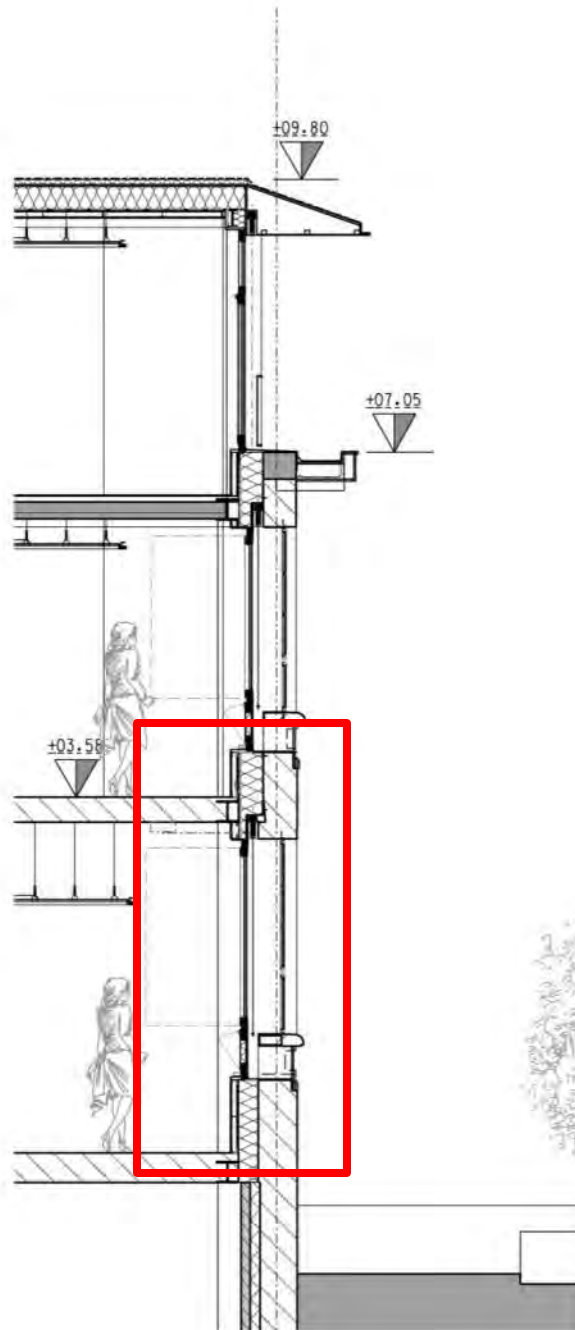
- 1 isoleerende gebouwschil
- 2 verwarming warmeterugwisselaar HR
- 3 ext en internal loads strategie
- 4 night cooling
- 5 plaats voor éventu adiabatischekoeling



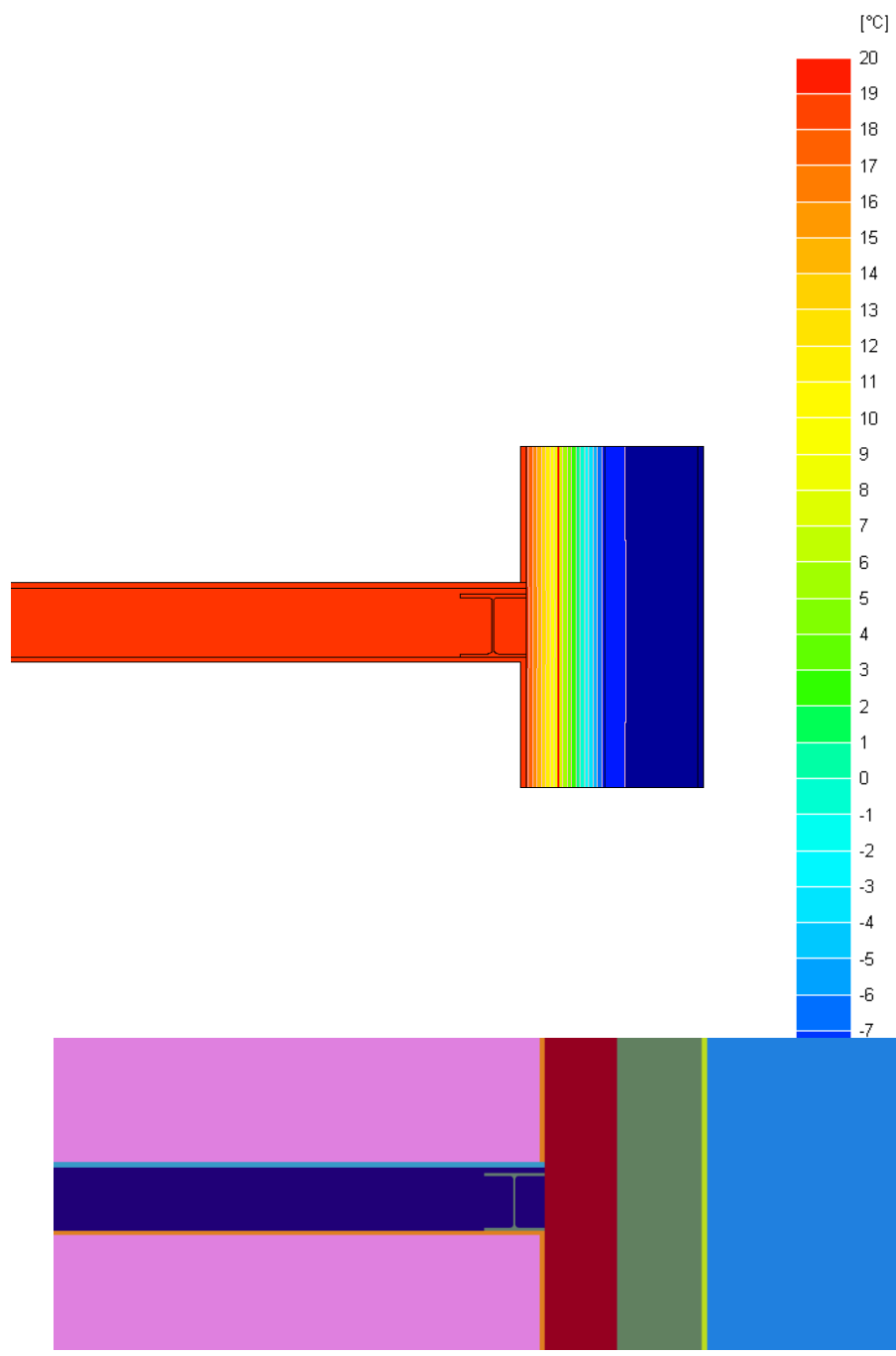
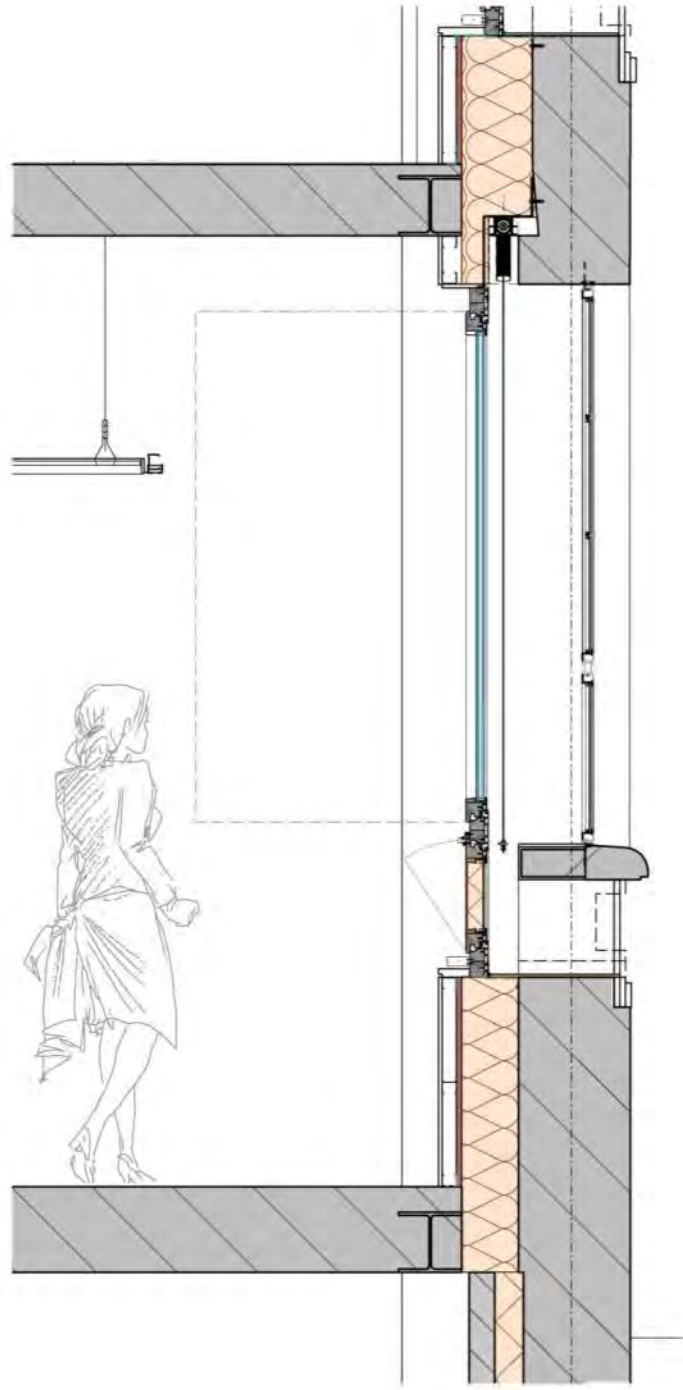








A 2 M

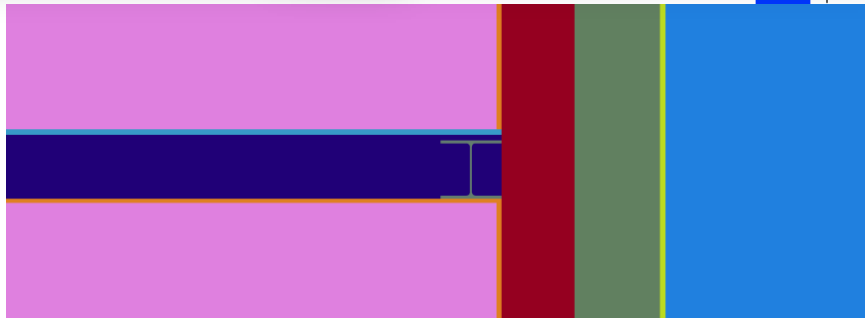
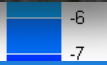
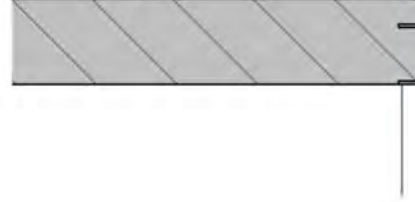


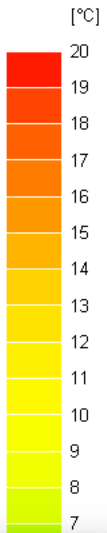
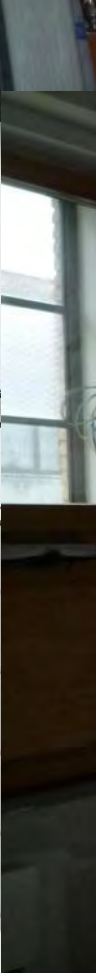


A 2 M

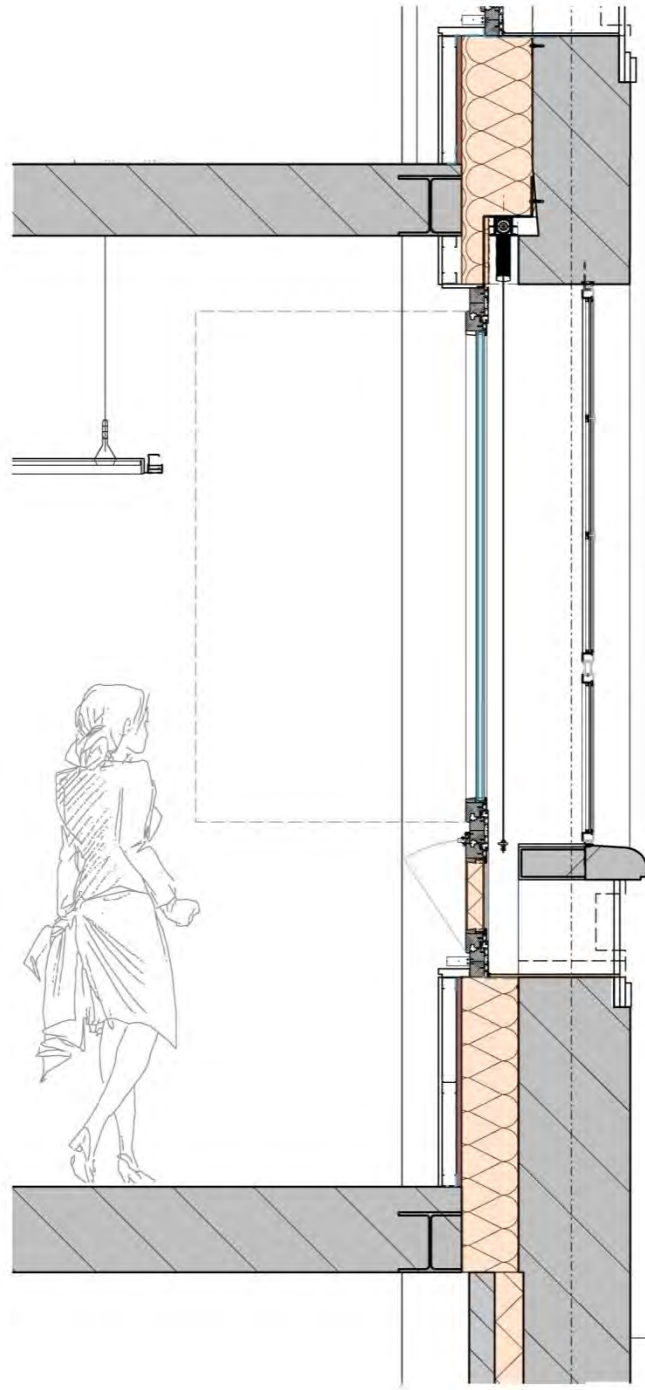
[°C]

20









### Phénomène hygrothermique

### Effets de l'humidité dans la pratique

### Dommages dus au gel



Dégâts causés par des pluies battantes trop fréquentes ou par la résistance au gel insuffisante du matériau.

Ref.: Andreas Holm 5

isoProC Fraunhofer Institut

Nom de la Couche: Brique Ancienne, Epaisseur [m]: 0.34

Extérieur (coté gauche): 0.34, Intérieur (coté droit): 0.25, 0.001

Attribuer à partir de: Base de Données Matériaux

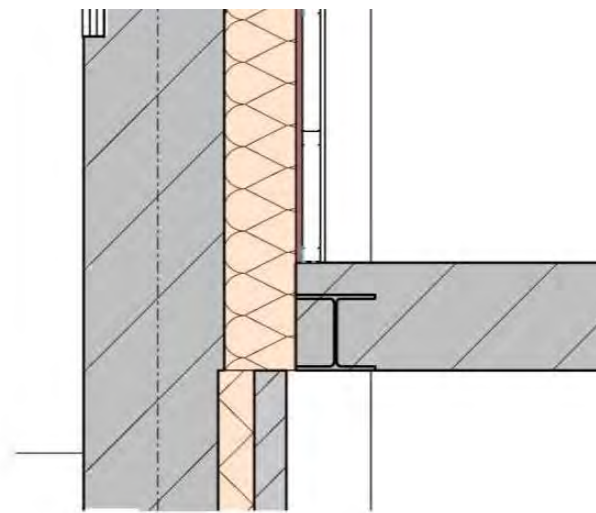
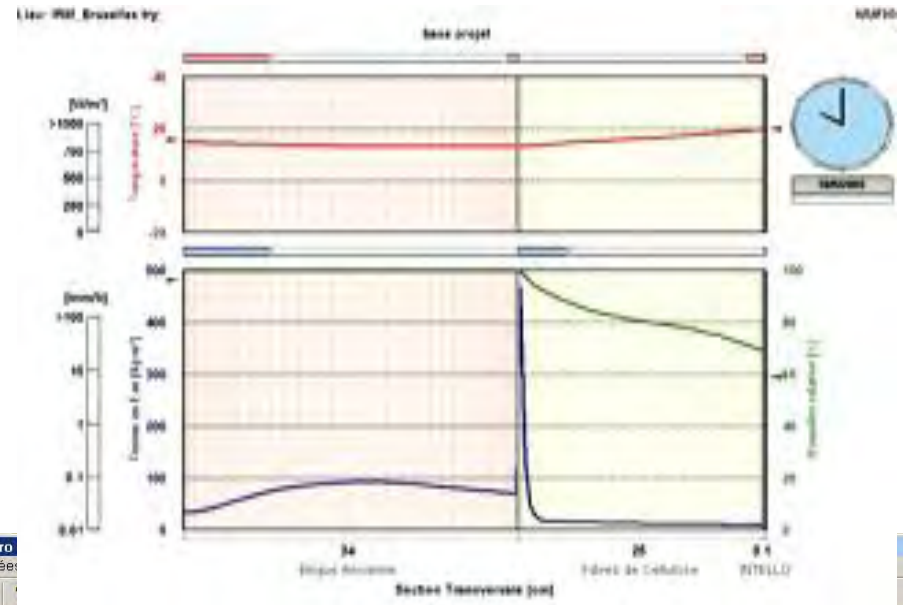
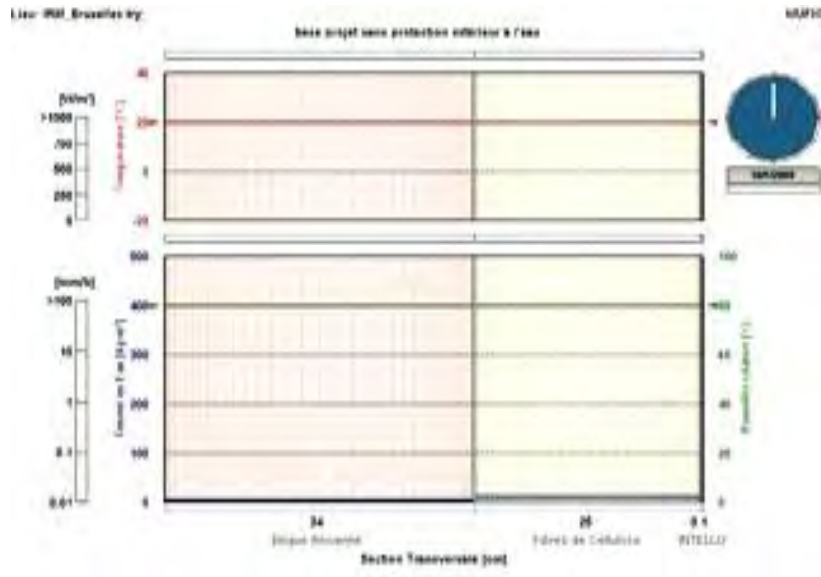
Maillage:  Maillage Automatique,  Grossier,  Moyenne,  Fin

Epaisseur totale: épaisseur: 0,53 m

Performance thermique globale: Résistance thermique R: 6,02 m²K/W

Coefficient U: 0,143 W/m²K

Unité: SI, Dernier calcul 9/21/2009



Pro Entrées

Cas: base projet

Maillage, moniteurs Orientation/Inclinaison/Hauteur Coefficients surfaciques Conditions initiales

Assemblage

Nom de la Couche: Brique Ancienne

Epaisseur [m]: 0.34

Données matériaux

Sources et pertes

Nouvelle Couche

Dupliquer

Effacer

Editer maillage par: Graphe (selected), Tableau

Attribuer à partir de: Base de Données Matériaux, Exemple

Maillage:  Maillage Automatique,  Grossier,  Moyenne,  Fin

Epaisseur totale: épaisseur, 0,53 m

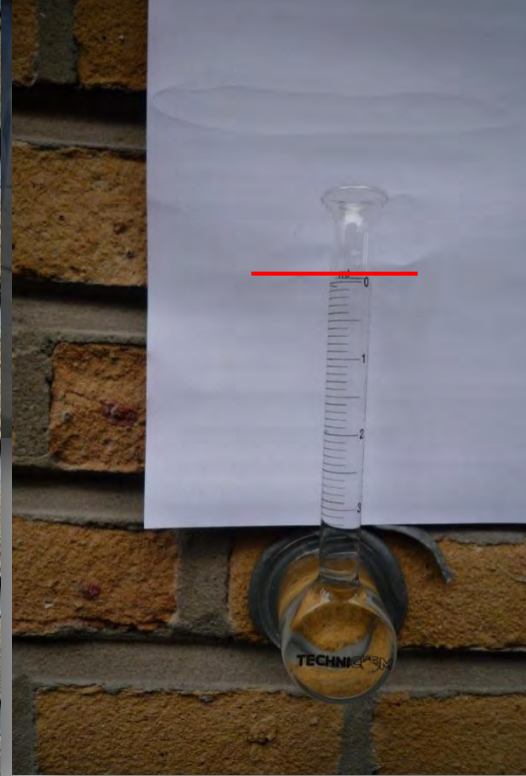
Performance thermique globale: Résistance thermique R: 6,02 m²K/W

Coefficient U: 0,143 W/m²K

Unité: SI

Demier calcul 9/21/2009





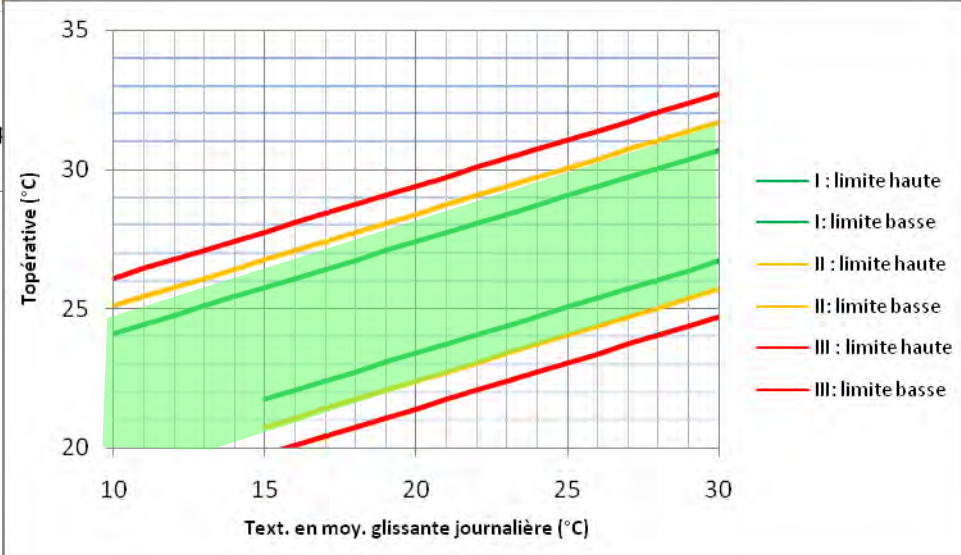
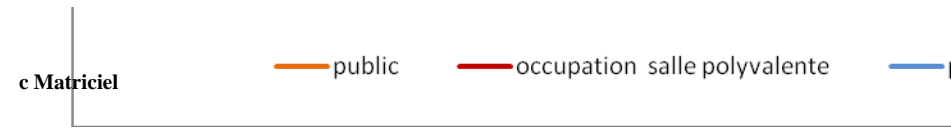
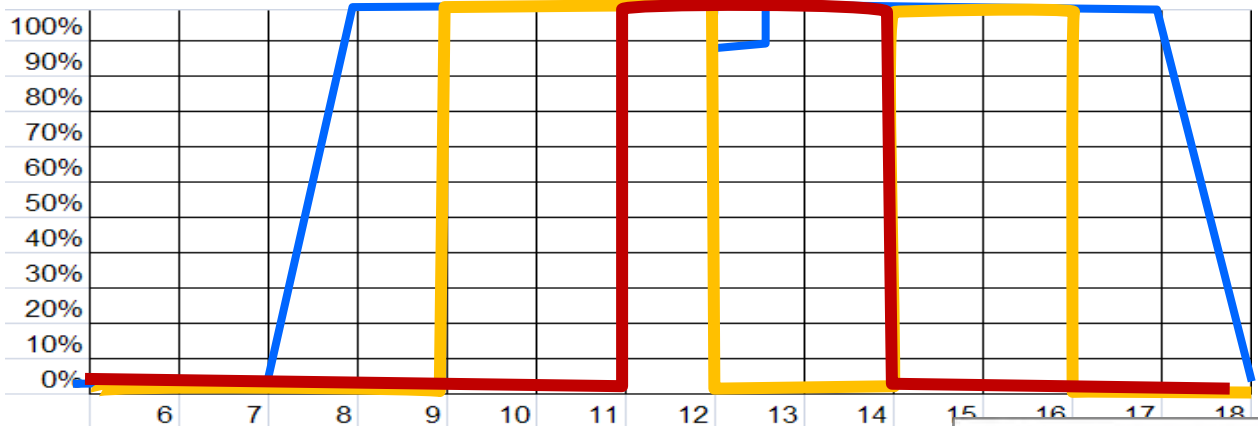
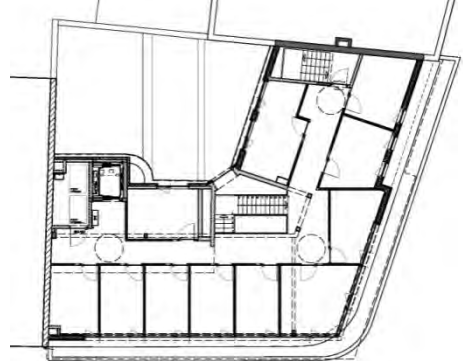
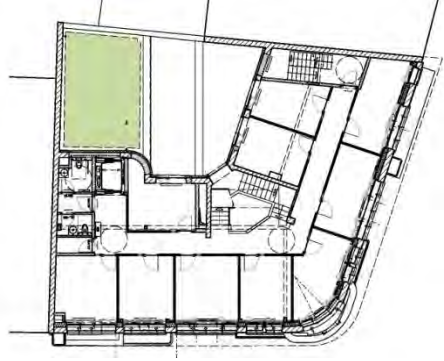
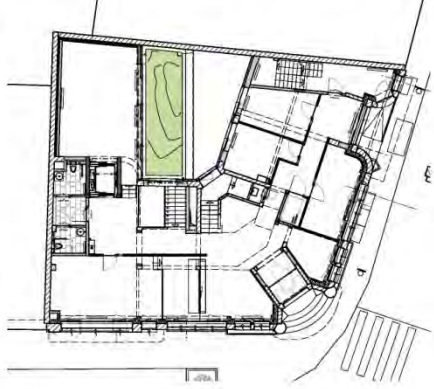


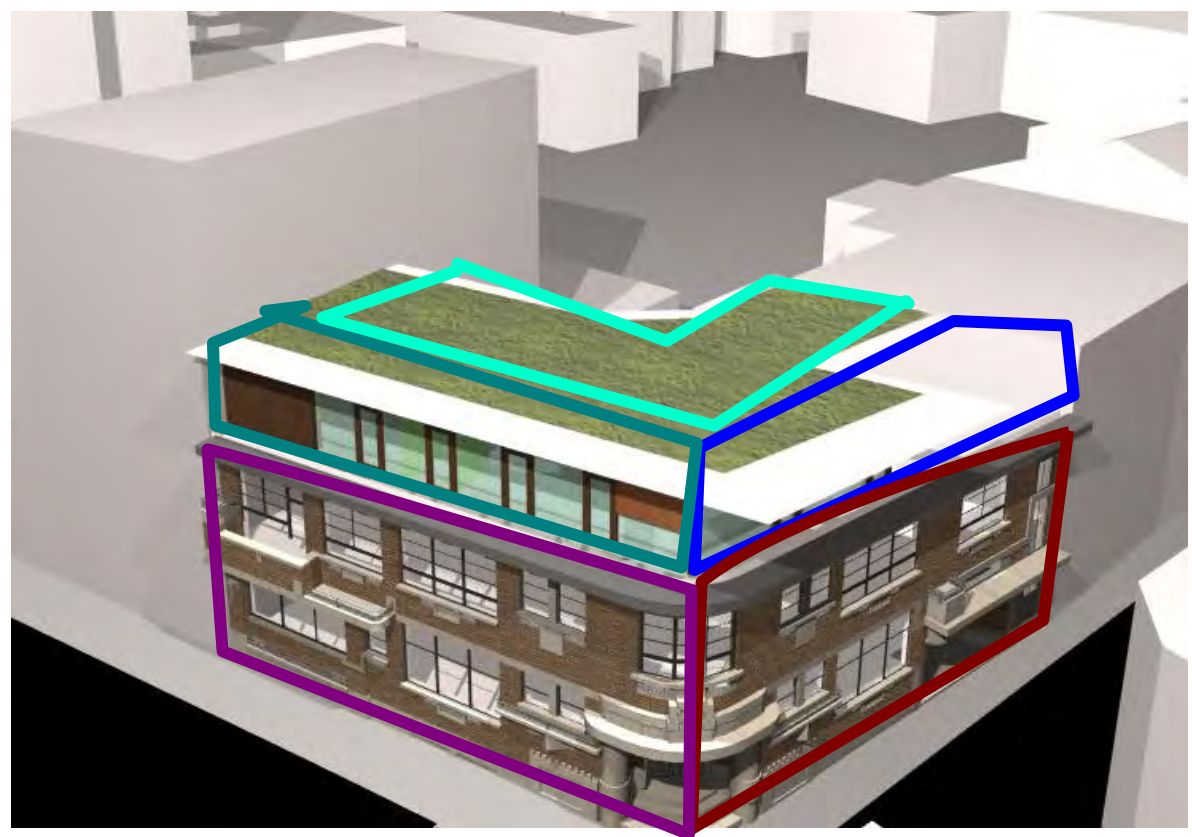
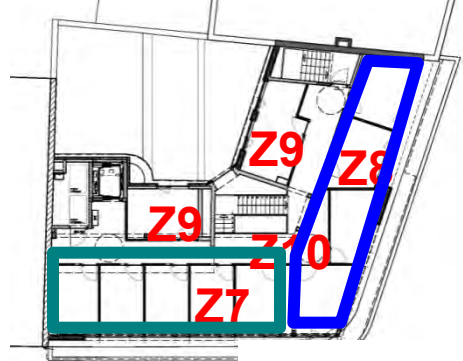
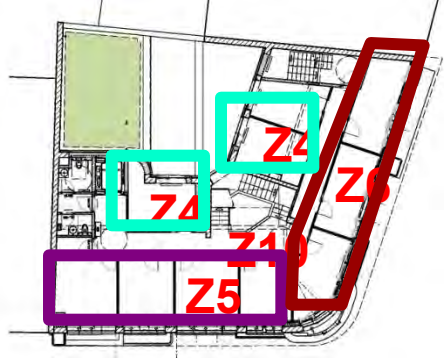
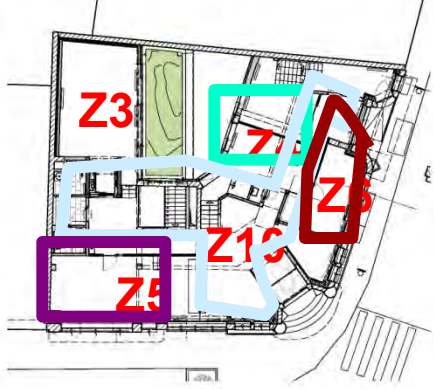
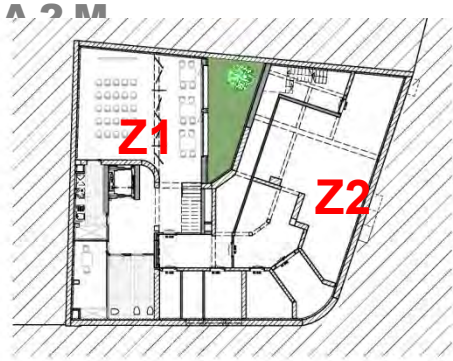
**Hydrofuge a coûté environ 3000€ + installation  
Garantie 10 ans MAIS on doit commencer  
à se préoccuper après ...  
25 ans !**

**En attendant, l'occupant gagnera environ...  
25 000 €/an**



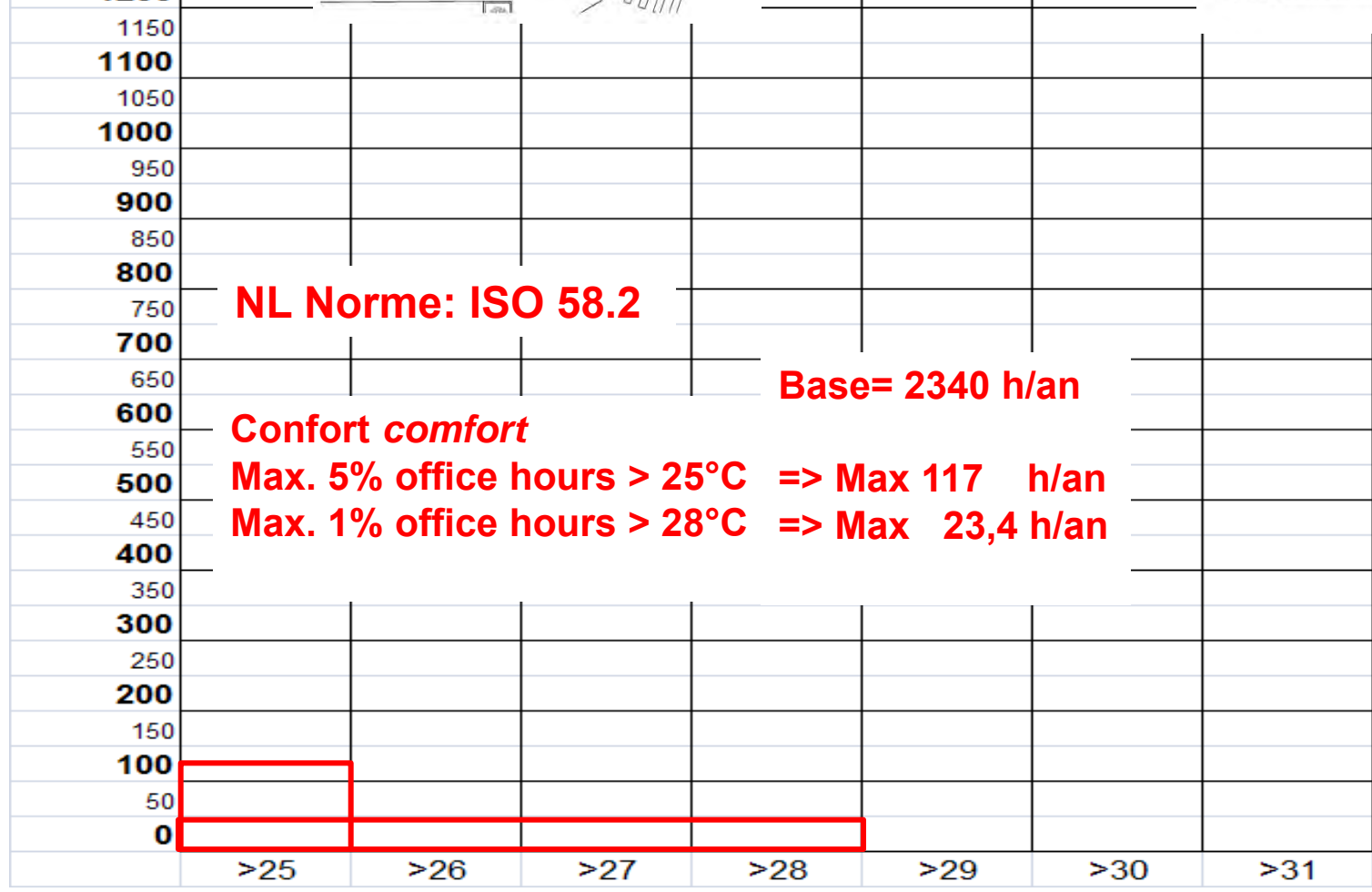
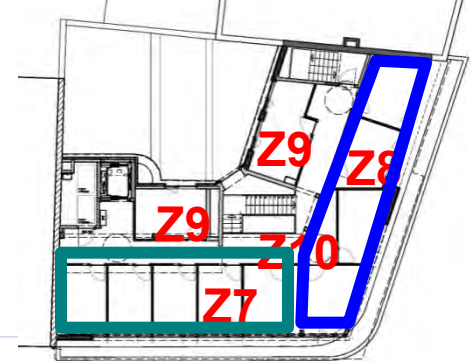
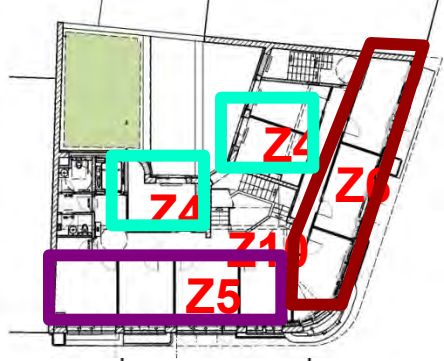
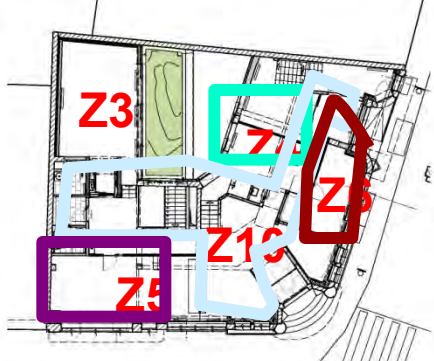




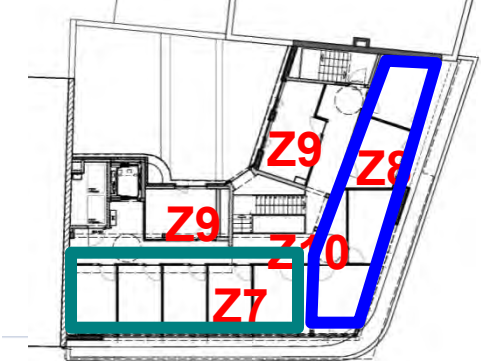
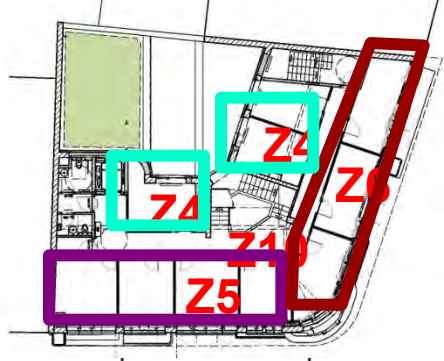
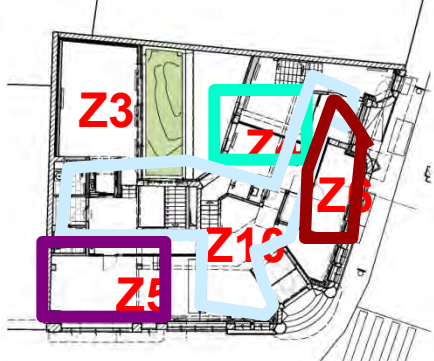


- zone1
- zone2
- zone3
- zone4
- zone5
- zone6
- zone7
- zone8
- zone9
- zone10



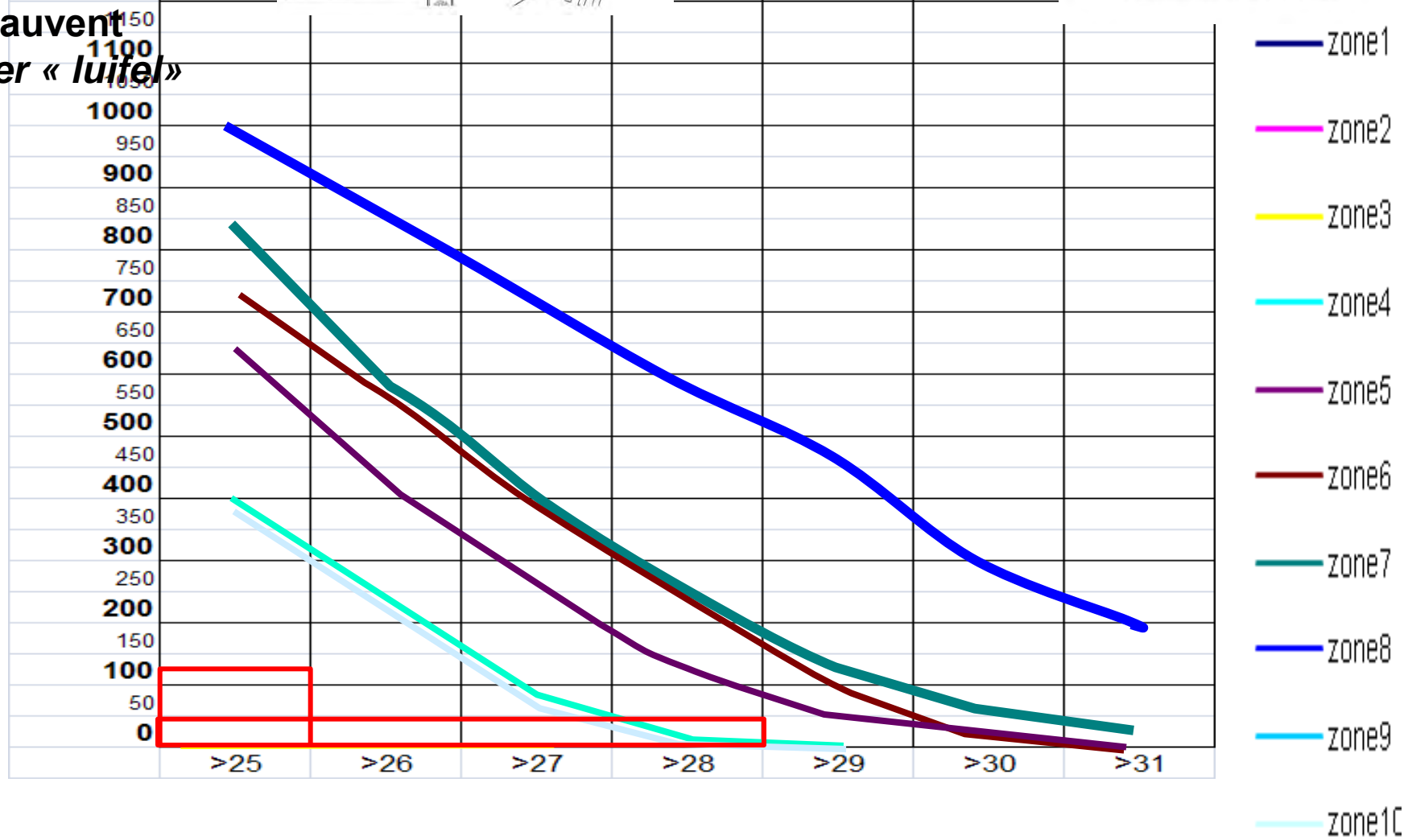


- zone1
- zone2
- zone3
- zone4
- zone5
- zone6
- zone7
- zone8
- zone9
- zone10

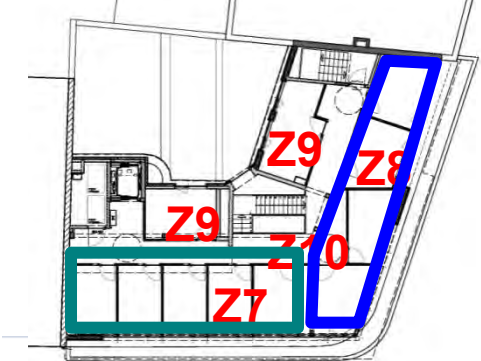
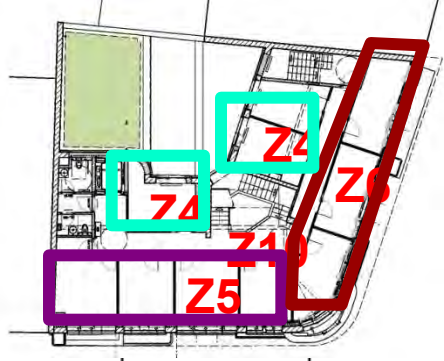
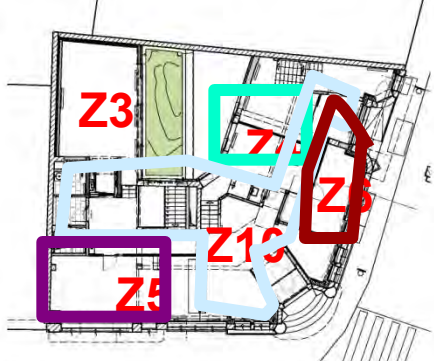


Sans auvent  
Zonder « luifel »

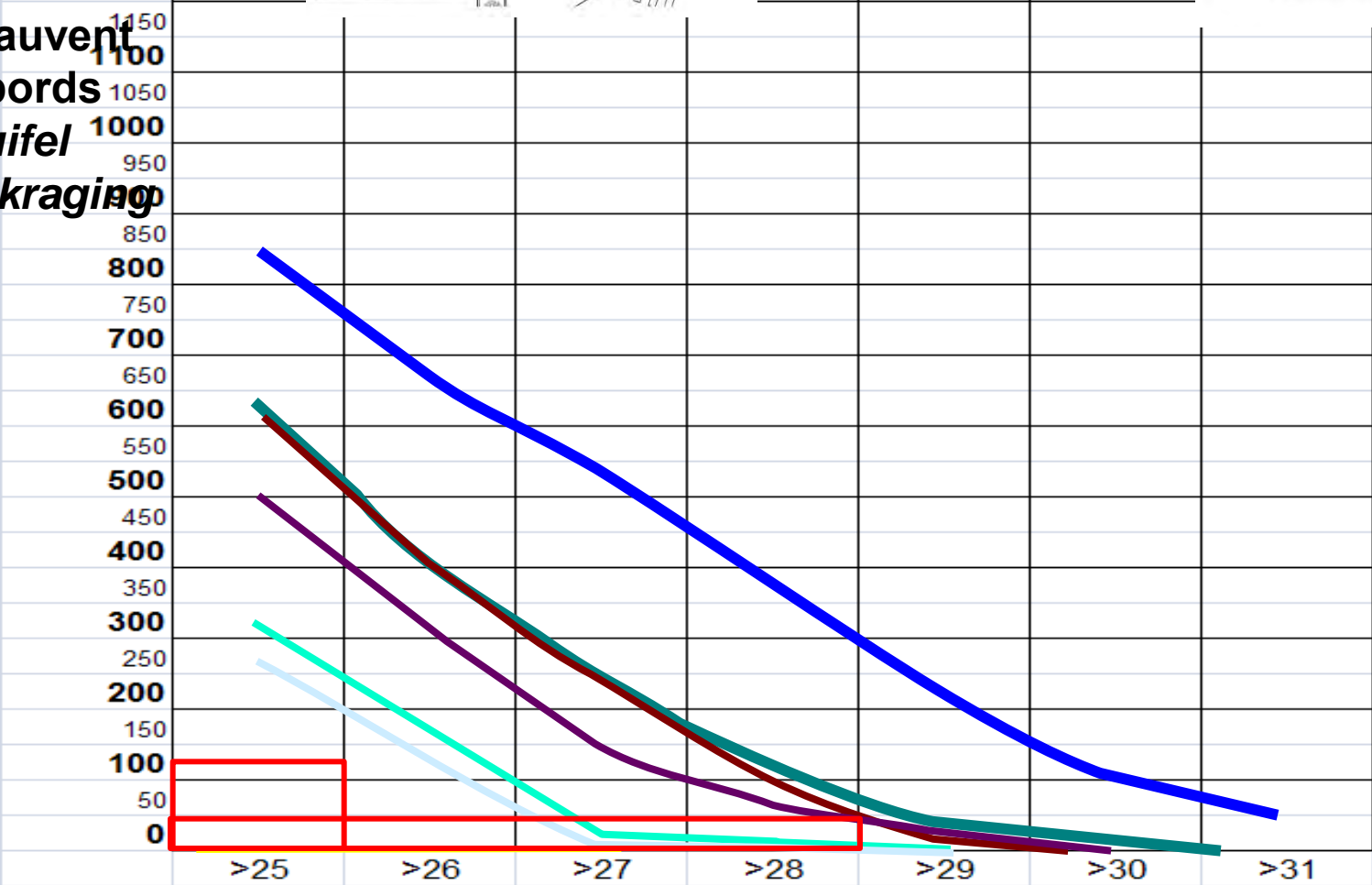
c Matriciel



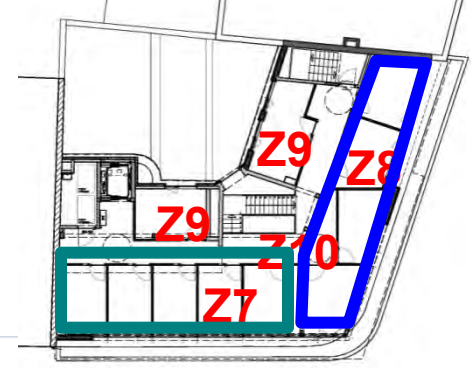
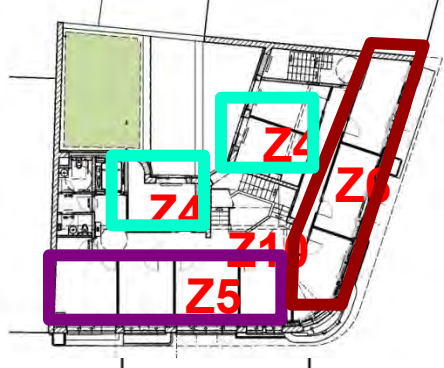
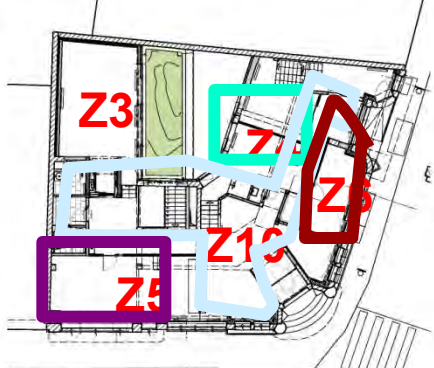




**Avec auvent  
et débords  
Met luifel  
en uitkraging**

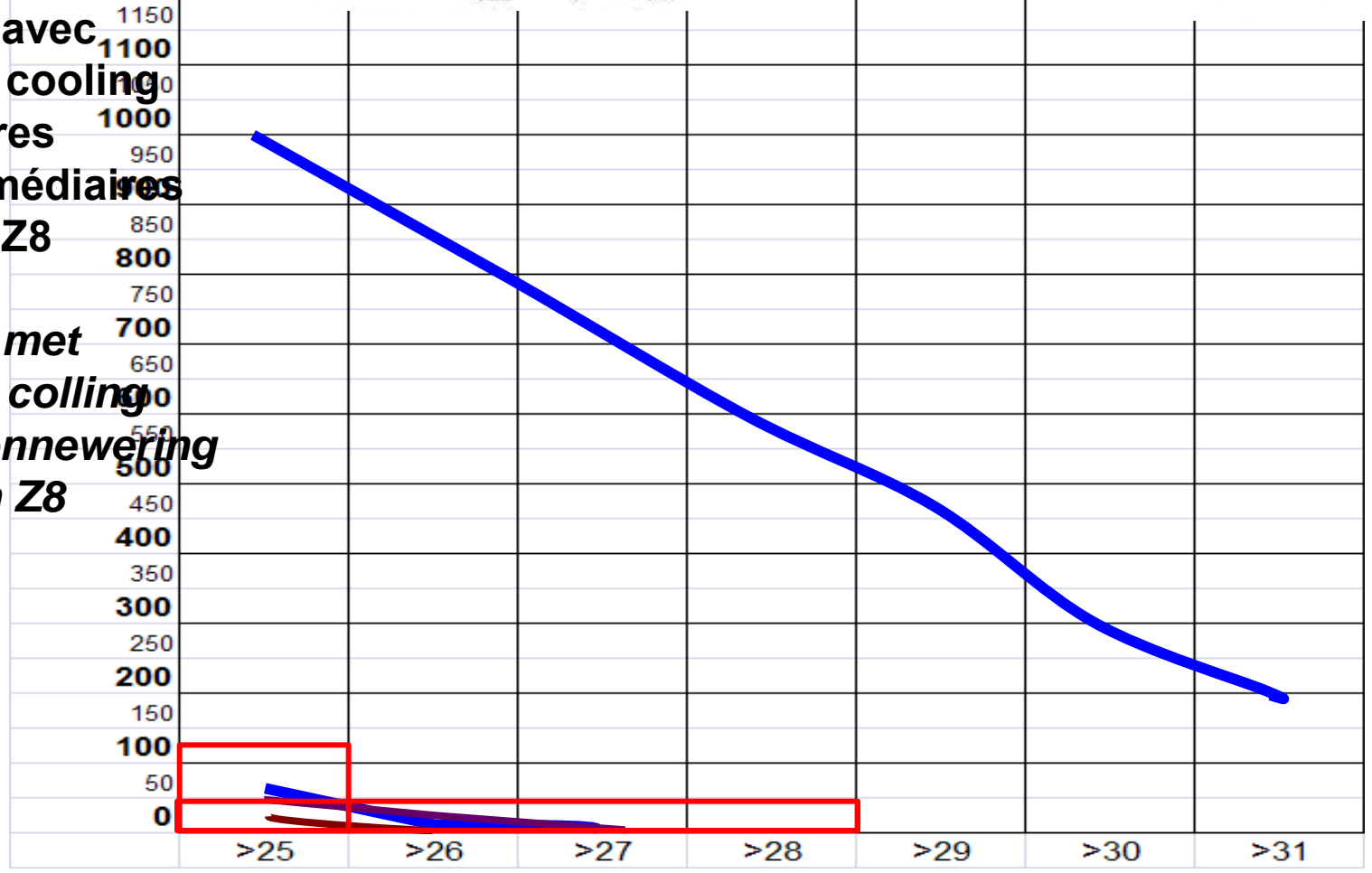


- zone1
- zone2
- zone3
- zone4
- zone5
- zone6
- zone7
- zone8
- zone9
- zone10



**Idem avec  
night cooling  
+ stores  
Intermédiaires  
Z7 et Z8**

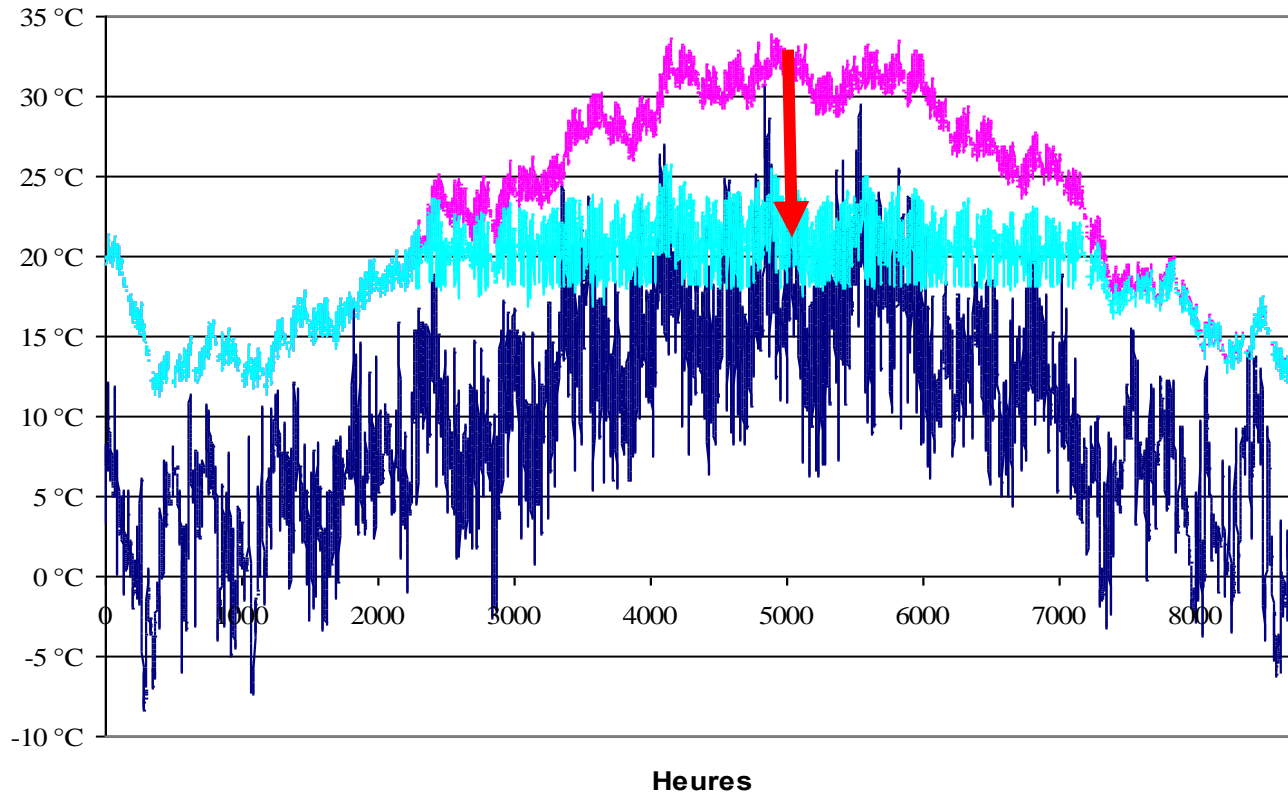
**Idem met  
night colling  
en zonnewering  
Z7 en Z8**



- zone1
- zone2
- zone3
- zone4
- zone5
- zone6
- zone7
- zone8
- zone9
- zone10



**A 2 M** rayonnement solaire, de charges internes basées sur une occupation moyenne du bâtiment et d'une gestion idéale de la ventilation nocturne (5 volumes par heure dès besoin).

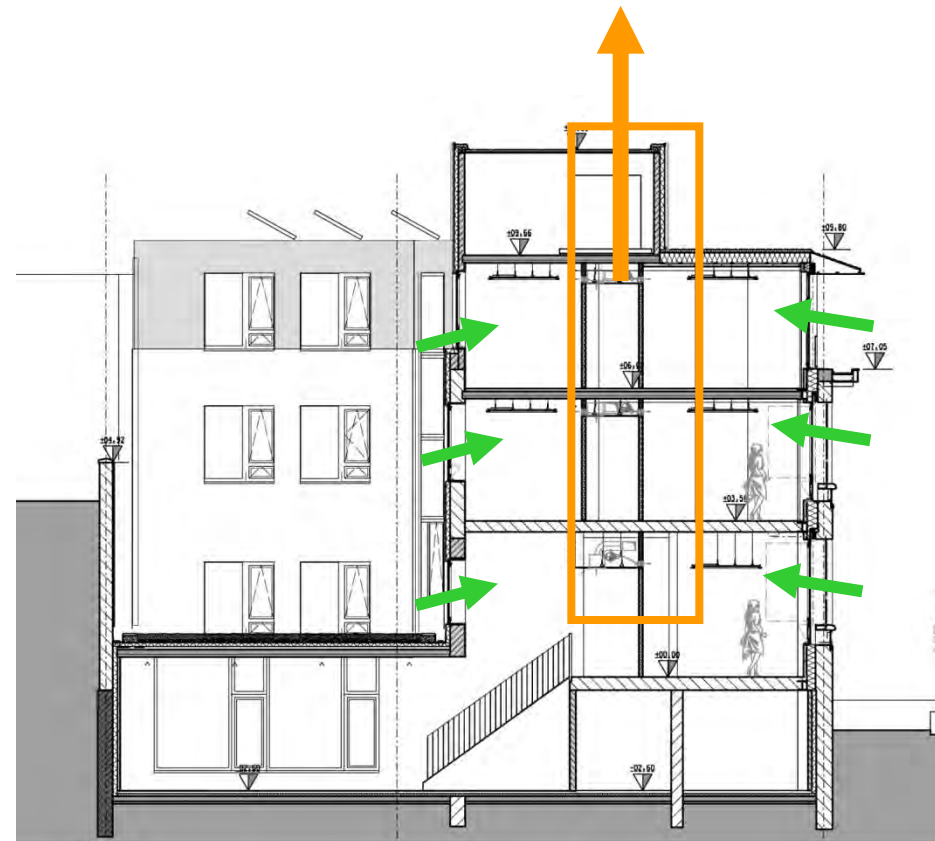
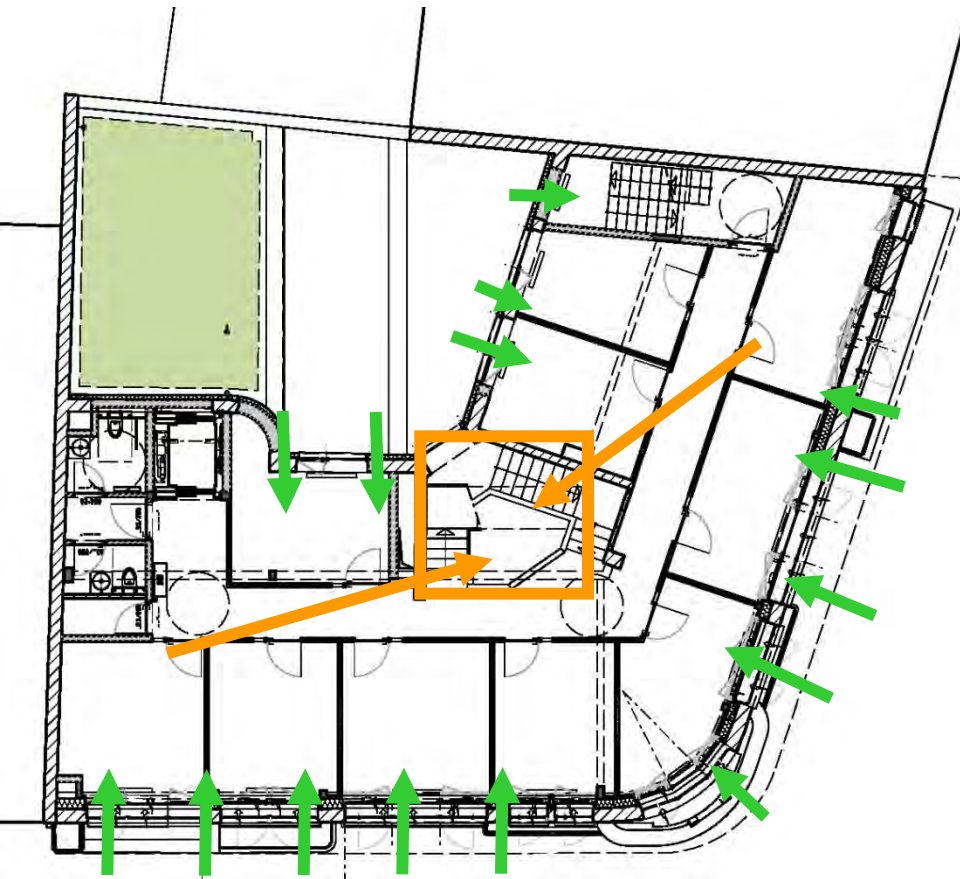


Température moyenne sans rafraîchissement nocturne  
Température extérieure  
Température moyenne ave

### Confort

**Max. 5% office hours > 25°C      => de 1 000 h/an à 45 h/an**

**Max. 1% office hours > 28°C      => de 500 h/an à 0 h/an**



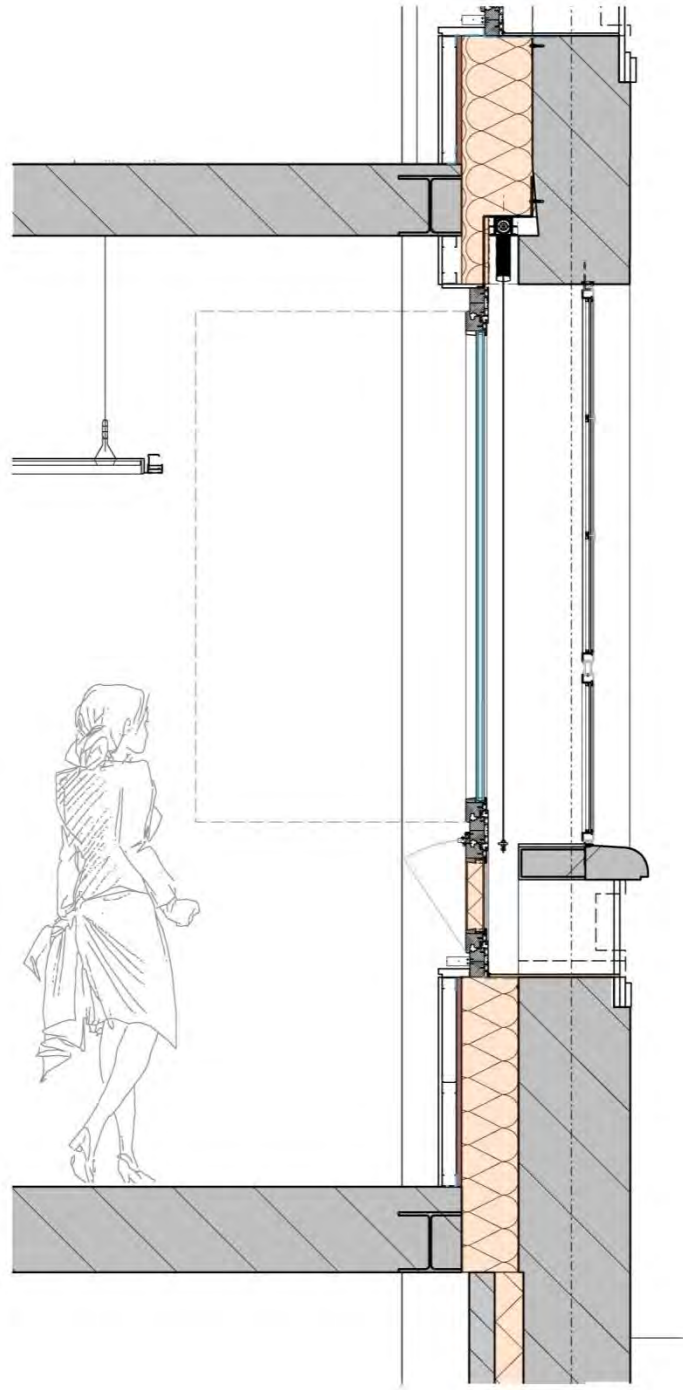
## Stratégie passive refroidissement

### *Passive koeling strategie*

- Night cooling et éventuellement (Refroidissement adiabatique )
- *Night ventilation en event adiabatische koeling*



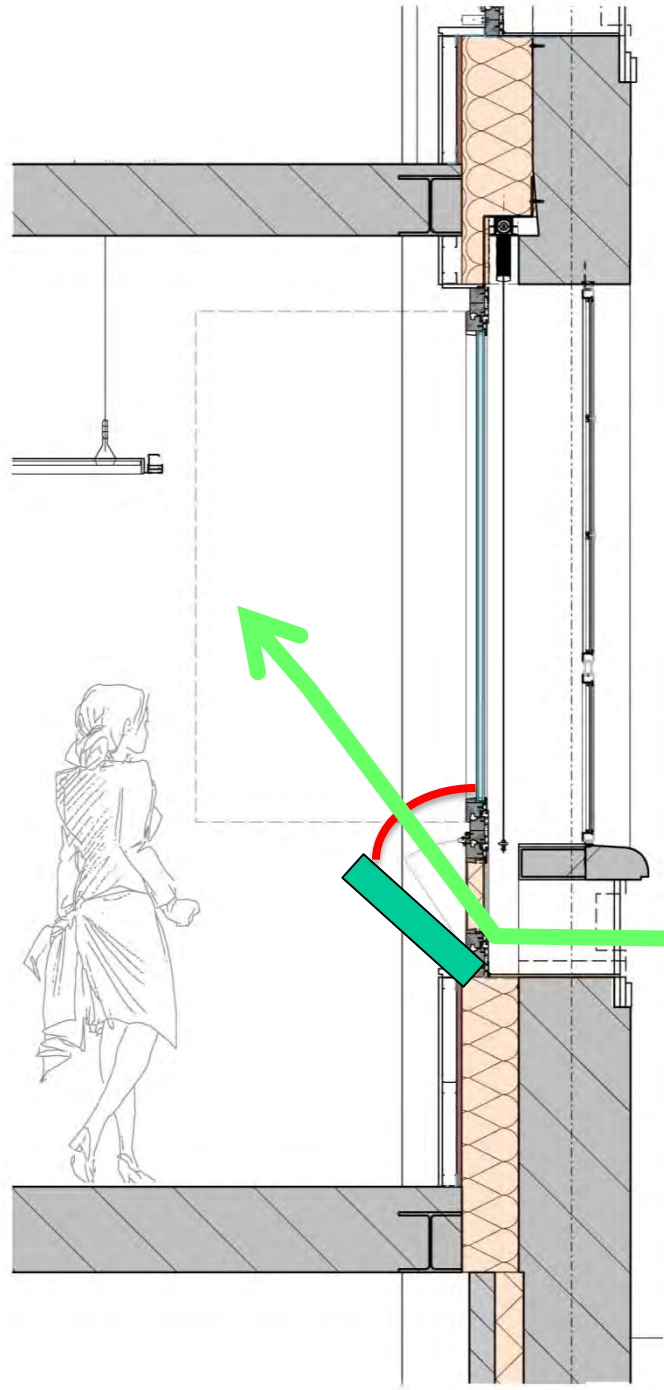
A 2 M



# Détail ventilation de nuit



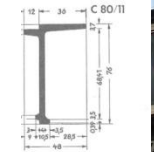
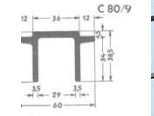
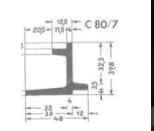
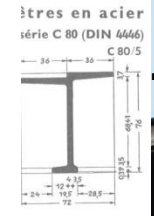
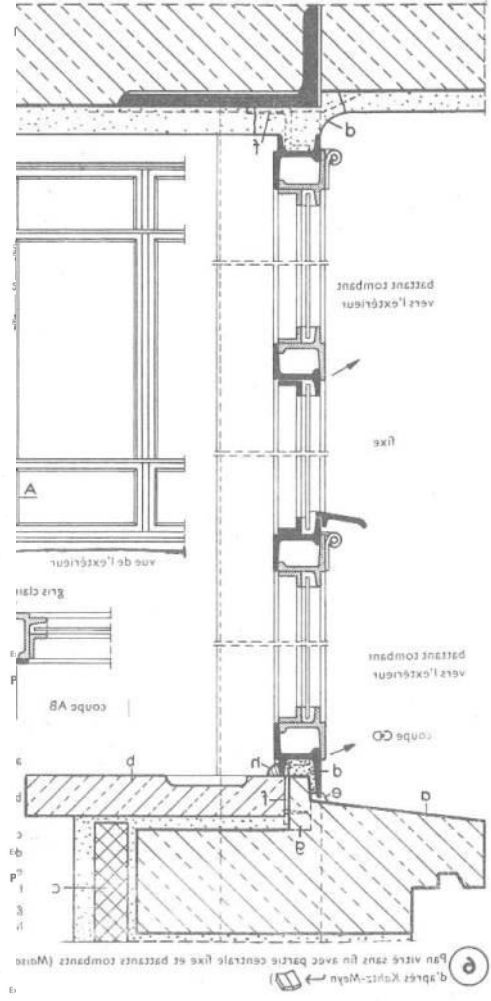
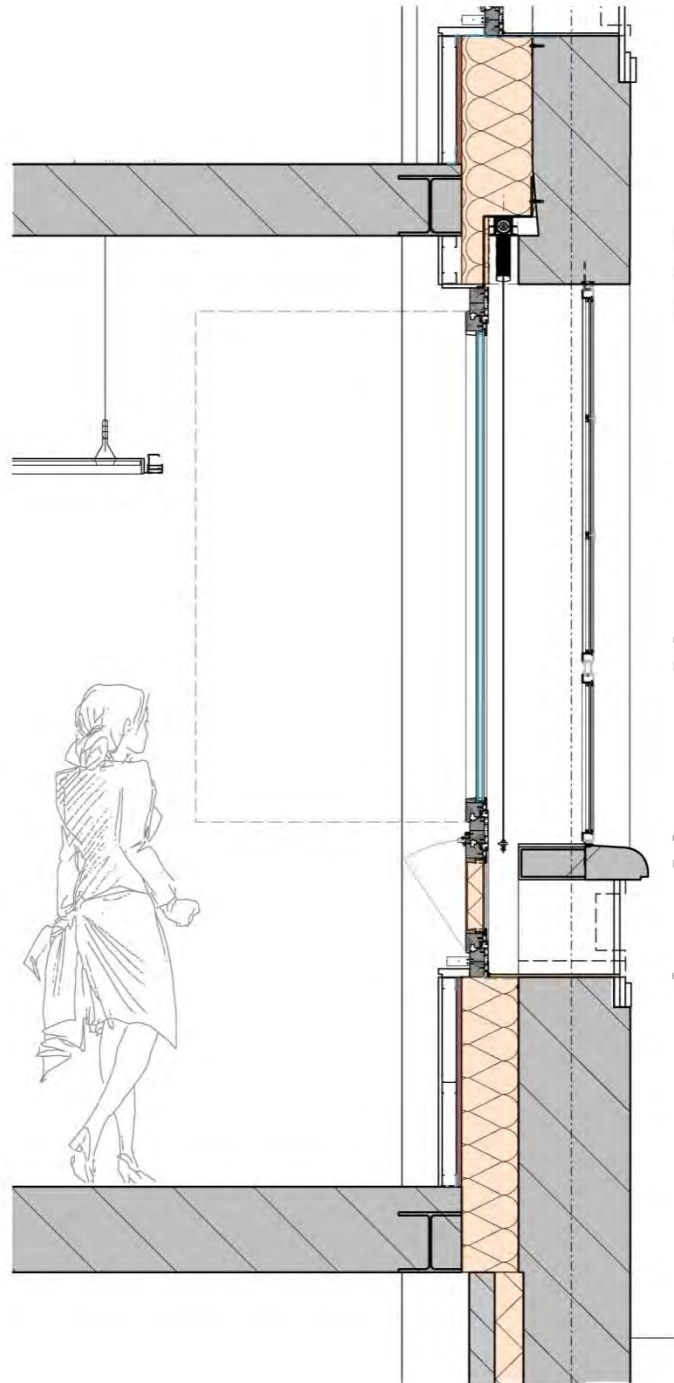
A 2 M



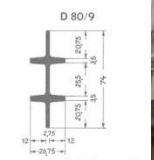
# Détail ventilation de nuit





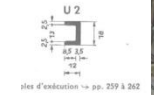


Exemple d'exécution -> p. 261



Exemple d'exécution -> p. 261

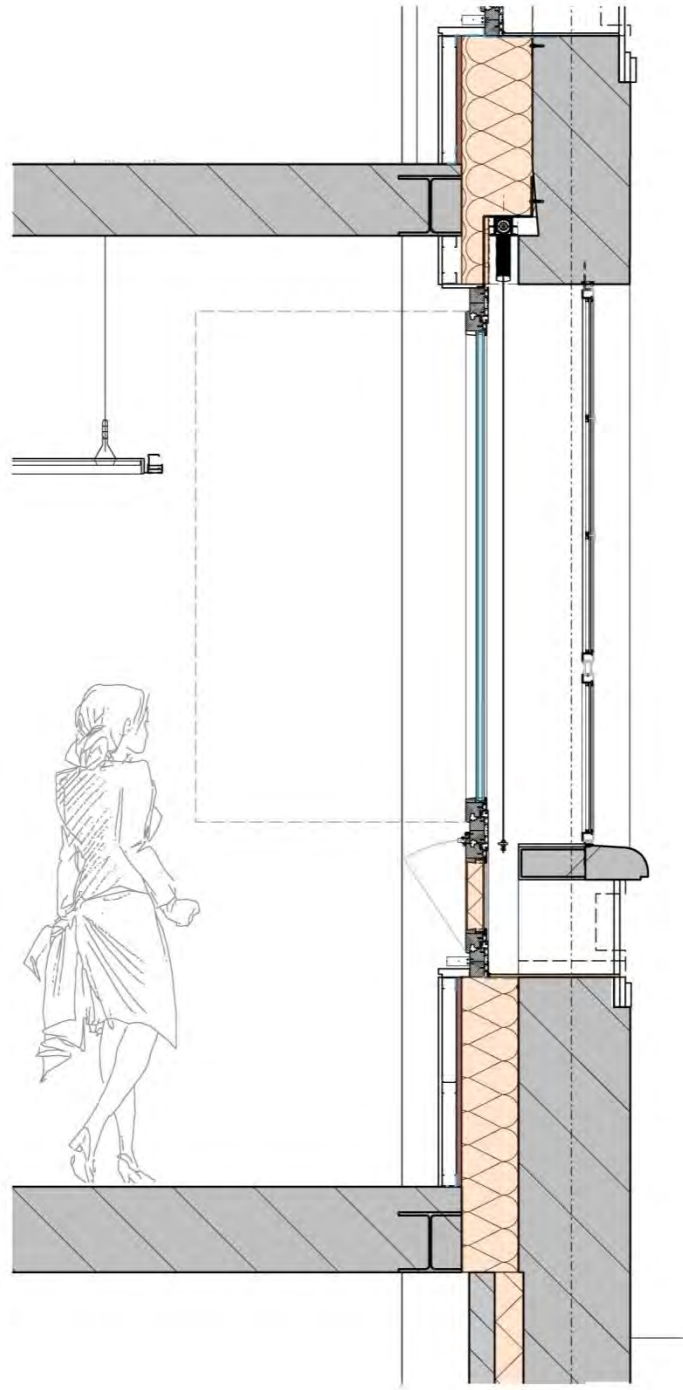
série U (DIN 4649)



Exemple d'exécution -> pp. 259 à 262



A 2 M



# Détail ventilation de nuit

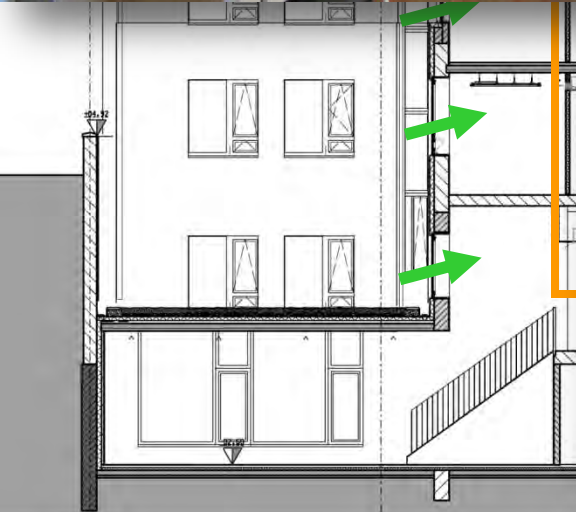




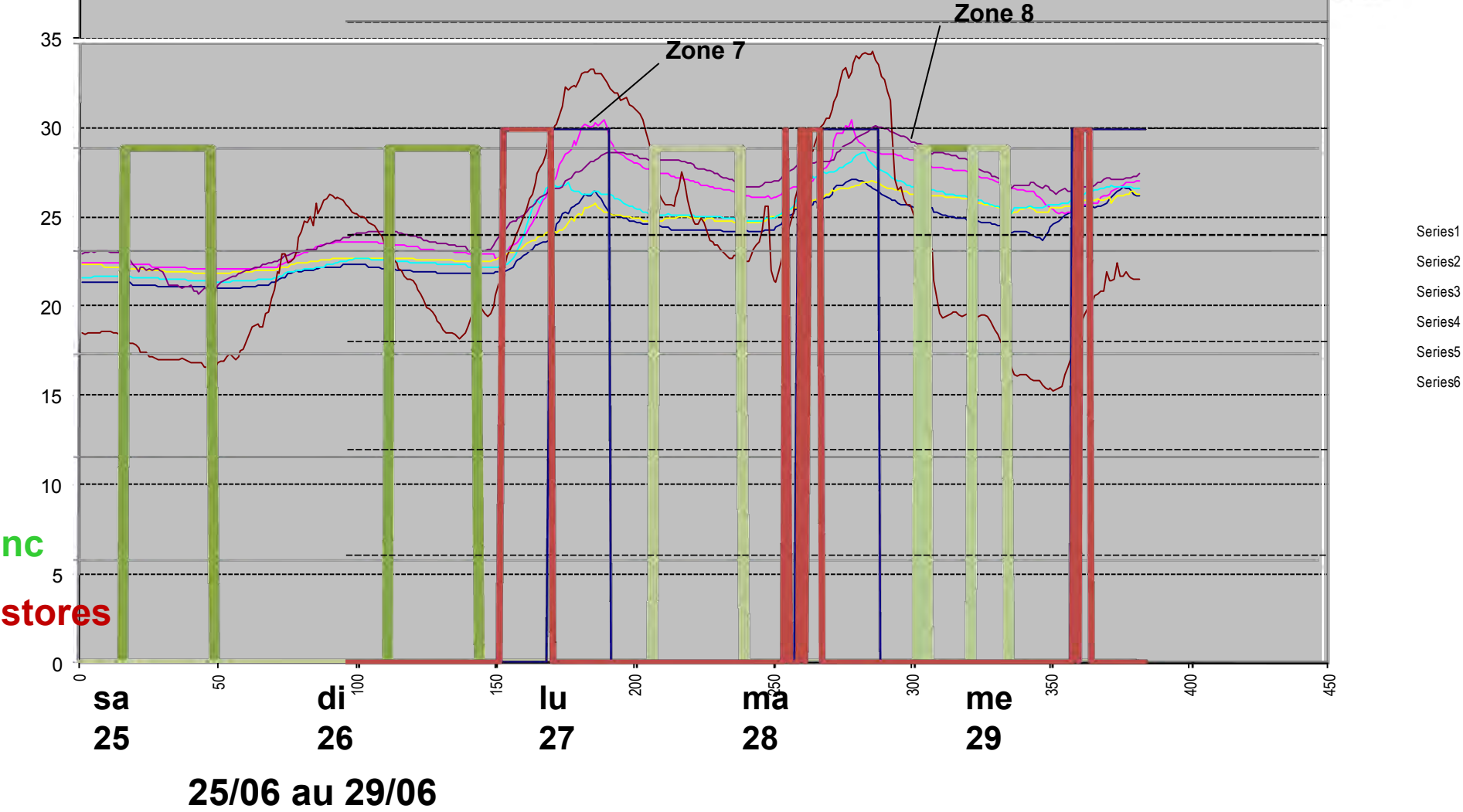
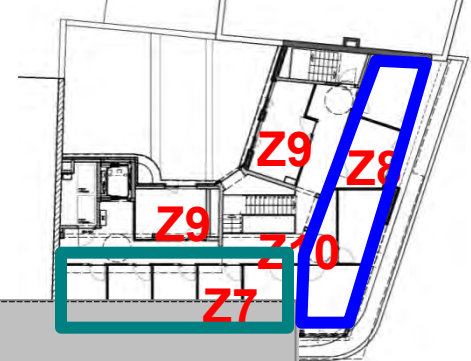
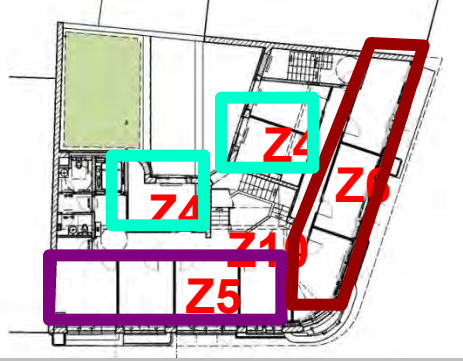
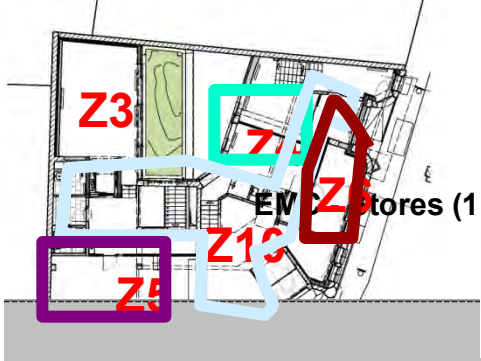


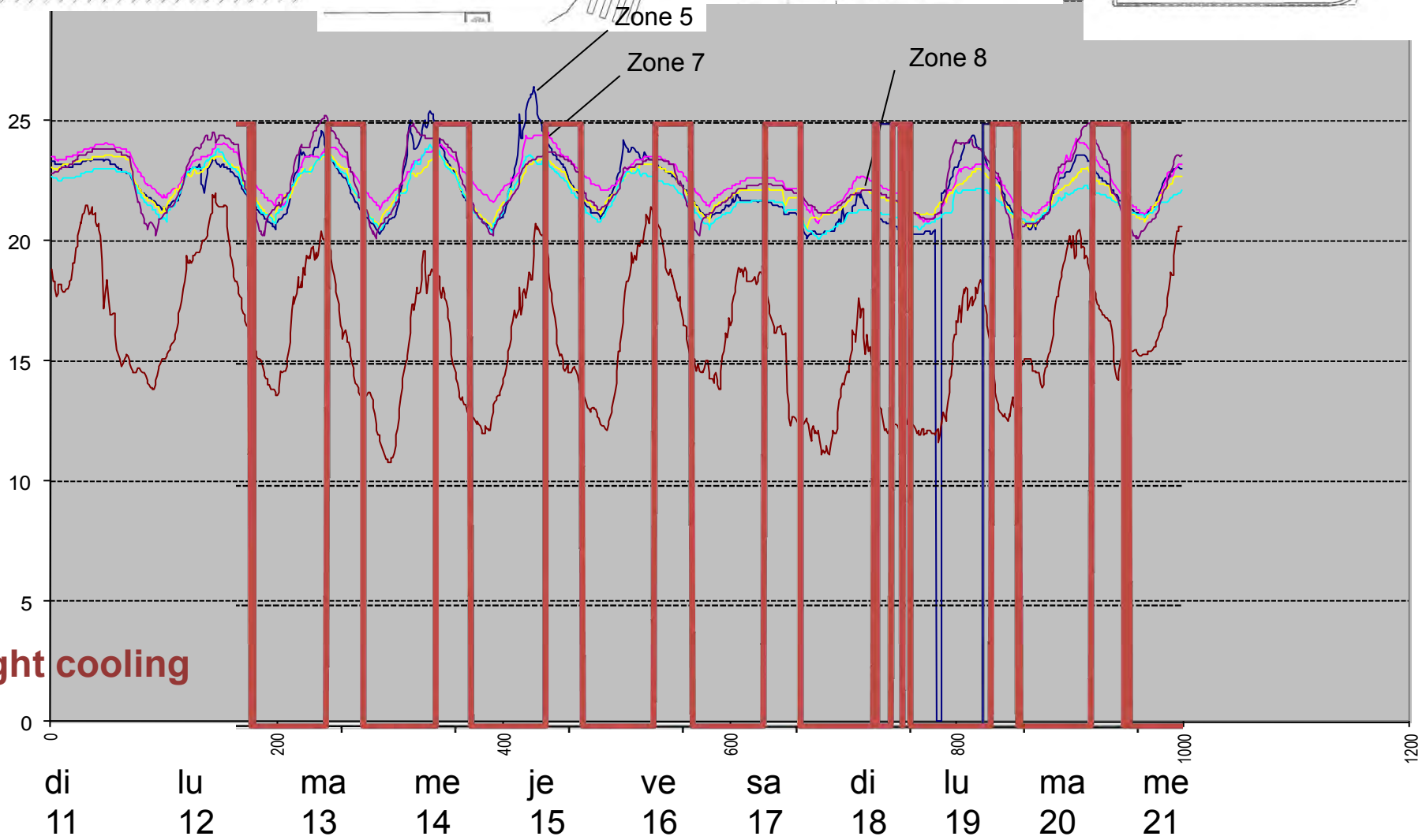
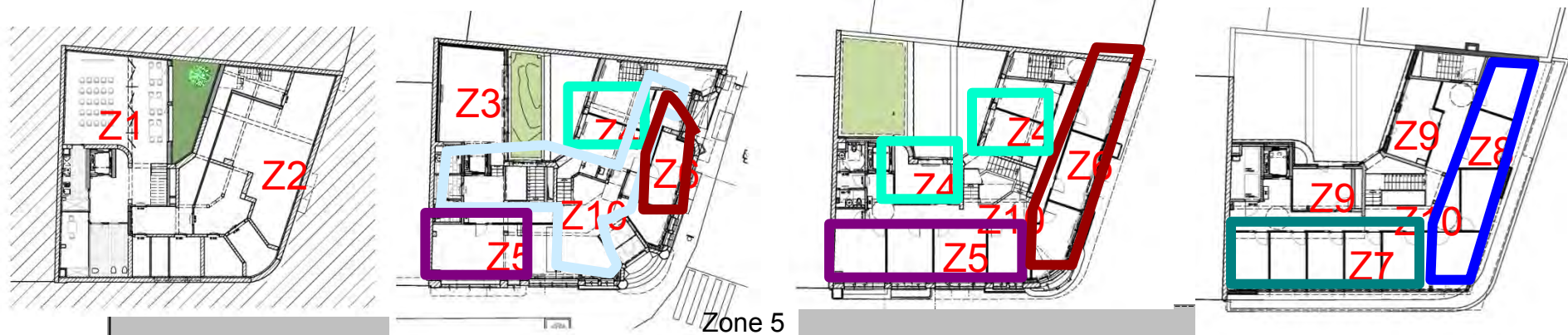
de nuit











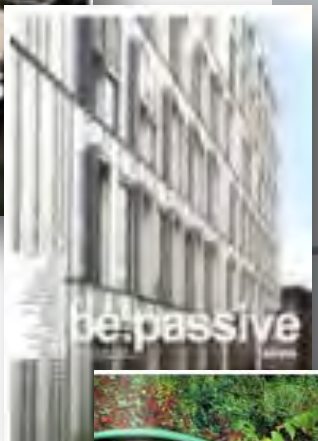






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# be passive



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I never *think* about the *future*  
it comes soon enough.

Albert Einstein



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