

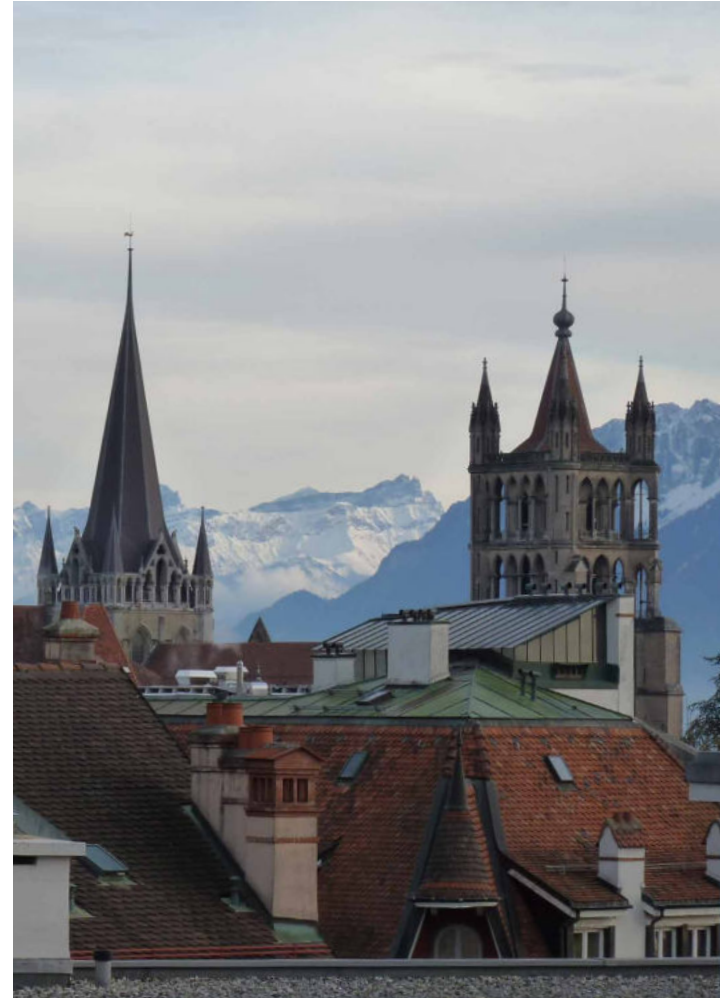
Different scenarios of energy renovation and their returns in the city of Lausanne

MAS EPFL

Expertise dans l'immobilier
2018 - 2022

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Swiss Real Estate Institute, Zurich
Best of research
23 nov. 23



Personal presentation



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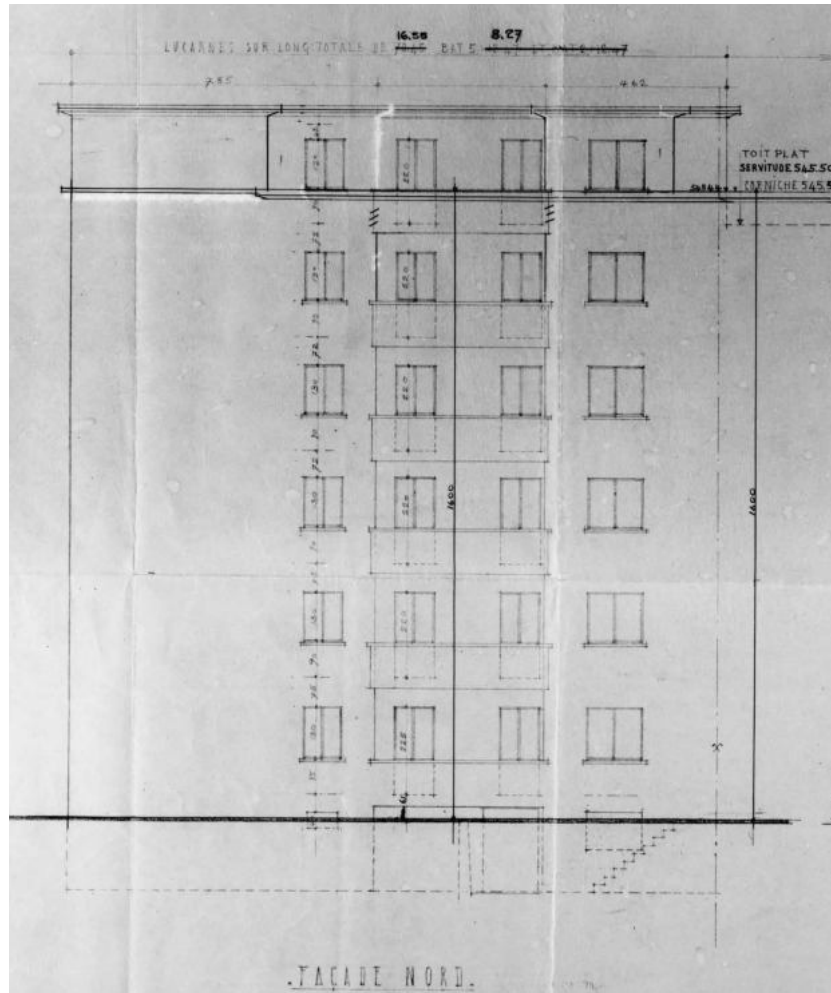
DOM
architectes associés

From 2018: associate

DOM architectes associés, dom-aa Sàrl
Galerie Saint-François, porte B, Lausanne :

- Planning and monitoring of maintenance of existing buildings
- Transformation and restoration of existing buildings and monuments
- Expertise in construction pathologies

1930's residential building with 18 appartements: which is the best renovation?



Structure of the analysis and comparison of scenarios

1. Analysis of the physical condition of the building and of his heritage qualities

2. Legal analysis of the legislations relating to the protection of the built heritage and concerning energy in the building

3. Economic and socio-economic analysis

4. Three scenarios of renovation

5. Comparison of the three scenarios and selection of the best scenario



1. Analysis of the physical condition of the building and of his heritage qualities

Overall state of health:

(a) - good condition

(b) - slight degradation

(c) - medium degradation

(d) - total degradation

Degree of urgency :

(1) - urgent

(2) - short term (1 to 3 years)

(3) - medium term, (3 to 10 years)

(4) - long term, (more than 10 years)

État physique du bâtiment

Vétusté

Sous-sols
14 - Evacuation EC EU au sous-sol

Diagnostic et interventions

Type:
Evacuation EC EU

Description:
Évacuations EC du toit et des balcons, en PVC, raccordé au sol à conduits métallique qui datent de la construction de l'immeuble (A). Évacuations EU en PVC avec portillon de regard (B). Grilles métalliques d'évacuation au sol (C).

Etat de dégradation: **a b (c) d**
Les tubes en PVC sont en bon état. Les raccords à la dalle ne sont pas réalisés correctement, et avec matériel non conforme. L'évacuation des EC, au sol, ne se fait pas correctement, les anciennes conduites seraient bouchés ou percés (A). Carbonation rayonnant autour du conduit EU (B) au sol et au mur, ce qui laisse imaginer la présence de fuites. Grilles au sol oxydées mais apparemment pas bouchées (C).

Travaux nécessaires: **(1) 2 3 4**
Planifier avec un ingénieur sanitaire des sondages caméra aux conduites EC et EU pour déterminer ou confirmer la cause des dégradations constatées. Un projet ad hoc sera rédigé sur la base des résultats des sondages.
Voir également les fiches d'obsolescence, protection incendie (ref. 3.3 - A), dangers naturels, substances nocives (ref. 3.3 - E).

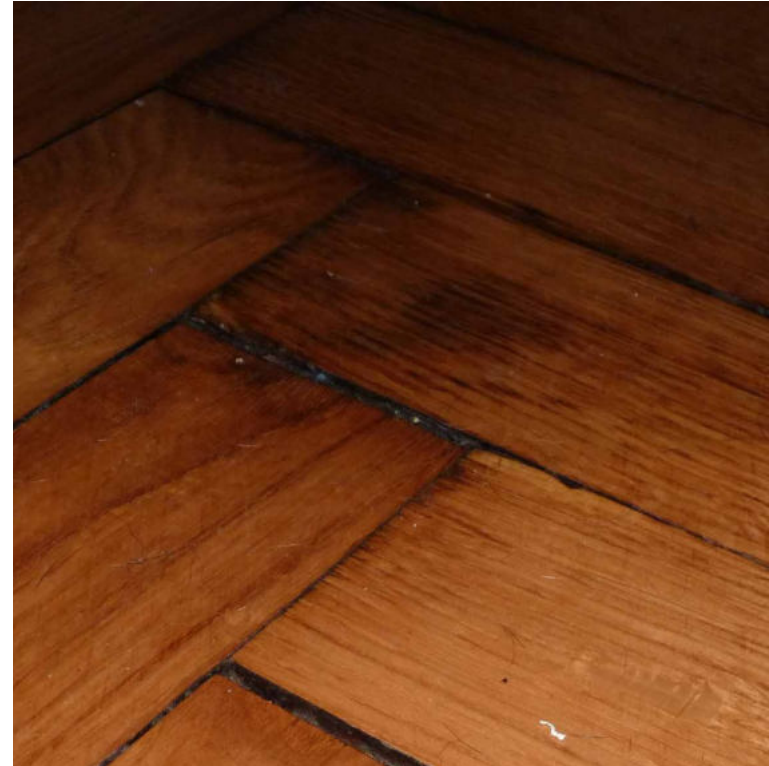
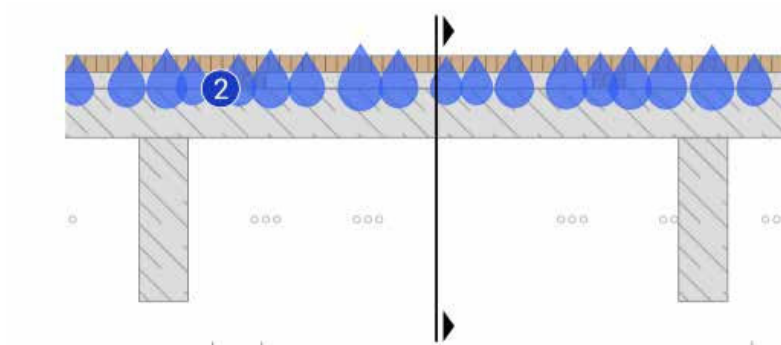


1. Analysis of the physical condition of the building and of his heritage qualities



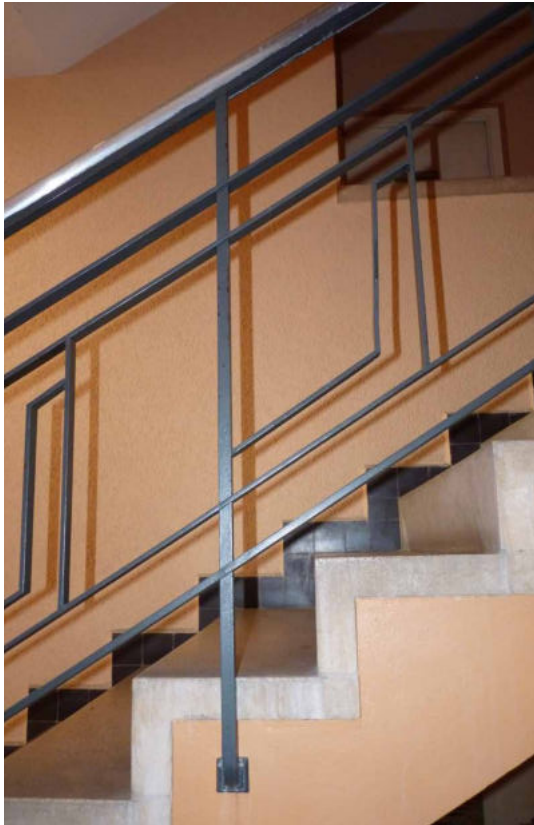
Example of window examined from the outside.
Warm air (yellow) exits through the blind boxes producing significant heat loss.

1. Analysis of the physical condition of the building and of his heritage qualities

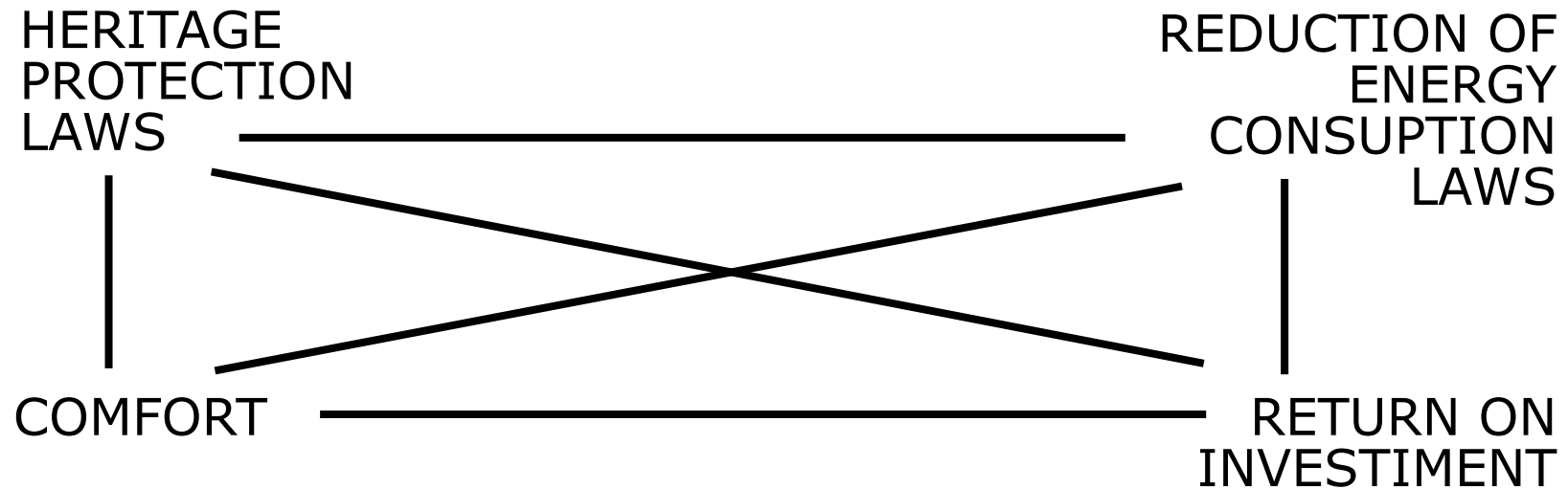


Floor between the cellars and the ground floor apartments.
Example of condensation and mold.

1. Analysis of the physical condition of the building and of his heritage qualities



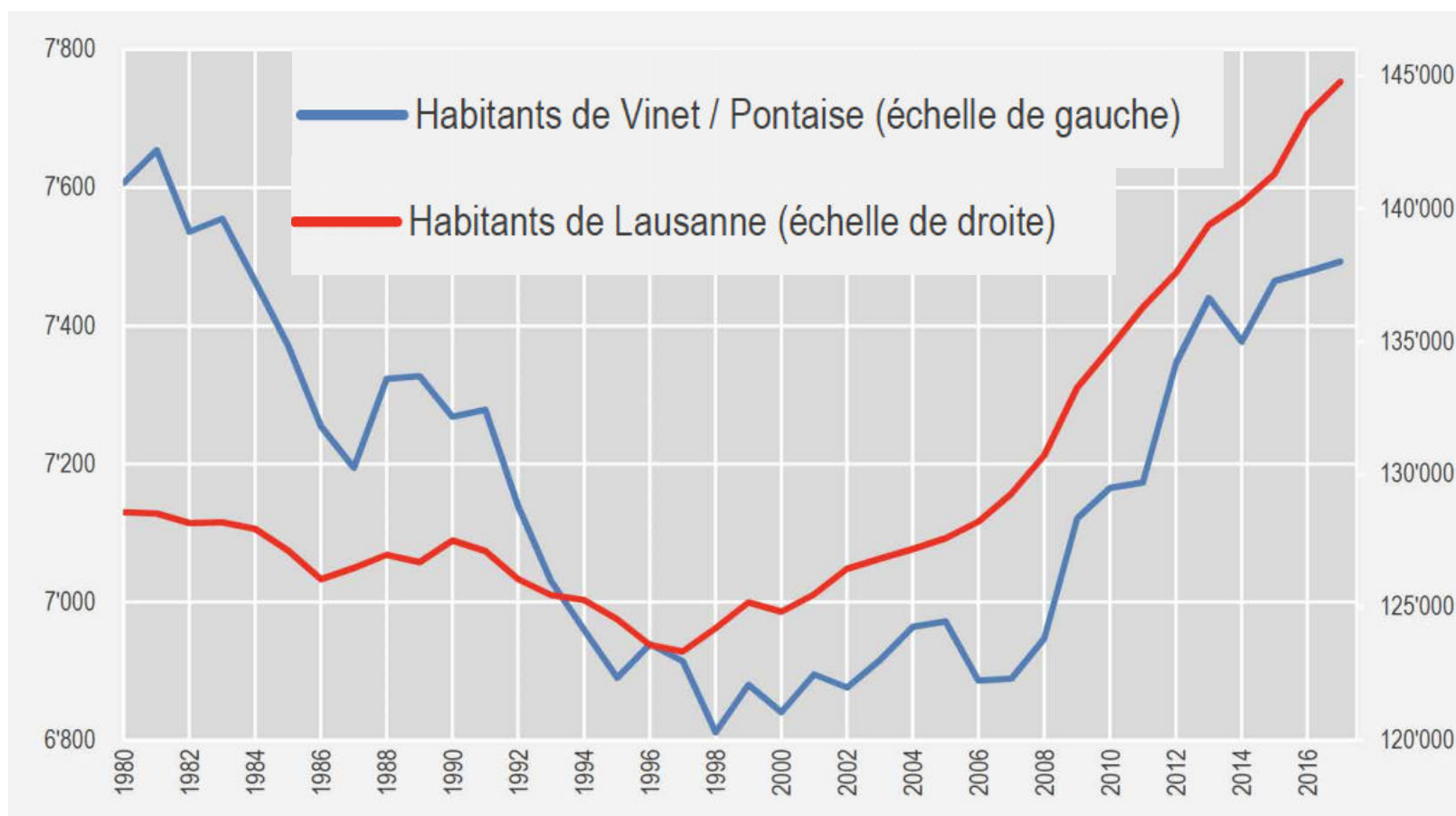
2. Legal analysis of the legislations : protection of the built heritage and energy in the building



3 CASE STUDIES :

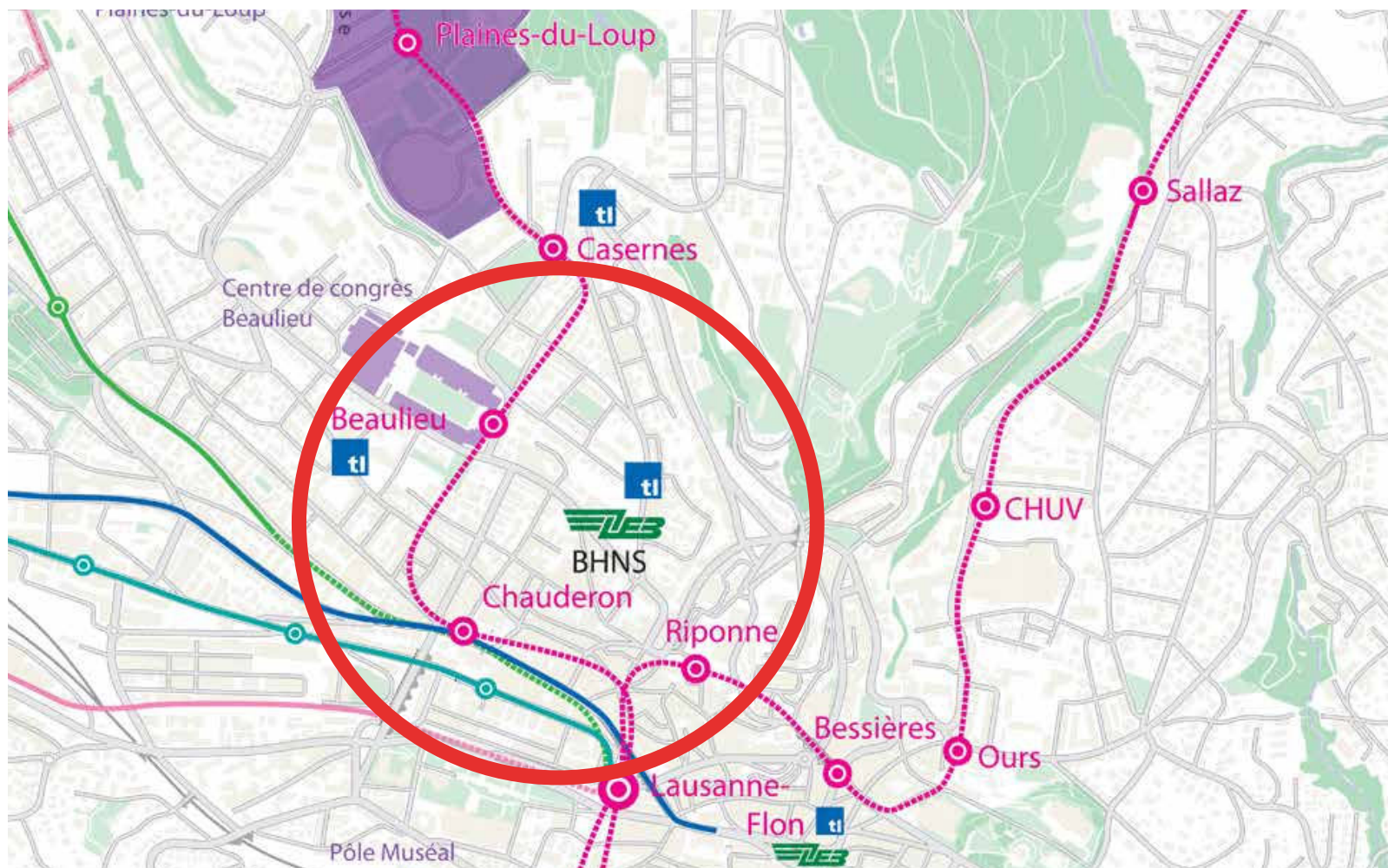
- > CONFLICT BETWEEN ISSUES ?**
- > POSSIBLE WIN-WIN SOLUTION ?**

3. Economic and socio-economic analysis



Increasing of inhabitants in Pontaise neighborhood et in Lausanne between 1980 and 2018. (www.lausanne.ch/statistiques, 2018)

3. Economic and socio-economic analysis

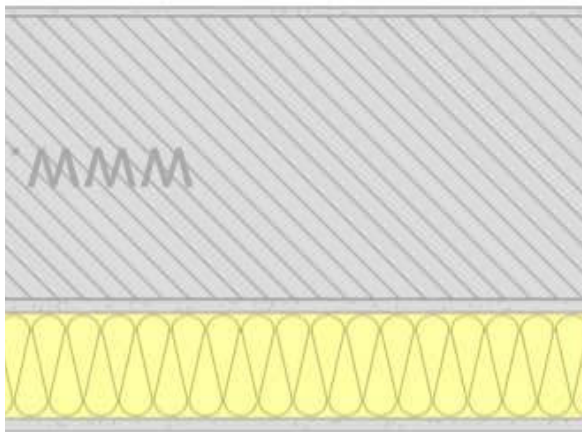


4. Three scenarios of renovation

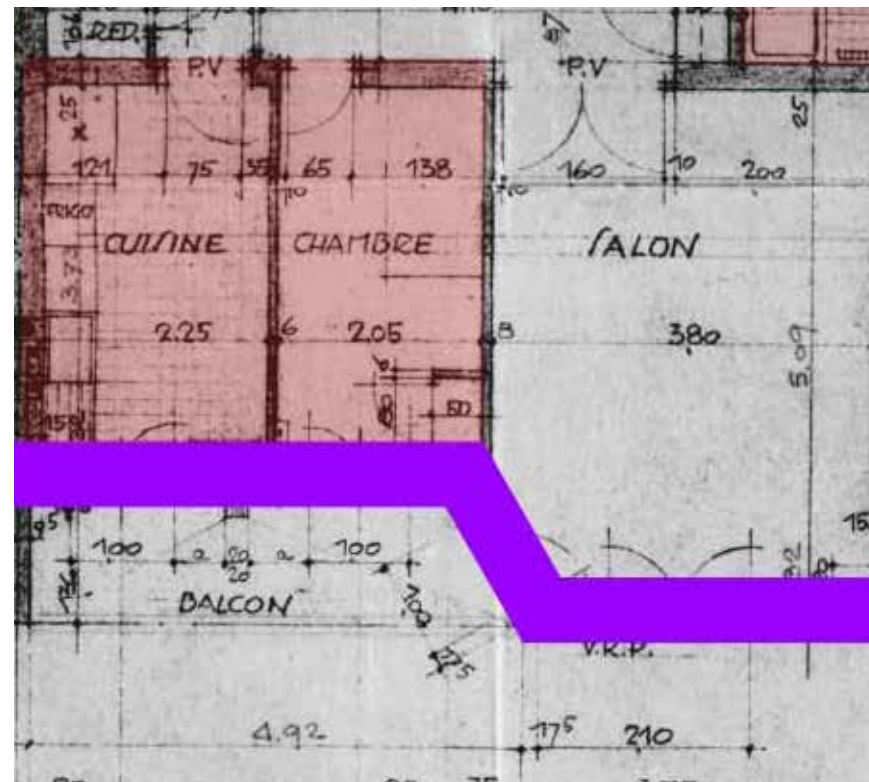
Scenario 1 : ENERGY **Improving the building's thermal envelope**

Global external insulation: 12 cm

int.



ext.



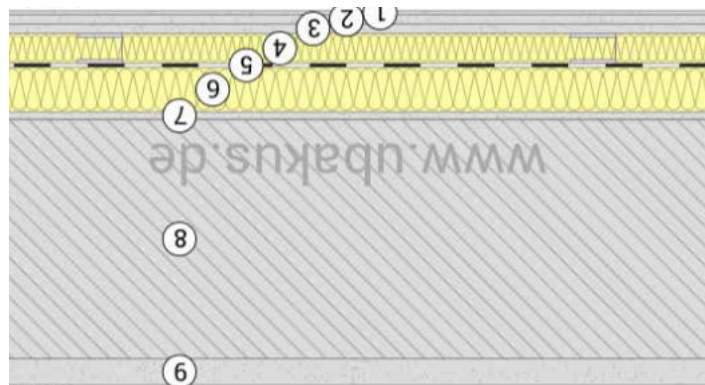
4. Three scenarios of renovation

Scenario 2 : ENERGY + HERITAGE

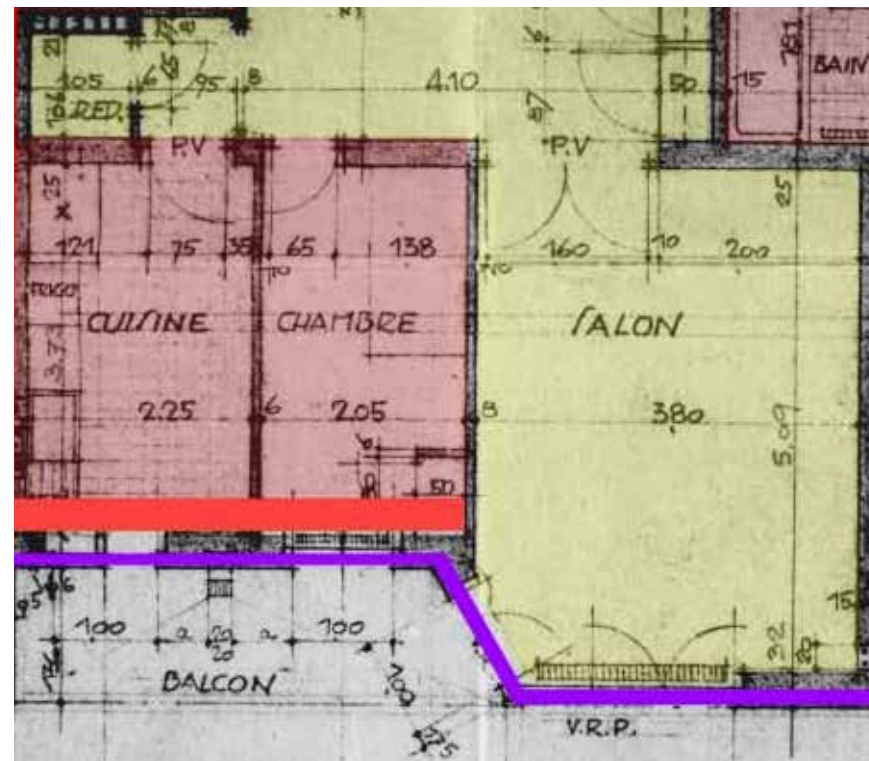
Improving the building's thermal envelope taking in account the building's heritage qualities

Global external insulation : 4 cm
Ponctual intern insulation: 10 cm

int.



ext.



4. Three scenarios of renovation

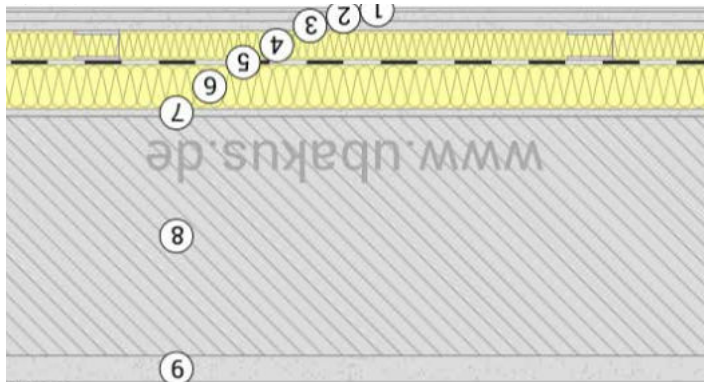
Scenario 3 : ENERGY + HERITAGE + COMFORT

Improving the building's thermal envelope taking in account the building's heritage qualities and a general improvement in users comfort

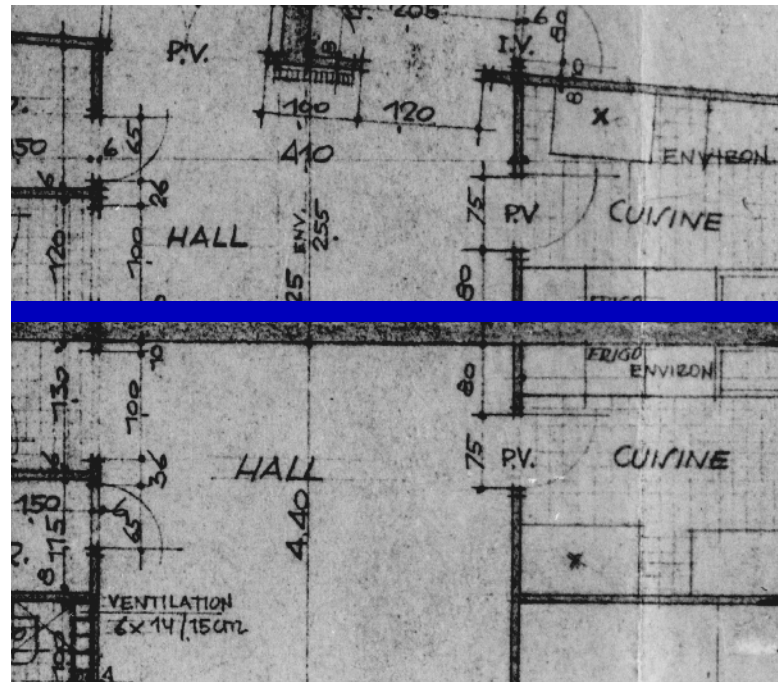
Global external insulation : 4 cm
Ponctual intern insulation: 10 cm

+

Sound insulation between apartments
int.



ext.



5. Comparison of the three scenarios leading to recommendations and selection of the best scenario

Case study building: rent increase after renovation

Scenario	1	3	1
Renovation cost	3'200'000 CHF	4'100'000 CHF	4'600'000 CHF
Rent increase / year	71'300 CHF	91'350 CHF	102'500 CHF
Gross return	2,2 %	2,1 %	2,2 %

5. Comparison of the three scenarios leading to recommendations and selection of the best scenario

Analysis, rental flats in Lausanne, comparison with case study building :

Adresse	Surf de locat.(m2)	Pièces	L brut (bailleur)	L brut/m2	L brut (bailleur)	L brut/m2
			1 mois	1 mois	1 an	1 an
1 Rue Centrale 25, Lausanne	78	3	1 720 CHF	22 CHF		
2 Boissonnet 76, Lausanne	86	3	1 940 CHF	23 CHF		
3 Rue de l'industrie 9, Lausanne	62	3	1 430 CHF	23 CHF		
4 Rue Saint-François 2, Lausanne	118	3,5	2 950 CHF	25 CHF		
5 Avenue de Sévelin 13D, Lausanne	60	2,5	1 530 CHF	26 CHF		
6 Rue Bellefontaine 2, Lausanne	95	3	2 825 CHF	30 CHF		

March 2020, homegate.ch, immoscout24.ch

<i>Building</i>	<i>Gross rent (chf/m2/year)</i>
Case study, current state.....	235
Case study, scenario 1.....	287
Case study, scenario 2.....	302
Case study, scenario 3.....	310
New/renovated flats, intermediate standard (1,2,3).....	271
New/renovated flats, superior standard (4,5,6).....	321

5. Comparison of the three scenarios leading to recommendations and selection of the best scenario

Analysis of the three scenarios by internal rate of return: scenario 3 is the best choice

Analysis of the three scenarios by discounted cash flow

	Renovation costs	Current value (VA)
Scenario 1	3'200'000 CHF	6'000'000 CHF
Scenario 2	4'100'000 CHF	5'100'000 CHF
Scenario 3	4'600'000 CHF	6'200'000 CHF

Comparisons between scenarios

	Current value	IRR (Internal rate of return)
Scenario 3 - scenario 1	185'000 CHF	3,8%
Scenario 3 - scenario 2	1'130'000 CHF	8,1%

(actual discounted cash flow rate: 3,5%)

5. Comparison of the three scenarios leading to recommendations and selection of the best scenario

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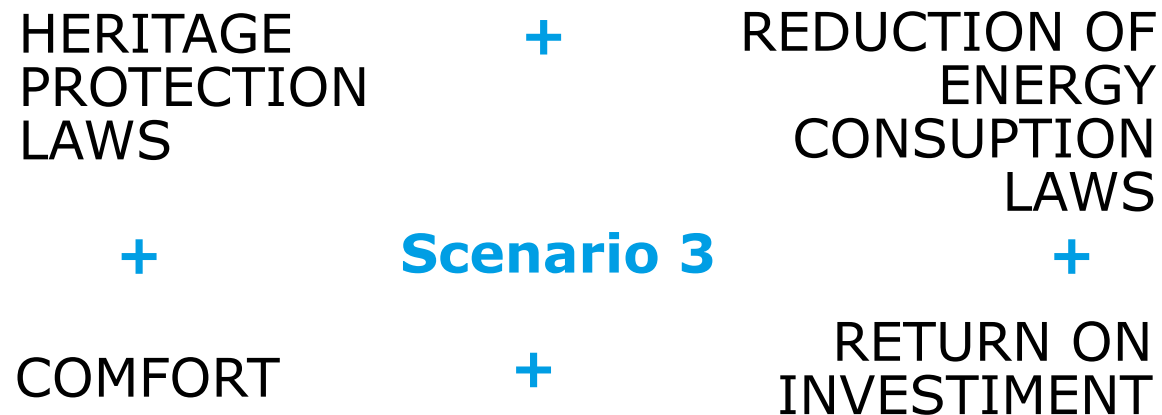


5. Comparison of the three scenarios leading to recommendations and selection of the best scenario

Selection of the best scenario :

**The third scenario is the most interesting:
NOT THE CHEAPEST BUT THE MOST COMPLETE ONE!**

The choice of the third scenario brings together all the qualities of a high-performance renovation design, the valuation of the building's heritage qualities, the attractiveness of the investment for the owner and a consistent level of comfort for tenants.



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THANK YOU

