THE OCCURRENCE OF LIGHT WELLS IN CROATIAN RESIDENTIAL ARCHITECTURE

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Abstract

The term light well, better known in Croatian language by its German term "lichthof" is defined as a space within a building serving to bring air and light to rooms surrounding it.

In the Croatian residential architecture they first appeared at the turn of the 19/20th century due to the great building depths where entrance halls and some service rooms had to be orientated to light wells. The Zagreb Building Regulations stipulated the number, size and light well characteristics.

The examples of this type of residential buildings dating from the beginning of 20th century in Zagreb (Croatia) show a whole array of plan types.

The Italian examples from the same period show the whole richness of this typology used in very luxurious apartments.

At the end of the 1950s this type at least in Croatia disappeared due to the small building depths as well as to the allowed use of artificial ventilation and illumination in some dwelling parts (corridors, bathrooms, toilets).

But at the beginning of this century especially in the POS projects (State subsidized housing) this type reappeared as an answer to the great building depths but this time of inadequate dimensions and with too many rooms orientated to it. It appeared as a sign of the time and of its values.

Today this negative space (not saleable) is reduced to the minimum and is degraded and as well degrading the spaces that caused its reappearance

1 Introduction

The term light well, better known in Croatian language by its German term "lichthof", is defined as a space within a building serving to bring air and light to rooms surrounding it. If the building plan could be seen as a positive space then a light well would be a negative or a hole but not a "dark hole" but as suggested by its name a space of light.

In the Croatian residential architecture light wells first appeared at the turn of the 19/20th century due to the great building depths where entrance halls and some service rooms had to be orientated to light wells. The Zagreb Building Regulations stipulated the number, size and light well characteristics. This

building type could be built using usual structural systems. It was more expensive than the building without "holes" but due to micro-climate created by heated light well walls cheaper than the type with court wings that had greater heat losses.



Figure 1: Plan – Prilaz 66, Zagreb

2 The building regulations in Croatia at the beginning of the 20th century

The Building Regulation for the Land capital Zagreb from 1902 stipulated that the residential houses courtyards should be large enough and where needed the light wells should be incorporated.

From 1896 the minimal courtyard size was stipulated to at least 25% of the building site area in the unbuilt part of the town and 20% in the already built part and at least 15% for the corner site. The shortest side was to be min. 6m with the ratio of building courtyard width to its height 1:1 in the unbuilt part, and 2:3 in the town centre.

The 1894 regulations set the light well minimal dimensions depending on the type of rooms: for the day lighting and airing of main rooms minimum 12m2, for the day lighting of corridors, pantries and bathrooms min.6m2 and for airing of toilets min. 3m2.

Residential buildings without courtyards could be exceptionally built in already built part of the town under condition that all main habitable rooms should get light and air from the street or square and ancillary rooms from adequately dimensioned light wells.

The adequate day lighting and airing via light wells was secured by the regulations that residential buildings should be maximum four-storey high.

Type of regulations	valid on the date	valid on the date
Construction regulations		
Brick size	29x14x6.5cm	25x12x6.5cm
Reinforced concrete	German regulations	German regulations
	for reinforced concrete	for r.c.from 1932
Load bearing brick walls width	45cm	38cm
on top floors		
Basement floor construction	massive	
Bathroom floor construction	not regulated massive	
Staircase floor construction	massive	
Minimum staircase width	1,28m	1,1mgrowing in
		10cm in lower floors
roof type	gable roof, mono-pitch on the street	
gable roof	mono-pitch on the street	
roof construction type	separated from the ceiling	
roof covering	tiles, sheet, roofing felt	
minimum window width	0,96m	
minimum window height	1,60m	
distance between window axes	between 2,24m and 3,20m	
Hygienic regulations		
Dwelling clear height	not regulated	2,80m
		3,00m ground floor
basement dwellings	3,00m	2,50m
clear height		
attic dwellings	2,75m	2,50m
clear height		
min.room area	15-18m2	
min. maid room area	<u>5m2</u>	
main rooms light well area	12m2	
corridor, toilet and pantry light	6m2	
well area		
maximum number of	2 one-,two-,three room flats or 1 four-room and more	
dwellings/per 1 toilet		
~	Regulation rules	
max. floor number	ground floor plus 3 floors	ground floor plus 5 floors with exceptions allowed
min ground floor distance	48-64cm	
from the street level		
min courtyard length	6,00m	
courtyard area to site area ratio	25%	
in town unbuilt part		
courtyard area to site area ratio	20%	
in town built part		
courtyard area to site area ratio	15	·····
for corner building		

The examples of this type of residential buildings dating from the beginning of 20th century in Zagreb (Croatia) show a whole array of plan types:

from the one with light well shared by two buildings,



Figure 2: in-built rental residential building in Bogoviceva st., Zagreb, by architect S. Lowy from 1932.

the one with large lightwell inside big flat,



Figure 3: in-built rental house in Kneza Borne st.12, Zagreb, by architects S.Gombos and M. Kauzlaric from 1933.



to one shared by two flats in the same building.

Figure 4: rental house, Dolac 8, Zagreb, by architect Z.Vrkljan, from 1929.



Figure 5: rental house, Draskoviceva st. 53, Zagreb, by architects Z.Neumann and V.Potocnjak, from 1930.

The Italian examples from the same period show the whole richness of this typology used in very luxurious apartments.



Figure 6: Point block residential building, Rome, architect U. Luccichenti



Figure 7: Point block residential building, Rome, architect M. Castellazzi

At the end of the 1950s this building type disappeared at least in Croatia due to small building depths as well as to the allowed use of artificial ventilation and illumination in some dwelling parts (corridors, bathrooms, and toilets) leaving these parts without sun and air.

Typology of residential buildings with lintels like any other housing typology is not conditioned by time but the adequacy of any residential typology lies in the appropriate approach, in the answer to a given task. In his book "Tenament buildings" architect G.Knezevic states :"The main dilemmas of the residential construction lies not in its typology (in this case it would be simple) but in disbalance of necessary and important, in the contradiction of needs and wishes on one side and adequate financial means on the other side, as well as in other circumstances." [1]

3 Realizations: POS - State subsidized housing model in Croatia

But at the beginning of this century especially in the POS projects (State subsidized housing) the use of light wells reappeared as an answer to greater building depths but this time in inadequate dimensions and with too many rooms orientated to it.



Figure 8: residential house, Daruvar, architects Z. Zidaric and T. Curkovic, 2003.

A three-storey building with ancillary rooms of two neighbourghing flats grouped around light well for the reason of airing and grouping of service verticals.

The light well plan in relation to its height results in questionable adequacy of day lighting of rooms orientated to it. Also as shown on the ground floor plan there is no access to the light well.



Figure 9: residential house, Zadar, arch. I. Pedisic, 2003.

A relatively tall building of 8 storey results in a light well serving as an enlarged ventilation channel. The light well is also not accessible on the ground floor.



Figure 10: residential house, Nova Gradiska, architect V. Grgic, 2004.

In this example it is evident that a special thought was given to adequate dimensioning of the light well which also has access at the ground floor level.

4 Conclusion

The occurrence of light wells in buildings of great depths in Croatia today is not followed by any regulations. In already very deficient Housing regulation there is no article dealing with light wells. As residential buildings could have even 9 storeys theoretically there is possibility that ligtwells could appear even in tall buildings. As light well floor plans are in no way defined or dimensioned the result is that they are in most cases not accessible for cleaning or for maintenance.

Light well reappeared after half a century as a sign of its time and of its values.

Today this negative space, this "hole" that in the fifties used to give light and air to large and small flats, today because not saleable and so without value, is reduced to the minimum and degraded and at the same time it is degrading the spaces that were the reason for its reappearance. It is the proof that the prejudices of any kind are not good including those on the external decks systems. And so, though in trend, they provide good answers (solutions).

Citations

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