

# The Challenge of Extending Panel House Loggia at a Neighborhood Level

**Kristýna SCHULZOVÁ**

PhD doctoral student  
Architecture, Building and Technology,  
Institute of Civil Engineering II,  
Faculty of Architecture  
Czech Technical University  
Thákurova 9, 166 34 Praha 6, Czech Republic  
E-mail: kristyna.schulzova@fa.cvut.cz

## Abstract

Neighborhoods of standardized precast panel blocks of flats form a significant part of the housing estate in the Czech Republic. As the comfort requirements have evolved since their construction, the buildings often need to be refurbished to suit the needs of a current user. Extending the loggias or balconies is becoming a rather popular modification. Besides improving the functionality of the apartment layout and helping enliven the outdoor environment of the neighborhood by drawing the inhabitants outside, the extension can also help improve the indoor environment of the apartments, as it decreases the overheating in summer. This type of modification encounters several obstacles, including the matter of ownership, acquiring the building permit and the hygienic demands on the apartments, especially on daylight. Façade renovations are not commonly coordinated within the neighborhood. This article examines the possibilities of extending the loggias in the housing complex Velká Ohrada in Prague, taking into account all the issues mentioned above, which make its realization on the level of an entire neighborhood very difficult, nearly impossible.

## Keywords

mass housing, prefabricated houses, loggia extension, indoor environment

## 1 Introduction

Neighborhoods of standardized precast panel houses form a major part of the post-socialist built heritage in the Czech Republic, with approximately 25% of the population currently living in this type of housing (Temelová et al. 2010). The precast panel building neighborhoods were designed to solve the housing crisis after the World War II and the goal of their construction was to build the maximum amount of apartments while still achieving an acceptable level of user comfort. As the user satisfaction with the comfort level of their apartments has a significant impact on their relationship to the neighborhood (Kutá & Česelský 2017), it is crucial that the apartments maintain their attractiveness for the contemporary user. Therefore, various modifications are made to suit current needs.

One of the aspect in which the apartments in panel houses fail to meet the user needs is the size of the loggia or balcony. Therefore, extending the loggia is becoming a rather popular alteration.

This article discusses the loggia extension from several viewpoints. It outlines the process, including the participants and the legislative conditions. The article also

lists the benefits of this modification and possible obstacles that can be encountered.


The possibilities of extending the loggia, the advantages and disadvantages it brings and the challenge of realizing it on a neighborhood level are demonstrated on a specific example of a mass housing neighborhood Velká Ohrada in Prague.

## 2 Variables in the process of extending the loggias

### 2.1 Construction options

The construction companies offer a variety of options for enlarging the balconies and loggias. The simplest and cheapest way is to mount the railing (which needs to be dismantled anyway while insulating the façade) in front of the façade instead of inside the loggia, gaining up to 150 mm of space. Another rather inexpensive and structurally undemanding option is a welded metal structure mounted on the loggia, which extends it by 200 mm, compensating for the space taken by thermal insulation.

For small-span construction systems (such as the T06B with a 3.6 meter span), a good option are loggias placed on consoles mounted into the load-bearing structure. This revitalization consists of removing suspended steel balconies or dismantling the cantilevered balconies and



replacing them with a brand new structure fixed into the existing wall system of the house.

The large-span construction systems (mostly the VVU ETA with a six-meter span) have loggias comprised in the structure of the building, rather than hanging steel balconies. The options for their extension are either to insert an additional balcony structure on the loggia (extension up to 800 mm) or a self-bearing structure (usually made of prefabricated concrete panels) (Witzany & kolektiv 2016).

## 2.2 Forms of ownership

City-owned apartments – the entire building (including the ground) is owned by the city (or a city district) and the apartments are rented.

Housing cooperative – the building and the ground is listed in the land registry under the name of the cooperative. Its members buy the rights to be a member of the cooperative and use a particular flat.

Owners association – each apartment is privately owned and its owner is recorded in the land registry. The shared parts of the building and the ground are listed under the names of all the owners with the size of their share. The owners form an owners association.

It is important to note that the exterior (the façade and all its parts) is a shared part of the building. The loggias are not owned by individual proprietors, even though they are only accessible to the owners of the adjoining apartments.

## 2.3 Building permit

The extension is usually performed along with other refurbishments, such as façade and roof insulation and window and door exchange. These modification do require a building permit, as the external appearance of the building is modified and there is usually some interference into the load bearing construction of the structure.

For the city-owned apartments, the municipality is the developer. For the private owned and co-owned apartments, either the owners association or the housing cooperative is the developer. The individual owners are not direct participants in the building permit proceedings, although a consensus among them must be reached to allow the construction.

If it is only a modernization, reconstruction, building modifications and repairs of the shared parts of the house, which do not change the internal layout of the house and at the same time do not change the size of the co-ownership shares, a 2/3 majority is sufficient to reach the consensus. However, extending the loggias changes the floor area of the buildings, thus usually changing the size of the shares.

Therefore, a 100% consensus among the owners is required.

The owner of the neighboring ground (usually the city) is also a direct participant in the proceedings.

For the building permit, binding assessments are needed from the managers of the technical infrastructure, as well as from the respective authorities protecting the public priorities pursuant to special regulations, some of which are much stricter in the Czech Republic compare to other European countries. The most notable is the hygienic station, which does require an assessment of the impact of the construction on the daylight and insolation in the affected apartments (see 4.3).

## 2.4 Financing

The reconstruction, building modifications and repairs are primarily financed by the owner of the building. Owners associations and building cooperatives have a repair fund to which the members monthly contribute an amount corresponding to their share of the building. The fund serves also to repay loans taken out by the association or cooperative. It is possible to acquire co-financing from the state, on condition that the refurbishment contributes to the energy efficiency of the building.

## 3 Benefits of loggia extension

The reason for extending the loggia and its main advantage is enlarging its area, thus improving the functionality of the apartment and raising its market value and general attractiveness of the apartments. The user satisfaction with the comfort level of their apartments has a significant impact on their relationship to the neighborhood, which subsequently improves the image of the neighborhood. Larger balconies also draw the inhabitants to spending more time out there, thus helping enliven the outdoor environment.

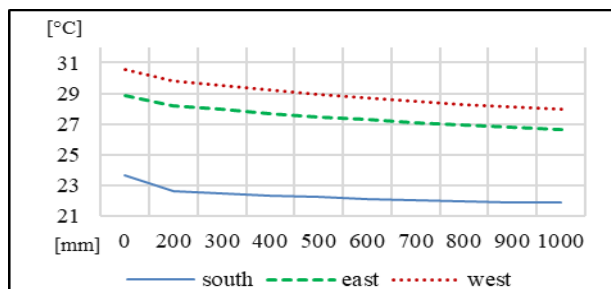
The precast panel houses were designed with a functionalist aesthetics and façade composition has been carefully proportioned. However, the renovations do affect the facades quite severely, although this is more significant in the thermal insulation, which changes the ratio of windows to the façade. Comparably, extending the loggia does not change the façade proportions to such extent.

The standard width of the precast panel house loggia is 1200 mm, further diminished by the railing (50 – 100 mm) and after renovation, the thermal insulation (usually 100 – 150 mm). The area required for the residential use of the balcony or loggia is 1400x2500 mm for two people and 1800x2500 mm for four people. Since the two bedroom

apartments are intended for families with children, it would make sense to extend the loggia by at least 800 mm.

An extension by 400 mm still majorly improves the comfort level of the apartments and the width of 1500 mm actually puts the loggias on par with the current residential development.

Perhaps a less obvious benefit of extending the loggia is the decrease in temperatures in summer (Fig.1).



**Fig. 1** The maximum indoor temperatures [°C] on the 21st of August in apartments that are not located directly under the roof. The southern oriented rooms are already sufficiently shaded by the existing loggias. In the east and west oriented rooms, however, the additional shading provided by the existing loggias can lower the indoor air temperature by up to 3 °C. (Source: Author (Schulzová & Bošová 2019))

#### 4 Possible obstacles to extending the loggia

##### 4.1 Reluctance of the owners

As mentioned in part 2.3, it is necessary to acquire consent from all the members of the owners association or cooperative. Even just one of the inhabitant protesting the extension can hold up the entire process. Some of the reasons for disagreeing include:

- reduction of the light inside
- an unequal share of the cost – especially when there is a mix of apartments with and without loggias, either the tenants with no loggias disagree with a modification that does not benefit them directly, or when completely new loggias are proposed, the other tenants refuse to pay for their construction
- they do not feel they would get a lot of use out of the new loggia
- they have installed a glazing on the original loggia (this is typically done and paid for individually) and it would have to be removed

If the building has already undergone some renovations that are still viable (such as insulating the façade or repairs of the railing), an additional extension of the loggias stands almost no chance of being approved.

##### 4.2 Acquiring the building permit

The building office usually insists on maintaining a uniform appearance of the façade, so it is not possible to

extend the loggias on just one of the sections, or extend only some of the loggias.

As mentioned above, the ground surrounding the building is normally owned by the city. For loggias mounted on the current structure, the city usually issues a permit for them to extend above the ground. Self-bearing loggias with their own foundations, however, require the developer to purchase of the ground and often also to relocate the technical infrastructure plumbing that runs close to the house.

#### 4.3 Hygienic requirements on the indoor environment

An often unsurmountable obstacle to extending the loggias are the legislative requirements on hygiene. In some apartments, especially the requirements on daylight make even a small extension impossible. The daylight values can be majorly improved by modifying the apartment layout (removing the partition between the kitchen and the living room and replacing the opaque part of the window with clear glazing). However, this alteration is clearly unfeasible in a large number of privately owned apartments.

#### 5 Case study – housing neighborhood Velká Ohrada

This complex was built in the years 1988-1993 as the last mass housing neighborhood of precast panel houses built in Prague. It was originally designed for 13 000 inhabitants and there are currently approximately 11 000 (Němec & Brabec 2015).



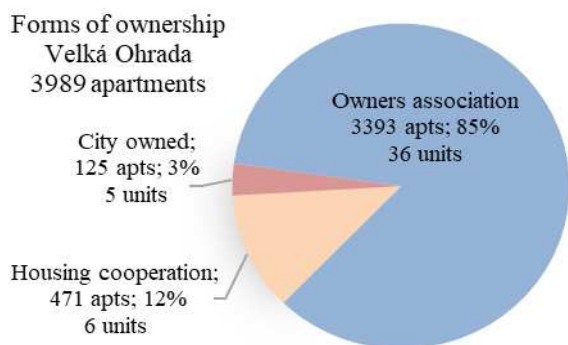
**Fig. 2** Drone photo of Velká Ohrada (Source: Wikipedia commons)

It consists of nine square-shaped open urban blocks, formed by two buildings of amenities and 29 residential buildings with seven floors (Fig. 2). The buildings are formed by individual sections with a distinct address and a separate vertical communication. The corner sections have five apartments on each floor, the common sections have two or three. In total, there is 3989 apartments. The majority of them (2955) is a three bedroom (3+1) layout with loggias with an area of 1200 x 5800 mm. There is 1006 one bedroom apartments (2+kk layout) with no loggias or balconies. In the two newest buildings (finished

in 1993), there are 28 apartments with above-standard terraces (which do not require an extension).

### 5.1 Forms of ownership

The majority of the apartments is privately owned (Fig. 3). Most of the buildings have one owners association for the entire buildings (encompassing several sections). There are however some exceptions, most notably a building with two sections of private owned apartments and three housing cooperation's. One of the buildings is owned by the city.



**Fig. 3** Forms of apartments ownership in the neighborhood Velká Ohrada (Source: Author acquired the data on the number of apartments and forms of ownership from the land registry).

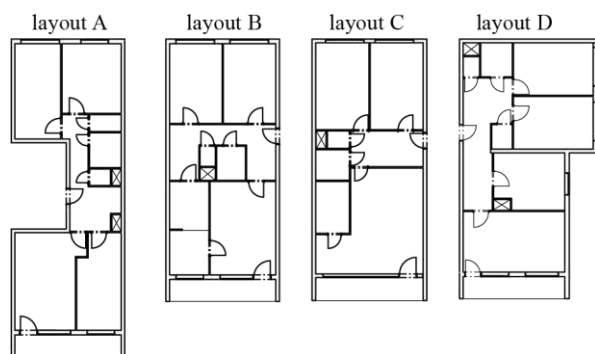
### 5.2 Construction options

The complex is built in the standard system VVU ETA with a six-meter span, which is one of the most frequently used systems in the Czech Republic. This allows either for an additional balcony structure inserted on the loggia or a self-bearing structure (see 4.2 for possible problems).

### 5.3 State of renovations

Although the buildings are relatively new, 14 out of the 29 residential buildings have already undergone major refurbishments, including the façade insulation. It is therefore highly improbable that their owners would invest in extending the loggias before the repairs have reached the end of their viability.

### 5.4 Indoor environment



**Fig. 4** Types of two-bedroom apartments (Source: Author)

The final width of the loggia is limited by the legislative requirements on daylight. There is a mixture of layout A and B (Fig. 4) in most of the buildings. Apartment type A does not allow for any extension without changes in the layout. Type B allows for an extension up to 500 mm. Removing the partition between the living room and the kitchen and replacing the opaque window panel with a clear one would allow for an extension up to 600 mm for both layouts, but this is hardly a realistic possibility in a large number of privately owned apartments.

The types C and D allow an extension over 1000 mm. Type C only appears in the newest buildings that have both undergone a recent façade renovations. Type D only appears in the corner sections (Schulzová & Bošová 2019).

### 6 Conclusion

The article tried to figure out whether it is realistically possible to extend the loggias of a large precast panel housing complex in Prague. The largest obstacle proved to be the hygienic assessment, followed by the large number of parties that need to reach a consensus and the fact that some of the houses have already been refurbished.

Extending the precast panel house loggias is virtually impossible on a neighborhood level in the current conditions and it is extremely difficult even on one building.

### Acknowledgement

This research was supported by the Czech Technical University research grant SGS18/197/OHK1/3T/15.

### References

- Kutá, D., Česelský, J., 2017. "Increasing user comfort of housing facilities blocks of flats in the Czech Republic." *AD ALTA: Journal of Interdisciplinary Research*, 7(2), pp.108-111. <https://doi.org/10.2495/SD150672>
- Němec, M. & Brabec, T., 2015. "Analýza vývoje sociální struktury velkých pražských sídlišť mezi lety 2001 a 2011." (Analysis of social structure development of large Prague housing estates between years 2001 and 2011), Praha: Institut plánování a rozvoje hlavního města Prahy. (in [Czech])
- Schulzová, K. & Bošová, D., 2019. The Impact of Extending the Precast Panel House Loggia on the Indoor Environment. In 19th International Multidisciplinary Scientific GeoConference SGEM 2019. Sofia: 19th International Multidisciplinary Scientific GeoConference SGEM 2019, 30 June - 6 July, 2019, pp. 565-572. <https://doi.org/10.5593/sgem2019/6.2/S27.072>
- Temelová, J. et al., 2010. Housing Estates in the Czech Republic after Socialism: Various Trajectories and Inner Differentiation: Various Trajectories and Inner Differentiation. *Urban Studies*, 48(9), pp.1811-1834. <https://doi.org/10.1177/0042098010379279>
- Witzany, J. et. , 2016. "Metodické a technické pokyny pro rekonstrukce, opravy, popř. výměnu a dodatečné zřizování lodžií a balkonů." (Methodological and technical instructions for reconstructions, repairs, resp. exchange and retrofit of loggias and balconies) Prague: Czech Technical University (in [Czech])