

## TRANSFORMATIONS OF HISTORIC URBAN TISSUE IN LISBON

### Abstract

Over the centuries, cities developed a variety of processes connected with transformations of urban tissue. Building in historical centres increased its density, up to the stage which resulted in visible reduction of the quality of life. Such changes compelled the escape of the inhabitants to the constantly expanding suburbs. These days, we can observe certain efforts that bring life back to the central areas of the cities. To follow the needs and expectations of the contemporary society, it became necessary to raise the standard of both: the buildings and the space between them. Re-establishing multi-functionality, entering new buildings or infills, and organizing new public and green spaces within the dense city structure are some actions that can be observed. Some of the most interesting and complex are connected with creating voids in the extremely dense areas of the historically formed nucleus of the city. Several examples of this type of intervention will be presented in this paper.

*Keywords: urban transformations of historic cities, quality of space improvement, shrinking cities, compact city*

### 1. Introduction

The problem of examining contemporary transformations within the area of a compact historic urban tissue constitutes the major objective of this study. Transformations of this kind can have a positive effect on neglected districts of European cities by improving the quality of public spaces, and all elements which contribute to this space.<sup>1</sup> These measures can prevent the depopulation of city centres,<sup>2</sup> as well as the economic, social, and demographical problems related to them. Transformation of the architectural and urban structure should always be part of a broader revitalisation/rehabilitation plan encompassing a fragment of the city, or the city in its entirety; it is comprised also of activities undertaken in different fields for them to be effective. The improvement of the quality of the urban space, according to various rehabilitation strategies can be achieved – among other things – via the creation of new attractive public spaces and the reconstruction of the existing ones; via the renovation of the existing buildings, particularly the residential resources; and, most of all, by promoting a multifunctional model of the city. Due to the formal criterion (referring to the existing urban tissue), three basic types of transformations can be differentiated: repletion of gaps in the surrounding dense layout, replacement of several elements within the existing urban grid, and perforation often connected with the creation of additional public space. Every type of transformation executed in historic cities should show respect for the existing tissue (preserving the original substance, if possible); display the most valuable relics, and make references to – or perhaps interpretations of – the history of the place applying contemporary means, if new forms and structures

are introduced.<sup>3</sup> This study discusses, most of all, the design aspect of several successful Portuguese executions and presents a revitalisation plan of the district, Baixa Pombalina, which comprises several strategic projects.

### 2. Lisbon as a Case Study

Lisbon is one of the oldest cities in Western Europe. As early as the Roman period, it was a port settlement that became a prosperous trade centre. By the 12<sup>th</sup> century, the city was governed subsequently by German and Muslim tribes, and in 1147, it was conquered by the first ruler of Portugal, Afonso I. For centuries, Lisbon strengthened its position, becoming an economic, political, and cultural centre of the country.

At present, the Metropolitan Area of Lisbon (Área Metropolitana de Lisboa) covers the surface of 2957.4 km<sup>2</sup> and consists of 18 municipalities, some of which constitute centres which developed around historic focal points.<sup>4</sup> It is also the most densely populated area in Portugal, whose population has been successively increasing<sup>5</sup>. For more than ten years, similar to many other European cities, Lisbon has been experiencing the effects of growing demographical, economic, and social changes, such as an aging population and deepening social divisions. It is also one of the cities affected by a phenomenon described as *shrinking cities*<sup>6</sup>. Since the 1990s, the population within the administrative borders of the city has decreased by nearly 10%<sup>7</sup>. Obviously, the causes of this phenomenon are diversified;

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<sup>1</sup> Also by the preservation and revitalisation of historic architecture, and the introduction of new structures and complexes in the old neglected urban tissue.

<sup>2</sup> Which may cause the phenomenon of *shrinking cities*.

<sup>3</sup> Which is important in light of the global preservation documents in force, including e.g. Cracow Charter 2000 – [8], [9].

<sup>4</sup> E.g. Sintra, Mafra, Cascais, Sesimbra.

<sup>5</sup> Since 2001 to 2011 by ca. 6%, cf.: *Censos 2011 – Resultados Provisorios*, 2011.

<sup>6</sup> Cf. e.g.: *Shrinking Cities* (online): [www.shrinkingcities.com](http://www.shrinkingcities.com), (date of access: 2014-05-02).

<sup>7</sup> In 2001, the population of the city was estimated to be 564.6 thousand; in 2011, it was 547,7 thousand, cf.: *Censos 2011 – Resultados Provisorios*, 2011.

nevertheless, one of the most decisive factors is the quality of space and the residential tissue, which does not correspond to the needs and expectations of contemporary people. High property prices, poor building conditions, and a lack of suitable infrastructure and public spaces have been – and still are – responsible for the gradual outflow of people to neighbouring villages located within the metropolis, as well as the outskirts of the city.

This tendency is highly visible, especially in historic districts, such as Baixa, Chiado, Bairro Alto, where the residential function has been replaced by other types of use, such as offices, trade, and broadly understood entertainment. The model of a multi-functional city, present in the central part of Lisbon for ages (which even today is firmly justified), has been replaced with mono-functional areas of activity. Additionally, the city has been struggling with a large number of vacancies – single apartments, and frequently even entire buildings – fall into decay, are not used, and are never subjected to any preservation measures. The urban strategies introduced in the period 1990–2007, ones aimed at the rehabilitation of the existing resources, have been interrupted due to the lack of financing from the public budget, which was a side effect of the global crisis. When evaluated from a 20-year perspective, the actions have not provided the expected effects – revitalisations and renovations were executed selectively, and very often in a superficial and careless manner. The tools of financing such investments did not work out, either.<sup>8</sup>

Currently, more than ever before, the city faces the challenge of improving the quality of life, as well as the quality of space, without the loss of the values connected with an architectural legacy moulded over the centuries. A new planning strategy introduced by the municipal authorities aims at maintaining the character and protection of the *compact city* (which Lisbon still is<sup>9</sup>), while holding back the uncontrolled sprawl of the outskirts and the outflow of people. Special attention is paid to the need to attract inhabitants and broad-based activities to the central districts via social, economic, and urban planning interventions.<sup>10</sup> The focus here is primarily on actions in the sphere of architecture and urban planning.

### 1.1. New Public Space, Dialogue with the Context, Infrastructure

One of the most interesting realisations (design strategy being based on the transformation of existing public space) is the municipal car park, *Portas do Sol*, located in the western section of the city centre. Embedding a multi-bay garage in the complicated topography of the historic district was a demanding task. Portuguese architects, Francisco

and Manuel Aires Mateus, realised a facility which fulfils a number of functions instead of a typical multi-storied engineering structure. The roof of the car park became a new municipal square and an observational point, one offering a spectacular panorama of part of the old town, the quay, and the estuary of the Tagus.

The building is located at one of the main streets intersecting the historic tissue of the district of Alfama, which is the oldest and best known part of Lisbon. An extremely dense, maze-like structure, small scale architecture,<sup>11</sup> picturesque backstreets, and little squares and passages provide this place with a unique climate. One can observe here the authenticity of a functionally diversified district, one still inhabited. In such a strongly defined historic context, a new public space has been created, complete with full contemporary styling.

Starting from the top of the hill, where there are ruins of a medieval castle, the land falls towards the south and the east. Due to this, it was necessary to mould a terrace body of the building; the roof of the car park constitutes one level of the public square, and the roof of a coffee shop opening onto it constitutes another level available directly from Rua San Tomè. Individual levels of the square are linked with the district of Alfama's network of minor streets and pavements, located underneath via stairways and ramps. The function of a multi-bay public garage has been introduced skilfully and discretely; the traffic does not disturb the flow of pedestrians that dominates this touristic district.

The resultant space enables the contemplation of one of the most beautiful city panoramas, and the simplicity of the architectural solutions (spare colours referring to the tradition of the city), provide a dimension of universality. The creation of an open public space, a square – which consists of a completion, extension of the existing streets, and squares – has its impact on the existing tissue, forming new spatial relations, new views, perspective openings, and panoramas. Furthermore, the new square subscribes to the historical sequence of viewpoints, present in the city for centuries.

### 1.2. Public space, memory of a place

Strong pursuits aimed at the creation of new public spaces can be traced in the 1994 renovation of a quarter in the Chiado district, located on the main street of this part of the city, Rua Garret. The design was prepared by a Lisbon-based bureau, Gonçalo Byrne Arquitectos. The renovation and reconstruction consisted of eight buildings which form the quarter; it was destroyed by fire in 1988. The main dimensions, and the majority of the front elevations, were preserved; the main design activities were focused inside the quarter. Instead of increasing the density of the tissue and developing the internal patio, it was decided to leave an open space, limited with the buildings located at its perimeter. The only new structure is a roof

<sup>8</sup> Cf. e.g. *Estratègia de reabilitação urbana de LISBOA – 2011/2024*, Lisboa: Câmara Municipal De Lisboa, 2011.

<sup>9</sup> Since 1994 to 2010, the surface area of ca. 2000 was urbanised; currently Lisbon is consolidated at the level of 82%. *Ibidem*.

<sup>10</sup> These measures were defined in e.g. the following municipal programmes: *Re-habitar Lisboa, BIP-ZIP*, [in:] *Lisboa Camara Municipal* (online) homepage: [www.cm-lisboa.pt](http://www.cm-lisboa.pt), (date of access: 2014-05-02).

<sup>11</sup> Thanks to this development characteristic, during the Great Earthquake of 1755, Alfama was destroyed only to a minor extent – cf.: M. Ellingham, J. Fisher, G. Kenyon, 2000.

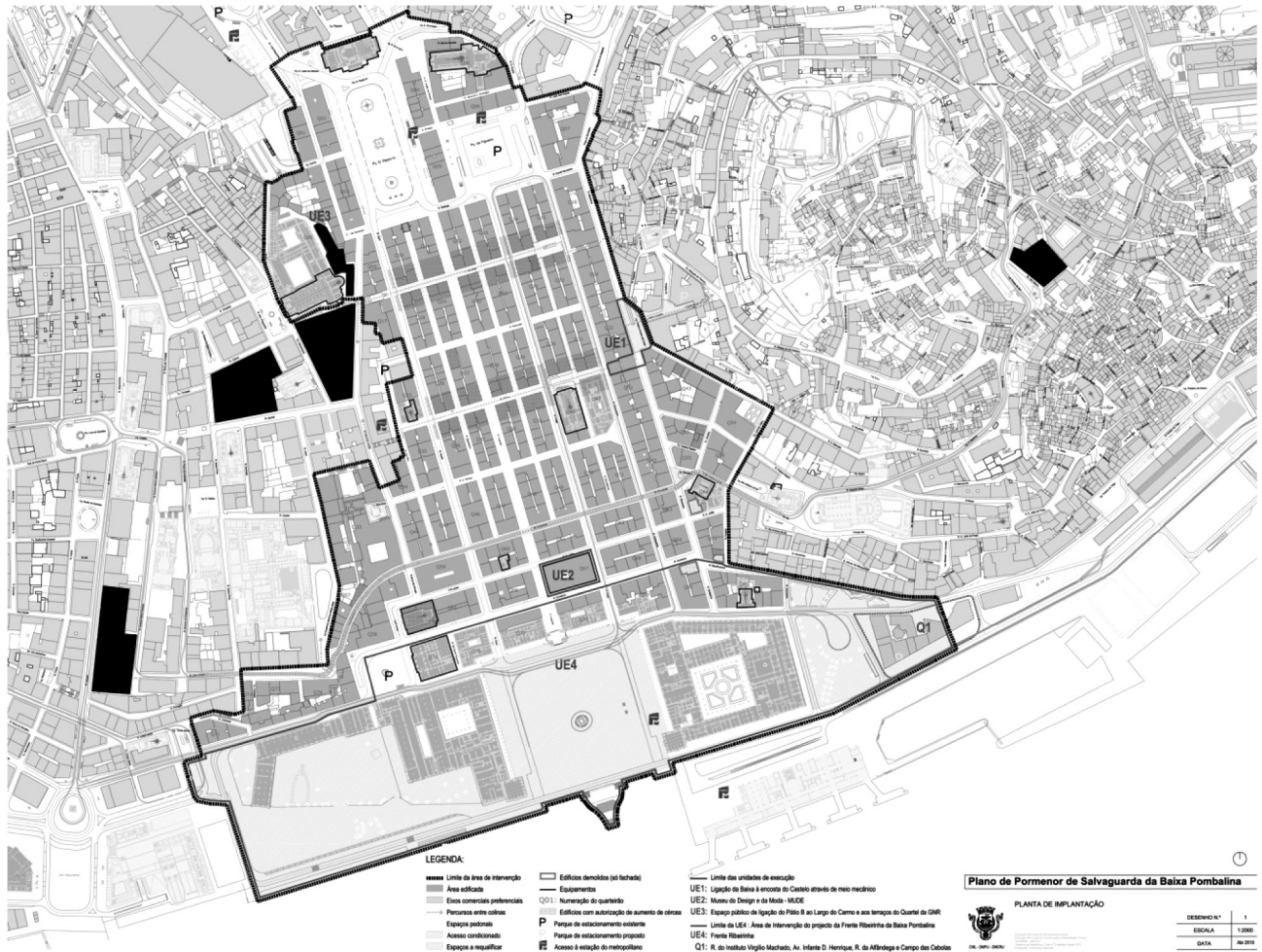


Fig. 1. Plan of central part of Lisbon old city with marked interventions described in the paper – edited by the author on the basis of *Plano de Pormenor de Salvaguarda da Baixa Pombalina, Planta de Implantação*, Lisboa 2011

over the exit from an underground garage. The new development emphasises the compositional features of the interior: a small garden, a belfry, and a body of the nearby church, which so far had been hidden in a dense structure of the district.

The space has been organised along two perpendicular axes: the main one leading in the direction of Travessa do Carmo/Rua Garrett, and the second one in the direction of Rua Serpa Pinto/Admiral Pessanha. Both of these directions have been opened for the pedestrian traffic, as new retail spaces have been introduced along them. In this way, the history of the transformation and reconstruction of the area has been restored and perpetuated in the city structure. Before 1755 (prior to the great earthquake), there was a passage leading from the present Rua Serpa Pinto to the heart of the quarter. Currently, it is visible only as a gap in the compact frontage of the street. The other direction appeared in the plans of the reconstruction of the city (developed by Marquis de Pombal), which assumed a division of the area into smaller units, more effective in the event of any seismic activity.<sup>12</sup> This layer of the design, referring to the

times from before the reconstruction, seems particularly interesting, although it is invisible for an outside observer. An important and symptomatic move in the context of the further development of the city is the resignation from the primacy of the office function and the focus on an even mixture of apartments, offices and retail spaces, which constitutes a return to the authentic and multifunctional city. All these factors strongly contribute to the improvement of the quality of space – the physical one, directly connected with

gnised as one of the precursors of seismology. He personally designed and supervised the reconstruction of the city after the last and largest earthquake in the series of more than ten earthquakes which destroyed 85% of the existing urban tissue. During the reconstruction, most buildings which had survived the disaster were demolished and a completely new district was created, fulfilling the modern planning principles (Baixa Pombalina), which, in a small, modified form constitutes the heart of the historic city today. The district is located between two hills on a flat land adjacent to the river, which allowed the introduction an orthogonal layout of streets and quarters. The division into small narrow blocks, which was to protect the district from destruction in the event of future earthquakes, is very characteristic. Wooden models of the architecture designed within the scheme of the reconstruction were subjected to tests examining their shock resistance caused by marching army troops. – cf. e.g.: K. Maxwell, 1995.

<sup>12</sup> Sebastião José de Carvalho e Melo, Marquis de Pombal – Prime Minister and the first advisor of king of Portugal, Joseph I, is reco-





Fig. 2. Public square, viewpoint and public garage *Portas do Sol* in Alfama neighbourhood, design by Manuel and Francisco Aires Mateus 2005. Photos by J. Mozas, A. Fernandez-Per 2006

architectural structures, and the intangible one, referring to the sphere of impressions, memory and identity.

### 2.3. Residential function

The residential and service complex *Terraços de Bragança*<sup>13</sup> is located in the western section of the district of Chiado. This part of the city was included in the plans of the city reconstruction of Marquis de Pombal. It comprises the area between the parallel streets of Rua Antonio Maria Cardoso and Rua Alecrim. The plot of land – shaped like a long, narrow rectangle, one with the longer axis running in the direction of north-south – has the surface area of nearly 5,000m<sup>2</sup>. It is a special area on the map of the city. Since the early 14<sup>th</sup> century, the city walls *Muralha Fernandina* were located here, which demarcated the borders of the city on the edge of a hill that falls steeply down. The land adjacent to the walls were urbanised, initially within the city walls; gradually the architecture comprised more and more space outside the fortifications. Since the 19<sup>th</sup> century, the Jansen-brand brewery has operated here. During the demolition of the existing buildings, fragments of the fortifications – a tower and a municipal gate preserved among the buildings of the brewery – were uncovered, which, as structures of extremely high historic value, needed to be preserved and maintained, as well as properly displayed. It was also decided to leave some of the brick foundation and walls of the industrial buildings, which had been previously located here.

The entire complex of historic relics is located in a wide strip in the north-south direction, comprised of a considerable part of the plot, which determined the composition of the new buildings. The buildings continue the frontage alignment of the neighbouring street. In this way, they complete the historic division into narrow prolonged quarters, which were established before the regulatory plan and the reconstruction of the city. The functional programme, *Terraços de Bragança*, consists of apartments and offices, and, on the levels accessible directly from the street – retail and

service spaces. Due to the layout of the land, the eastern part of the complex (which consists of two buildings) is located much higher, and the apartments offer spectacular views on the metropolis, reaching far to the west. From the inside of the quarter, buildings have been founded on posts; in the open space created at the level of the ground floor, the remains of the municipal fortifications are on exhibit as a kind of outdoor museum (archaeological and architectural park).

Simple bodies of the buildings, sparing in expression, have been finished with light limestone and blue ceramic tiles of the type of *azulejos*.<sup>14</sup> The articulation of the front elevations, with bands of shallow balconies at the level of the first and last floors, makes the complex subscribe to the neighbouring architecture. Inside the quarter, the shapes of buildings become more chiselled, benefiting from the play of light and shadow, white and blue, and various textures. Nevertheless, they do not constitute any competition for the neighbouring historic structures and displayed relics. Reference to history and tradition of the place, as well as respect for these values, is legible on various levels of the design. In the most direct sense (which doesn't require any interpretation of the phenomena observed), preservation of the structures – which previously existed here – shapes the architecture and enables them to be displayed in the best



Fig. 3. *Quarteirão Império* – a transformation of quarter adjacent to Rua Garrett, design by Gonçalo Byrne Arquitectos 1994. Photos (online) homepage: [www.bymearq.com](http://www.bymearq.com) (date of access: 2014-05-02)



Fig. 4. Multifunctional complex *Terraços de Bragança* design by Álvaro Siza Vieira 2004. Photos by F. Marquez Cecilia and R. Levene 2008

<sup>13</sup> The complex was completed in 2004, and the design was drawn up by Álvaro Siza Vieira. It is a large multi-functional complex with the floor area of nearly 14,000 m<sup>2</sup>. In 2009, it was granted an annual award, *Prémio Valmor e Municipal de Arquitetura*; Lisboa Camara Municipal (online): [www.cm-lisboa.pt/Viver/Urbanismo/Prémios](http://www.cm-lisboa.pt/Viver/Urbanismo/Prémios) (date of access: 2014-05-02).

<sup>14</sup> Ceramic enamelled tiles, plain or ornamented, were used for mosaic compositions (ones often very complex) which presented mythological, historic, and religious motifs. Mosaics of this kind covered floors, walls, and often entire elevations of buildings. Azulejo tiles are one of the most characteristic elements of decorative art in Portugal; *Encyklopedia PWN* (online) homepage: [www.encyklopedia.pwn.pl](http://www.encyklopedia.pwn.pl) (date of access: 2014-05-02).

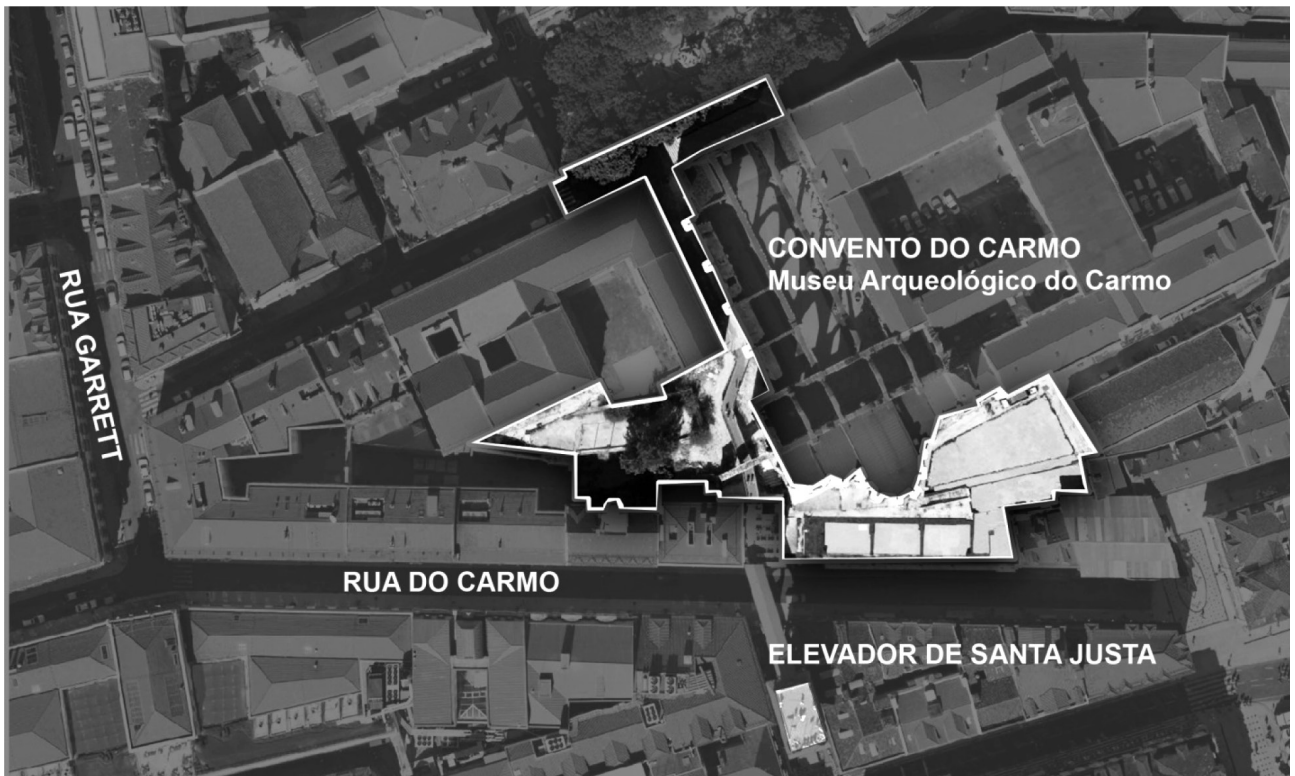


Fig. 5. Plan of Baixa/Chiado showing the area to be changed into the pedestrian connection between Chiado and Terraços do Carmo – edited by the author on the basis of municipal materials of City of Lisbon. Photos: Lisboa Camara Municipal (online) homepage: [www.cm-lisboa.pt](http://www.cm-lisboa.pt) (date of access: 2014-05-02)

possible way. On the basis of the preserved fragments of the walls, a composition of the interior has been created, a space of a special and unique character. Due to its close proximity, the local apartments and premises also acquire the features of uniqueness, of luxury. It definitely improves the value of the place as a sort of privileged location, where residents can commune with history on an everyday basis.

#### 2.4. Sequences of Pedestrian Public Spaces

As it has been mentioned in the introduction, currently historic districts of the city contend with negative effects of several processes, such as the depopulation and degradation of the central areas. Fighting these phenomena could consist of the creation of attractive, accessible spaces, as well as their sequences connected to important landmarks on city maps. One of the strategic projects in the updated plan of the revitalisation of Baixa Pombalina<sup>15</sup> district pertains to the area adjacent to the former Carmelite Monastery; it consists of closing the sequences of pedestrian public spaces and passages linking the upper and the lower part of the district. The project constitutes the last phase of the revitalisation of the quarter between Rua do Carmo, Rua Garrett, and the former Carmelite Monastery.

The monastery, destroyed during the great earthquake, has never been reconstructed. Out of the church, only the

external walls, pillars, and several gothic arches have been preserved; today the monastery houses the Archaeological Museum. The neighbouring buildings were nearly completely burned down during the great fire, which actually began in this very area.<sup>16</sup> The quarter is located at the border of the upper and the lower part of the city centre, in a place where the natural layout of the land forces considerable differences in height, hindering the pedestrian traffic of both tourists and city residents. So far the pedestrian passage has been along the main street, Rua do Carmo. One of the greatest attractions of the city – the historic lift *Elevador de Santa Justa*, which dates back to 1901 and is usually swarming with tourists – does not constitute a realistic alternative.

The interior sections of the renovated and reconstructed quarter have been opened for the pedestrian traffic to the patio at the edifice of the former monastery; here there is a walkway to the lift. After the completion of the last stage of the reconstruction, this area will be linked to the lower level of the district of Baixa with stairways, ramps, and additional lifts. In the area of the *lower city*, there are plans to create two main east-west axes. According to the concept, they are to be pedestrian routes, connected by commercial functions and tourists

<sup>15</sup> *Plano De Pormenor de Salvaguarda da Baixa Pombalina* resolved on 18 March 2011 defines e.g. limits of the area and the scope of activities in three strategic fields of the realisation – *unidades da execução*.

<sup>16</sup> In the district of Chiado in 1888, a fire consumed 18 buildings located at the main street, Rua Garrett. This disaster finally sealed the degradation of this part of the city; on the other hand, it constituted a stimulus to undertake rehabilitation measures. A multi-stage project of the renovation and modernisation, launched in 1989, was entrusted to the most distinguished Portuguese architect – Álvaro Siza Vieira; the works are still in progress; Lisboa Camara Municipal (online): [www.cm-lisboa.pt](http://www.cm-lisboa.pt) (date of access: 2014-05-02).



services. These will link together the Chiado and Alfama districts via the district of Baixa. Creating sequences of public spaces on the scale of several districts – which strengthens the relations between Lisbon’s individual important parts of the urban tissue (regarding its history and city planning composition) – is significant and worth noticing.

### 3. Summary

All activities specified in the documents strategic for Lisbon focus, most of all, on re-use, rehabilitation, and increasing the density of the existing compact tissue of the city<sup>17</sup>; this gives it precedence over the parts of the city and the metropolis located more towards the outskirts. The rehabilitation of the urban space is to be executed by creating new public

spaces and rehabilitating the existing ones, promoting the multi-functional model of the city, and renovating the existing buildings (especially the ones belonging to the municipal residential resources.) These documents emphasise the enormous role of the historic heritage in building the present and future quality (brand) of the city. It is to take place, most of all, by displaying the existing historic structures, or their remains, and integrating new structures in the context in a skilful way.

The selected realisations presented above were executed over the last 20 years, and at a time when the abovementioned problems did not yet require urgent corrective measures. Nevertheless, they constitute successful examples of transformations within the area of a compact historic city. The selection of the cases presented depicts the types of contemporary actions, which constitute precise responses to the problems of a place (quarter), a district, or the entire city. New public spaces and modifications of the urban structure to a much greater extent than new architectural structures will constitute a legacy which the future generations will have to face.

<sup>17</sup> The term *cidade consolidada* – compact city – describing Lisbon’s qualities is used e.g. in *Estratégia, op. cit.* The borders of the part of the city referred to in this way largely correspond to its administrative borders.

### Bibliography

- [1] Benevolo L., *Miasto w dziejach Europy*, Wydawnictwo Krąg – Oficyna Wydawnicza Volumen, Warszawa 1995.
- [2] *Censos 2011 – Resultados Provisorios*, Lisboa: Instituto Nacional de Estadística, 2011.
- [3] *Cities of tomorrow – Challenges, visions, ways forward*, European Commission, Directorate General for Regional Policy, European Union 2011, doi: 10.2776/41803.
- [4] Eislinger A., Seifert J. (Eds.), *Urban RESET. How to Activate Immanent Potentials of Urban Spaces*, Birkhäuser, Basel 2012.
- [5] Ellingham M., Fisher J., Kenyon G., *Portugalia*, Pascal, Bielsko-Biała 2000.
- [6] *Estratégia de reabilitação urbana de Lisboa – 2011/2024*, Câmara Municipal De Lisboa, Lisboa 2011.
- [7] Kantarek A., *Post-event re-revitalization. Expo '98 and Lisbon Park of Nations – revitalization of revitalized areas*, Technical Transactions 12(3-A)/109, 2012.
- [8] Kadłuczka A. (Ed.), *Karta Krakowska 2000. Dziesięć lat później*, Monografia 400, Wydawnictwo Politechniki Krakowskiej, Kraków 2011.
- [9] *Karta Krakowska 2000. Zasady konserwacji i restauracji dziedzictwa architektoniczno-urbanistycznego*, Wiadomości Konserwatorskie, 7/8/2000.
- [10] Martins J., Pereira P., Almeida P., Machado P., Vaz D., Baptista L.V., *Planning Lisbon at the metropolitan scale: elements for an historical analysis of urban planning programs (1950–2010)* (online): [www.academia.edu/4612097/Planning\\_Lisbon\\_at\\_the\\_metropolitan\\_scale\\_elements\\_for\\_an\\_historical\\_analysis\\_of\\_urban\\_planning\\_programs\\_1950-2010](http://www.academia.edu/4612097/Planning_Lisbon_at_the_metropolitan_scale_elements_for_an_historical_analysis_of_urban_planning_programs_1950-2010) (date of access: 2014-05-01).
- [11] Marquez Cecilia F., Levene R. (Eds.), *Alvaro Siza 2001–2008 – the meaning of things*, El Croquis no. 140, Madrid 2008.
- [12] Marquez Cecilia F., Levene R. (Eds.), *AIRES MATEUS 2002–2011 – construir el molde del espacio*, El Croquis no. 154, Madrid 2011.
- [13] Maxwell K. *Pombal, Paradox of the Enlightenment*, Cambridge University Press, Cambridge 1995.
- [14] Mozas J., Fernandez-Per A., *In common. III, Espacios colectivos = Collective spaces*, a+t ediciones, Vitoria–Gasteiz 2006.
- [15] Paszkowski Z., *Transformacja przestrzeni śródmiejskich – Na przykładach wybranych miast europejskich*, Walkowska Wydawnictwo, Szczecin 2003.
- [16] *Plano de Pormenor de Salvaguarda da Baixa Pombalina*, Câmara Municipal De Lisboa, Lisboa 2011.
- [17] *Reabilitação Urbana, Baixa Pombalina: bases para uma intervenção de salvaguarda*, Câmara Municipal de Lisboa, Lisboa 2005.
- [18] Tavares L., *Plano Da Baixa Pombalina – 250 Anos Depois*, [in:] VIII Congresso Internacional das Cidades e Entidades do Iluminismo, (online): [www.slideshare.net/AiCEi/plano-da-baixa-pombalina-250-anos-depois-lisboa](http://www.slideshare.net/AiCEi/plano-da-baixa-pombalina-250-anos-depois-lisboa) (date of access: 2014-05-01).
- [19] *Urban sprawl in Europe, The ignored challenge*, European Commission, Directorate-General, Joint Research Centre, European Environment Agency, EEA REPORT no. 10/2006.
- [20] Węclawowicz-Gyurkovich E., *Architektura najnowsza w historycznym środowisku miast europejskich*, Wydawnictwo Politechniki Krakowskiej, Kraków 2013.
- [21] Zuziak Z.K., *Strategie rewitalizacji przestrzeni śródmiejskiej*, Monografia 236, Wydawnictwo Politechniki Krakowskiej, Kraków 1998.