

Elements of the Gründerzeit Architecture

A comparative analysis of the Berliner and Viennese Mietsbaus

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Abstract

During Historism, urbanization led to a vast growth. By 1910, Berlin's population grew to 2.5 million inhabitants, making it the fourth biggest city in the world. Closely followed by Vienna, which was the sixth largest city with a total population of 1.7 million people.

The question therefore arises, what parameters shaped the growth of both cities and in what way did urban planning respond to the given conditions?

Urban planning produced alike structural elements delivering a similar picture in both cities. Yet, some preconditions led to a different outcome. James Hobrecht, responsible for the later called Hobrechtplan, was able to implement street profiles based on the British model ranging from 11 to 15 (connecting roads) meters up to 49 to 57 meters (Boulevards). Unlike Berlin, Vienna faced topographical challenges with the unregulated Danube River in the East and the Vienna Woods in the West. This led to overall smaller street profiles varying from 9 up to 18 meters, but in a consequence also to a more compact city.

While some parameters are rather obvious, like the above-mentioned street profiles that differ gravely, other parameters lie more hidden and need further investigation, especially those that shaped the Berliner Mietsbaus. Basic data of about 50 houses allows a precise study of the Berliner Mietsbaus and reveal relevant information on micro structural elements, such as the vertical and horizontal developments. In a typical Berliner Mietsbaus one finds vertical developments accessing two to three apartments per floor. This stands in contrast to the Viennese approach using only one vertical development accessing all apartments of the floor. What concrete goals were pursued in formulating the floor plans? Which design principles were applied for the development?

The paper will focus on a comparative analysis of the two cities and elaborate on the urban development of the cities delivering insights on the city level zooming in to the micro level of the neighborhood. What challenges did both cities face and how did they overcome those?

Keywords (Garamond 10 bold)

Hobrechtsplan; urban planning research; Berlin

Introduction

More than a quarter (27%) of the building stock in Berlin goes back to the period of historicism, which is also known as the *Gründerzeit* era. [IBB Wohnungsmarktbericht 2017: p.43] The situation is similar in Vienna, where buildings dating back to the *Gründerzeit* era account for around 20% of the building stock [Wien im Querschnitt 2011,18] (one in four apartments in Vienna is in a *Gründerzeit* building). [Psenner 2012, 30] Essential urban structural elements that still fundamentally shape both cities to this day date back to the 19th century.

Thus, Berlin counted 1900 2.53 million inhabitants and was therefore fourth largest city of the world. Closely followed, Vienna, with 1.7 million inhabitants, came in sixth. Both cities experienced a tremendous upswing during the period of industrialization and faced similar challenges, both of demographic and urban planning nature, such as housing shortages, disastrous hygiene conditions or socioeconomic difficulties faced. The rapid population increase had to be counteracted by the rapid provision of housing. The establishment of *Gründerzeit* townhouses still characterizes the cityscape.

Against the background that a vast part of both cities' built environment dates back to the *Gründerzeit*, this work attempts to investigate the following research questions:

Which (urban) structural parameters led to the structuring of the Gründerzeit StadtParterres in Berlin?

How are these different from those in Vienna?

The paper discusses the urban planning motives that led to the built environment in Berlin as well as in Vienna during the era of the *Gründerzeit*. First of all, the urban formation of Berlin will be discussed by depicting key figures of Berlin's urban development and city expansion of the 19th century since they – together with the building regulations – laid the foundations of Berlin's urban development and urban expansion of the 19th century.

Methodology

With the aim to understand those structural parameters that shaped the StadtParterre in Berlin, the work examines the Hobrechtsplan and planning instruments and regulatives such as the building regulations 1853, 1887 and 1897. The focus is on how Hobrecht's visions have manifested themselves in the built environment.

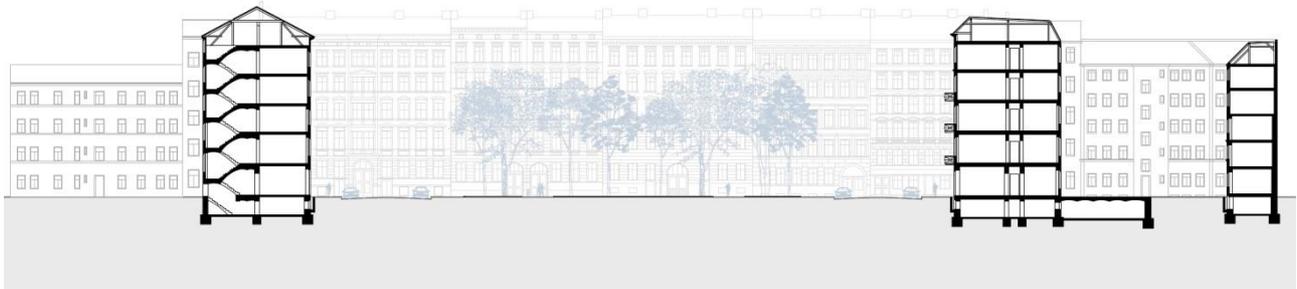
In order to have access to precise data sets, research was carried out extensively during a three-month research stay at the "Institute Urban and Regional Planning" of the TU Berlin with a focus on streets in secondary locations. In several workshops together with the researchers Florian Hutterer and Felix Bentlin, two research streets – namely Chamissoplatz and Nollendorfstraße - were defined as outcome of an intense selection process for potential roads in *Hobrecht's Berlin*.

In order to understand those urban parameters precise data is needed. Therefore this research is based on the research methods of Angelika Psenner's Urban Parterre Model methods, which she has redefined since the early 2000s. The method of Comprehensive Ground Plans goes back to Saverio Muratori, who performed them for Venice, or Gianfranco Canniggia, who created them for Florence and Como and was further developed by Psenner by adding a three-dimensional aspect to the ground plans.[Psenner 2012, 30] To carry the method out, original data of the two research streets was collected from the Bauaktenkammer. The files of the individual plots were photographed and then digitized using CAD software. The floor plans are drawn on an urban scale of 1:1000 and 1:5000.

In addition to the research in archives and the digitization of the original data, particular attention was paid to field research. Investigative city walks were carried out, where the facades of the buildings were examined for their permeability, inner courtyards were researched on their condition and the uses of various ground-floor spaces were recorded.

Building parameters shaped by Hobrecht and the building regulations

The aim of the paper is to precisely understand how the typical *'Berliner Mietshaus'* differs from the Viennese one dating back to the *Gründerzeit*. Therefore, it examines the parameters ranging from an urban scale up to the micro level.



1: Section through Chamissoplatz demonstrating the research focus (Klaus Kodydek)

Block sizes and plot structures in Berlin

Hobrecht, who refers to his master plan as a flexible building line plan, defines with his specifications for block sizes and street widths cornerstones for the built environment in Berlin.

The instructions that Hobrecht received from the Ministry to formulate the block sizes were directed at those of the Friedrichstadt, which was built in 1688, with a size of 75 x 115 m and an area of about 0.8 ha. [Dolff-Bonekämper, Million, Pahl-Weber, 2018, 62, 64] Larger blocks were to be planned for the construction of factory buildings, which were to be built on the outskirts of the city or on shipping lanes. However, a look at the Hobrechtsplan shows that the size of the blocks is not linear out of town, but rather irregular. This irregular city mosaic also results from the fact that the block sizes and block blanks are primarily adapted to existing parcels and site conditions. [Dolff-Bonekämper, Million, Pahl-Weber, 2018, 63]

The urban planning motif of the block grid runs through the development plan. Hobrecht considers the guidelines for block sizes based on the block of Friedrichstadt to be too small and exceeds it by a factor of two to three, often even by a larger factor, in order to accommodate the various interests of the property owners, but also to enable mixed residential and commercial blocks. [cf. Dolff-Bonekämper, Million, Pahl-Weber, 2018, 64] If one compares the development plan with the revision plans, it becomes apparent that larger blocks were subsequently subdivided into smaller ones. This again proves that the Hobrechtsplan is a flexible plan.

The development of the blocks is often left to the private property owners in order to pass on the costs to private builders. However, this was rarely the case. For example, property owners who were intent on maximizing profits used a missing regulatory system to make maximum use of the land. Thus it became generally accepted that the development of the blocks was created by the system of inner courtyard development. As a result, the tenements typical of Berlin were created, consisting of a front building, side wings and rear building, which are accessed via the inner courtyard.

Assmann, Hobrecht's deputy, also pointed out that more attention should be paid to parcelling. [Dolff-Bonekämper, Million, Pahl-Weber, 2018, 71]

When looking at research street *Chamissoplatz*, it becomes clear that the Hobrechtplan was conceived as a flexible planning instrument. Where the *Chamissoplatz* is situated today, there is only one large block that stretches from *Friesenstraße* to *Tempelhoferstraße* (later *Belle Alliance Straße*, today *Mehringdamm*) and is bordered by streets "23" and "24" in the original plan from 1862. It is therefore a product of the later revision planning. Thus the 13.81 ha block is divided into six blocks of different sizes in the revision years. The current *Chamissoplatz* is also the result of this subdivision. The block sizes now vary from 0.7 ha to 5.6 ha and, with an average size of 1.95 ha, exceed the ideal size of the Friedrichstadt with 0.8 ha.

The depths of the parcels in Arndtstraße vary between 28.79 m and 35.59 m, "Am Chamissoplatz" between 24.26 m and 36.65 m and in Willibald Alexisstraße between 18 m and 43 m.

Like Chamissoplatz, the other research street Nollendorfstrasse is not part of Hobrecht's original plans. It will be introduced in later revisions as a dividing road in the 7.7 ha block between *road 19* and *road 20* in section IV of the development plan. If one examines the blocks adjacent to Nollendorfstraße, it becomes apparent that the "Friedrichstädtische" guideline of 0.8 ha was exceeded. Thus the average block size is 2.73 ha. The plots vary in width between 20 and 31 m and have a depth of 42 to 65 m. Among the 26 houses there are eight buildings that make relatively dense use of the plot with a front building, two side wings and a rear building.

The Viennese Block

There is no such thing as an ideal 'Wiener Block'. Thus, a distinction must be made between *Gründerzeit*-style blocks inside and outside the belt and the geometry of the block edge buildings must also be taken into account.

The urban planning researcher Erich Raith emphasizes that in the case of the *Gründerzeit* block in Vienna, a distinction can be made between two façade systems, namely between the street façades lavishly decorated with stucco and the courtyard façades, which do not have stucco. [Raith 1998, 107] This system also applies to the Berlin façades.

Block within the *Gürtel* 7 District, 2.6 ha

Block within the *Gürtel* 9 district, 0.59 ha

Block outside the *Gürtel* 15th district 0.79 ha

Block outside the *Gürtel* 18th district 0.47 ha

Plot structure in Vienna

The plots in the early *Gründerzeit* period are narrow and rectangular. [Offterdinger, Schultmeyer 1975,4] Square plots were cultivated with front buildings, narrow plots with side wing types. In the main *Gründerzeit* period, pressure on ground increased due to industrialization and the associated increase in population. Similar to Berlin, there was a construction boom. The typologies of the early *Gründerzeit* period were further developed. Deep parcels were reacted to with tractors lined up one behind the other. [Offterdinger, Schultmeyer 1975,7]

Road width in Berlin

Hobrecht received concrete instructions from the Ministry from *Minister August Freiherr von der Heydt*, who supervised the development planning, for the formulation of the street widths. This is also discussed in detail in the publication "Das Hobrechtsche Berlin": "According to von der Heydt, the streets should be organised hierarchically in different street cross-sections depending on their significance as promenade streets (13-15 Ruthen/ 49-57 metres), main streets (7-9 Ruthen/ 26-34 metres), side streets (5-6 Ruthen/ 19-23 metres) or connecting streets (3-4 Ruthen/ 11-15 metres). The Minister specified and supplemented this street hierarchy in 1862. Each district was to be given an additional twelve Ruthen (45 metres) wide main streets planted with rows of trees and the smallest street cross-section was to be five to six Ruthen (19-23 metres)." [Dolff-Bonekämper, Million, Pahl-Weber, 2018, 74]

Road widths smaller than secondary roads of 19-23 metres were not considered essential for traffic, which meant that little attention was paid to them. These can hardly be found on the outskirts of the development plan in particular, as Hobrecht wanted to make it possible to react flexibly to future urban growth. [Dolff-Bonekämper, Million, Pahl-Weber, 2018: p74] If one compares the *Hobrechtsplan* with the *Plan Cerdà*, it becomes clear that the principle of the orthogonal street grid is not strictly pursued here. This is mainly due to the fact that Hobrecht took existing ownership into consideration and subordinated the idea of the road grid to this principle. [Dolff-Bonekämper, Million, Pahl-Weber, 2018,75]

In 1862, for example, the public sector hardly owned any land, which led to the fact that the construction of the streets was almost entirely transferred to the task of private ownership. The interests of these people were strongly taken into account. If, for example, road planning led to unfavourable cuts of the plots, the course of the road was changed. The planning of the access roads at block or neighbourhood level was left to private builders. This liberal approach to urban planning led to the development of a very typical Berlin development system, the inner courtyard development. [Dolff-Bonekämper, Million, Pahl-Weber, 2018,79]

Road width in Vienna

While the layout of streets in Berlin and their dimensions are a product of the *Hobrechtplan*, the width of streets was determined by the urban regulations of the building code. Thus, the 1st Viennese Building Code of 1829 provided for a street width of 5 Klafter or 9.15 m [Bauordnung 1829]

while the 1868 Building Code already provided for 8 fathoms, which corresponds to 14.36 m, and was then corrected to 16.0 m. (Amendment of the building regulations to the metric dimension). [cf. Bauordnung 1868]The typical Viennese road width of 12 to 16 meters, therefore stand in harsh contrast to the generous road width of average 22 meters in Berlin, which were specified through the *Hobrechtplan* of 1862. *Hobrecht* defined secondary roads for 5-6 Ruthen/ 19-23 metres. [Dolff-Bonekämper, Million, Pahl-Weber 2018: p74]Even the building regulations for Vienna and Lower Austria of 1883 – 21 years after the approval of the *Hobrechtplan* - provide for 12-16 m for street profile. [cf Bauordnung 1883] In relation to building heights of approx. 25 m, the Viennese streets appear like street canyons compared to the ones in Berlin. Those narrow street profiles also lead to lighting problems[Psenner 2012,6] unlike in Berlin, where the situation is different due to the fact that even streets in secondary locations have got a dimension of 22.0 m and a maximum building height of 22.0 m. This leads to ground floor spaces that are adequately illuminated.

Typologies in Berlin

Typologies are a result of the various block sizes and the plots. Gustav Assmann - *Hobrecht's* representative and member of the building commission - drew attention to the fact that parcelling should not be ignored, as the shape and size of the building sites depend on the parcelling. [Assmann 1862,6]

In the floor plan collection developed by him in 1862, he distinguished between six different typologies, which can be extended depending on the layout of the plot:

1. front buildings and a backyard building
2. front buildings with one side wing
3. front buildings with two side wings
4. front buildings with one side wing and a backyard building
5. front buildings with two side wings and backyard building
6. corner plots

This floor plan collection also makes it clear that - although the *Hobrechtsplan* is a plan that only distinguishes between built-up and undeveloped areas - the building commissioner has also thought about what architectural design might be possible on the parcels. The floor plan collection can be read as a reaction to the unhygienic conditions in the *Gründerzeit* era, as Assmann emphasizes the importance of buildings that guarantee healthy living conditions. [Assmann 1862,6]

The publication on the model floor plans was supported by an accompanying letter in which the general conditions such as the size, superstructure and development of the site were defined, but also concrete architectural statements were made about the dimensions, proportions and construction of the house.

Assmann's floor plans, apart from the concept of accessing the buildings, at first glance they hardly differ from the homogeneous, open-use floor plans of Vienna. It becomes clear that the *StadtParterre* is conceived as a coherent system. Thus, apart from the main development core, the floor plans of the basement floors repeatedly contain direct connecting stairs to the inner courtyards. There are also

internal connecting stairs that connect a ground floor restaurant directly with a basement floor below. Further connection stairs between ground floor and first upper floor prove that the ground floor was thought again and again in connection with the adjacent rooms.

The references to "workshops" in the floor plans, for example on the ground floor or on the first floor, make it clear that the Berlin "tenement houses" - just like the Viennese Gründerzeit townhouses - were conceived as townhouses open to use. Assmann stresses that cellar apartments should have direct entrances from the streets or the courtyards, which allows businessmen to convert single rooms into shops directly accessed from the street. [Assmann 1862,6]

Typologies in Vienna

The Viennese typologies differ only insignificantly from those of Berlin.

"The basic module of the Gründerzeit block structure is the single parcel with the building standing in closed construction at the building line ". [Raith 1998,103]

Offterdinger distinguishes between five typical plot developments:

1. front building
2. side wing L-type
3. side wing U - type
4. side wing T - type
5. Frontbuilding with backyard buildnign [Offterdinger, Schultermeyer 1975,9]

Apart from these main types, there are other variations. These are mostly due to special features such as special plot cuts. [Offterdinger, Schultermeyer 1975,9]

If one compares these typologies with those of Berlin, one can claim that the street wing in Vienna corresponds to the front building in Berlin. The Viennese "side wing L-type" is similar to the Berliner front building with side wings and the "side wing U-type" corresponds to a Berlin front building with two side wings. These types are also represented in the research streets Chamissoplatz and Nollendorfstraße.

Room height in Berlin

The height of the ground floor was mainly regulated by the building regulations. The building regulations of 1853 specified a minimum room height of 2.48 m,[Baupolizei Ordnung für Berlin 1853: 26 (§88)] and were adapted to a height of 2.80 m with the new regulations of 1897 it was 2.80 m.[Bau Polizei Ordnung für den Stadtkreis Berlin 1887,36 (§37)] The total height was dependent on the width of the road.

Looking at the storey height in the research streets Chamissoplatz and Nollendorfstraße, however, it becomes clear that these specifications of 2.50 m and 2.80 m respectively are exceeded not only on the ground floor, but also on all other floors, apart from the basement and attic. Looking at a section through the building, it becomes clear that the room heights are decreasing upwards.

In the context of the StadtParterres, it should be emphasised, as can already be seen from Assmann's sample floor plan collection, that the ground floor interacts with the floors below and above it, but also represents the interface to the street or to the inner courtyard.

The fact that the ground floor was intended for semi-public use becomes visible not only in Assmann's floor plans, but also in the original plans from the Bauaktenkammer. The permeability can be felt through large portals and their ground floors are often internally connected to the adjacent floors by additional staircases.

Special importance is also attributed to the street shops in corner properties. Assmann points out here in his *floor plan collection* that shops should be located in corner buildings due to the fact that a high frequency can be expected due to the fact that two streets are crossing. [Assmann 1862,10]

Room height in Vienna

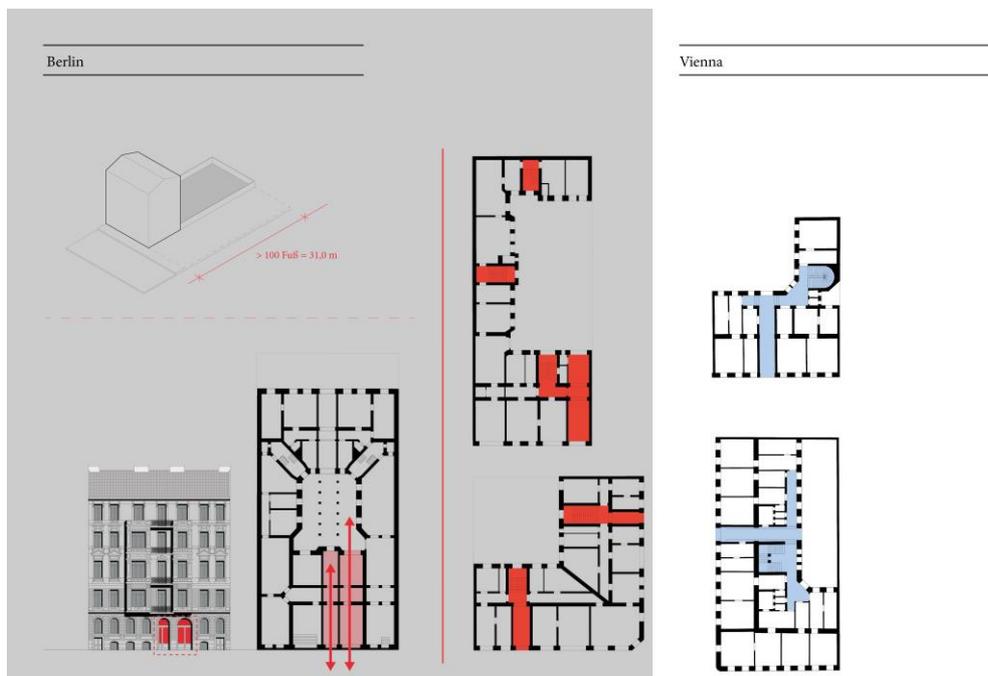
The first building regulations of 1829 specified the minimum for a room height of 2.74 m [cf. Bauordnung 1829] and thus provided for 24 cm more room height than the Berlin building regulations of 1853. When the building regulations of 1868 were leveled to the metric dimension in 1870, the minimum room height was raised to 3.0 m. [Bauordnung 1870] (Berlin 1897: 1,80m) What is striking, however, in both cities is that these minimum room heights were clearly exceeded.

In the pilot study carried out by Angelika Psenner, she explains that exceeding the minimum requirement of 2.74 m and later 3.0 m is due to economic and health-economical principles, the market value of the room height and the "town house image". [Psenner 2012,9-15]

Permeability and access in Berlin

The access of buildings was mainly shaped by the building regulations. If plots were deeper than 100 feet (about 31 meters), passageways had to be built. However, Assmann writes in his explanatory report that houses without passageways should only be the exception. [Assmann 1862,6] This is no different in the research roads.

If a building is only accessed by the passageway, doors should be placed at the entrance of the main building in the passage to avoid cold drafts by arranging doors. Assmann explained an additional house entrance should be placed next to passages, in order to avoid cold draft during winter. [Assmann 1862,6]



2: View and floor plan visualizing the different accessing concept in Berlin (left) and Vienna (right) (Klaus Kodydek)

Internal accessing

The internal concept of accessing a building in Berlin is the parameter that probably differs the most from a Viennese Gründerzeit building. The horizontal traffic areas were reduced to a minimum and the apartments were accessed by two or three staircases. As a result, more staircases had to be built per building. The building regulations of 1853 stipulated that all staircases had to be fireproof and enclosed by massive walls. [cf BO 1853]

Assmann also detailed precise measurements for staircases, corridors and entrees varying if it is a front building, side wing or backyard building. [Assmann 1862,6]

Permeability and access in Vienna

The internal accessing of the buildings in Vienna was deprived from the 'Pawlatschen system'. The side wings and rear wing were accessed from the street wing via a 'Pawlatsche, an open arcade. [Offterdinger

1975,13] Yet, the concept of accessing through 'Pawlatschen' was banned after the fire at the Ring Theater.[Bobek-Lichtenberger 1978,70]

In the early Gründerzeit the Pawlatschen system was replaced by integrating the accessing system into the building. The apartments were thus accessed either a corridor or directly from the staircase.[Bobek-Lichtenberger 1978,73] This internal access system via a corridor represents a contrast to the access system in Berlin, where apartments are accessed directly via the staircase, leading to more than one staircase per building.

The staircases in the Gründerzeit houses in Vienna are made of natural stone and reinforced concrete steps from 1910[Bobek-Lichtenberger 1978,91], while the staircases in Berlin are made of wood.

Courtyard regulations in Berlin

The inner courtyards of the buildings play a special role in the Gründerzeit period, as they assumed the role of semi-public development areas, especially in the case of deep plots. They also provided access to the numerous cellar and basement apartments adjacent to the inner courtyard, which were permitted until the building regulations of 1887.

The dimensions of the inner courtyards were shaped by the building regulations of 1853. They had to have a length and width of at least 17 feet (5.33 m). This requirement for the courtyard space of at least 27 m² was raised in 1887 to 60 m² and in the building regulations from 1897 to 80 m². [Bauordnung 1853 und 1887]

Since Hobrecht's planning included relatively large blocks, which on the one hand should not restrict the design will of the private clients and on the other hand should reduce the construction costs for roads to be built, the inland development of the blocks was transferred to private clients. As a consequence, rental blocks with rear buildings were built, which were accessed via the rear courtyards and were only lit and ventilated via these. [Geist/Küvers Band 1, 1980,124]

Courtyard regulations in Vienna

In Vienna, a similar picture of maximum land use utilisation emerged during the Gründerzeit period. Particularly in the late founding period, plots were maximally cultivated using atriums.[Bobek 1978,44] The building regulations of 1883 stipulated that at least 15 percent of the parcel had to remain undeveloped. This included the light shafts.[Bauordnung 1883]

Conclusion

Having access to the original data of 56 houses in Berlin, accurate statements not only to the built environment in Berlin, but also in comparison to the Viennese Mietshaus can be made.

Block sizes and plot structures in Berlin – both concepts developed through the Hobrechtsplan - are two to three times larger than the Viennese block. Also street profiles in Berlin with dimensions of 22 meters are wider than the Viennese street canyons with its dimensions ranging from 12 to 16 meters. Comparing the room height, which were in both cities defined by the building regulations, it is interesting to mention that, although the Vienna's first building regulation from 1829 comes 24 years earlier into effect than Berlin's first building regulation, it defines higher room heights.

When it comes to the concept of access, the Mietshaus in Berlin differs largely from the Viennese concept that was developed from the 'Pawlatschen' system. While in Berlin the front building, side wing and backyard building are accessed through separate stair cases, the access of a Viennese Mietshaus works through one single staircase in the front building.

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