ALONG THE RAILWAY

TRACKSIDE *GROSSFORM* IN EMMENBRÜCKE

Abstract

This thesis book describes the analysis, ideas and experimentation that lead to the "Along the railway" project proposal in Emmenbrücke. It begins by identifying and analyzing current challenges related to private property development, the housing crisis, and urban growth—focusing specifically on Switzerland and the Lucerne agglomeration. After that, it provides some background into SBB's ambivalent role as both, a profit seeking real estate developer and a publicly accountable urban shaper.

Central to the thesis is the idea to utilise underused land along railway lines, which is considered of low value but potentially provides great connectivity. This land would allow for a mix of uses which under normal circumstances would be limited by plot boundaries, but SBB's dual role enables a more gradual approach.

After studying available land, the thesis proposes to use a long plot of land along the tracks in Emmenbrücke as a *Grossform*, drawing ideas from Oswald Mathias Ungers, Cedric Price and urban developments in Tokyo, among others. The project highlights ways to balance different needs such as housing, low impact industry, public and common spaces as well as public transport (by integrating the Emmenbrücke railway station) within a single structure. While the outset of the thesis was to accommodate housing, the exploration lead the project to the urban aspects of *Grossform*. Therefore, the project emphasizes it's interactions with it's context. Over it's length, these context's change multiple times, and the structure attempts to be a connector, drawing connections for pedestrians and bicycles. It proposes not just an architectural form, but a framework for coexisting needs.

CONTENT

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1 PROLOG

«If it [speculation] alone builds the city, is not taken under a greater will, does not serve but rules, then our cities are nothing more than an expression of this speculation.» [1]

1   Buckhardt, Kuter, Frisch, 1955.

Switzerland is expecting a further increase in the permanent resident population in the upcoming decades. At the same time, the country has experienced consistent decline in the average vacancy rate. Housing shortage is part of multiple debates in Switzerland. This debate does not come alone. Over the years, urban sprawl and densification carried out by private investors have become tightly connected in what it is termed as aglomerations of urban economic centres. The need of densifying then meets the urban discussion in Switzerland.

The so called agglomerations have been characterised by layouts that maximise the square footage to the limit, driven by profit maximisation and density, resulting in an urban like typology standing on green fields or rural landscapes in the peripheries of bigger cities.

In past decades, experts have expressed their concern for the qualities of a spatial development driven primarily by economic priorities; what Buckhardt, Kuter and Frisch have described already in 1955 in their publication "Achtung Die Schweiz".

The architecture of maximum profit is shaped by the demands of the market, where buildings are often treated as commodities rather than urban or social assets, leaving little room to address pressing social issues within the housing shortage sector—one of them being housing affordability. In Switzerland, the average household allocates 15% of its income to housing expenses, including rent, utilities, mortgages, and minor repairs. However, for low-income households, this burden is considerably higher and has increased to more than a third in the past 15 years. With housing costs expected to continue rising alongside prices, the strain on low-income households in urbanized areas will only intensify.[2]

As a result, this trend is likely to push lower-income households further to the periphery—into less developed and poorly connected areas—deepening social and spatial segregation within cities.

2   Bracher, Schläpfer, Wüest Partner AG, 2024.

Overall, there is a wide spread social interest in Switzerland, to increase the construction of new apartments. In order to address the housing shortage and the sprawl in Swiss cities, the Spatial Planning Act of 2014 proposes a further internal development in already consolidated urban centres, including the strategy of densification.

A study carried out by Wüest Partners for the Federal Office of Spatial Development, have quantify the possibility of densifying already developed land. It identifies the region Luzern as an area with high potential for internal densification in relation to the existing building stock.[3]

The increase in urban density is not only a question of spatial planning but also of social acceptance. As city centers become more congested, a comprehensive urban strategy is needed to ensure that public spaces and the overall urban fabric remain of high quality. However, when densification is driven primarily by profit, the livability of the city is at risk.

The outset of this study is to explore urban development in relation to the existing logic of inner densification, specifically in Luzern, by the study of underused land around train stations, with the aim of facilitating the development for non-profit housing.

3   Bundesamt für Raumentwicklung (ARE) and Wüest
     Partnert AG, 2024. P.24

2   ZOOM OUT: FOCUS LUZERN

The Federal Office for Housing of Switzerland reported in 2024 that while the market for high-price housing eased last year, the search for housing continues to be a difficulty for the middle class and households with low budgets especially in Central Switzerland and some mountain regions.[4]

In response, several initiatives have been introduced in the Canton of Luzern to increase the availability of affordable housing within the city. Notably, the initiative "Für zahlbaren Wohnraum", which was approved in 2012, aims to raise the share of housing rented out under non-profit criteria from 13.5% to 16% by the year 2037.[5]

According to the most recent Control Report published in 2024, the market share has increased to 13.8%. To stay on track with the target, the city reports that approximately 130 new non-profit housing units need to be constructed annually from 2024 onward.

Within the framework of this initiative, the City of Luzern identifies housing and building cooperatives as key stakeholders in the non-profit housing sector, alongside institutions such as the Gemeinnützige Stiftung für preisgünstigen Wohnraum Luzern (GSW). Working in collaboration with the City Council, these cooperatives and organizations operate under the umbrella of G-Net Luzern (Netzwerk gemeinnütziger Wohnbauträger Luzern) to achieve the initiative's goals.[6]

The broader political context around housing in Luzern reflects a clear orientation towards ensuring affordable rental prices. However, it is important to clarify what is meant by "affordable housing" in this context.

According to the Städtische Wohnraumpolitik, Gemeinnütziger Wohnungsbau (non-profit housing) refers to apartments provided

4   BWO Jahresbericht, 2024
5   Volksinitiative «Zahlbares Wohnen für alle», 2017, P. 10
6   Charta zum gemeinnützigen Wohnungsbau, 2021, P. 1

by cooperatives, associations, non-profit stock corporations, foundations, municipalities, and similar entities that offer rental housing in accordance with the Swiss Housing Promotion Ordinance. This includes adhering to a non-profit legal status— meaning no dividends or royalties may be paid out, and any profits must be reinvested into the organization.[7]

While the initiative was initially passed for the city of Luzern alone, new proposals have since emerged to expand its scope to the entire canton. These would raise the goal to 20% and recommend that building rights for state-owned land be preferentially granted to organizations engaged in non-profit housing development. This broader initiative could open the door to include surrounding municipalities—already part of the Luzern agglomeration—as potential areas for the development of affordable housing, thereby addressing the regional housing demand more comprehensively.

In this context, the housing landscape in Luzern clearly reflects a growing social need for affordable living options. The continued efforts of the city, in partnership with cooperatives and non-profit institutions, highlight a strong political and societal commitment to providing secure housing for low- and middle-income residents.

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7   Medienmitteilung Städtische Wohnraumpolitik, 2024,
      P. 1

3 BEYOND THE TRACKS

Throughout this thesis, railroad infrastructure will play a pivotal role. To provide the necessary background, this chapter will take a look at SBB, Switzerlands largest, formerly state-owned, railroad company and it's role as a property developer.

The Schweizerische Bundesbahnen (SBB), was established in 1902 through the merger of several private railway firms. Since its inception, SBB has played a foundational role in shaping patterns of living and development across Switzerland.

The construction of new railway lines enabled faster, more comfortable travel, tightly linking cities with surrounding villages. Previously minor settlements gained significance and experienced rapid growth as they became railway hubs, catalyzing industrialization. The improved interconnectivity between major cities expanded job opportunities, unified cantons, and enhanced integration across Switzerland's diverse regions.

SBB AS A REAL STATE DEVELOPER.

While SBB's influence on urban development is deeply tied to its transport infrastructure, nowadays the company plays a critical role as a real estate developer.

Initially, this role was functional—providing housing for railway employees who needed to live close to the tracks. In 1909, the Eisenbahner Baugenossenschaft (EBG) was founded to build cooperative housing for railway workers. The railway division helped the workers to purchase land, made available building rights and granted favorable second mortgages. In return, membership was restricted to SBB employees.[8]

8   Scherr, Niklaus, Bezahlbahre Wohnungen Nr. 2, 2020

Fig. 1. Entry to the settlement Eisenbahner Baugenossenschaft Luzern, 1922

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SBB's role in real estate expanded significantly after its transformation into a state-owned stock company in 1999, tasked with greater financial self-sufficiency. In 2003, SBB restructured internally, establishing a dedicated real estate division.

Roughly 80% of SBB's land remains with its infrastructure division—tracks, signal systems, and access routes. However, ongoing modernization and efficiency measures regularly free up land near tracks, some of which may be transferred to the real estate division if there is external development interest.

A pivotal turning point came in 2007–2008 when the SBB pension fund, already weakened, suffered further losses during the global financial crisis. By 2009, its coverage rate had fallen to 80%. To stabilize it, SBB was required to generate profits from its real estate division.[9]

This pressure led SBB to maximize returns from its prime real estate holdings, particularly near train stations. A flagship example is the Europaallee development in Zurich. After decades of stalled plans, the area behind Zurich's main station was transformed between 2009 and 2020 into a complex with over 400 apartments and 8,000 jobs. Despite being designed by multiple renowned architects, the project was widely criticized for its homogeneity and lack of urban character. Critics from the political left argued it encouraged gentrification and failed to provide genuinely affordable housing.[10]

By 2010, projects like Europaallee and Schleife-Nord in Zug drew increasing criticism from the architectural community. The journal Hochparterre argued that SBB's mandate to seek "reasonable profits" resulted in low-quality urban developments that ignored local needs. The journal also faulted SBB for neglecting smaller and mid-sized towns in favor of large urban centers.

9   Immobilien der SBB, 2012, P. 3
10   Scherr Niklaus, Die unbekannte Gigantin, 2018

As a public entity, SBB has the potential—unlike private developers—to incorporate broader social and regional development goals. Hochparterre called on the Federal Council (Bundesrat) to adjust SBB's strategic goals accordingly.[11]

SBB responded in part by initiating a competition in collaboration with the city of Zurich, specifically for cooperative housing. The Zollhaus project, by the Kalkbreite cooperative, emerged as a result. Built on partially leased land north of the tracks, it offered a more inclusive and community-oriented alternative to Europaallee.

In 2022, following the compromise to include more affordable options, SBB signed a framework agreement with the Federal Housing Office (BWO) and the Swiss Housing Cooperatives Association, establishing standardized terms for leasing land to cooperatives. The agreement includes a commitment to ensure around 50% of SBB housing is affordable, either through direct development or partnerships with cooperatives.

Fig. 2.   Europaallee with Lake Zurich in the background.

11   Marti Rahel, SBB : Areale vergolden oder Städte
      Formen?, Hochparterre Band 23 P. 16, 2010

Fig. 3.   Cover of the Hochparterre story: SBB: Areale vergolden, oder Städte formen?

SBB role around urban development in Switzerland has evolved over time. It has shifted towards a more balanced relationship between profit and non profit interests within their developments.

The possibility to adresss this tension between social respons-ability and economic pressure is a unique condition from their status as a publicily owned company. Therefore, thoughtful urban development and the inclusion of social concerns may only be truly possible within frameworks where private interests are not the sole driving force.

4 ZOOM IN

4.1 JUNKSPACE

'There is no form, only proliferation...Junkspace is additive, layered, and lightweight, not articulated in different parts but subdivided, quartered the way a carcass is torn apart—individual chunks severed from a universal condition.'[12]

12   Koolhas Rem, Junkspace, 2013

Generally, housing blocks provided by private property developers are the product of financial viability: maximizing rentable space— pushing for greater height, larger surface areas, and higher density.

Given the high costs and resource demands of construction, it is unsurprising that much of the built environment reflects these economic pressures. Architects and planners continue to seek opportunities for meaningful space-making, yet their influence is often limited by plot boundaries and the relentless drive for square meters. This profit-driven approach frequently results in frag-mented, disconnected neighborhoods that function like isolated islands rather than cohesive urban environments.

Rem Koolhas has pessimistically described these kind of architec-tures as *Junkspace;* refering in his essay to those big bodies of construction that are designed for consumption and provide only a vessel, foreign to their context and reflecting the sole interest of a capitalist development.

On the other hand, Hal Foster's essay *Running Room* often printed together with *Junkspace*, acknowledges the criticisms of Koolhas, but takes a more hopeful approach, attempting to identify niches in the rigid capitalist logic, to reintroduce areas of uncertainty, giving architects back their autonomy.[13]

Therefore, searching for a *Running Room* between private inter-ests and societal needs could find a middle point.

13   Foster Hal, Running Room, 2013

4.2 RUNNING ROOM AND TOKYO

As a central focus of this thesis, the analysis of the broader Swiss context and the non-profit housing initiative in Luzern come together around the role of SBB as a real estate actor. Serving as a key connector between urban agglomerations in Luzern and a major influence on urban development across Switzerland, SBB is positioned as the framework—or operating context—for this research.

SBB has a dual role: as a profit-seeking enterprise and as a public institution. This introduces a fundamental ambivalence in its approach to urban development. On one hand, financial constraints require the pursuit of profitable projects. On the other, its public accountability allows for a broader interpretation of "reasonable profit" that can include social and urban values.

Therefore, developing on SBB land presents a unique opportunity: while it can not ultimately solve the ambivalence of profit seeking versus public interests, it can approach it on a more granular level, possibly creating *Running Room* on purpose.

To draw this opportunity it is important to understand the stock of land in SBB portfolio. Land around train station is deemed the most valuable because of its connectivity. These plots have been systematically developed in large and medium cities, for example the Basel Wolf Areal, the already mentioned Europaallee or Pont Rouge in Genf.

Smaller pieces of land are developed at middle sized stations when the context is set out for this. The programs of these smaller plots consists mostly of housing and offices programs above or around the train station. Some examples are Liestal, Wollishofen, Wettingen or Horgen Oberdorf.

Fig. 4.   SBB real estate projects in Liestal (built) by Burkard Meyer Architekten

Fig. 5.   Rotkreuz (proposed) by op-arch.

Generally, these middle sized plots are used between boundaries of SBB property around its stations, since further away; along the tracks, the pieces of land become narrower and more constrained, and therefore are of less value. The *Running Room* sought in this work starts from these kind of ribbon like plots that run linearly along the stations and not limited to the vicinity of the train stations.

From its linearity, immediately the thought emerges, that the long and thin "street-like" shape of these plots should be used to seek out connectivity between the city and the station itself, making the project a part of the urban infrastructure in middle sized cities.

At the same time, their proximity to transportation nodes make them ideal to be part of a network that connects the agglomerations with one another, and to Luzern; a network of sub-centralities connected by public rail transportation, in a similar fashion that Cedric Price imagined the *Potteries Thinkbelt Project*, where the lack of function in empty industrial facilities and its rail connections are taken as an existing canvas to propose a circular university that is connected through train stops, embracing the industrial and existing train infrastructure as part of the landscape.[14]
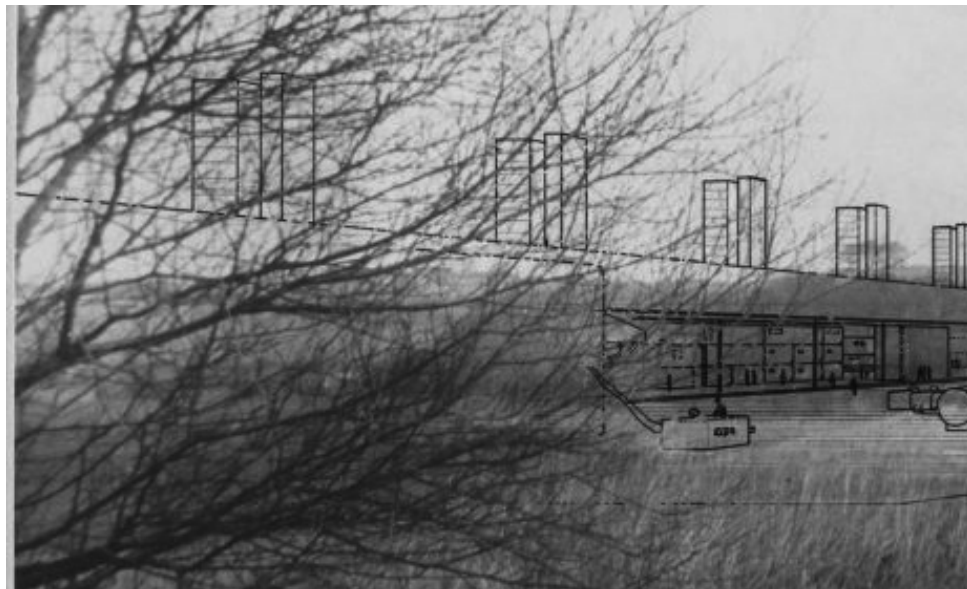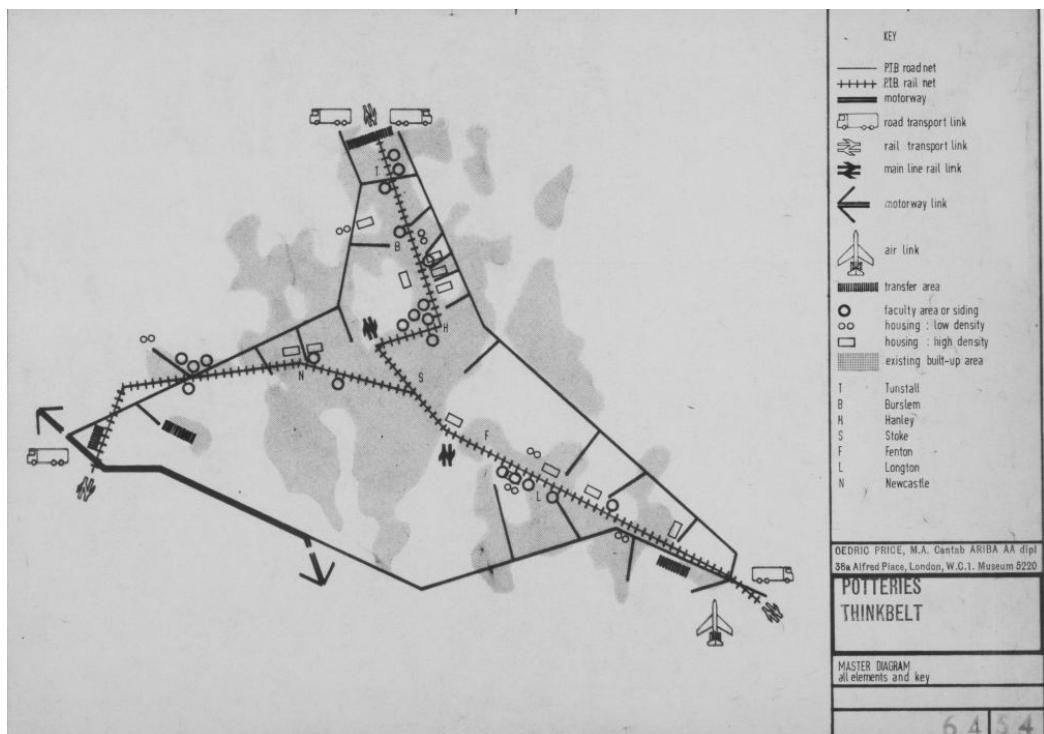

Fig. 6.   Thinkbelt Potteries project by Cedric Price.

14   https://hiddenarchitecture.net/potteries-think-
       belt-project/

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In a similar manner, identifying the ribbon like parcels available around the tracks in order to densify could create a network of housing (profitable and non profitable) through a network of mass mobility, while making the most use out of the space available in cities; much like the inner densification that Switzerland has proposed to stop further urban sprawl.

Identifying the already existing agglomerations as urban spaces that can be further densified, and using the most stock of land available around their urban centralities -the stations- could create a tighter urban network.

By making full use of the existing land stock that is immediately connected to the railway infrastructure—often irregular in geometry and constrained by rail operations—new possibilities for urban intensification emerge.

This strategy echoes the spatial condition of Tokyo, as described by Atelier Bow-Wow in *Made in Tokyo*, where every square meter is optimized due to the scarcity and high value of land.

In Tokyo, buildings often house an unlikely stack of programs: housing above production spaces, shops embedded into transport hubs, or shared use of leftover spaces between infrastructure and private buildings. These spontaneous and pragmatic responses to spatial constraints have shaped a unique, high-density urbanism and its maximizing of space have made possible the "*use of spatial byproduct*".[15]
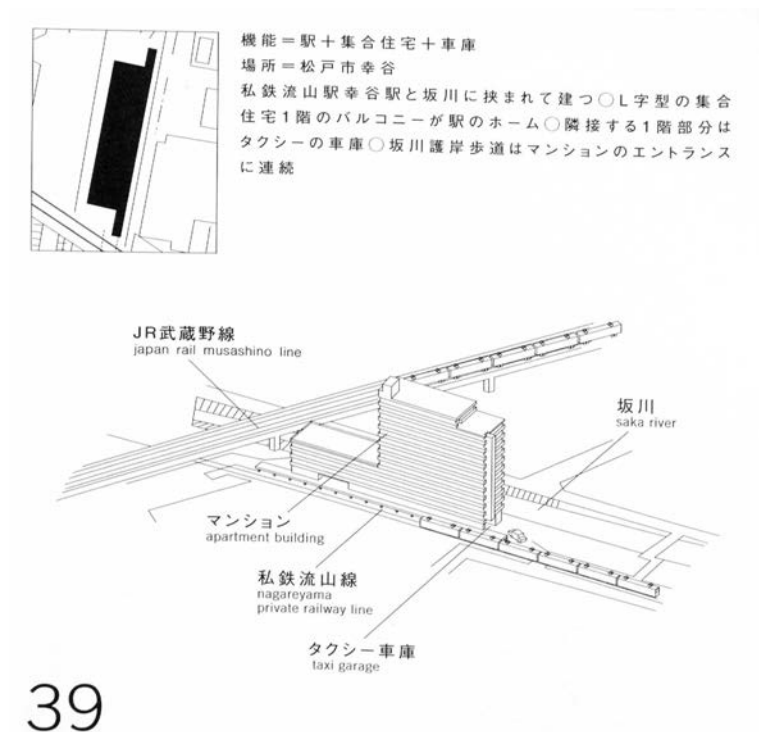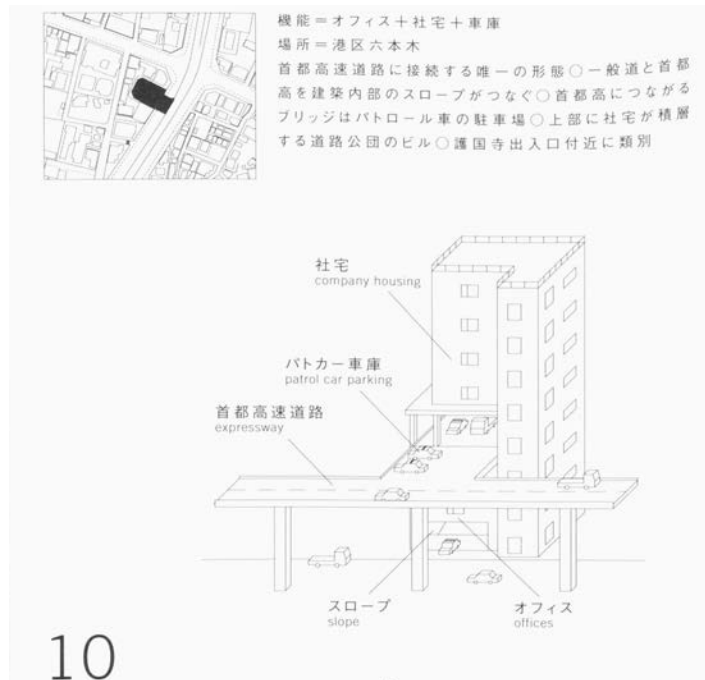
15 Kaijima Momoyo, et. al., Made in Tokyo, 2001

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機能＝オフィス＋社宅＋車庫
場所＝港区六本木
首都高速道路に接続する唯一の形態 ○ 一般道と首都
高を建築内部のスロープがつなぐ ○ 首都高につながる
ブリッジはパトロール車の駐車場 ○ 上部に社宅が積層
する道路公団のビル ○ 護国寺出入口付近に類別

社宅
company housing

パトカー車庫
patrol car parking

首都高速道路
expressway

スロープ
slope

オフィス
offices

10

機能＝駅＋集合住宅＋車庫
場所＝松戸市幸谷
私鉄流山駅幸谷駅と坂川に挟まれて建つ ○ L字型の集合
住宅1階のバルコニーが駅のホーム ○ 隣接する1階部分は
タクシーの車庫 ○ 坂川護岸歩道はマンションのエントランス
に連続

JR武蔵野線
japan rail musashino line

坂川
saka river

マンション
apartment building

私鉄流山線
nagareyama
private railway line

タクシー車庫
taxi garage

39

Fig. 7. Axonometric depictions of buildings from Made in Tokyo, integrating public
infrastructure.

Fig. 8.　Photo of the apartment building + train station building (no. 39) from Made in Tokyo.

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Drawing inspiration from these precedents, this study proposes a planned adaptation of the *Made in Tokyo* model within the Swiss context. By strategically reactivating the underused rail-adjacent land owned by SBB, the proposal envisions new hybrid buildings that serve as connectors between train infrastructure and urban blocks while making extra space for housing in places that are often overlooked. On one side, these interventions provide much-needed housing; on the other, they activate the in-between spaces, changing our surroundings into resources.

Based on this criteria and in the framework of the idea of a 15 minutes city, a study of these kind of plots was made in the Luzern agglomeration. The selected centers of the study are located within a ride of less than 15 minutes from station to station, resulting in Ebikon, Buchrain, Littau, Horw and Emmenbrücke.
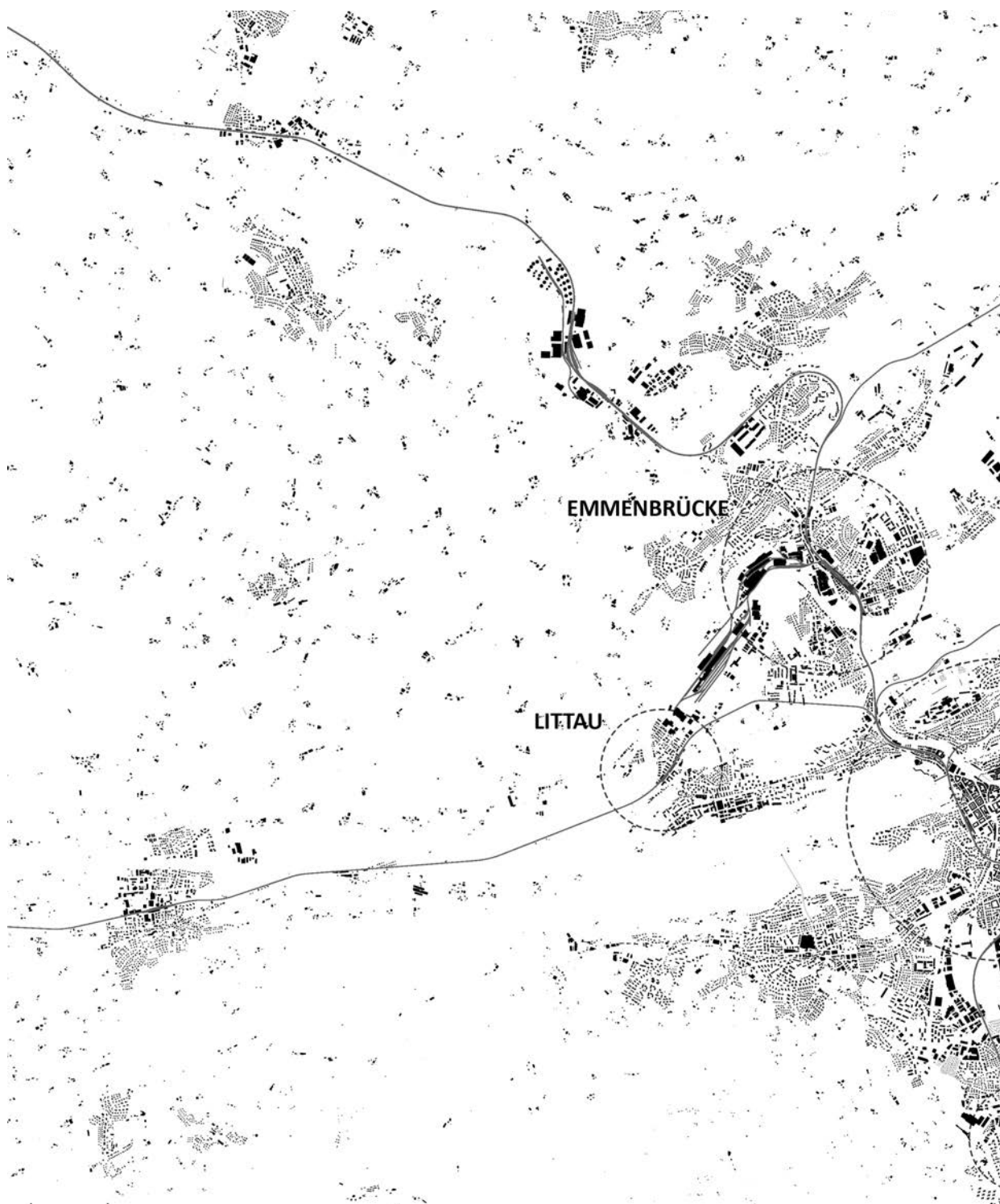
Fig. 9.   S-Bahn stations in the agglomeration of Luzern. The sites correspond to the leftover land study.

BUCHRAIN

EBIKON

LUZERN

HORW

The criteria followed for this study involved mapping publicly available data on land registration and railway line properties to identify the free square meters owned by SBB, as well as adjacent public land. The focus was not limited to the immediate surroundings of train stations but extended further to capture the broader extent of well-located, underused spaces.

BUCHRAIN 1:1500
SBB PROPERTY
RAILWAY

EMMENBRÜCKE 1:1500
SBB PROPERTY
RAILWAY
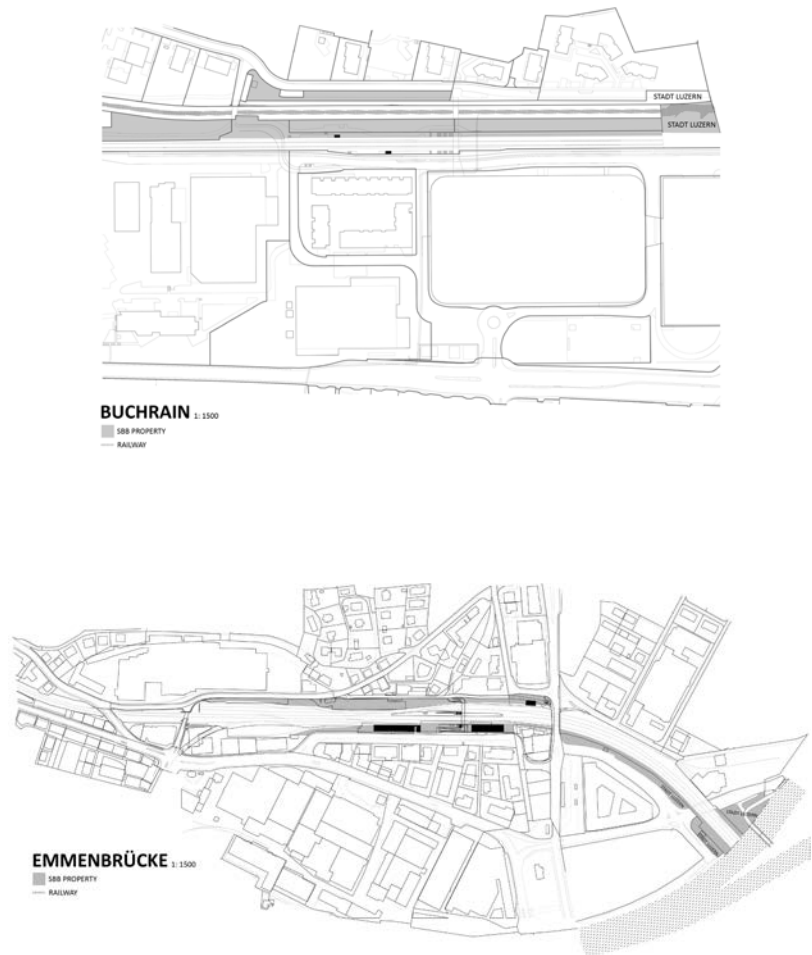
Fig. 10. Rail adjacent land either owned by SBB or municipality in gray.

HORW 1 : 1500

SBB PROPERTY

RAILWAY

STADT EBIKON

STADT
EBIKON

EBIKON 1 : 1500

SBB PROPERTY

RAILWAY

LITTAU 1 : 1500

SBB PROPERTY
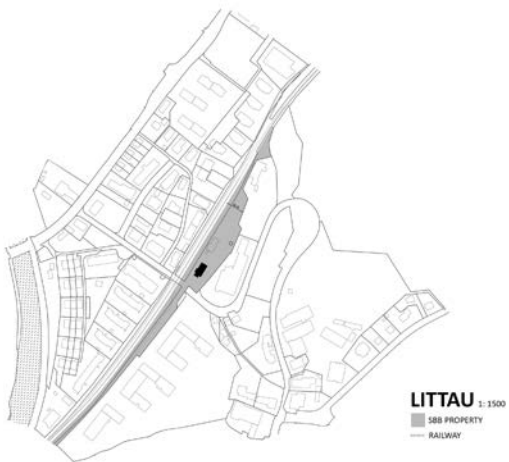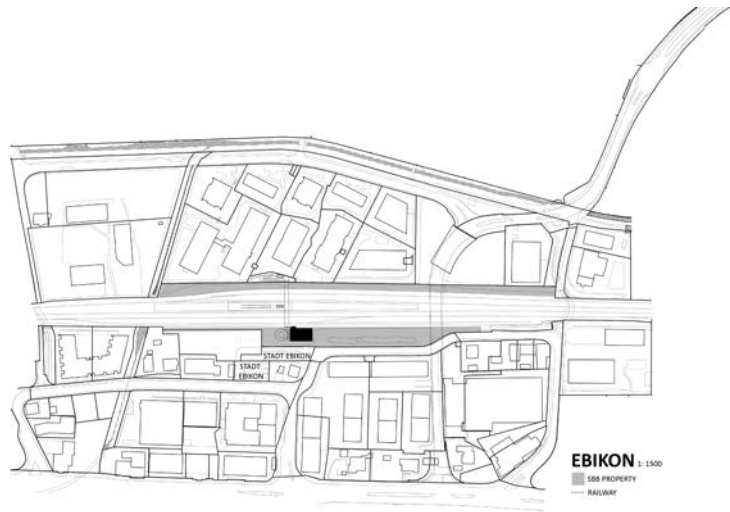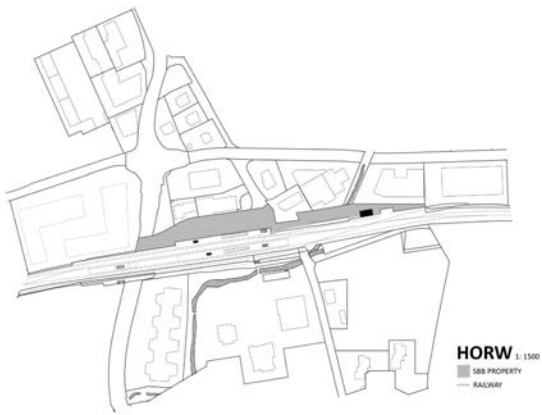
RAILWAY

This approach revealed a substantial amount of land in a linear configuration—typically consisting of parking lots, bus stops, low-impact railway operations, and other liminal areas. These elements shape the urban landscape around train stations, often resulting in a fragmented mix of emptiness and urban-like development: the station itself, followed by a band of underutilized space, then city-like blocks, and finally the countryside in the background.

Fig. 11. Exemplary land uses around the tracks. Note how low density utility functions dominates.

4.3 GROSSFORM

"...Only when a new quality arises beyond the mere sum of individual parts, and a higher level is achieved, does a Grossform arise.."[16]

The use of the length of the shape in a continuous building, as well as its capacity to be embedded in the city comes together in the concept of a *Grossform*. A *Grossform* as conceptualized by Oswald Mathias Ungers, refers to a structure that transcends the individual building and functions as a coherent form within the city. Unlike traditional urban fabric, which grows through the accumulation of smaller elements, the *Grossform* is conceived as a singular, organizing figure—clear in geometry, monumental in scale, and persistent in identity, even as it absorbs internal variety and change. Such structures provide with unity, predictability and orientation.[17]

Ungers emphasized that the *Grossform* often arises in response to pressing urban needs, particularly the demand for housing. He starts his essay with a reference to quantity. As a structural and spatial framework, it enables the integration of large housing programs within a unified form, allowing for density without fragmentation. In this sense, the *Grossform* is both a typological and a social response—providing order, identity, and cohesion while accommodating the complexities of urban life.

Far from being static, the *Grossform* is a resilient and flexible system: it accommodates diverse uses, adapts over time, and mediates between architecture and urbanism. It serves as both a spatial order and a visual marker, capable of giving form to large-scale interventions and anchoring them within the evolving context of the city.

The Grossform that applies best to these long and narrow plots would be the Wall Concept. According to Unger's categorization

16 Ungers Oswald Mathias, Grossformen im
     Wohnungsbau, 1966 P. 2
17 Schrijver Lara, Grossform, 2018, P. 5

of different Grossform types, while the Wall Concept can be a div, "It defines spaces, squares, yards and nooks, or forms a background or protection. The wall is according to its form and urban function defined by its surroundings."[18]

Within this framework, we can imagine a building that functions as a connector as well as a densification point. Moreover, the ambivalence of SBB can be portrayed rather than solved, making room for both profit and non profit programs in one system.

18Ungers Oswald Mathias, Grossformen im
    Wohnungsbau, 1966 P. 19
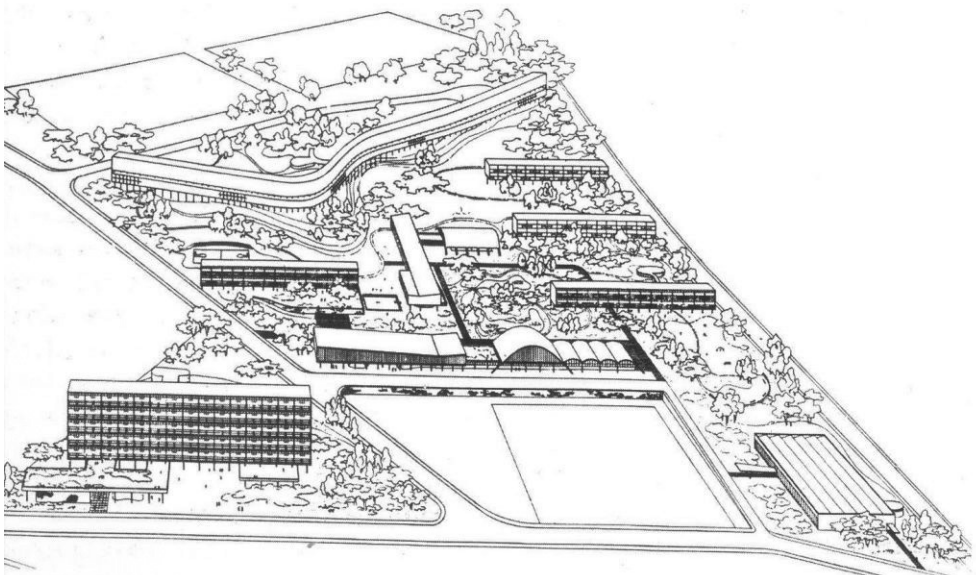
Fig. 12. The Pedregulho Housing Development from 1946 by Affonso Eduardo Reidy exemplifies the
    wall concept of a Grossform described by Ungers.

Fig. 13. The Pedregulho Housing Development as seen from it's galery. Note how bridges are connecting the building to its surrounding.

4.4 CASE STUDY: EMMENBRÜCKE, LUZERN NORD, CH.

47.070310, 8.283416

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Fig. 14. The Orthophoto of Emmenbrücke

Emmenbrücke Train Station ●

From the study of the leftover parcels of the train infrastructure, a study case was chosen to test the hypothesis of its usability for housing. It is important to point out that while in the five places a stock of land is available, the interventions that could happen in the leftover parcels should be site specific, therefore there is not a recipe to this land areas but rather an approach or an intention to give them a use that could address social or urban necessities.

For the purpose of this thesis, the case study project was chosen based on existing plans for urban development published by the respective municipalities. Emmenbrücke Süd, north of Luzern was selected as a case study because it is currently undergoing a massive construction under the *Luzern Nord* development framework, in a cooperation between the municipality of Emmen and the city of Luzern. It is part of a bigger development between Luzern City and its agglomerations called *Luzern Plus*, that seeks a better integration between the municipalities around Luzern and the main city.

Emmenbrücke Süd is the one of the largest developments of the *Luzern Plus* plan, and due to its urban sprawl almost colliding to the city of Luzern, the new development area is tought to bridge the gap between both cities and will be considered a secondary center of the city of Luzern.

The plan encompasses five key developments with different focus programms that diversifies the offers of the area but also has a strong focus to market priced housing and working spaces. The total planned area for redevelopment accounts for 58.440m2 between the two municipalities. [19]

In total, the projects in the plots that have already released a project or a competition account for at least 830 new market price flats, 85 housing cooperative flats, 88.000 m^2 of office/work space and 45.000m^2 of dedicated commercial space.

19   Bearbeitungsperimeter Luzern Nord, 2021

The urban plan concept was carried on by Metron in 2010. In this urban concept Metron defined construction areas in the existing parcels, heights, public space, street design and the bus hub and access to the train station as the overall plan for Luzern Nord. Additionally Seetalplatz is a public square between towers, the bus hub area referred as Bahnhofplatz and Reusszopf Island in the conjunction of the rivers (Kleine Emme and Reuss) are referred as public space for the development.

Overall, *Luzern Nord* —as we will referred to the place from now on— in its planned development sets the context for the project of the thesis, looking to the endpoint of the development as a referential context.
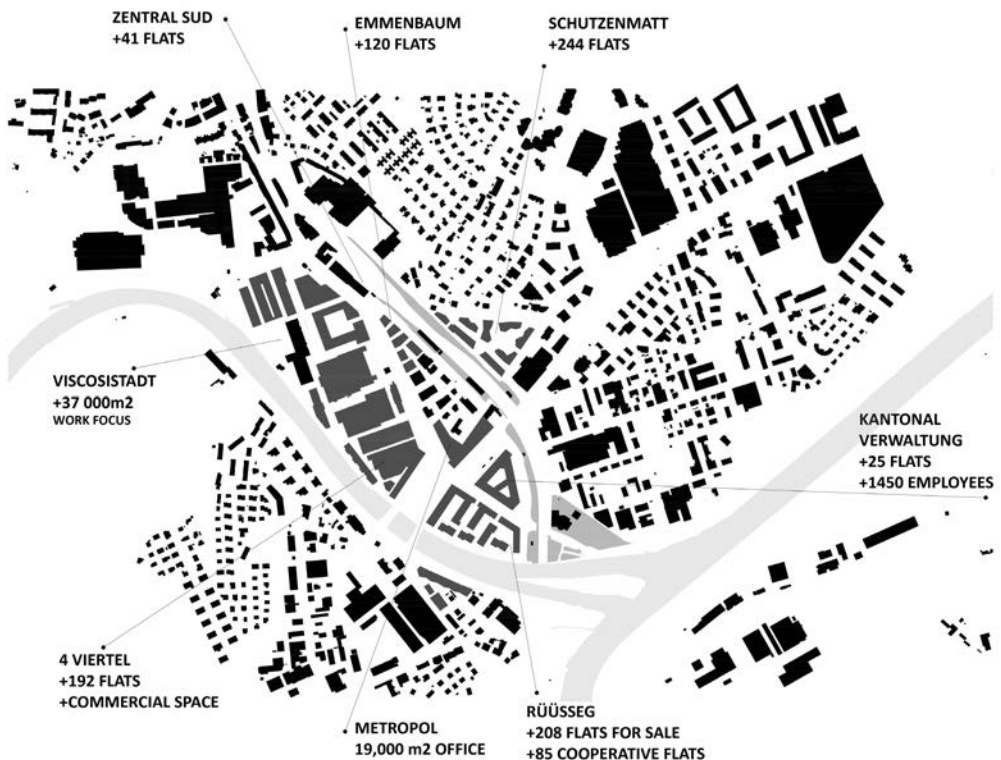
Fig. 15. Luzern Nord in numbers after its completed state.

As the initial thesis of this work, the main goal is to accomodate housing in the leftover parcels, specifically housing units that align with the plan of G-Net Luzern to address affordable housing, i.e. housing collectives or non profit housing. In general, the idea of a *Grossform* that organises the city through built mass which accomodates the neccesity of housing is preserved by this thesis. Nonetheless, while looking closer at the *Luzern Nord* context, it became rather noticeable that an urban strategy had to be drawn up first to generate the right conditions for housing, in order to make use of the leftover parcel,

In *Luzern Nord*, the conditions of the city are particularly constrained by mobility infrastructure nodes. The development plan is clearly based on a motor-focused context, which increases its island condition between building blocks next to the site.

The leftover parcel in question then becomes for the *Luzern Nord* Plan not only a left over but an endpoint to this part of the city. At the east of Schützenmatt and the Cantonal Administration the street is not even walkable. The pedestrian experience in this area is almost non existant, and the accesibility to the other side of the tracks is only possible on a small sidewalk located next to the car connections under the tracks. One can say that the state of the pedestrian experience is not even ideal for the planned developments next to the site.

The tracks and their embankment area act as a wall within the city—a divider between two sides of Emmenbrücke. It becomes a non place and the back side of Luzern Nord. It almost seems as though the city stops here, but in reality, it continues beyond, waiting to be woven back together.

This condition of the site took the focus of the study to the urban aspect of the *Grossform* rather than its dwelling aspect. To enable density in this particular leftover parcel, the parcel has to first integrate to the urban fabric. Its position and its condition of divisor can be shifted in favor of the city to enable a cohesive transition for other kind of mobility models besides the motorised and train alternatives. It has to first be city to then become housing.

URBAN FIGURE.

The case study site in Emmenbrücke consists of an elongated, linear parcel— measuring approximately 593 meters—with varying widths that allow for a consistent buildable width of around 14 meters along most of its extent. In addition, a second plot located on the opposite side of the railway tracks, measuring approximately 300 meters in length is also considered part of the study area. However, this parcel is excluded from densification strategies due to its immediate proximity to an adjacent development.

The lenght of the parcel extends from the train station all the way to the Kleine Emme, it also touches three existing tunnels to the other side of the tracks, two correspond to road infrastructure and one to the underpass of the train station. This proximity to connection arteries to Luzern and to both sides of the tracks are a precondition to think the built intervention as a continuos building, a continuos urban figure that integrates the context into its system and adds quality to the the white part of the ground floor figure plan.

Fig. 16. Emmenbrücke *Grossform* in territorial map. New developments marked in dashed line.
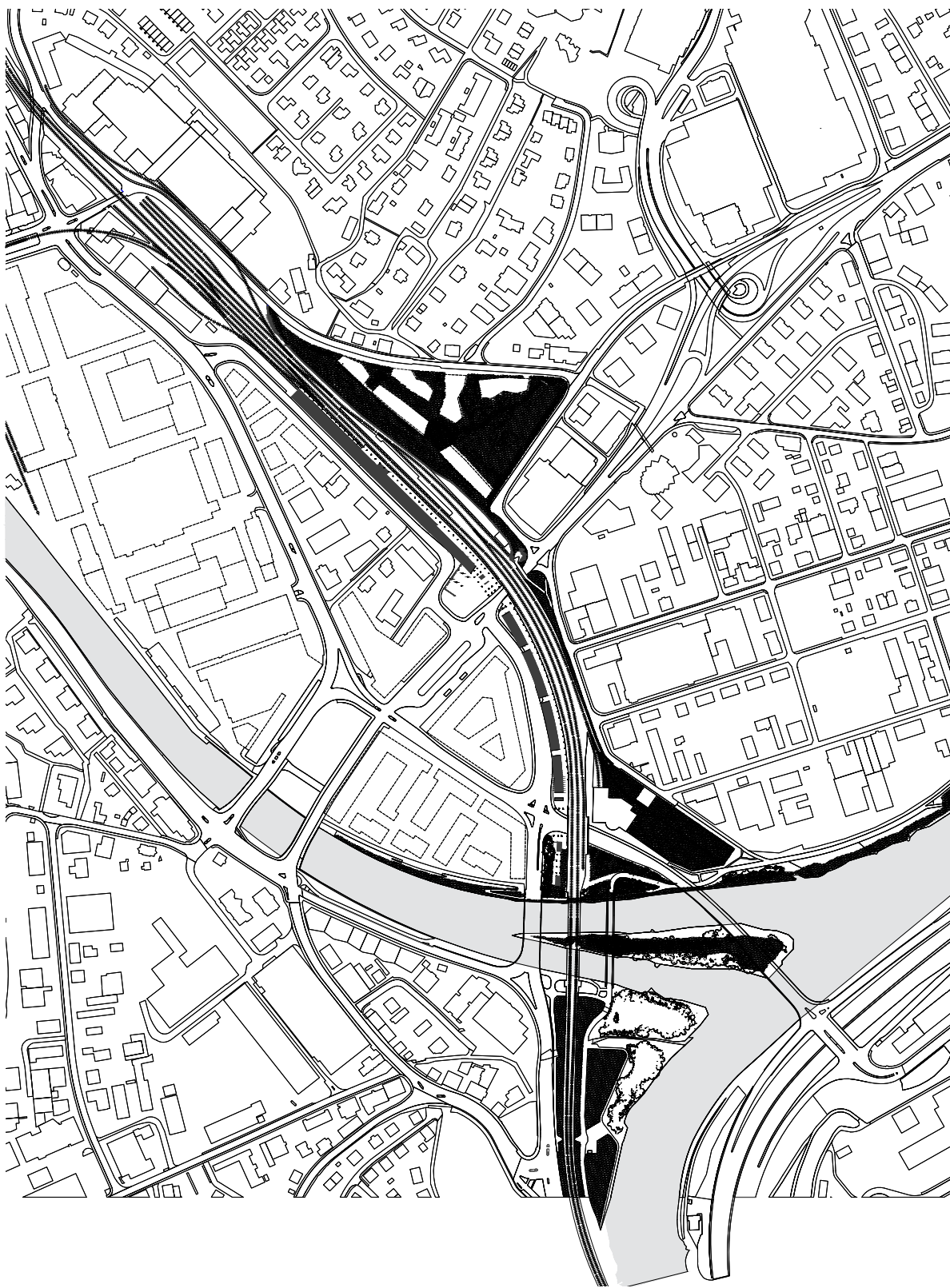
The proposed building can be explained in two parts. Firstly a continuous 3 floor shape in steel construction, that enables lighter structural profiles when spanning roads. It elongates from the river edge to the train station. We will referred to as ''the base''. Secondly, a series of buildings on top of the base for housing units accessed by a series of evenly located staircases and shaft cores at the base.

The continous geometry of the base allows to create a system that is uninterrupted and integrates different qualities of the street that runs along it, which as well brings the building in tune with the surroundings, the street shapes the plot and therefore the building.

This continuous form is not only a buidling but an urban gesture that organises the housing units above. It draws from the *Royal Crescent* in Bath by John Wood The Elder, completed in 1769, a noticeable example of Georgian Architecture in England.

The *Royal Crescent* takes its name from the shape of the building. Nonetheless, the urban figure in our case study not only looks at the formal shape of the crescent but to the idea of an organising figure that at the same time offers diversity. Bath is a city famous for its roman built baths. In the *Royal Crescent* every town house was individually designed within the framework of the urban shape.

At the same time, the crescent's geometry organised the town houses towards a park. Thus creating harmony but also individual expressions, while making an urban statement rather than building individual townhouses. In a similar manner, the *Gross-form* along the tracks takes a half circular geometry that responds to the geometry of the plot, creating this continuous harmonious facade but that is hyperspecific to the surrounding, therefore changing character as one progresses along the line.

Fig. 17. Royal Crescent, Stituation Plan.

ALONG THE RAILWAY

Fig. 18. The Roycal Crescent as seen from the street level as well as an aerial view

This continuity was also observed in a more recent project in Zurich, the housing complex *Limmat West* by Kuhn Fischer Partner Architekten, built in 2001. It consists as well of a continuous building in two rows of housing that adapts its morphology to the preexisting conditions of the city. It crosses a road and existing preserved buildings, adding them to its composition.

Fig. 19. Limmat West as seen from across the river. Note the existing building that is integrated into the development

The shape of the building runs along the curvature of the *Limmat West*. The project, seen from the publicly accessible terraces above, looks like an elongated row of houses with an interior street, but walked through it seamlessly blends into the city.
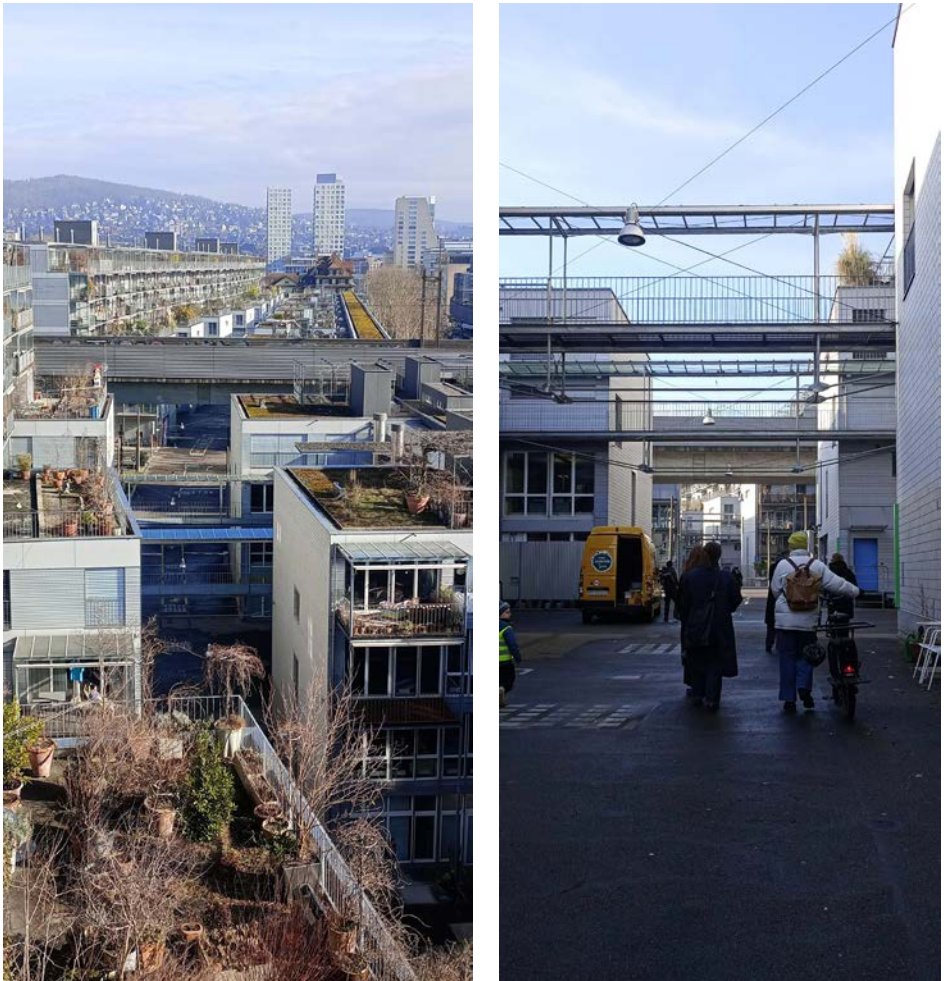
Fig. 20. Impressions of Limmat West. At the left from the terrace, at the right from the inner street.

The linear *Grossform* in Emmenbrücke takes this approach as well, it crosses two main roads and integrates two grade B buildings (erhaltenswert) into its composition near the train station area: the old Bahnhof Hotel and the old train station building.

In the elongated shape, a series of vertical circulation cores are distributed evenly according to fire safety regulations to allow for different combinations of housing buildings over the base. A composition of an elongated 3 level building above the base and three taller buildings over it was chosen as a combination that adds on density.

The taller buildings are located in three key points. The first at the river side, where the open area to the river allow for good views and taller heights.

The second building is looking to the new Bahnhofplatz and bus hub of the area. This area is already enclosed by three tower like figures: a taller building in 7 floors looking to the open space closes up this configuration giving it a square morphology.

The final housing building is above the train station, respecting the heights of the neighbors to create a city like feeling at the Bahnhofstrasse.
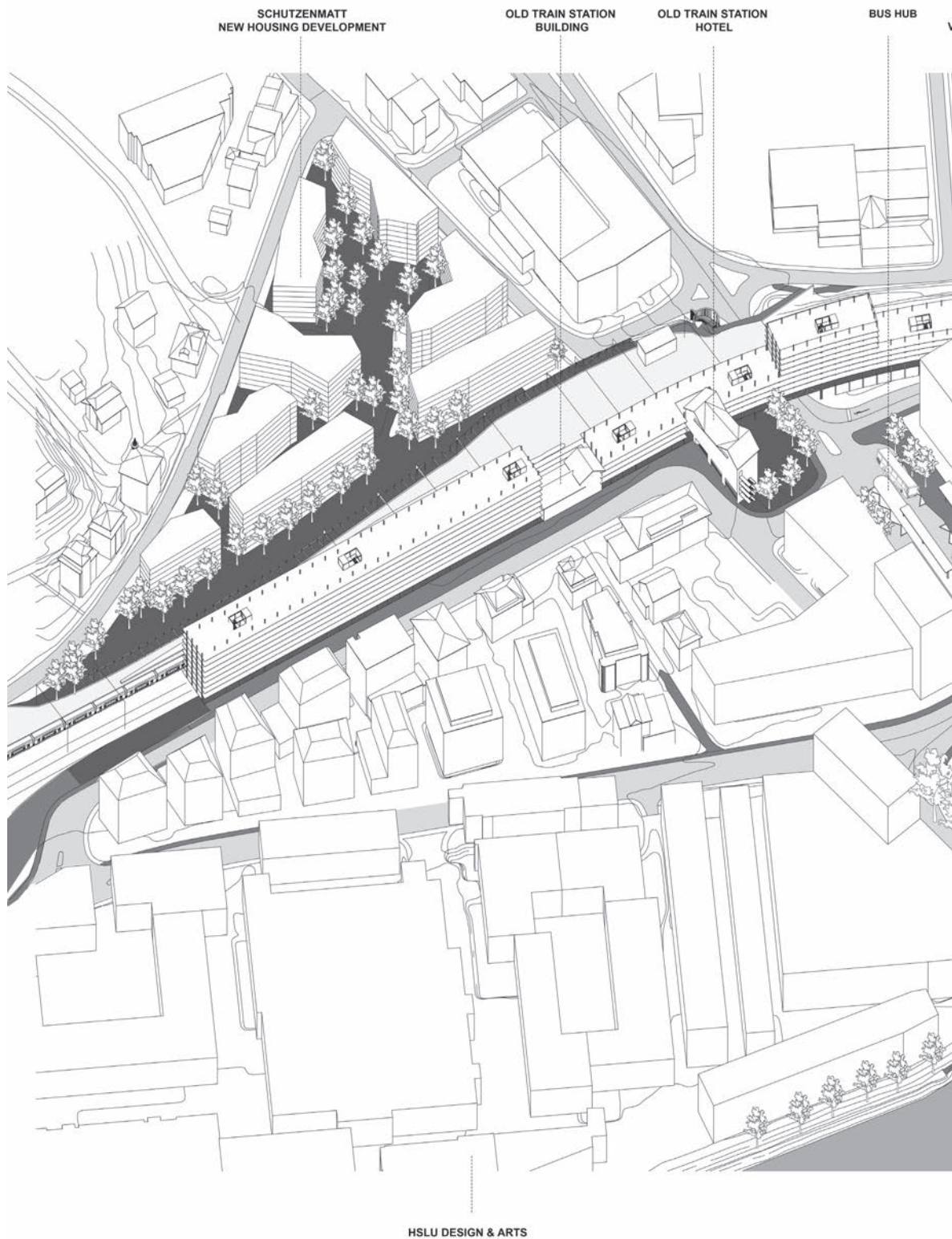
Fig. 21. Urban axonometric, depicting bicycle and pedestrian routes, as well as the newly formed connections

KANTONAL
VERWALTUNG

RÜÜSSEG NEW HOUSING
DEVELOPMENT

BIKE BRIDGE TO
LUZERN
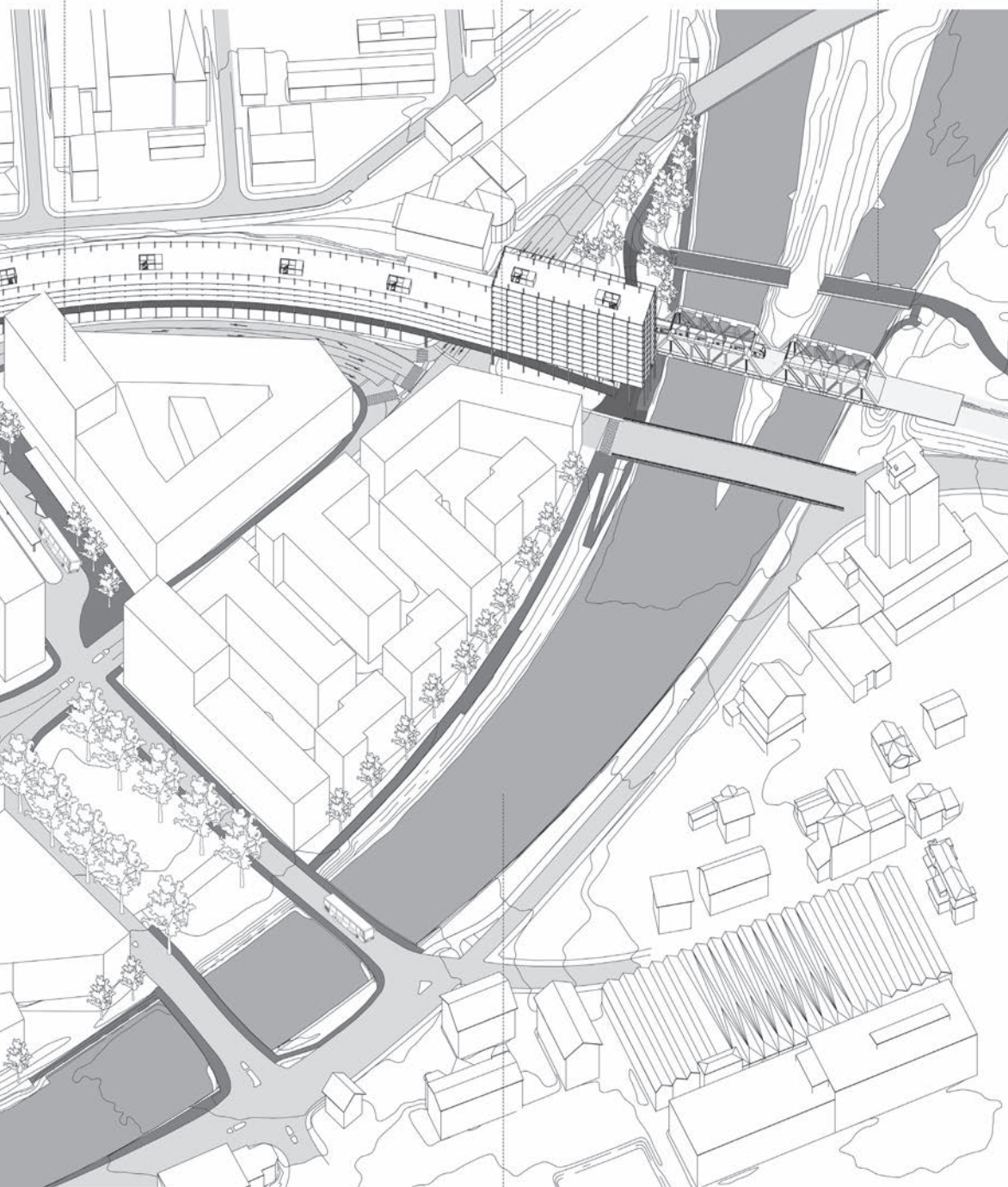
KLEINE EMME

MULTIPLE GROUNDFLOORS

A distinctive feature of the Emmenbrücke case study site is its topography, which follows the railway embankment—an artificial terrain constructed to accommodate the train infrastructure in a cost-efficient manner. The embankment begins near the banks of the Kleine Emme river and gradually merges with the natural ground level at the Emmenbrücke train station. This elevation shift is not treated as a constraint, but rather as a design opportunity: the project strategically uses the level difference to articulate a series of multiple ground floors, enabling spatial and programmatic variety at different heights.

These layered ground floors are a direct response to the complexity of the surrounding context. At this specific point in Emmenbrücke, several major transportation arteries intersect. On one side, three cantonal roads—Route No. 2, No. 10, and No. 26—connect to key regional infrastructure: the A2 motorway (Switzerland's main north–south axis), the A14 toward Zurich, and the Entlebuch region. One of these cantonal roads runs parallel to the Grossform, stretching from the riverfront to the local bus hub, and carries four lanes of continuous traffic. Additionally, two major road crossings intersect the Grossform, bringing even more motorized flow into direct contact with the site.

Positioned between the railway tracks and intensive road traffic, the site may appear trapped by infrastructure. However, rather than seeing these arteries as undesirable neighbors, the project embraces and responds to them. The *Grossform* incorporates pedestrian and bicycle movement, transforming the building from a passive object into an active urban interface. The multiple ground floors are not simply thresholds; they become the connective tissue of the city—the building becomes housing, street and infrastructure, offering not just density, but urban porosity and access.

THE ARCADE

To articulate the linear form of the project as a cohesive whole, the typology of the arcade is employed. This typological strategy takes advantage of the five-meter height difference beneath the railway embankment, creating a sheltered passage that runs continuously from the Kleine Emme river to the underground level of the Emmenbrücke train station. This arcade functions as a public, street-like space, positioned between the retaining wall of the embankment— open to the sky—and the new facades of the *Grossform*.

The arcade acts as a connective spine, linking the city-side street level directly with the pedestrian tunnel to the island platforms of the station. It transitions fluidly from ground level to underground, creating a seamless and accessible pedestrian route. More than just circulation, this space offers refuge from the surrounding high-speed traffic, functioning as a protected corridor embedded within infrastructure.

This spatial logic draws from the arcade systems in Paris from the 19th century, where covered but yet ouside-like pedestrian routes were integrated into the dense urban grid to increase the facades of shopping, while at the same time provided shelter from traffic and weather, incentivizing commercial activity, and offering new, more intimate ways to traverse the city. These protected short-cuts, while often lined with shops, ultimately generated new layers of urban life.[20]

In contrast, the programmatic content of the Emmenbrücke arcade is more diverse. Depending on the building's section, the arcade hosts a variety of uses—from public and civic programs, to productive and labor spaces, and finally to retail and transportation functions within the station. This functional variation enriches the arcade's character, making it not just a shopping strip, but an urban continuum—part infrastructure, part public realm.

20 Leong Sze Tsung, Mobility, Projects on the City 2, 2001, P. 478
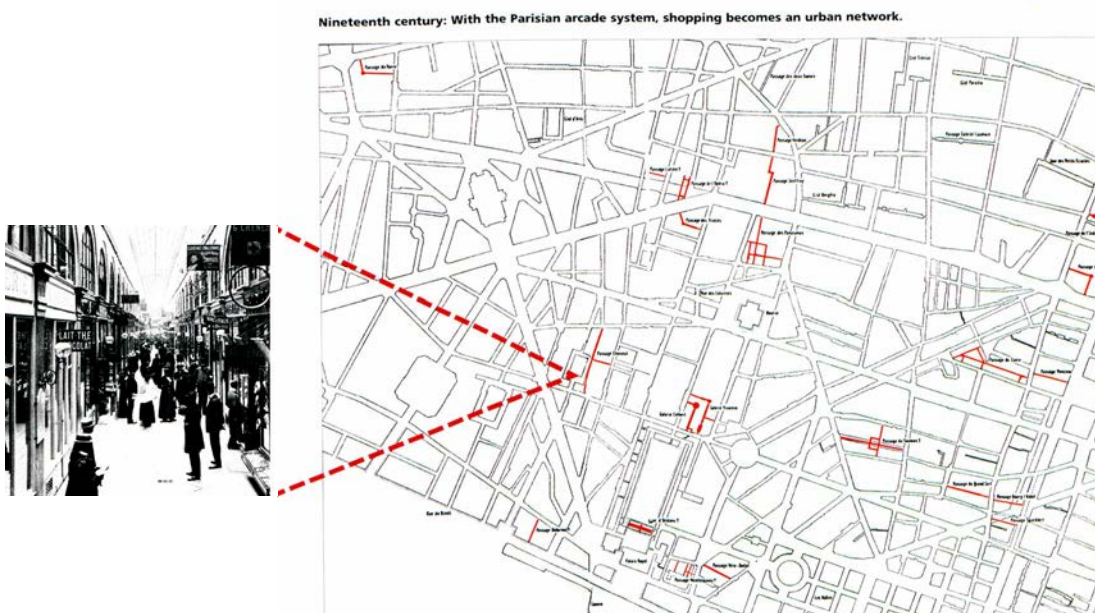
Fig. 22. Map of the arcade system of Paris in the nineteenth century.
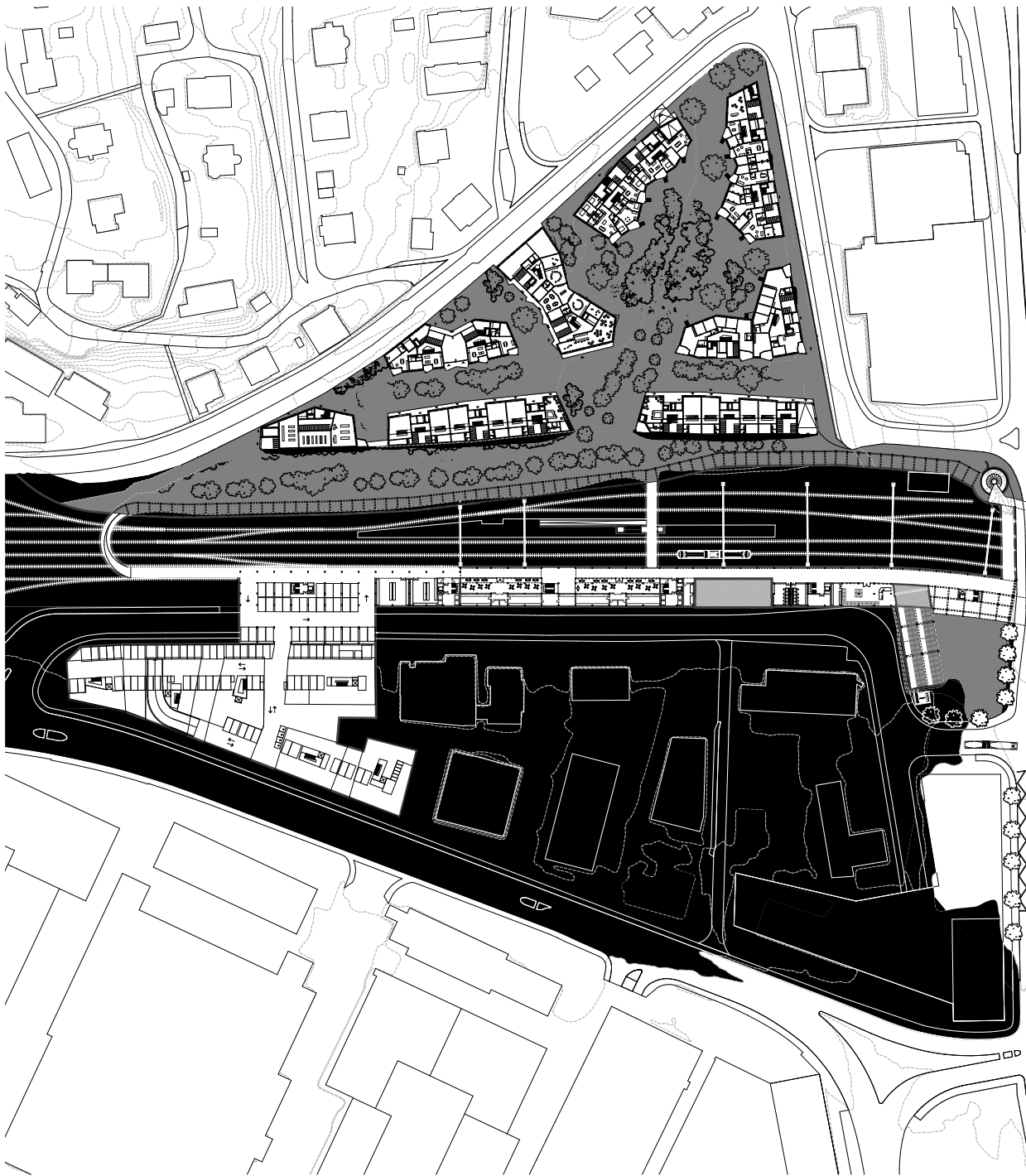
Fig.23. -1 UG, Arcade Level Plan.

TRACKSIDE GROSSFORM IN EMMENBRÜCKE
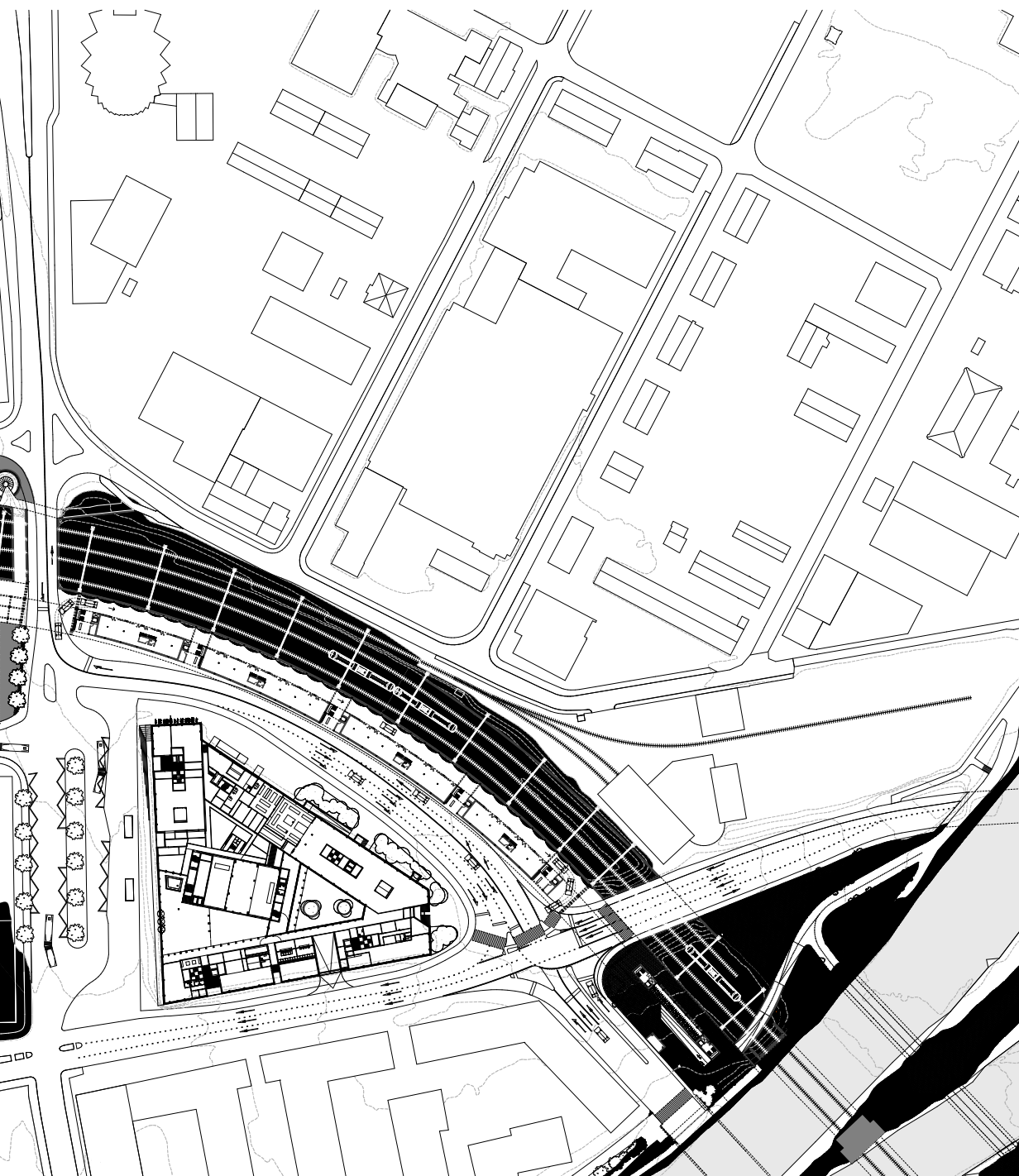
The arcade typology also recalls the *Olivetti Headquarters* designed by James Stirling, where an open megastructure blurred the boundaries between factory, office, and civic life. Stirling's vision for Milton Keynes was of an integrated urban system—an architecture that facilitated the movement of people, goods, and services within a self-contained but adaptable organism. Similarly, the Grossform in Emmenbrücke does not isolate itself from its context. Instead, it opens up to the city through a sequence of spatial connections, including cross-track tunnels and access points, integrating both sides of the rail infrastructure into a unified urban experience.
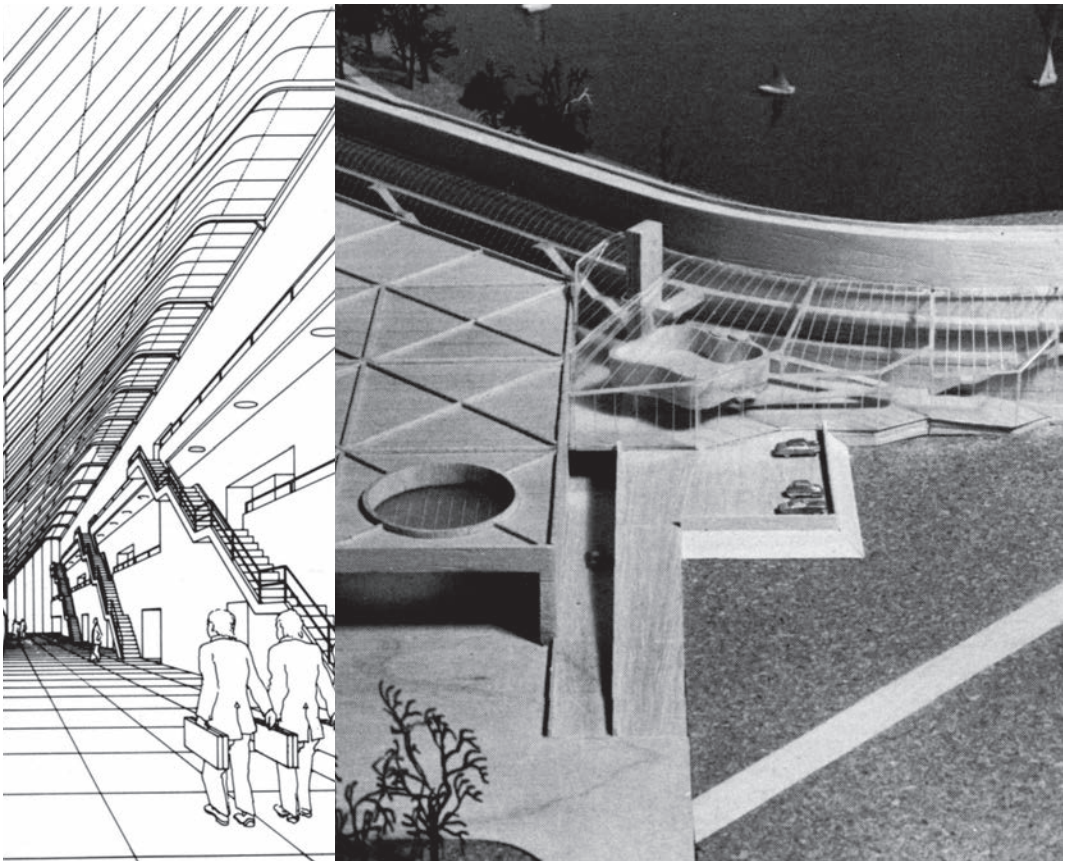
Fig. 24. Olivetti Headquarters, Model and perspective of the arcade structure.
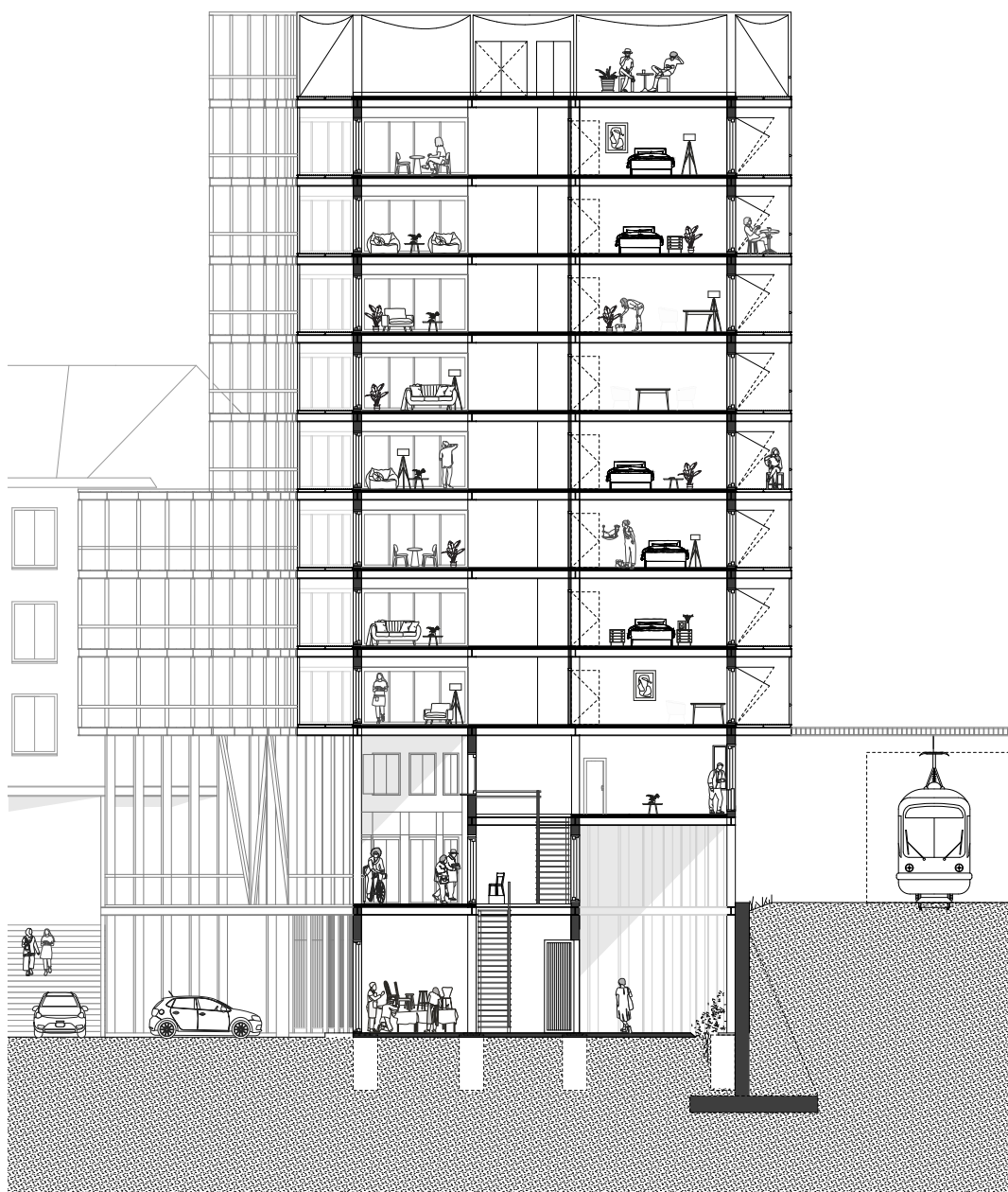
Fig. 25. Section of the building near the crossing of Seetalstrasse
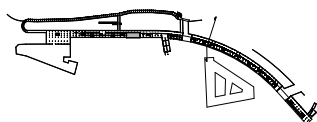
THE GALLERY

At the intersections, where major roads cross the Grossform, the scale of the pedestrian is compromised. With four-lane roads and fast-moving traffic, the act of crossing by foot loses the intimacy and legibility of a neighborhood street, becoming more akin to walking along a highway. In response, the project introduces a public gallery—a continuous elevated street running the length of the building, free from vehicular intersections. This elevated route allows bicycles and pedestrians to move seamlessly from the southern edge of the site (toward Luzern) to the north (toward the train station) without interruption, just as a street in an urban fabric.

Moving public live to the first floor while leaving the ground floor for utilities and commerce draws similarities to the concept of the Piano Nobile in roman architecture. A palazzo would usually use the base floor for business and crafting activities, while the first floor, the Piano Nobile, would serve as the public square of the building. The levels above would then be private to the owners of the palazzo, similar to how the upper floors above the gallery are used for housing.[21]
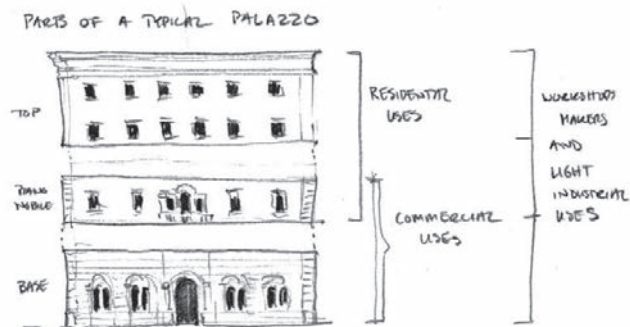

Fig. 26. Piano Nobile in a typical italian palazzo.

The gallery connects directly to the existing bike route to Luzern, beginning at a ramp on the southern end of the building that gently lifts the street to the second level, This integration signifi-

21 Zeeren, Lessons from Rome 1, 2015

cantly improves the current cycling conditions, which are fragmented and inconvenient, offering a safer and more coherent route through the area. While elevated walkways are often criticized for breaking the connection with the ground and creating inaccessible or underused spaces, the gallery of the *Grossform* avoids this problem: it rises to meet the level of Bahnhofstrasse, the main street in front of the train station. In this way, the gallery acts not as a detached bridge, but as a natural extension of the existing street.

The gallery then is a flexible street that traverses the traffic situation almost like a new topography. It is shaped by the colonade of the building structure, and the showroom space (connected to the workshops below) animates the new street gallery for pedestrians and bikers, producing a street layout that has as well ties to the -1 level.
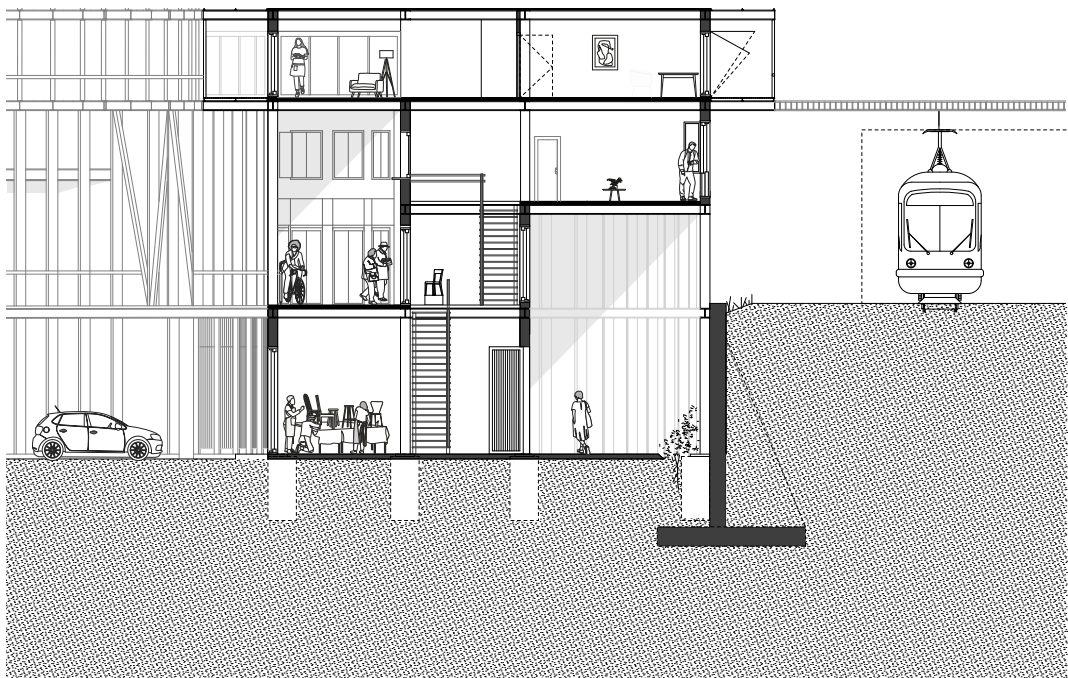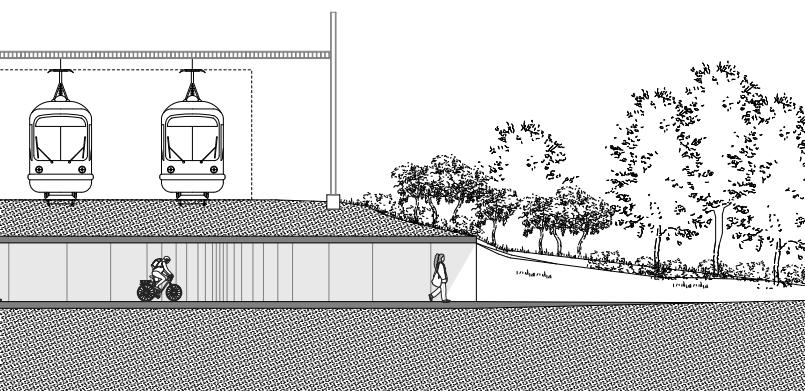
Fig. 27. Section of the building along the kleine Emme
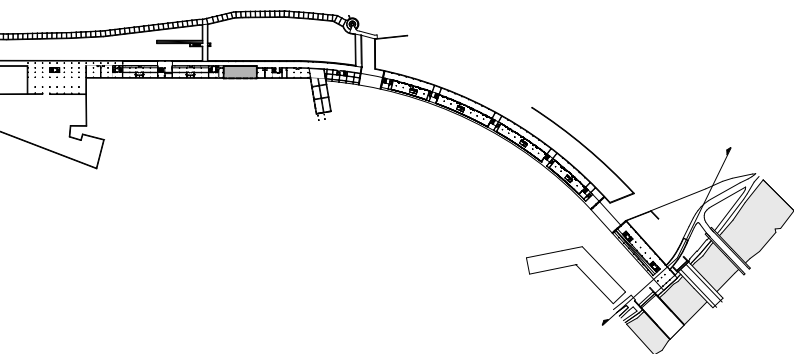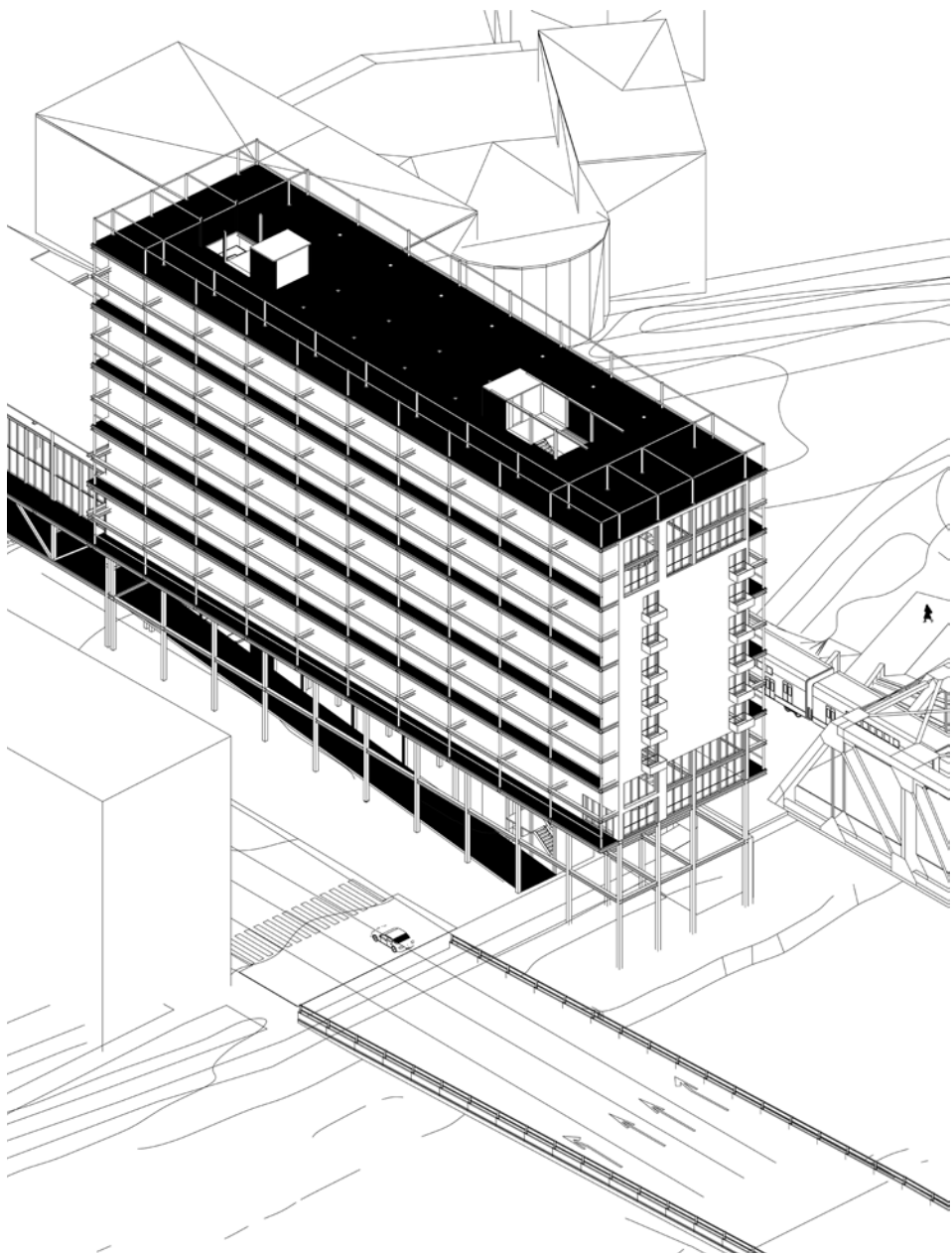
ON TOP OF THE BASE

The building's design is highly specific in its first three levels, directly responding to the context and effectively weaving itself into the urban fabric—almost like building the city itself. This specificity at the base opens up opportunities above: it frees the land at the top to accommodate densifying programs that enhance the overall vitality of the area.
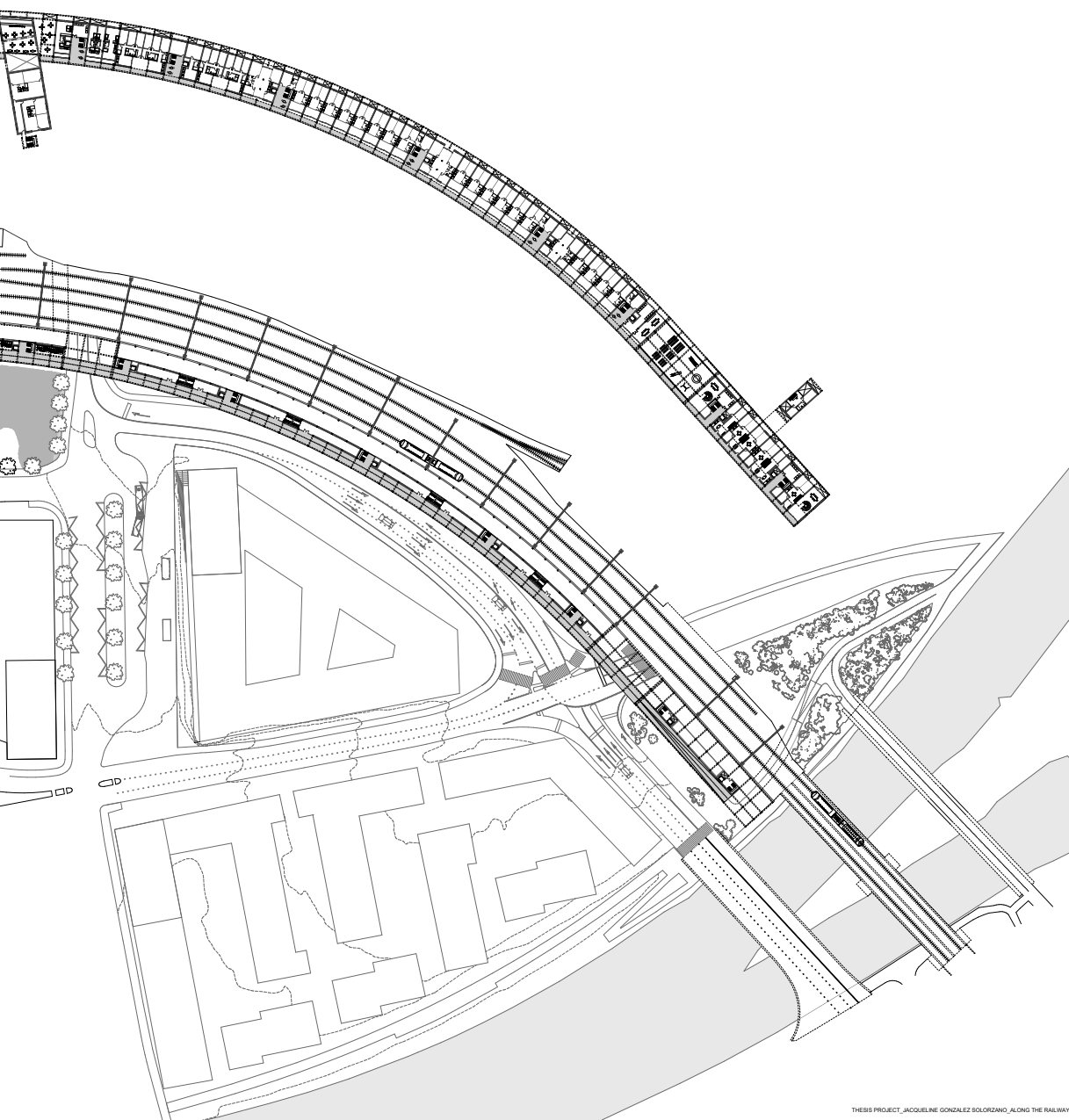
Such a strategy makes it possible to build in these complex, left-over plots adjacent to the train tracks—places that might otherwise remain neglected. By thoughtfully addressing the ground conditions first, the building establishes a strong urban presence that allows density to take root.

The relationship between the housing above and the carefully crafted base is essential. The base elevates the housing units, much like an urban street's ground floor supports the life above. In this project, the ground floors—alive with production, workshops, commerce and public uses—create a solid foundation for living spaces on top of it.

Without this density, a bridge-like structure would risk becoming a non-place—an empty passage for movement only, lacking the vibrancy that true urbanity requires. But here, density brings life to the new street, and in turn, the new street enables this density to thrive. The building doesn't merely exist in isolation; it offers new neighbors to relate to, turning what could be dead or "backside" spaces into active, interconnected fronts.

Specifically in Emmenbrücke, the robust base of the building allows for different housing typologies above. The 14-metre depth of the structure, along with the double-sided "Laubengang" access, offers a flexible framework that can accommodate varied combinations of housing types.

2. OG_ON TOP OF THE BASE
1: 500

8. EG_GALLERY LEVEL
1: 500

Fig. 28. Plan of the Gallery and on top of the base

THESIS PROJECT_JACQUELINE GONZALEZ SOLORZANO_ALONG THE RAILWAY_

URBAN SEQUENCE

While the project can be described in terms of levels with disparate functions, pedestrians and bicyclists will experience the structure more in a linear fashion as they move along it. To capture this experience of walking along and interacting with the building and the city around it, the structure can also be described in a narrative of three sequences.

SEQUENCE I: OPEN SPACE

The recently naturalised Kleine Emme, with its island at Reusszopf—where the Kleine Emme and the Reuss converge— has become a public space, though not formally designed as such. Along the banks of the Kleine Emme, the building's base is an open space where the steel structure is exposed and vegetation from the riverbanks climbs up the facade. This is where the ensemble's first housing address is located.
Here, a new tunnel under the tracks connects the bike path from Luzern to Emmenbrücke and the train station. This open space becomes a meeting point: a junction for the new bike/pedestrian tunnel, the riverside walkway, and the housing entrances. It is also where a ramp elevates the ground level, transitioning into the gallery above.
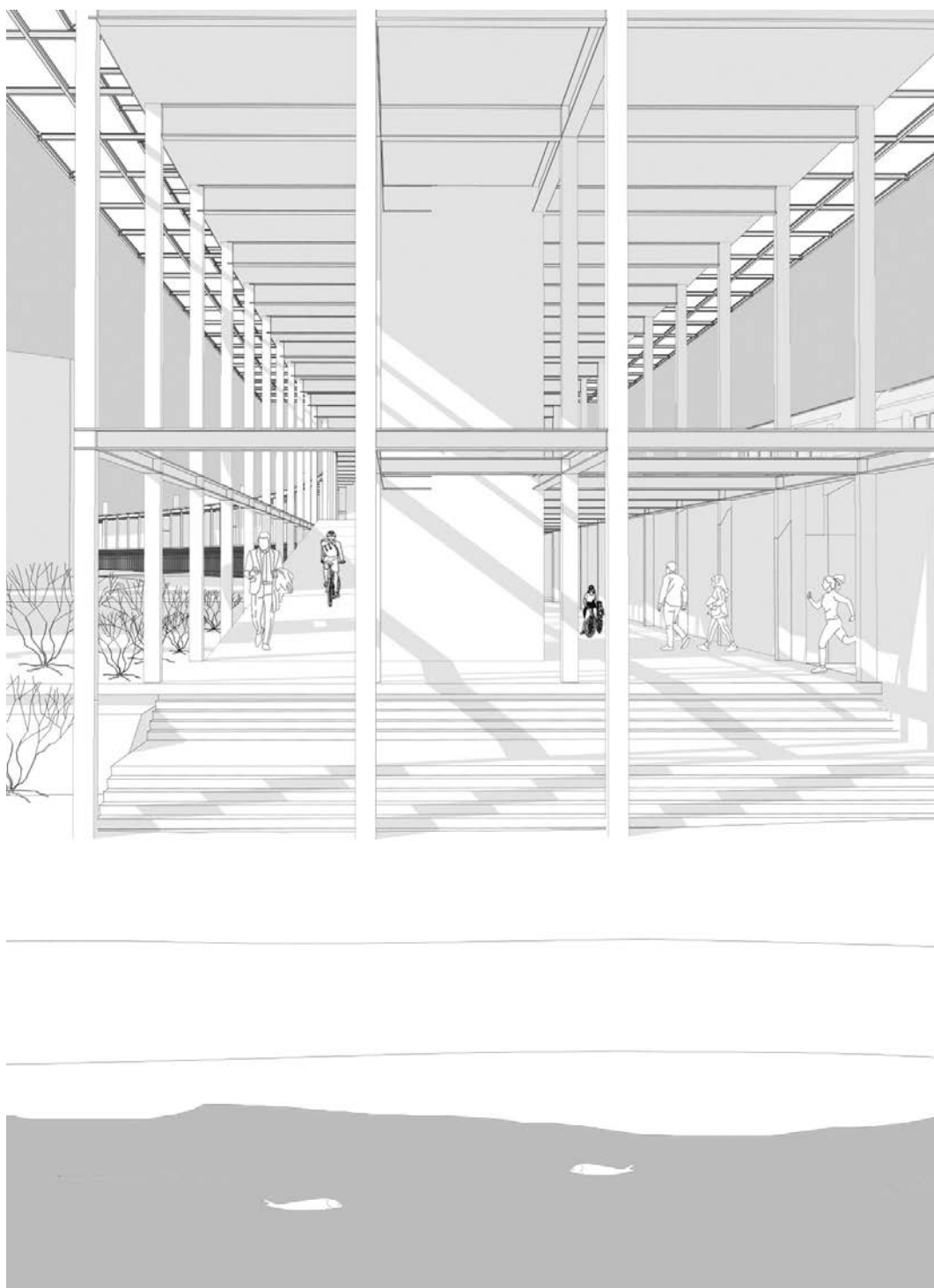
Fig. 29. View from the river to the base of the structure. The tunnel to the right is used to access the bike / pedestrian bridge to Luzern. The ramp to the left is accessing the Gallery.

SEQUENCE II: SPACE OF PRODUCTION

Moving along the arcade at street level, the surrounding's change character. The river is replaced by a space caught between two transport axes: the train tracks on one side and a four-lane road with a major intersection on the other. Across from this site is the rear facade of the new Cantonal Administration Building.

The building's use in this section aligns with the existing character of the area. Along the arcade, a series of workshop spaces open onto the new street and the main road, creating a productive edge. This is a space for small- and medium-sized craft businesses that thrive in an environment less suitable for other uses, bringing life and energy to the arcade.

At this point, the gallery and arcade levels are interconnected. Internal staircases link the workshops to showrooms, offices, or administrative spaces above—extending production into the gallery and giving it an active, street-like character. Above these, additional staircases lead to two housing units tied to the workshops below, creating a vertical integration of production, trade, and living. These staircases also provide access to the housing units above, serving as addresses for the residential spaces.

Along the *Grossform*, two Grade B (erhaltenswert) buildings are integrated into the system, becoming part of the gallery's evolving character. The first building encountered along the gallery was once the old hotel of the station—a five-level structure divided by three firewalls, currently occupied by local businesses and some housing units. The proposal opens the ground floor of this building, transforming it into a permeable facade that links the bus hub—otherwise disconnected from the Bahnofstrasse—to the gallery. Above, the existing housing units remain, adding another layer of activity.

The second building is the old train station itself. It too is integrated into the gallery, retaining its current programs as part of the new urban composition. This careful incorporation of existing structures ensures a sense of continuity and local identity, weaving past and present seamlessly into the project's narrative.
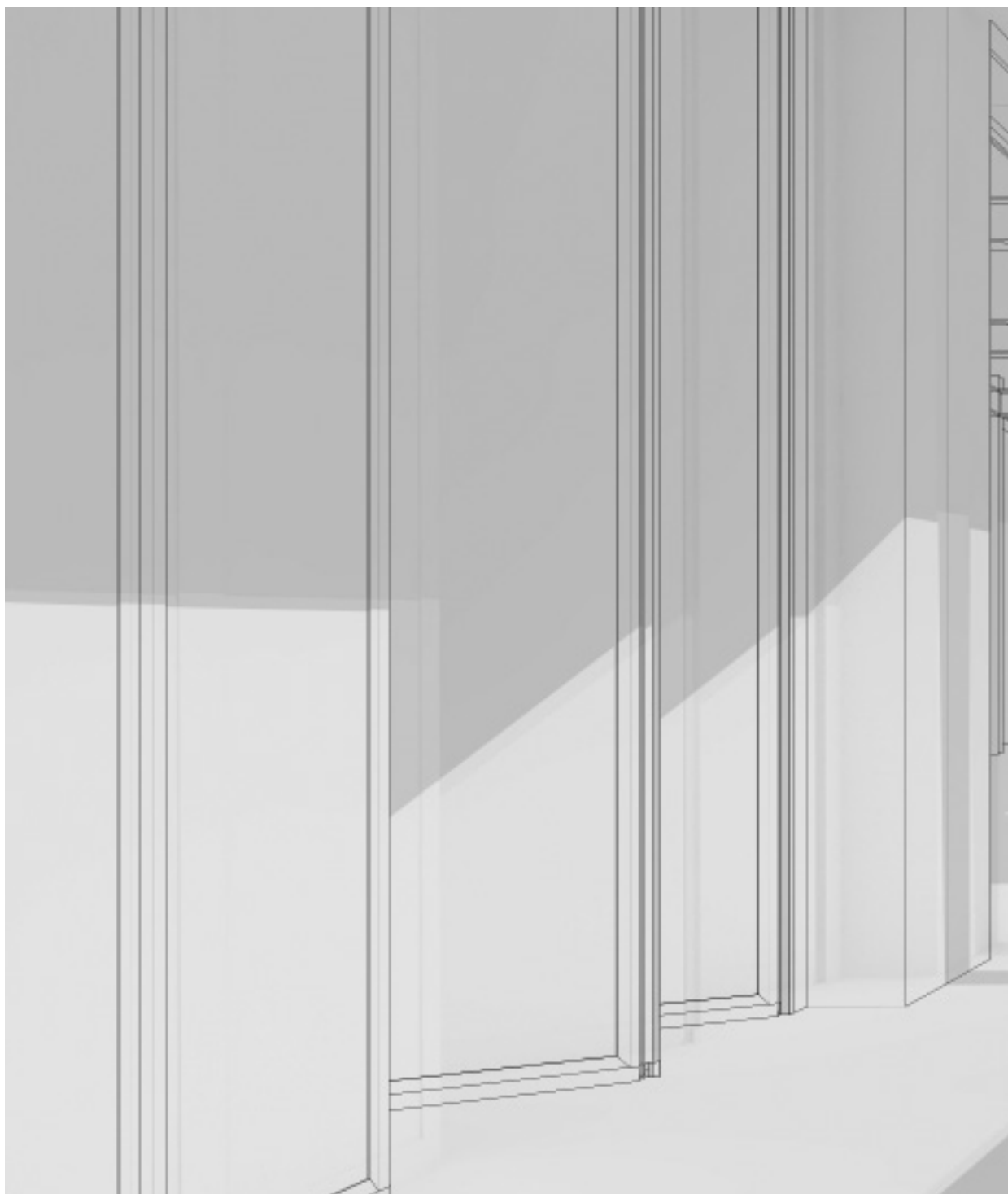
Fig. 30. View into the arcade. To the left the workshop accesses, to the right the train tracks.

Fig. 31. View along the Gallery. In the distance, the old Bahnhof hotel building can be seen, where the Gallery transitions into the Bahnhofsstrasse. Along the facade are the showrooms of the workshops.

SEQUENCE III: SPACE OF TRANSITION

The final section integrates the Emmenbrücke train station, which is expected to be expanded in the long term to meet increasing demand. Currently, the station serves around 6,000 passengers per working day via three platforms, with three S-Bahn lines (S1, S9, S-99) stopping every half-hour. Additionally, the RE24 to Olten stops hourly. In 2018, a postulate was presented to the municipality of Emmen, advocating for long-distance train service at Emmenbrücke as part of the SBB's service concept 2030/2035. The argument noted that, with the anticipated 15-minute interval for the S-Bahn lines (S1 and S9) and the reorganised intercity and interregional services, the platforms would need to be extended from 150 m to 250–300 m—an expansion already included in Metron's 2010 master plan. Metron's plan also proposes a new station access point opposite the bus hub and a new station building by SBB.

Considering the *Luzern Nord* master plan and the station's projected redevelopment, the integrates the station at the arcade level. This becomes an underground layer connecting parking, the tunnel to platforms 2 and 3, and the other side of the tracks, forming a continuous level. After this tunnel the space opens up to a newly introduced green area on the left over plot of SBB that extends the landscape of the planned development of Schutzenmatt. The significant construction work already planned in this area makes it possible to tie in a -1 level, weaving the station into the urban fabric. This also opens up possibilities: linking parking facilities in front of the station (Emmebaum) with those serving the housing units in the station area, via a single ramp. This enables shared rental of parking spots in both basements, seamlessly connecting two different buildings.

Drawing inspiration from Victor Gruen's original concept of the mall as an urban centre prioritising the pedestrian experience, the station becomes the anchor point—already animated by foot traffic. Here, medium-sized retail and gastronomy spaces cluster in two interconnected levels (the gallery and the arcade). Despite this, the arcade remains an open-air street, continuing across the tracks and into the intersection beyond. The new station program envisions a mid-sized station with two gastronomy

offerings, three commercial spaces, and a supermarket that remains open at night and on weekends—serving the newly vibrant Emmenbrücke station area. Above, an SBB-managed residential building completes this layered urban node.

Fig.32. View into the basement level of the train station. To the left are small stores/cafes, the trains are accesses to the right.

5　EPILOG

This thesis set out to use leftover plots along the railway and adjacent to train stations, in order to allow for densification in a highly constrained environment and provide much needed additional housing.

While the initial idea of the thesis was to accommodate a specific typology of housing (non profit), the research showed that the ambivalence of SBB allows to a balance real state and the interest of other parties such as the housing collectives. On top of that, using SBB owned land allows for a more varied mix of uses and to integrate high quality public transport into the project from the outset.

Given the size and shape of the plot, the concept of a *Grossform* was employed, making the construction not only a housing project, but an urban project as well, as it integrates pedestrian and bicycle lanes as well as bus and train infrastructure.

While the *Grossform* offers a compelling framework for shaping the city through architecture, the inherent limits of this approach became apparent as well. Due to its length and volume, a project like this risks to become too dominant and to start acting as a wall rather than a connector. It is therefore important that the *Grossform* carefully takes its context into account, creating bridges and connections wherever possible. On top of that, a balance of uses should be employed to avoid uniformity.

 The project in Emmenbrücke exemplifies this approach: its scale enables greater connectivity within the city, enhancing urban quality in line with Ungers' principles, where the value lies not only in the number of housing units added, but in the spatial and experiential improvements achieved through densification. Through the gallery, the project creates a much needed connection for pedestrians and bicycles between the kleine Emme and the train station area, and has therefore urban qualities in it's own right.

Similar strategies could be applied to other case studies, enabling them to act as connectors within their contexts. It is important to note that these projects must be highly site specific, as the urban context needs to be carefully assessed first.

Architecture and urbanism should not be seen as separate, but as deeply interconnected disciplines, that dependent on one another beyond the mere relationship of the volumes, but to the architectural properties of a building.

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Fig.22: Map of the arcade system of Paris in the nineteenth century, source: Scan from Projects on the City 2, Taschen, P. 478

Fig. 23: Arcade level plan, image from the author

Fig.24: Olivetti Headquarters, from https://www.cca.qc.ca/img-collection/akXz_UUyr1_FdJ2vm9z1W5Z1gO8=/1400x1721/393928.jpg (20.04.25) and https://iqbalaalam.wordpress.com/wp-content/uploads/2010/01/2010_01_04.jpg (20.04.25)

Fig.25: Section of the building near the crossing of Seetalstrasse,image from the author.

Fig.26: Piano Nobile in a tipycsl italian palazzo., from: https://quartermilesmile.com/wp-content/uploads/2015/02/qmz-palazzo-diagram-1.jpg (07.06.25)

Fig.27: Section of the building along the kleine Emme, image from the author.

Fig 28.: Plan of the Gallery and on top of the base, image from the author

Fig.29: View from the river to the base of the structure, image from the author.

Fig.30: View into the arcades, image from the author.

Fig.31: View along the Gallery, image from the author.

Fig.32: View into the subterrain level of the train station, image from the author.

8 DECLARATION OF HONESTY

I hereby certify that this thesis with the title:

ALONG THE RAILWAY
TRACKSIDE *GROSSFORM* IN EMMENBRÜCKE

has been written independently by me, that no sources and aids other than those specified have been used and that the passages in the thesis that have been taken from other works - including electronic media - in terms of wording or

meaning have been identified as borrowed, stating the source.

Gonzalez Solorzano Jacqueline

Luzern, 13.06.2017