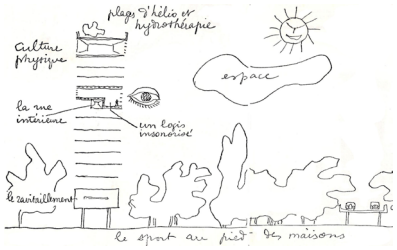
DE BARY, BASEL
Modern Housing Development

THE GELLERT-AREA AND DE BARY ESTATE
Modern Housing Development

The Gellert area and De Bary estate are typical post-war developments based on modernistic design principles. Thereby, a much more pleasant living environment was imagined by placing new developments on un-built fields or replacing historically grown city fabric with high-rise buildings. These new designs were thus situated in an artificial park-like open landscape while providing large quantities of housing in high density typologies.

During the 1920s, the Swiss-French architect LeCorbusier, one of the first advocates of vertical high-density housing, had already manifested these design principles in various publications. In his plans and sketches he had attempted to underline the advantages of his ideas over the historically grown city fabric with its inefficient donkey-path-like alleys and irregular plot-sizes. It took, however, up until the late 1950s that these tabula-rasa principles for new urban development gained foothold in the conception of new developments. Their rational approach to design which reduced costs and simplified the building process prooved to be very suitable for the high demand in low- and middle income class housing after the 2nd World War. The ideas developed during the early 20th century thus had a tremendous influence on various international mass-housing projects and the future of city planning in general.

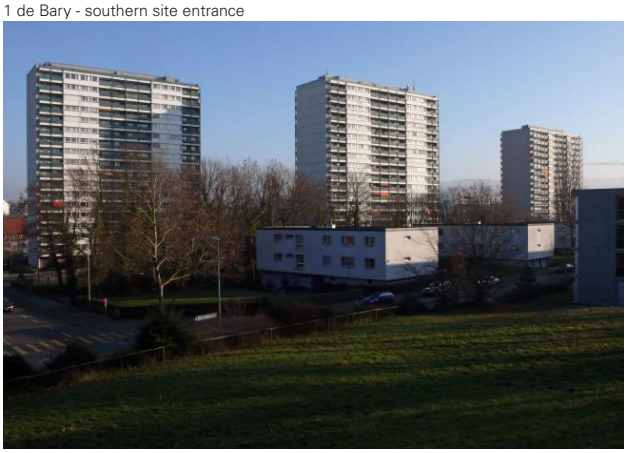
With the rise of the automobile as a means of transportation for large parts of the population these modernistic projects were often located in the vicinity of major traffic arteries. The focus on private car-ownership in relation to high-speed mobility channels connecting high-density clusters with each other was therefore conceived as an admirable future lifestyle which took natural resources as abundantly given.



Sketch by LeCorbusier on vertical housing, 1950s

Gellertareal and de Bary site

1 de Bary - southern site entrance



2 de Bary - highrise ensemble *

3 de Bary - in-between spaces

4 de Bary - low rise pavillions

5 Gellertquarter - Bethesda hospital *

6 Gellertquarter - 1940s housing

7 Gellertquarter - 1900s houses

8 Gellertquarter - school building *

*Source: Juri Weiss

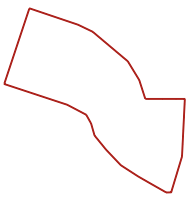
SITE

The chosen site for the analysis consists of two modern housing developments from the late 1950s, the Gellert area and the de Bary mixed-height housing estate. Each project is characterized by a relatively different plan layout and divided by a north-south running rail track and regional higway. Between the De Bary estate and the railway lies a park-like hospital and residential area.

Aerial view Gellert area and De Bary estate

Source: Swiss Airforce

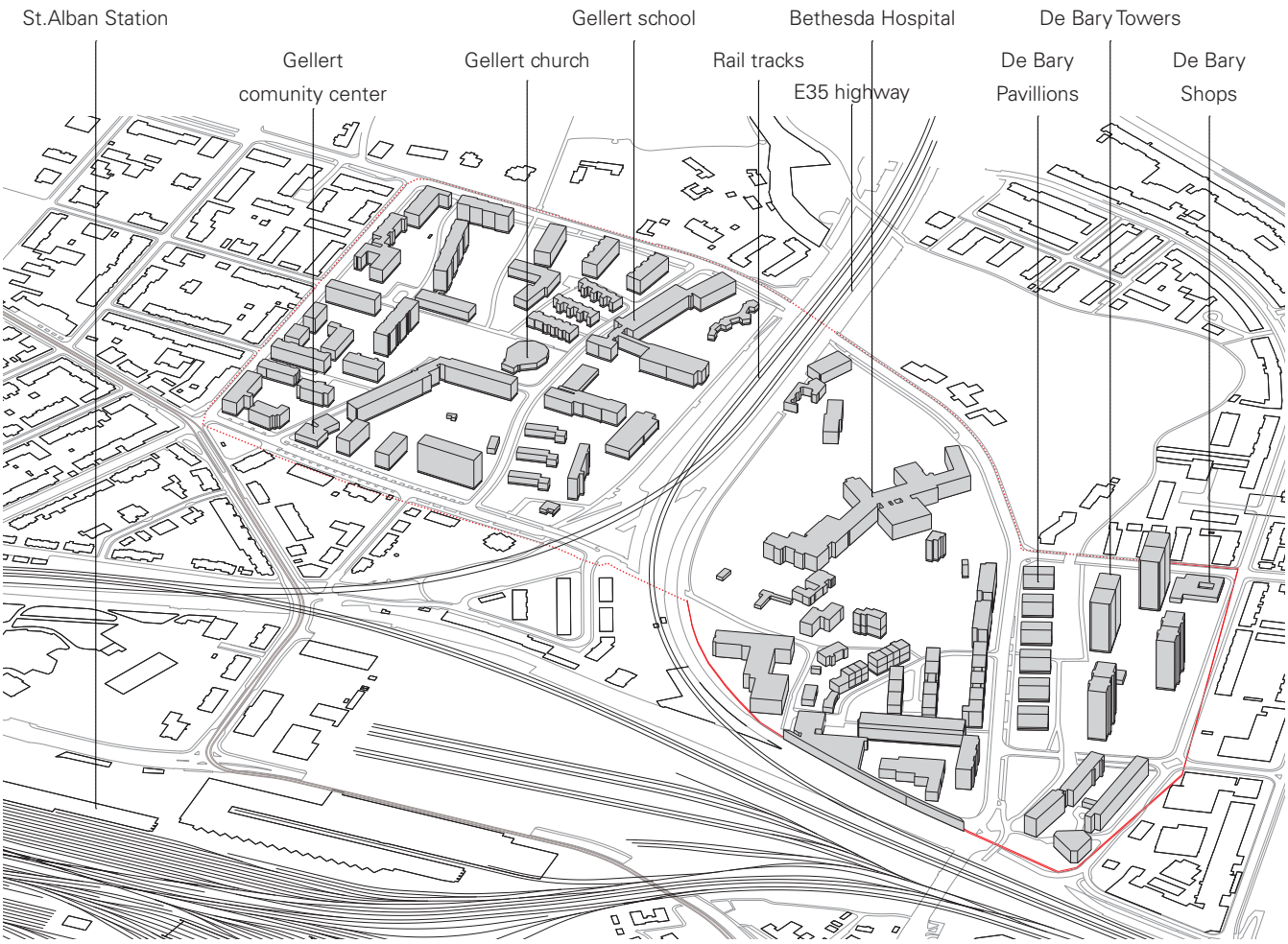
1 : 7 500



37, 8 ha
1% of Baselstadt

Baselstadt
total 3700 ha

Mixed Height Modern Housing Development
- Gellertquarter
total 37,8 ha



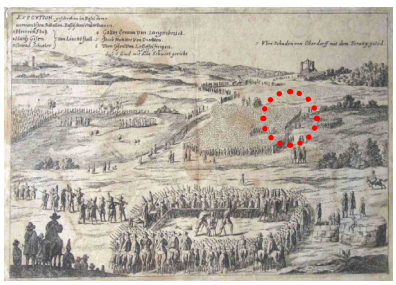
Aerial perspective Gellert area and De BAry

Gellert-Area

De Bary

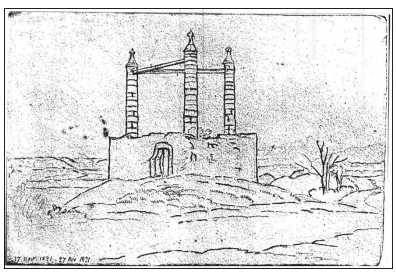
The Gellertfield

The name Gellert stems from a medieval forest area adjacent to the old city wall which provided burning wood for Basel till the 14th century. After the field had been cleared of trees it became Basel's official site for public executions and thus the location of permanent city gallows. Up until the 19th century, the field remained unbuilt as the Basel residents avoided building any houses around this area. After the last execution in 1819 and the demolition of the gallows, the entire area suddenly became very appealing for higher class members of Basel. Due to a cholera epidemic during the middle of the 19th century, calmer and larger estates in a healthy environment and in distance to the over-crowded and unhygienic conditions of Basel's city center were thus in great demand. Hence, throughout the 19th century, the Gellert area rose to become a noble city quarter with large free-standing villas situated in a spacious natural environment. During the 1870s new railway-tracks were layed through the Gellert field thereby connecting Basel's main station on a new route with the German side towards the Badische Bahnhof. As the Gellert had also been home to the St. Alban monastery for centuries, a site adjacent to the rail tracks was chosen in the 1930s for the construction of a regional hospital to serve the public good.



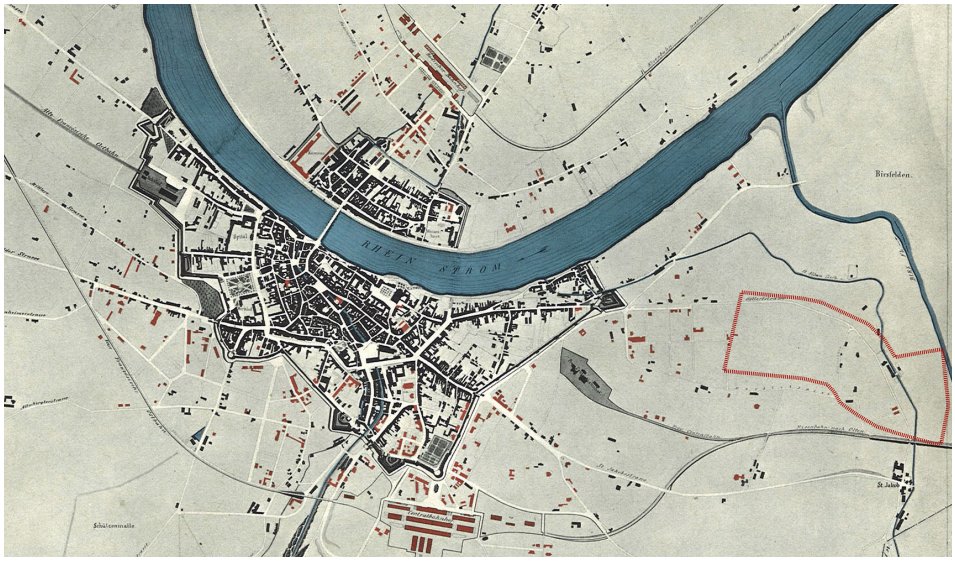
Gellert field with gallows, 1653

Source: floydvaresi.com



Gellert gallows, 1821

Source: floydvaresi.com



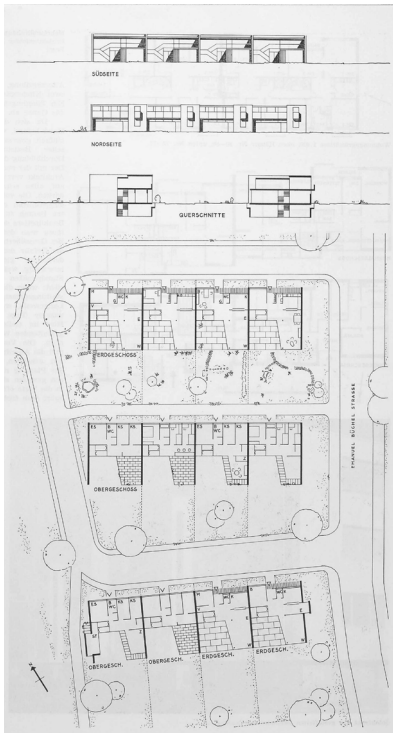
Basel 1852

Basel 1862

Basel 1882

Source: Staatsarchiv Basel

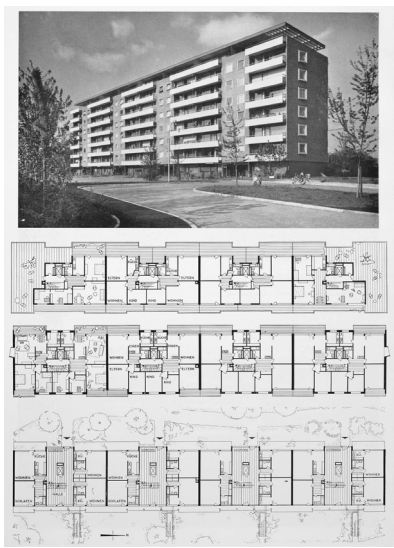
GELLERT-AREA
Masterplan



Gellertareal low-rise housing, 1962

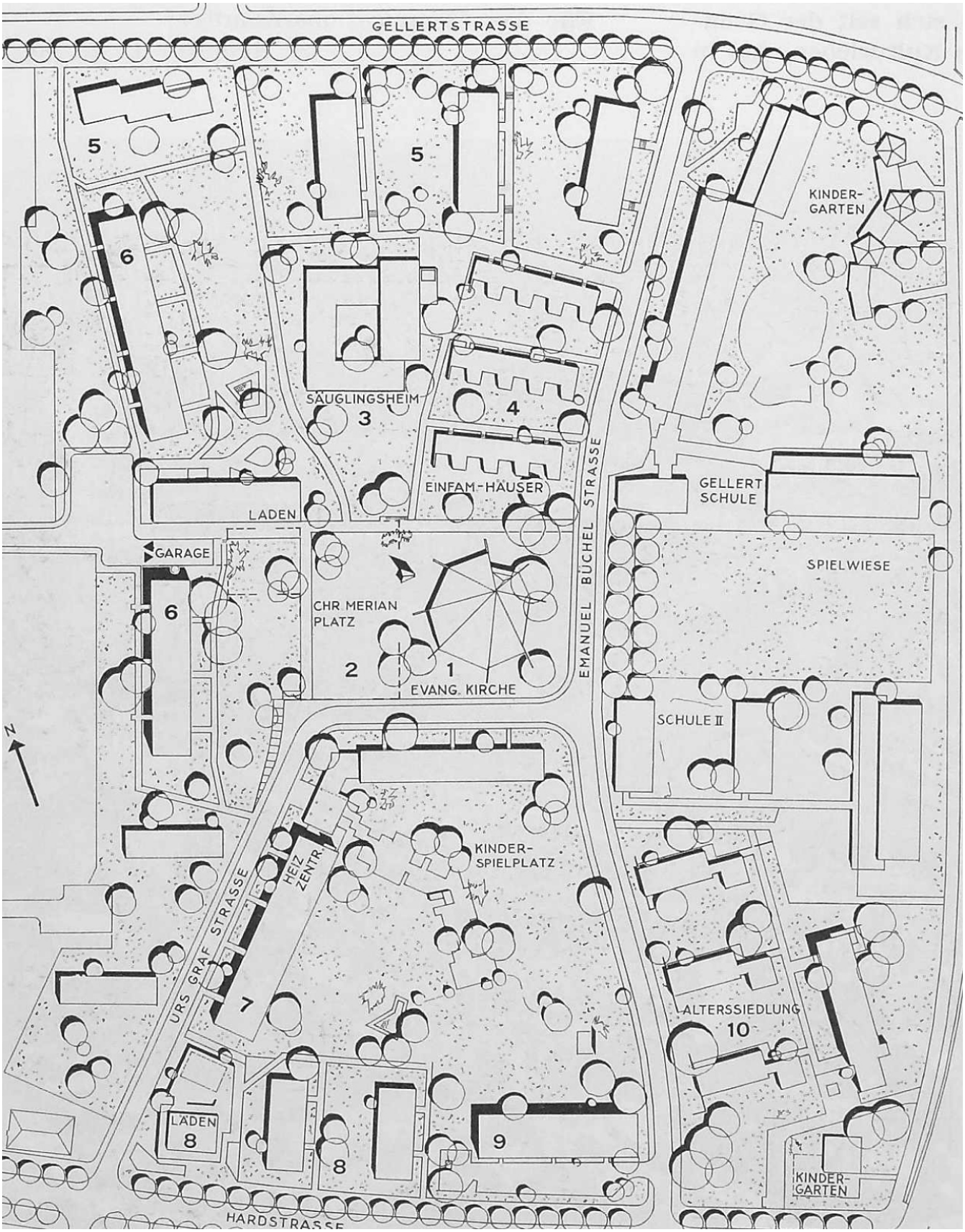
Source: Schweizer Bauzeitung

The Gellert area masterplan designed by Swiss architect Hermann Baur at the end of the 1950s represents a concentric organization of various sized apartment slabs around a commmunity church building. Other uses such as a nursing home, community center, senior housing and shops are spread around the predominantly vegetated and open ground plane.
The primary plan orientation seems to have followed an existing street pattern as most volumes are place perpendicular or in parallel to the roads leaving long view corridors into each direction. The architect Baur restrained from designing all buildings himself in order to avoid a monotonous spatial appearance. Instead, various architects were commissioned to design specific buildings. In order to ensure that the open ground plan was orchestrated into a balanced composition of uninterrupted corridors, the site also consists of a large underground garage beneath the main square under which most of the parking spaces are hid away.



Gellertareal apartment slabs, 1962

Source: Schweizer Bauzeitung



Gellertareal masterplan by Hermann Baur , 1962

Source: Schweizer Bauzeitung

Gellert church *

Family apartment houses *

Apartment blocks *

Gellert school *

*Source: Juri Weiss

De Bary Dynasty

At the beginning of the 17th century members of the De Bary Family arrived in Basel as religious refugees from an area around today's Belgian borders. Eventually, in 1633 the entire family became official Basel residents. The De Bary are a dynasty of ancient nobility with family branches in Frankfurt, Antwerp, Buenos Aires, Munich and New York.
The De Bary soon became a wealthy family by building up a trading company and later from 1717 onwards expanding with the production of silk-bands. During this period the production of silk-band bestowed upon Basel an economical upturn which also enabled the De Bary family to rise to power within the city. In 1767 Johann de Bary-Frey became mayor and bought buildings in the Augustinergasse which would remain the headquarters and property of the Family's company for over 250 years.
In 1815, the De Bary were the first silk-producers to introduce a Jacquard-loom within the Basel region. This mechanical loom simplifies the process of manufacturing textiles with complex patterns. Further, in 1856, Johann De Bary-Sarasin constructed a factory in the St.Jakob area run by Basel's first turbine-system. This enabled him to increase the families wealth considerably while soon in 1868 it also triggered the first workers strike.
By 1960 the Silk-band factory De Bary & Co AG was put out of service as the the production of silk was not lucrative in Switzerland anymore. During the demolition of the factory Hans and Rudolph De Bary hired the well established architecture firm Suter & Suter to design a large-scale housing project. The design ultimately constructed four 18-storey high-rise towers with six low rise 2-storey pavillions leading up to 312 apartments in total.

Johannes Simon de Bary, 1950s

Source: Staatsarchiv Basel

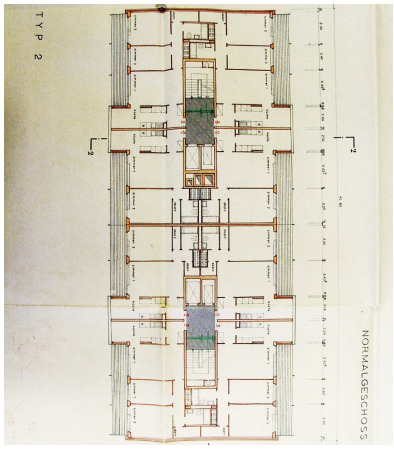
De Bary Factory, 1930s

Source: Staatsarchiv Basel

De Bary site in 1938

Source: Swiss Airforce

DE BARY
Masterplan

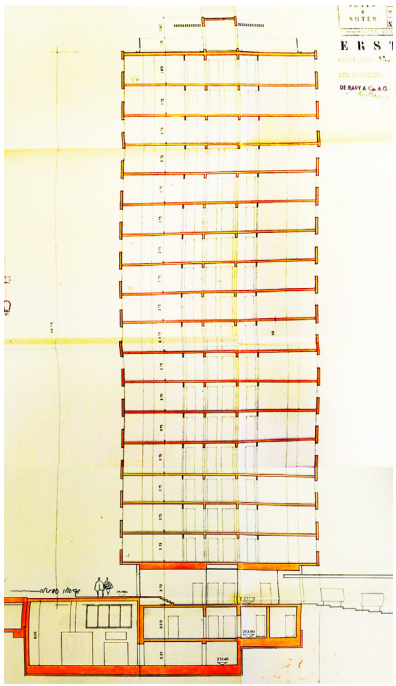


De Bary highrise , typical floor plan - 1959

Source: Suter & Suter

The De Bary housing estate on the border between the provinces Basel Stadt and Basel Land was designed by Suter & Suter architects between 1959 and 1962. The design follows typical spatial principles of modernistic architecture which intended to increase the amount of light, air and space in urban environments in order to free the mostly congested ground floor of the early 20th century industrial city and perimeter block housing.

Accordingly, the De Bary development consists of 4 east-west oriented 50m high housing slabs with 4 apartments per floor. These 18 story towers are accompanied by 6 pavilion-like low-rise blocks on the western side of the property comprising of 4 family apartments in each of the two story high pavilions. This results in a total of 312 apartments of about 70-90 m2 and a population of approximately 500 residents on the entire 44 000 m2 de Bary site. The only exception to the mono-functional domination of housing are two low-rise volumes in between the 4 towers which provide space for a 300 m2 kindergarten and a 1000 m2 grocery shop.



de Bary, highrise section

Source: Suter & Suter

De Bary Housing Masterplan

Source: Suter & Suter

highrise towers *

low rise pavillion and highrises

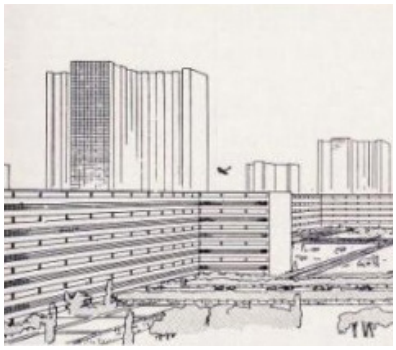
high- rise ensemble

backside low-rise pavillions

*Source: Juri Weiss

Mixed-Height Housing

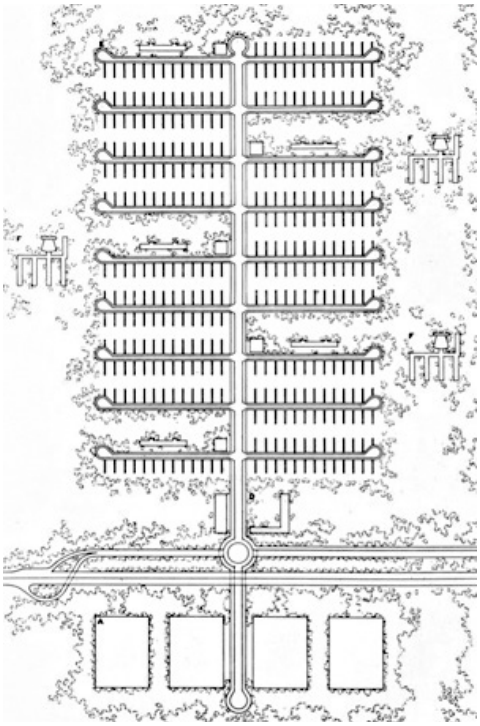
In the early 1920s,with his design for a city of three million people, Le Corbusier was one of the first to envision a vertical concentration of metropolitan programs within a natural open space. It was designed to offer an ordered alternative to the narrow and curvilinear pattern of historical cities. Although the orthogonal layout with axial hierarchies and distinct functional zones was evocative of renaissance and baroque masterplans, its scale and intention to order the city according to efficiency, economy of circulation and provision of natural landscapes was unprecedented. Its inspirational roots can be found in Garnier's Cité Industrielle and Sant `Elia's futurist drawings of rationalist high-rise towers.



A City for 3 million people - LeCorbusier -1922
Source: Evenson

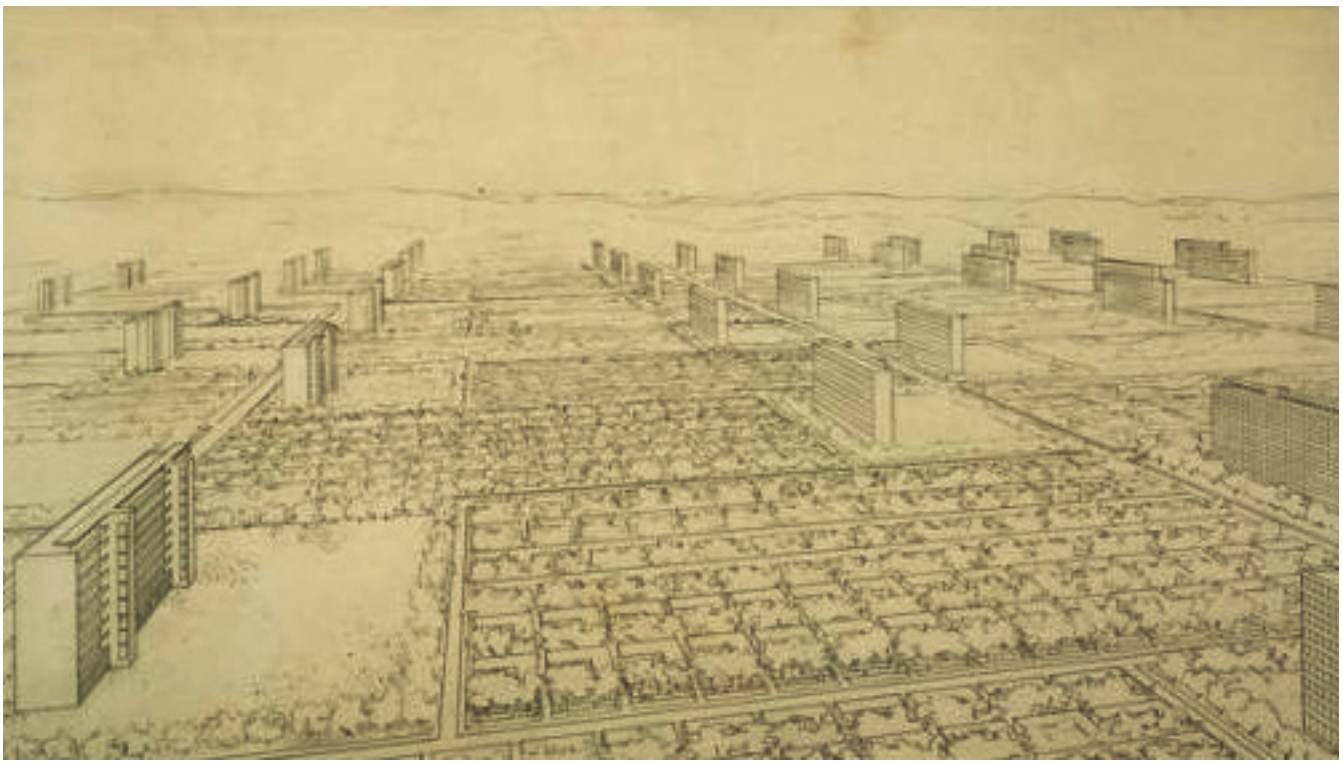
The purely commercial center consisting of cartesian highrise towers was surrounded by layers of large apartment blocks widely spaced in landscaped areas. Le Corbusier favored this latter type over the suburban ideal of a single family house as he believed that such low-density housing was wasteful of roads and utilities, encouraged urban sprawl and through an extensive land coverage actually increased the demise of a peaceful rural atmosphere which its inhabitants had initially sought.

At almost the same time, the German urbanist Ludwig Hilberseimer was developing similar ideas on vertical concentrations of urban dwelling units. Although similar in its intention his plan titled Großstadtarchitektur from 1924 can be seen as an answer or counter-concept to Le Corbusiers ville contemporaine. While these early schemes of high-density block housing were placed in the midst of historical city centers, by 1930 he had rectified its rather inhuman appearance by replacing asphalt with landscape as dominating surface. Together with his collaborator Ludwig Mies van der Rohe, Hilberseimer developed highly rationalized urban settlement schemes which combined low- and high-rise housing in an untouched natural environment.



Plan of settlement unit - Hilberseimer, 1940s

Source: Waldheim



Mischbebauung / Mixed-Height housing development - Hilberseimer 1930s

Source: Waldheim

REFERENCES
Lafayette Park, Detroit

Composition VII - van Doesburg 1917

Source: kemper art museum

One of Hilberseimer's and Mies van der Rohe's first projects that combined all ideas on urban development was the Lafayette Park housing project in Detroit from the 1950s.
As in earlier projects, the basis for the masterplan was defined by the settlement unit, a community sized housing arrangement providing all necessary functions except work on a large-scale housing estate.

In reference to Mies van der Rohe's open building plans, the Lafayette masterplan resembles a free-floating composition of volumes in space similar to conceptual art paintings of that time. Theo van Doesburg's composition VII is an abstract conceptual painting depicting a balanced orchestration of slabs and blocks in different colors. Although its aesthetics were regarded as a representation of real situations, they appeared to have also influenced the methodologies of urban planners. In this sense, they are most likely to have seen in these art studies a compelling clarity that could be matched with their intentions to create free floating rational spaces that are equally functionally divided and well connected to air, light and space.

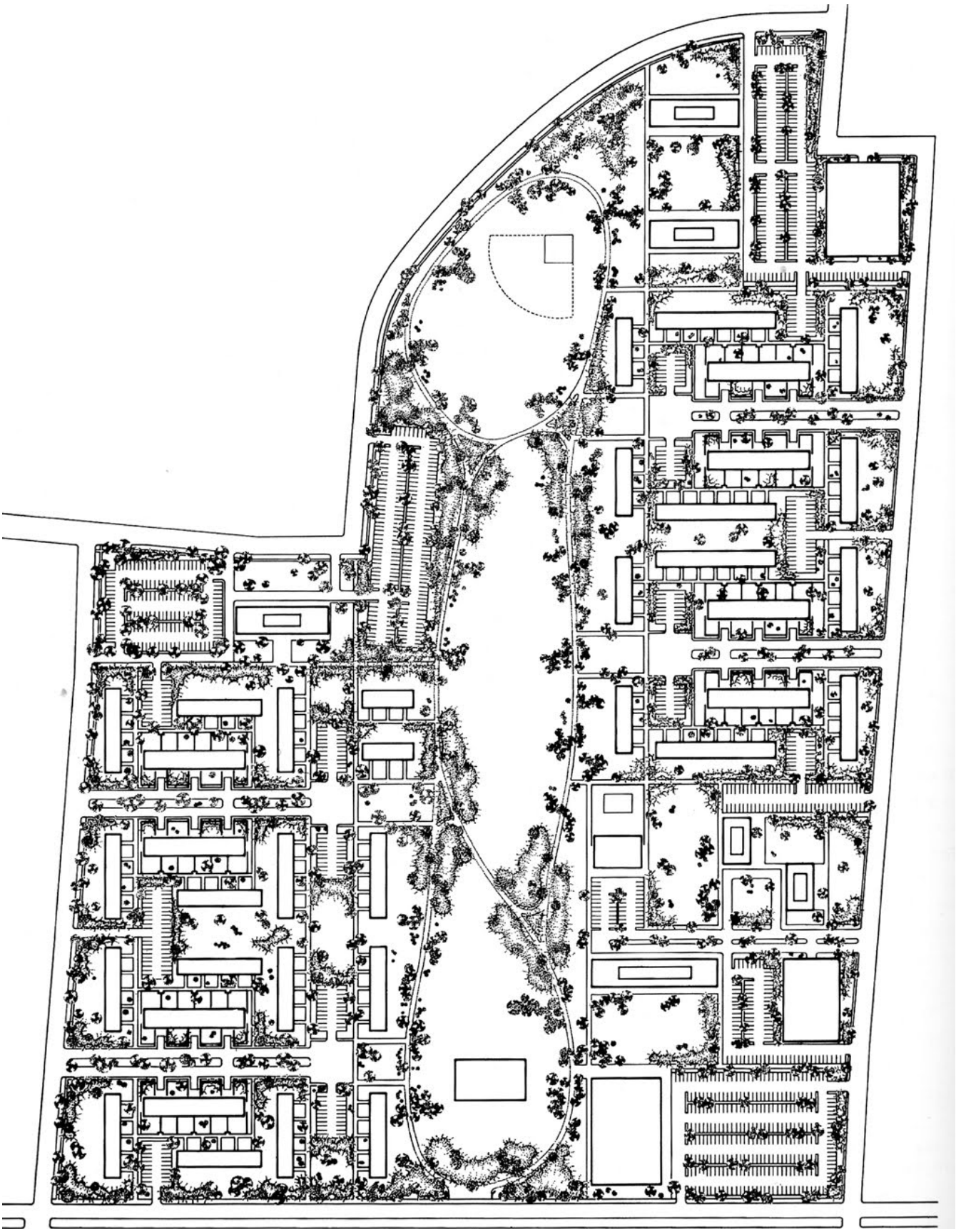
Similar to the De Bary housing estate, Lafayette park was based on a east-west orientation of high-rise apartment blocks placed in an open field. Throughout this artificial landscape low-rise pavillion-like slabs are placed and thereby represent a compositional counter-weight to the idea of a balanced settlement unit.

Lafayette Park, highrise

Source: Waldheim / 2004

Lafayette Park, low-rise

Source: Waldheim / 2004



Lafayette Park - original masterplan - Detroit 1956

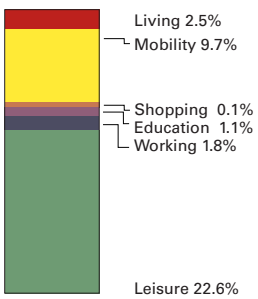
Source: Suter & Suter

The following spatial analysis intends to highlight specific conditions throughout the entire site with the objective of revealing potential areas of improvement. Thereby, the site is mapped in a series of diagrams which relate to a certain topic such as facilities, open spaces, mobility and architectural typologies.

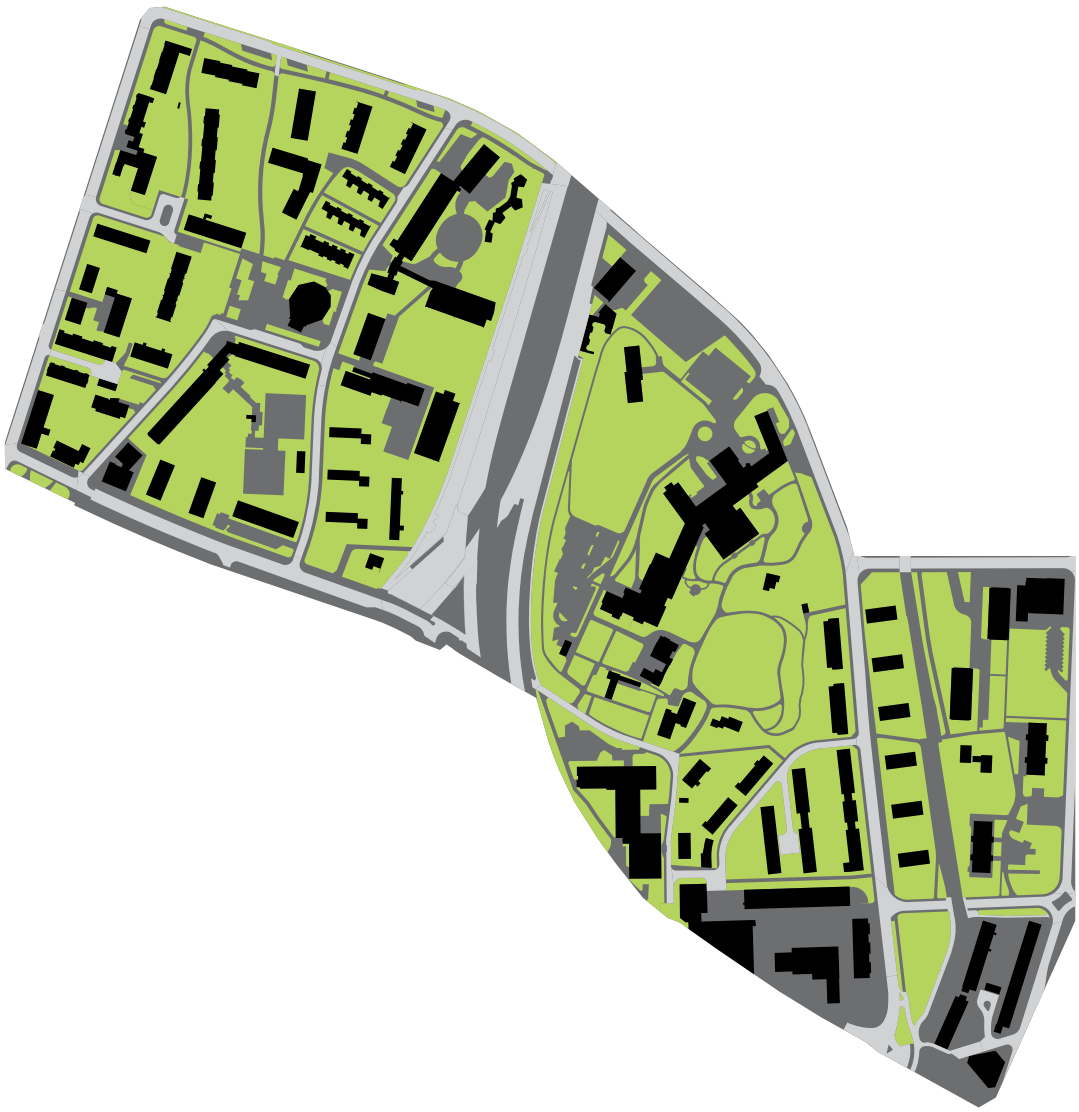
The density of facilities underlines the monotonous domination of leisure and moving activities within these areas, whereby the De Bary represents a higher level of mono-functionality in comparison to the Gellert area as the latter also incorporates schools, office spaces and recreationals facilities. However, as one of the guiding principles during both project's design was to divide urban functions such as living, working and commerce from each other it is not surprising that only few social attractors such as shops and community facilities still remain in both areas. Additionally, as the leisure areas include open and undefined spaces it is questionable to which extent they are used or left idle throughout most parts of the year. Further, the minuscule amount of commercial spaces combined with a low percentage in work spaces indicates that residents most likely are obliged to leave their neighbourhood for employment and other daily activities.The Gellert area as well as the De Bary estate were designed with relatively large underground parking facilities, thereby increasing the amount of residents who favor private vehicular transportation. This additional amount of daily commuters is most likely to add to the traffic overload at the metropolitan scale and the assumption that residents experience little interaction with each other on a daily basis.

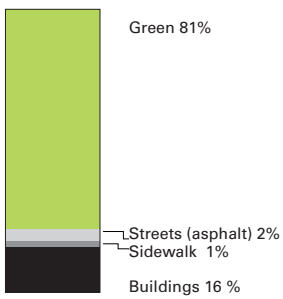
As both masterplans intended to place the buildings directly in relation to open green areas, most of the site's architectural typologies such as small villas, mid-rise apartment blocks as well as high-rise residential towers are all siutated within a free-standing setting. Therefore, the residual spaces reveal a large potential for filling in usable spaces in areas that are currently left idle. To which extent the open spaces must be protected or transformed is partially tested in the scenario study. However, in order to make appropriate proposals that take all original premises into consideration further in-depth studies are necessary.

commercial pavillion

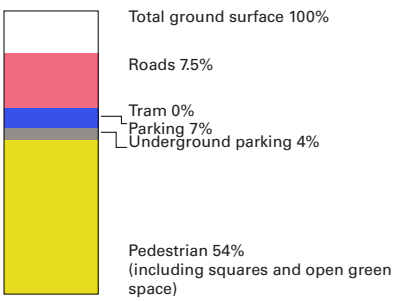

Living 2.5%
Mobility 9.7%
Shopping 0.1%
Education 1.1%
Working 1.8%
Leisure 22.6%

ground space




Green 81%
Streets (asphalt) 2%
Sidewalk 1%
Buildings 16 %

underground garage entrance


Total ground surface 100%
Roads 7.5%
Tram 0%
Parking 7%
Underground parking 4%
Pedestrian 54%
(including squares and open green space)

1 housing 1950s

2 housing 1950s

3 buildings 1960s

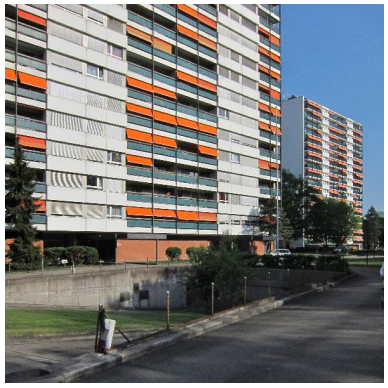
4 residential pavillions 1960s

5 hospital1930s

6 residential block 1960s

7 building 1990s

8 residential block1960s



9 residential highrise towers 1960s

10 residential buildings 1950s

11 public building 1960s *

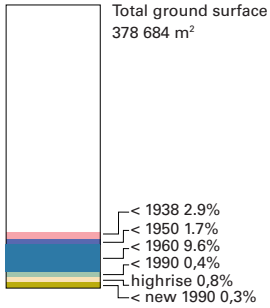
12 church 1960s

Source: Juri Weiss (all images)

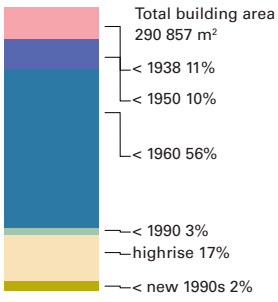
BUILDING TYPE

- pre-industrial/ old city
- buildings turn of 19th century
- villas turn of 19th century
- pre-war welfare housing < 1938
- housing around 1950s
- residential buildings 1960s-1980s
- residential buildings since 1990s
- single family homes
- highrises
- new buildings since 1990s

Area of building type/ total ground surface



Area of building type/ total building area



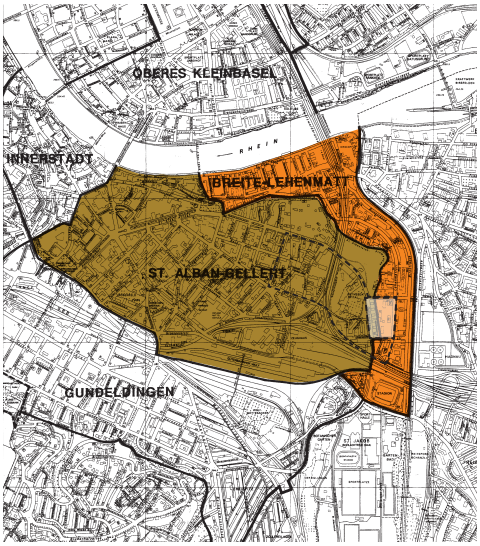
The quantitative study within the urban typological comparison along with the previous spatial analysis show that the two sites represent an urban condition that offers a high potential and perhaps need for spatial improvement.
The following spatial inventory of the De Bary estate tries to show specific characteristics of the site and its buildings that reveal first areas of potential spatial improvement. Thereby, aspects such as lighting, parcel sizes, topography, vegetation, building structures and open spaces are shown in comparison. By matching these rather qualitative issues with the quantitative performance study of the comparative analysis one is able to make first conclusions about certain shortcomings within the current site.
In relation to issues on embedded energy and energy consumption the comparative study showed that especially the high-rise towers in the De Bary estate appear to consume relatively and in absolute quantities high levels of energy at 60% of total energy consumption per year. They are followed by the other 1950s and 60s low rise buildings at 24% of total energy consumption. Although the overall energy consumption of the 300 by 300 meter radius site is still relatively low at about 12,5 million kWh/m2 per year, it is primarily the heat loss in high-rise and other buildings from the 1950s and 60s period that creates high energy demands. In addition, the De Bary estate shows a relatively low potential for solar power generation as the sheer quantity of usable roofs is limited in a high density typology with small overall footprints and large shadow areas cast by the height of the buildings.

The further analysis thus takes the following premises as guidelines to reveal eventual potentials within the entire site and its individual buildings:

- Reduction of overall energy consumption in relation to building envelope improvements
- Reduction of spatial monotony in relation to density / quality of usable space
- Increase of uses at ground level
- Increase of roof surfaces for potential solar power generation

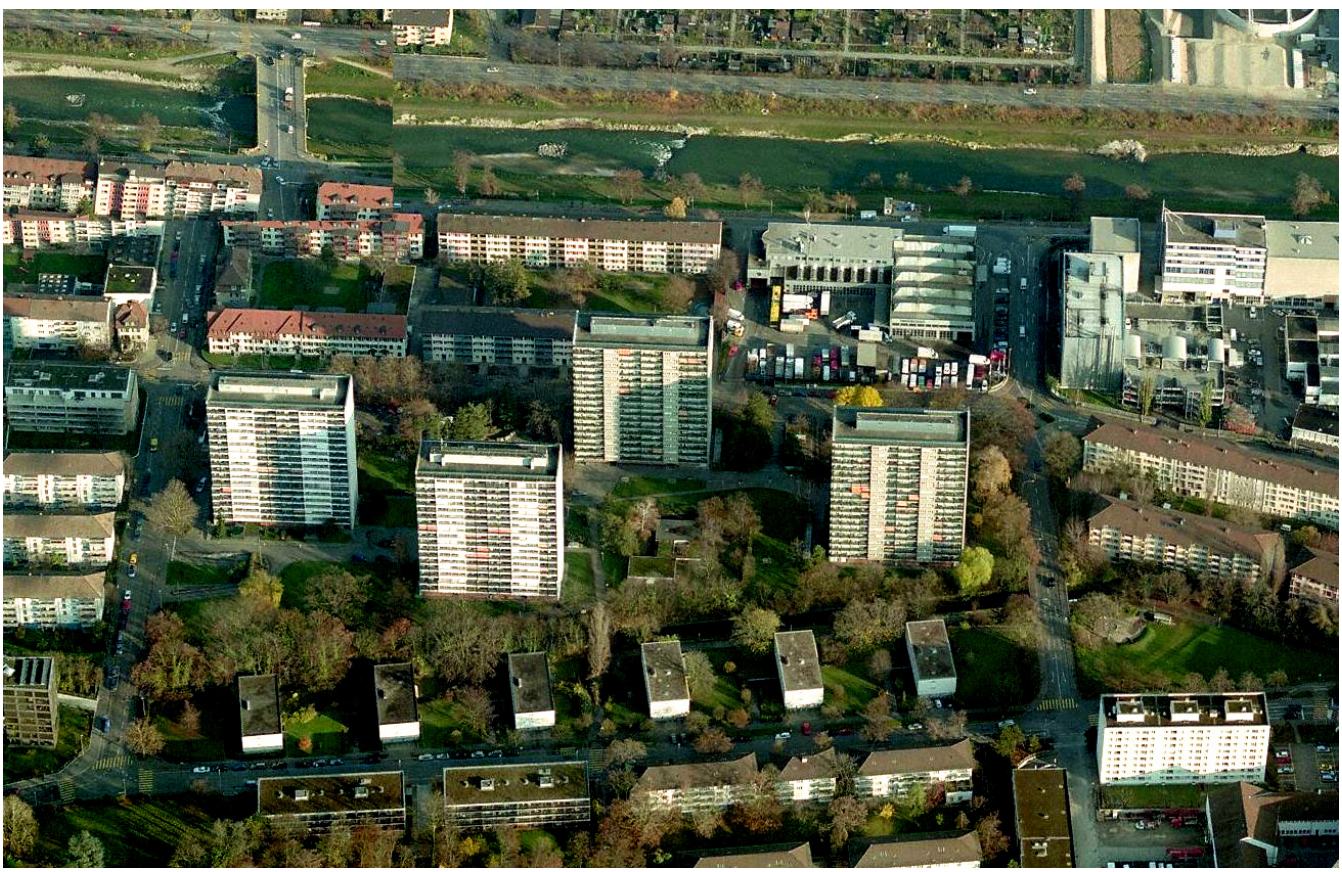
DE BARY
Site and context

The site is divided by an eight meter wide stream which is also the border of the two Kantons Basel Stadt and Basel Land. The 2-storey pavilions on the western side are spatially more related to the newer apartment blocks at the edge of the slope. Due to their height and rigidity, the high-rise towers create a spatial enclave as they stand in the midst of various row-houses from the early and middle 20th century.

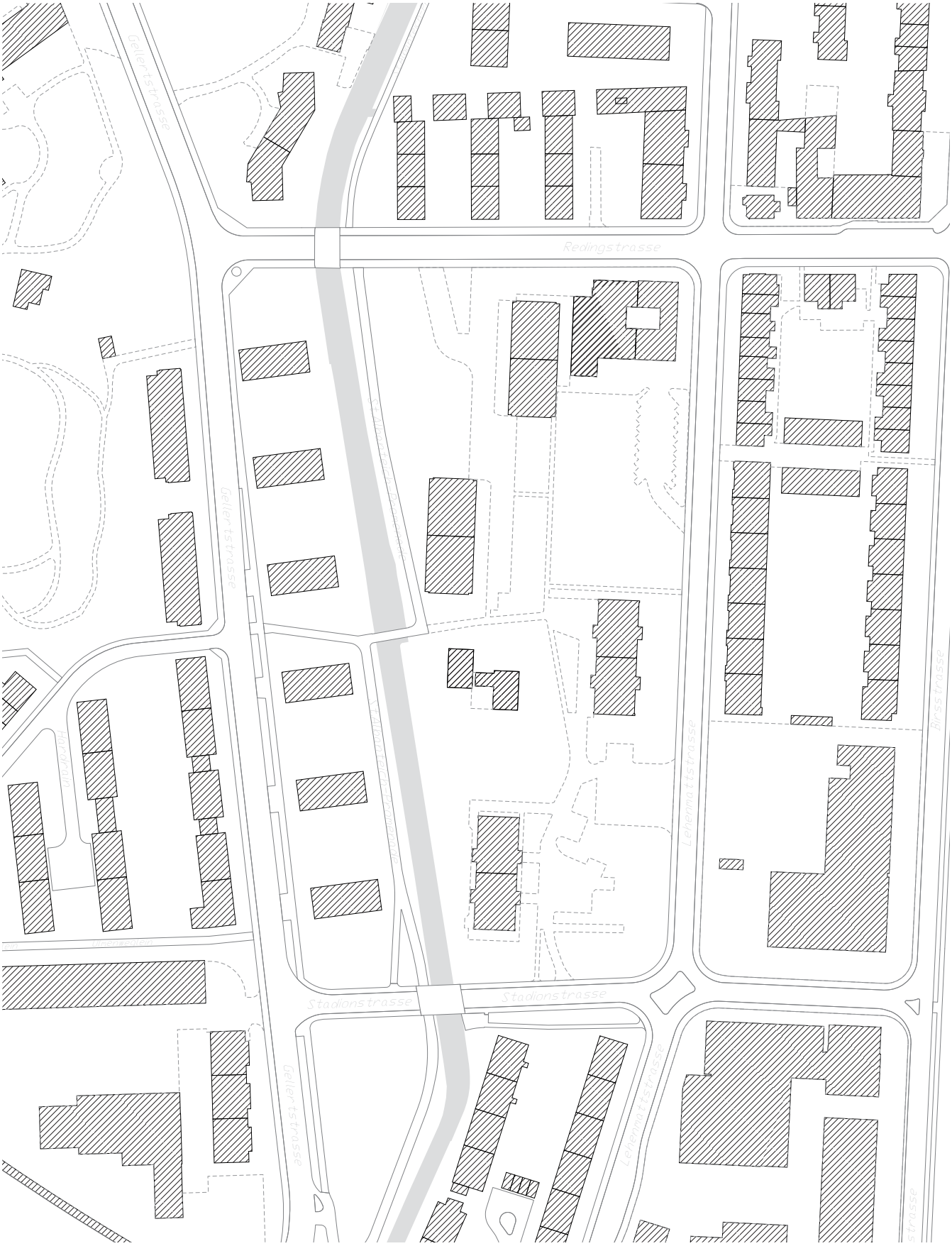


De Bary estate on the municipal border

Source: Basel Stadt



aerial view



De Bary estate - plan - 1:2000

DE BARY
Spatial conditions

There is a harsh contrast between the 3 large parcels of the De Bary Estate and the more minuscule parcel pattern of the surrounding buildings. The topography descends along the stream to – 1 meter and ascends in the West up to 11 meters towards the Bethesda Hospital Park. The majority of the site is covered with high trees along the stream and streets. The tower area however only shows certain concentrations of trees along the perimeter and around the kindergarten low-rise volume in the centre. The residual un-built area shows the harsh contrast between small building footprints and large open

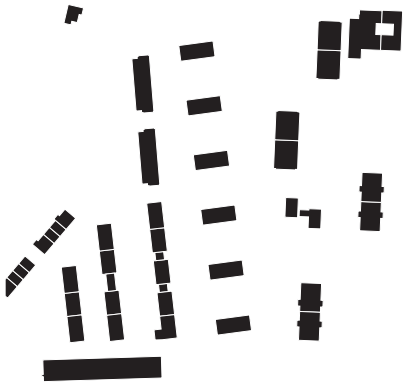
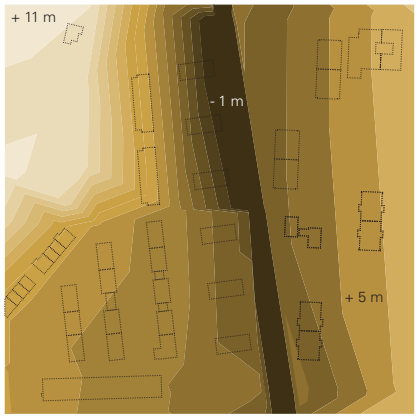


figure ground plan

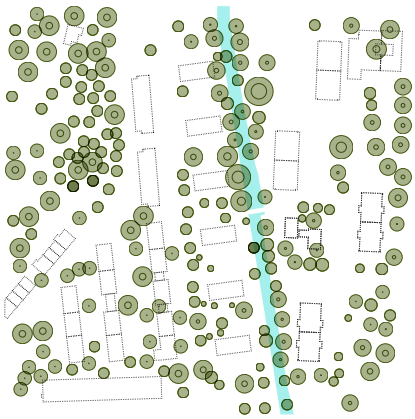
ground floor lawns

parcel dimensions

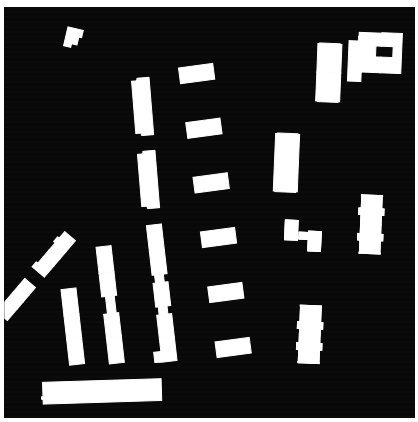
topography



water & trees

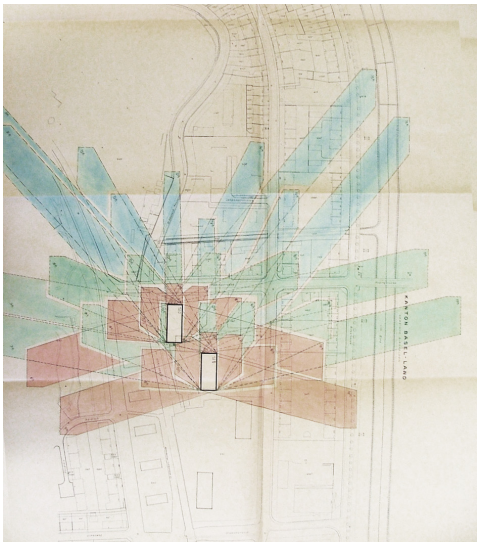


unbuilt area



DE BARY
Shadow study

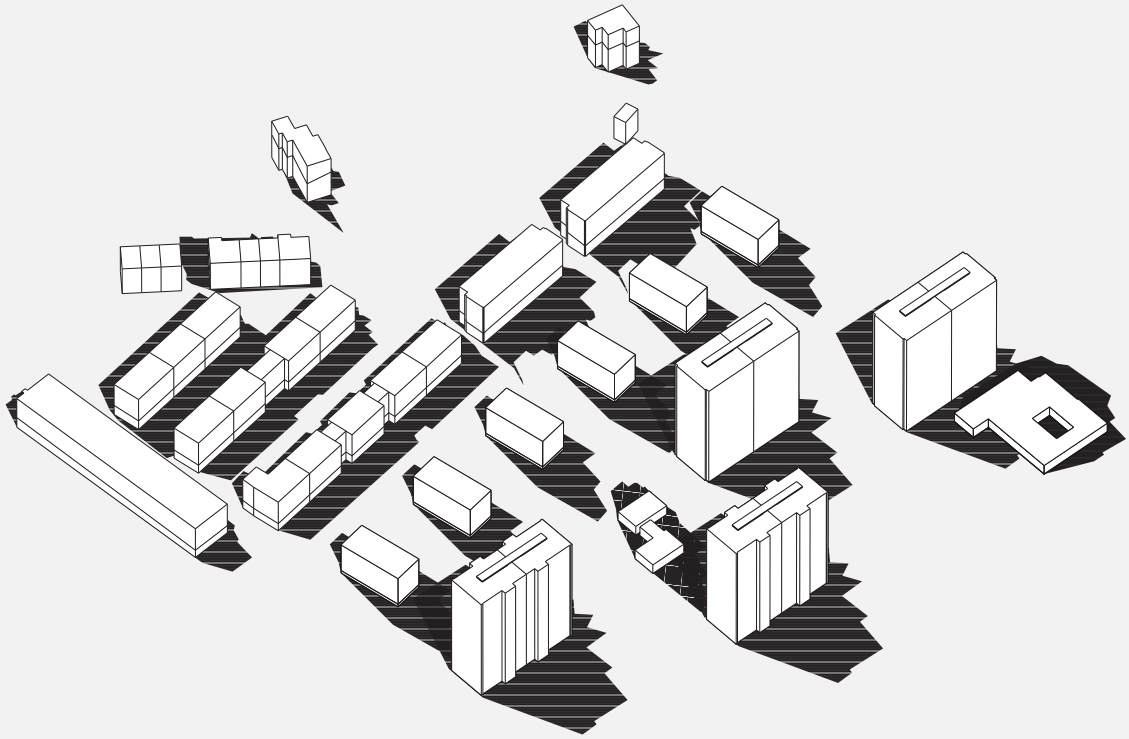
The shadow study overlays all hourly shadows between 8 and 18 o'clock on 21st of March and 21st of September in order to map the surfaces that appear in each 3 hour shadow period. The result is an overlapping star-like pattern for each building which represents the zones that have more than 3 hours shadow per day. An original map of a similar study done by the building's architects Suter & Suter shows that building orientation and daylight were already an essential criterion during the design process in the 1950s.



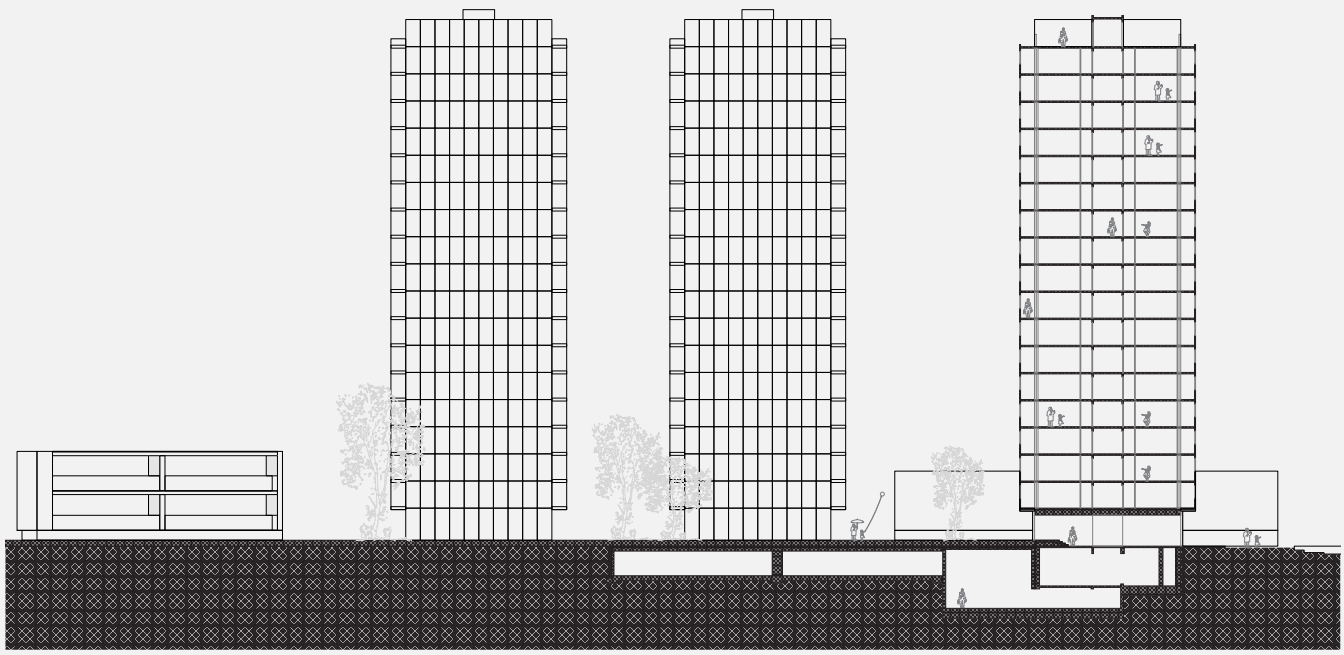
de Bary - shadow study - 1959

Source: Suter & Suter

ground floor parking



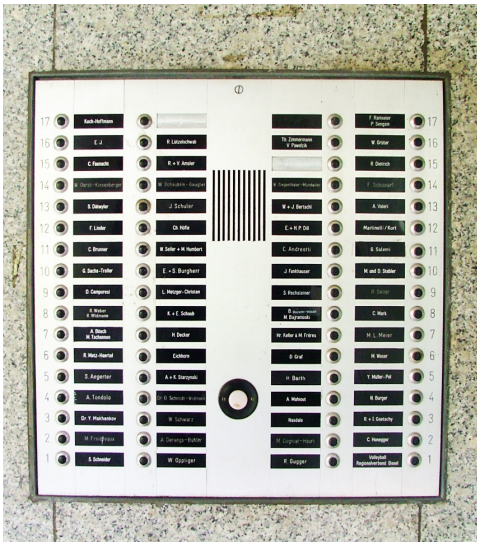
3h shadow study
21. March / 21. September



cross section

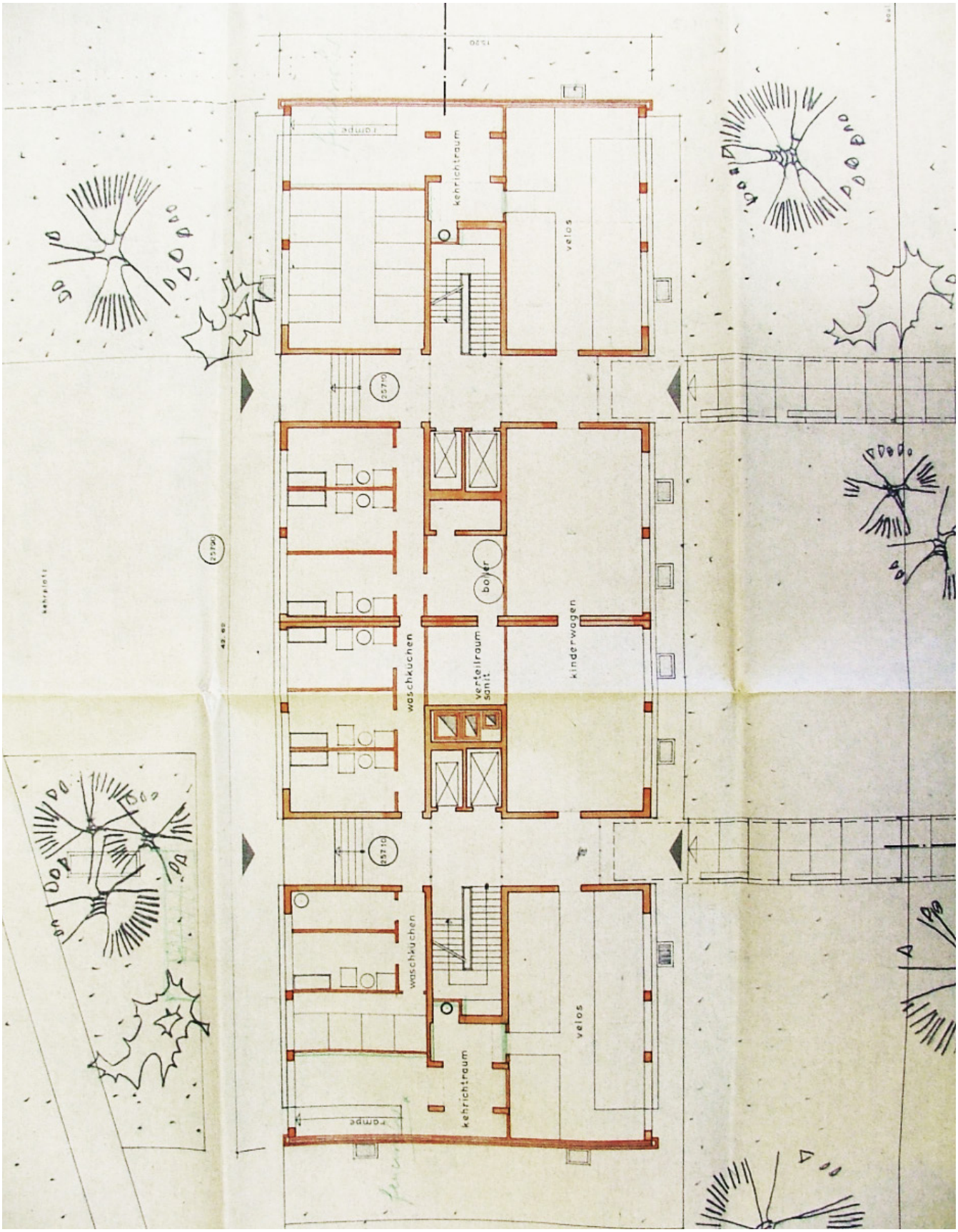
DE BARY
Highrise building

Each high-rise residential building consists of 2 central circulation cores with two elevators and a stair case. The ground floor plan is structured by load-bearing walls perpendicular to the spine of the core. They are closed off towards the street with a brick facade. This stands in contrast to the curtain wall façade of the upper floors which is cantilevering above at an offset of about one meter.



De Bary - apartment bells

highrise entrance

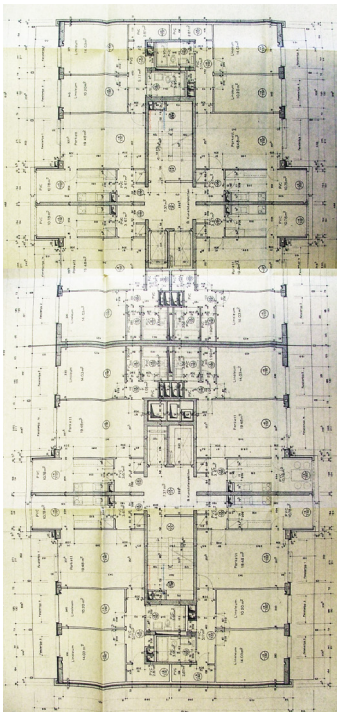


De Bary - ground floor plan - high-rise - 1959

Source: Suter & Suter

DE BARY
Highrise building

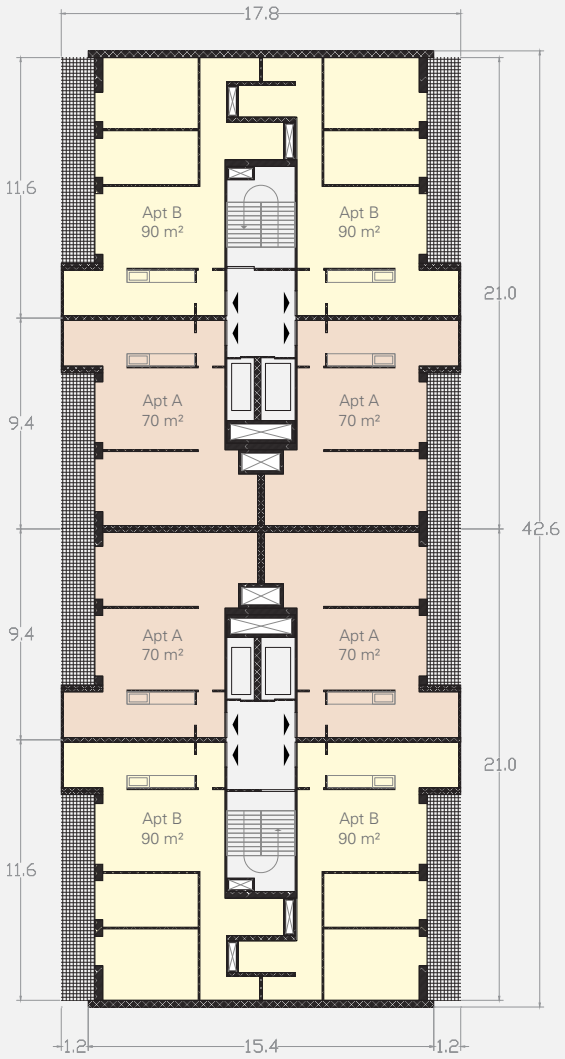
The four apartments per level are accessed via the elevators and stair case. Structurally, each high-rise block can be defined as a merger of two towers with independent cores. The apartments vary between 70 and 90 m2 in size and open up towards the east-west facing façade with an open balcony and closed loggia.



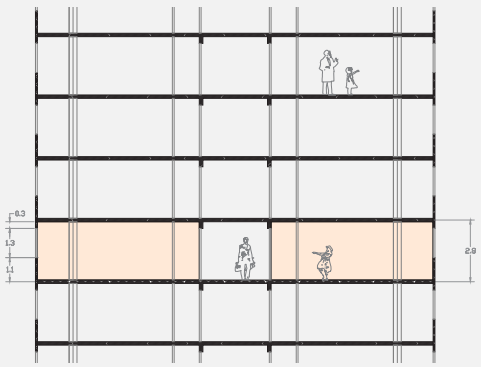
De Bary - structural plan high-rise - 1959

Source: Suter & Suter

high-rise facade



schematic typical plan



schematic section

Despite the relatively harsh height contrast between towers and pavilions, the shadow study shows that an addition of building volumes between the existing De Bary buildings would create spaces that are still relatively well lit. In reference to the spatial quality of Basel's historical compact core or the perimeter block typology in Gundeldingen, the relationship between the human scale, light and shadow periods during the day and a diversity of parcel sizes creates a living environment which is more lively and according to rent prices apparently more demanded. Further, in comparison to other housing typologies from other time periods, at 155 kWh/m2 per year, especially high-rises from the 1950s and 60s represent the highest energy consuming buildings in relation to total energy consumption for heating, electricity and water usage.
In summary, the spatial characteristics of the de Bary estate therefore raise questions in relation to underused ground floor areas, lack of spatial interaction between residents and a potential to improve the large façade surfaces in order to reduce overall energy consumption.

Hence, the following three intervention strategies are defined as tools which are then further adapted in each alternative scenario:

- division of open unused spaces into smaller parcels of different sizes
- expansion of the existing towers in order to create climate buffers and spaces for more interactive and diverse uses
- creation of further roof surfaces to increase solar power potential

Accordingly, the proposed intervention alternatives are outlined as:

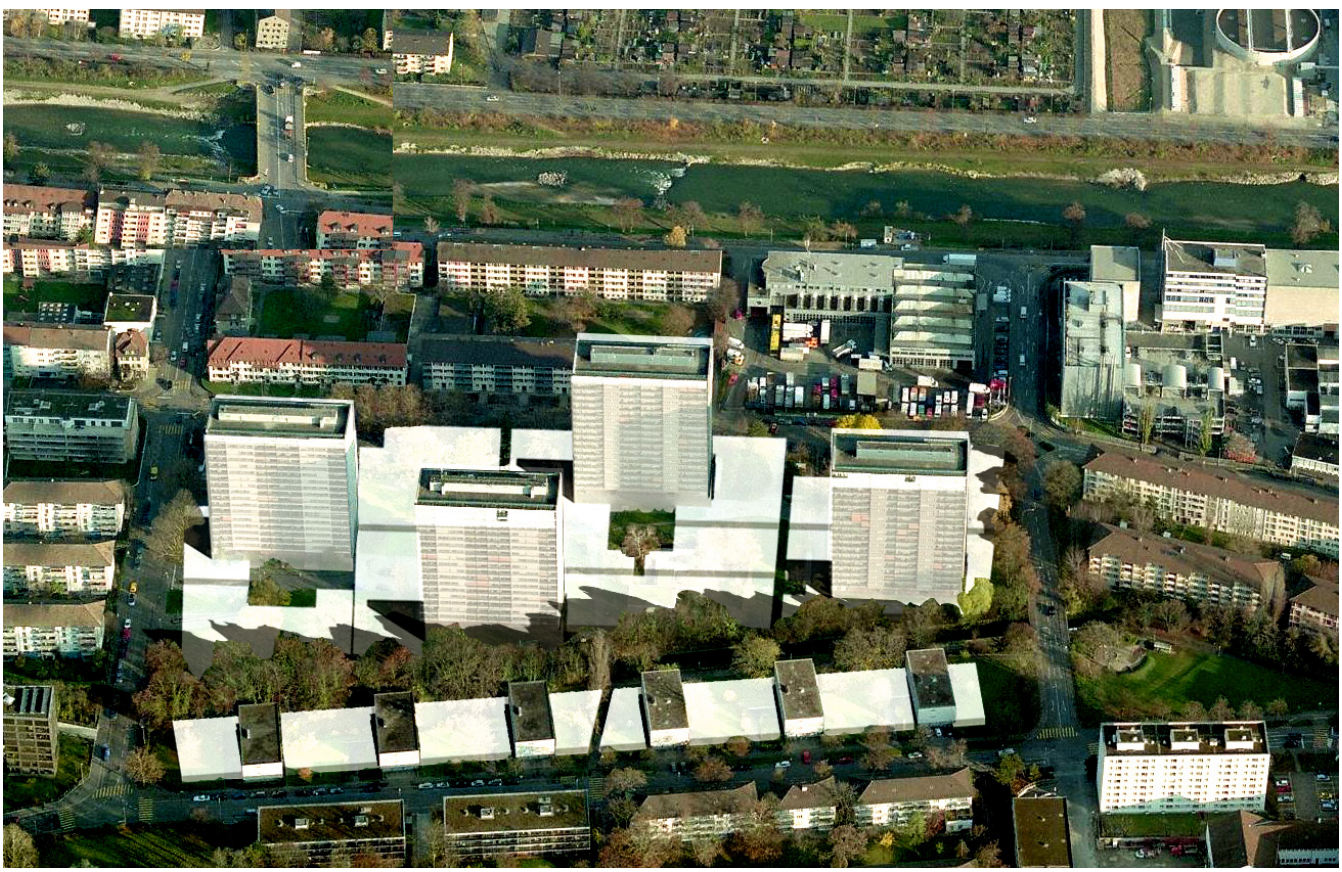
- extension of the high-rise towers on the east-west facades and infill of a widespread covered garden/greenhouse structures with open courtyards and access paths towards towers and bordering streets
- division of open fields into smaller parcels of new private ownership in order to instigate the development of various sized buildings at a maximum height between 4-6 stories and a general courtyard-like organization
- completion of the current rectangular layout into a large courtyard block and extension of the towers on each façade oriented towards the South

PROPOSAL 1: EXTENSION

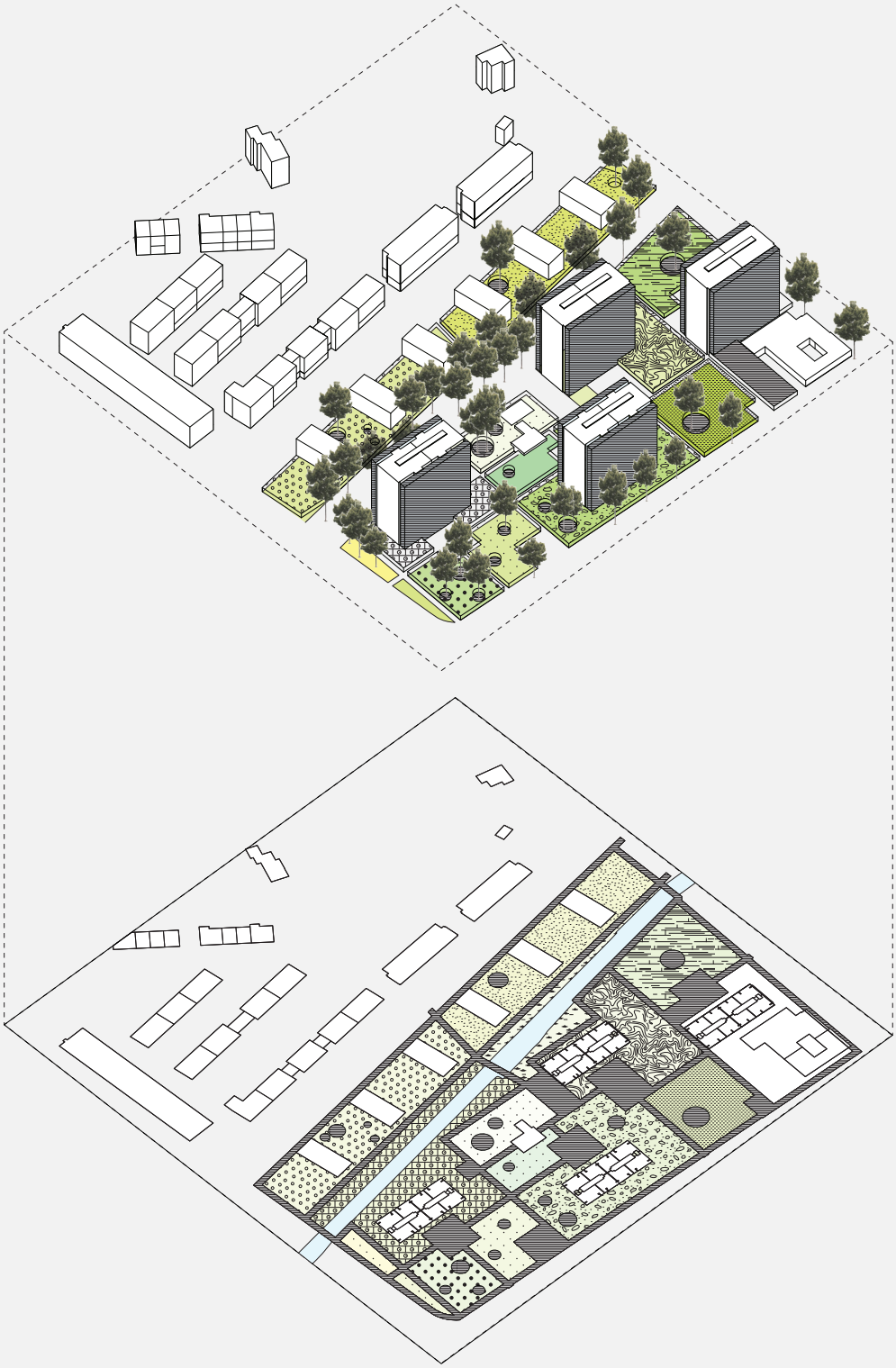
Scenario 1 proposes single storey covered greenhouses which could be dedicated to various commercial or residential uses, i.e. schools, shops, restaurants, private gardens. The majority of the open space is thus covered with a composition of rectangular volumes that open up to various sized courtyards. A system of circulating paths gives access to different areas from each side of the property boundaries. The large roof surfaces offer the potential of utilizing solar power as primary energy source as the energy consumption level of transparent volumes is most likely to be relatively high.

Typological reference: Tour Bois le Pretre, Paris

Source: Google Earth



aerial view with extension

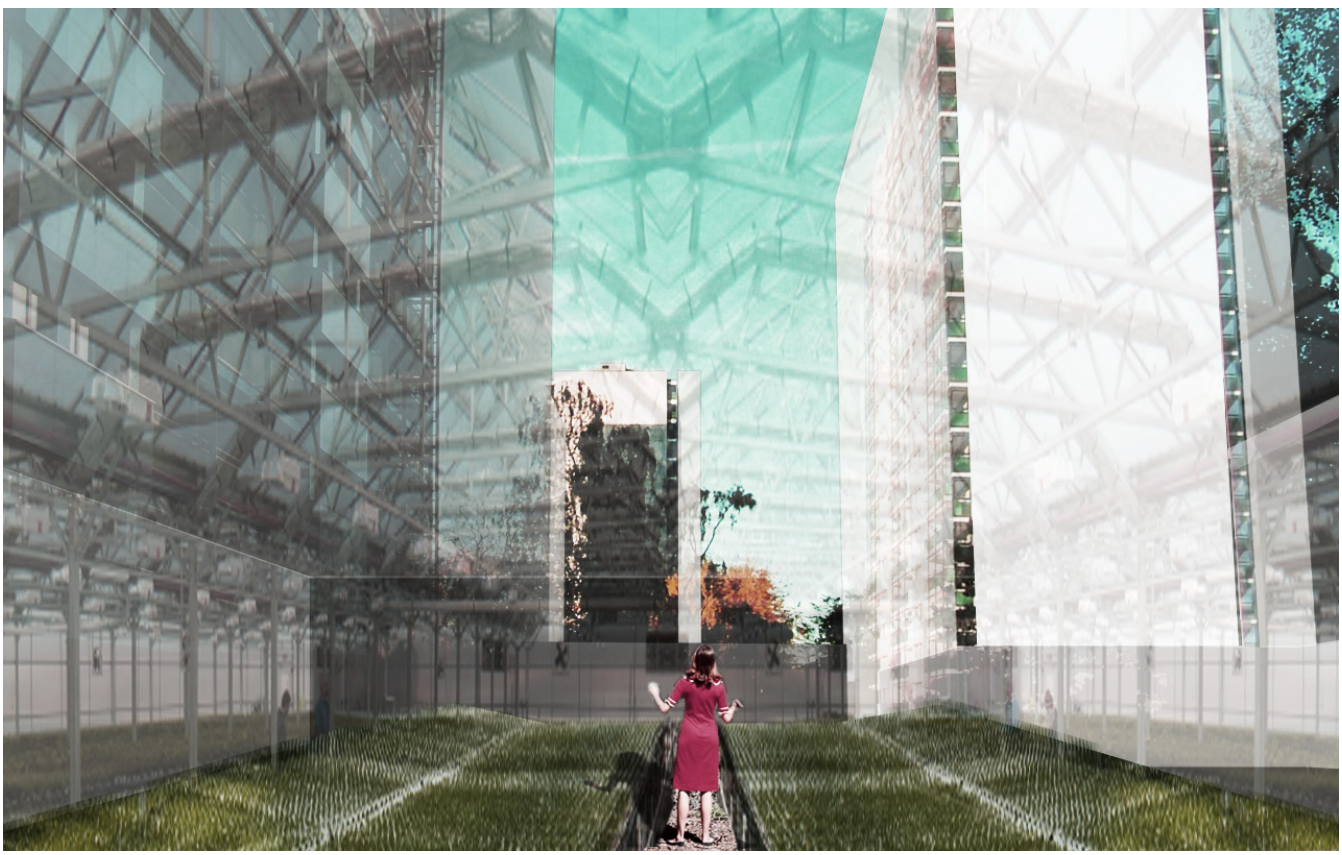


exploded axonometric - scenario 1 - extension

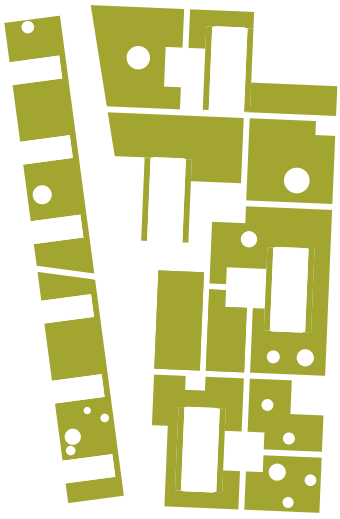
PROPOSAL 1: EXTENSION

Typological Reference: Tour Bois le Pretre, Paris

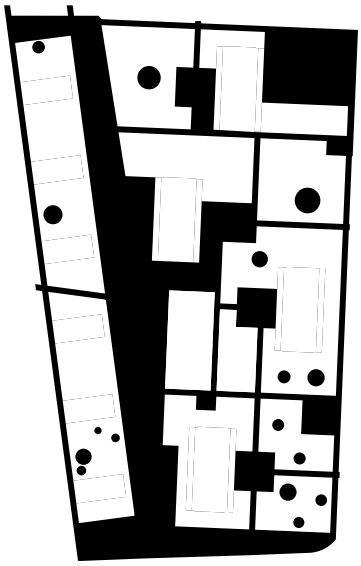
Source: Architectural Review / Lacatan Vassal



view from within a greenhouse



built plan



unbuilt plan

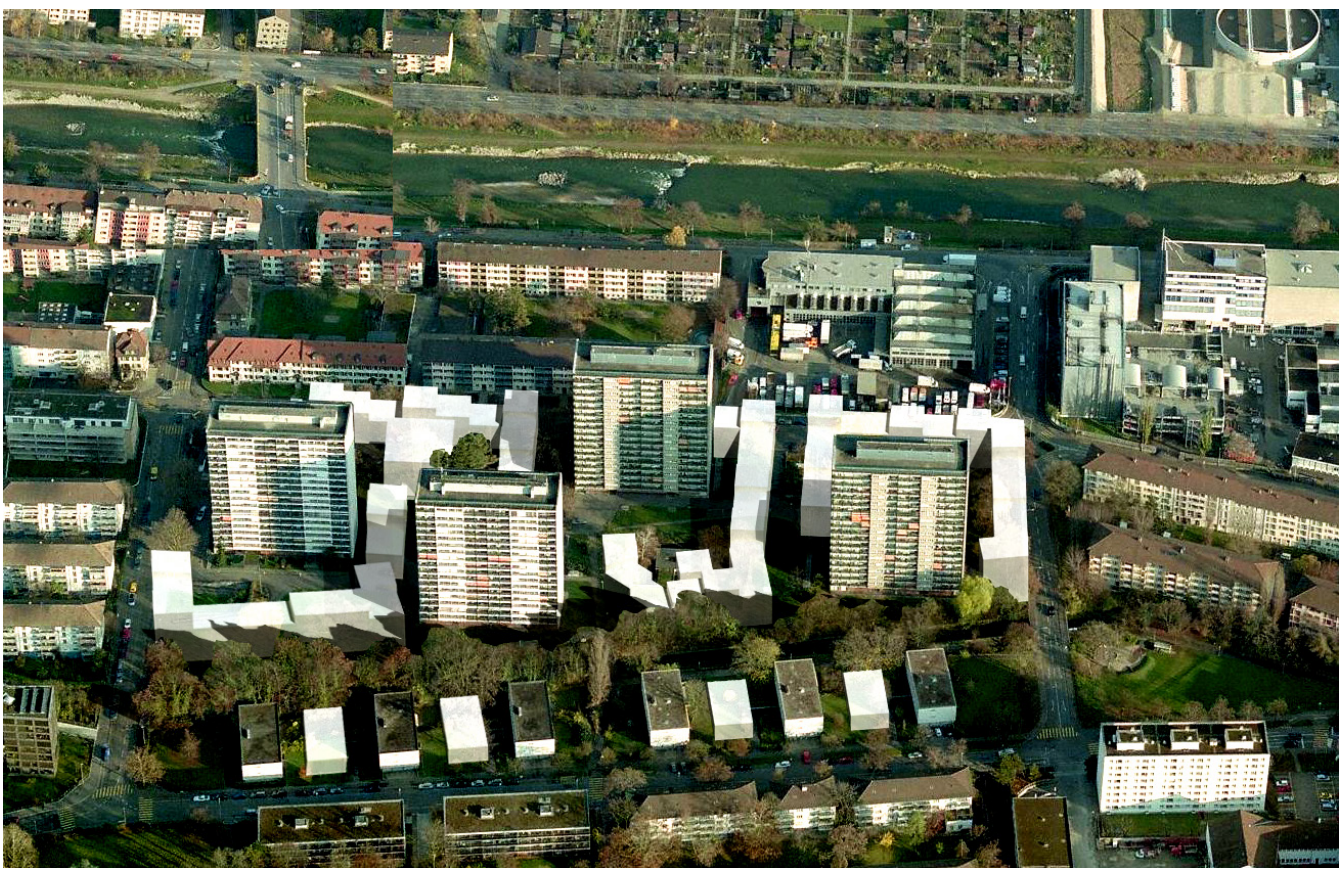
plan - scenario 1 - extension

PROPOSAL 2: DIVISION

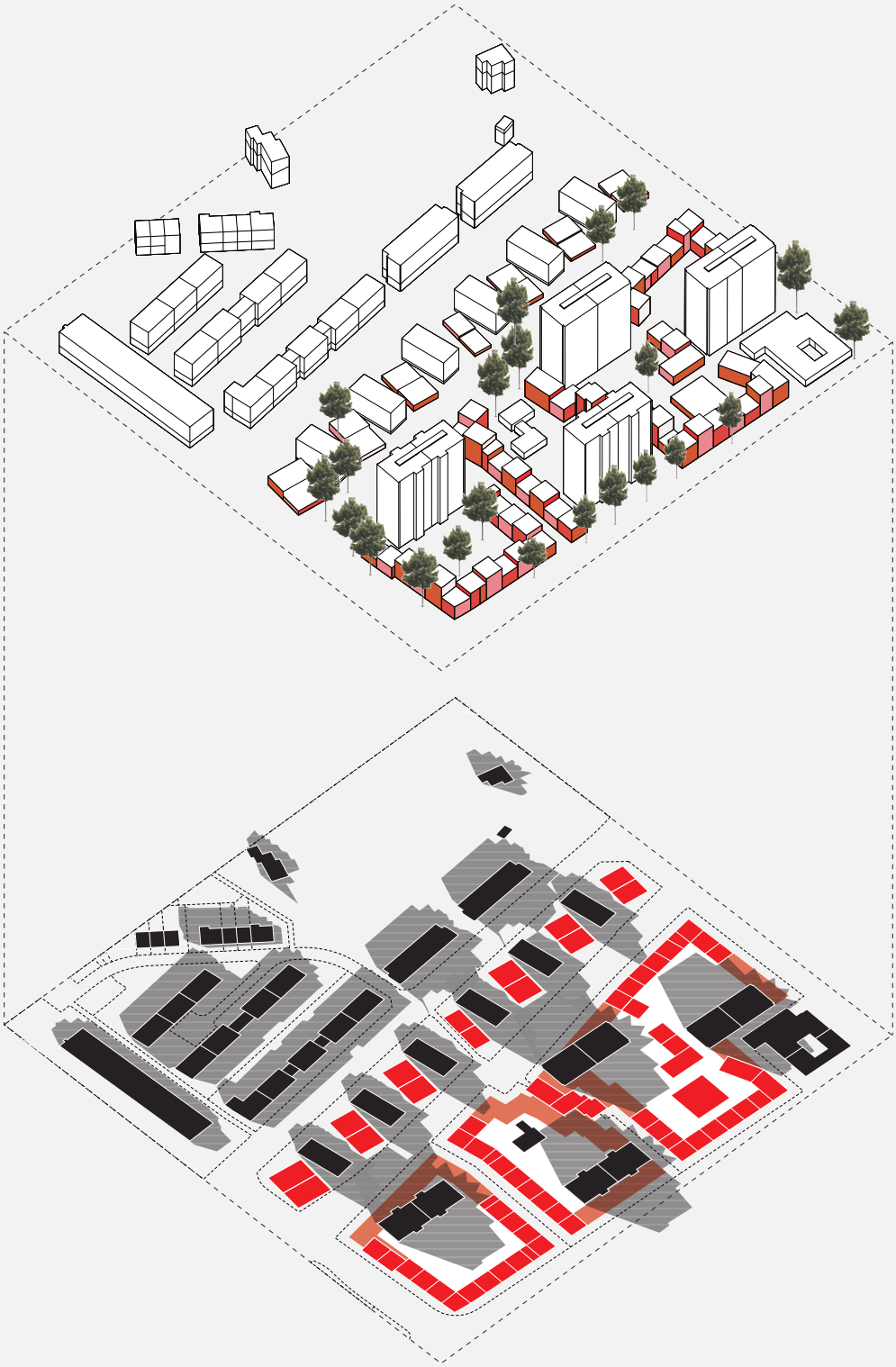
Scenario 2 starts from a new division of courtyard parcels into smaller plot sizes. Thereby, the new perimeter block buildings are built around the area covered primarily by the tower's shadows. Each plot can be developed according to owner's needs, thereby creating a multitude of types within a newly defined space. The building heights are limited between 3 and 5 levels in order to keep a balance between new residents and the quality of the open courtyard spaces.

Typological reference: Werd-Tower, Zürich

Source: Bing maps

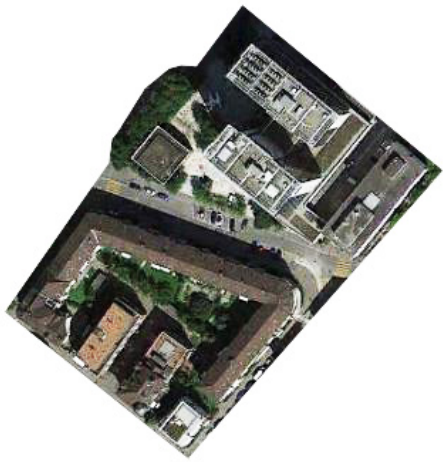


aerial view with perimiter blocks



exploded axonometric - scenario 2 - division

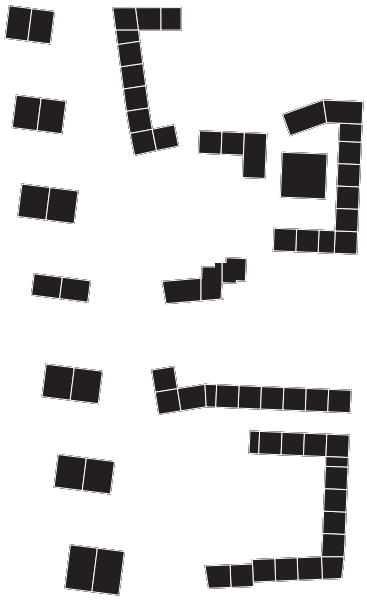
PROPOSAL 2: DIVISION



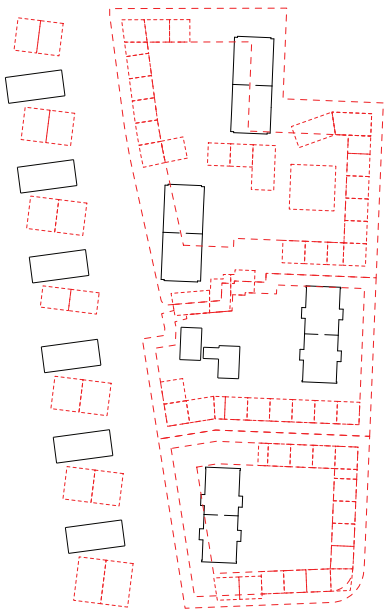
Typological reference: Werd-Tower, Zürich

Source: Google Earth

view from courtyard



volume division plan



new parcel plan

plan - scenario 2 - division

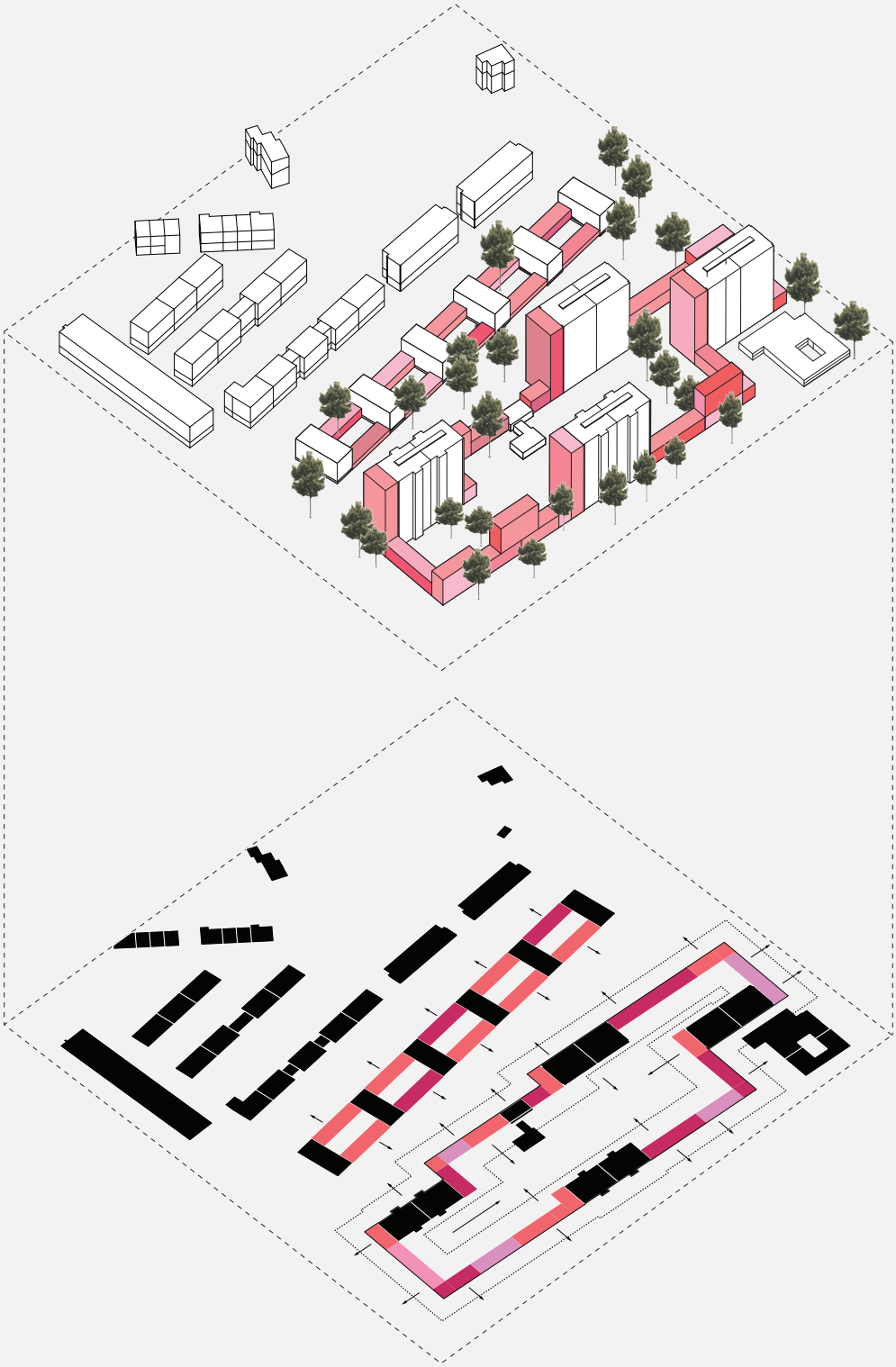
PROPOSAL 3: COMPLETION

Scenario 3 completes the rectangular layout of the masterplan with long building stripes which form a large closed courtyard in conjunction with the high-rise towers. Along these stripes higher volumes are placed on top and at the end on each South facing tower façade. Thereby, the new spatial differentiation between in- and outside the courtyard intends to distribute new parcels among residents in order to enable a sense of ownership and social interaction.

Typological reference: Karl-Marx Hof, Vienna

Source: Google Earth

aerial view with perimeter slabs



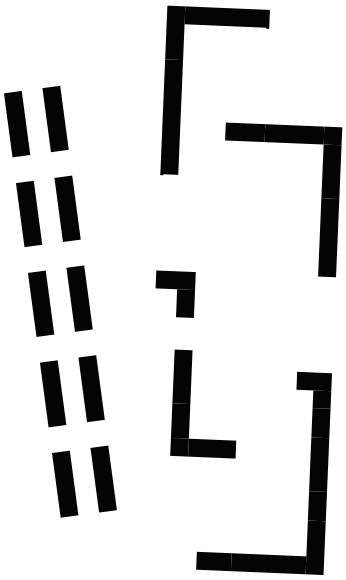
exploded axonometric - scenario 3 - completion

PROPOSAL 3: COMPLETION

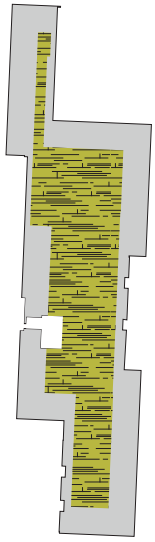
Typological reference: Karl-Marx Hof, Vienna

Source: Google Earth

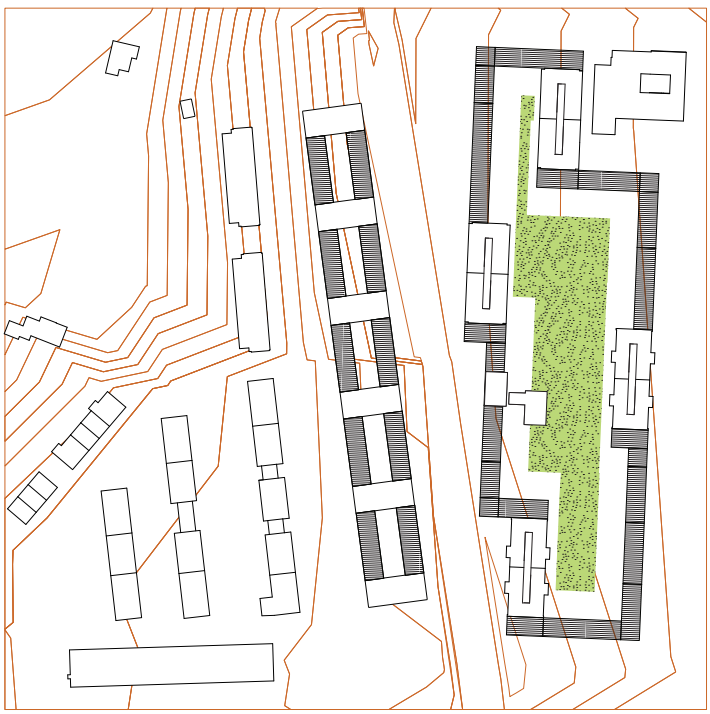
view from courtyard



building completion plan



completed courtyard plan



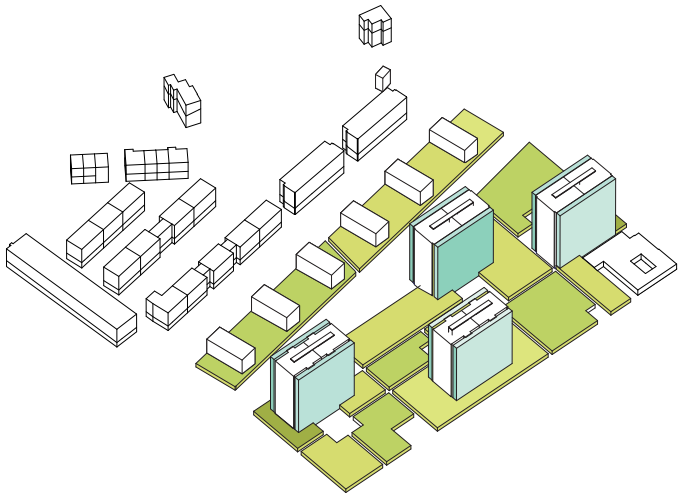
plan - scenario 3 - completion

PROPOSALS COMPARISON

Each scenario follows a different spatial strategy in order to provide an alternative transformation of the existing open space. Thereby the amount of residents and users is increased based on added capacity and fleibility over time. The scenarios are intentionally kept at an abstract level in order to avoid evaluations at an architectural scale. This would require a further in-depth study along with an elaborate program definition and structural study.
In conclusion the scenarios intend to propose alternative ways of adding residents in order to reactivate the ground floor, add building and roof space as well as create an environment that enables the integration of more social facilities.

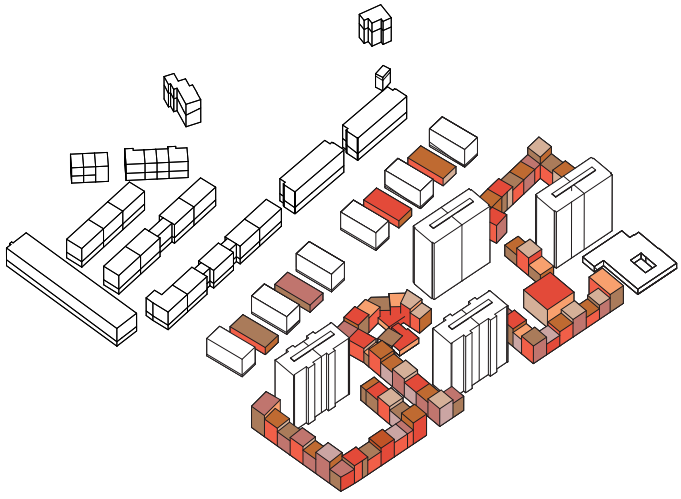
Scenario 1

Footprint: 9569 m2
GFA: 9569 m2
Potential new residents: 0
Energy consumption: 5 578 727 kWh/m2



Scenario 2

Footprint: 10910 m2
GFA: 49095 m2
Potential new residents: 926 (53 m2 / p)
Energy consumption: 5 596 830 kWh/m2



Scenario 3

Footprint: 12212 m2
GFA: 44187 m2
Potential new residents: 833 (53 m2 / p)
Energy consumption: 5 037 318 kWh/m2