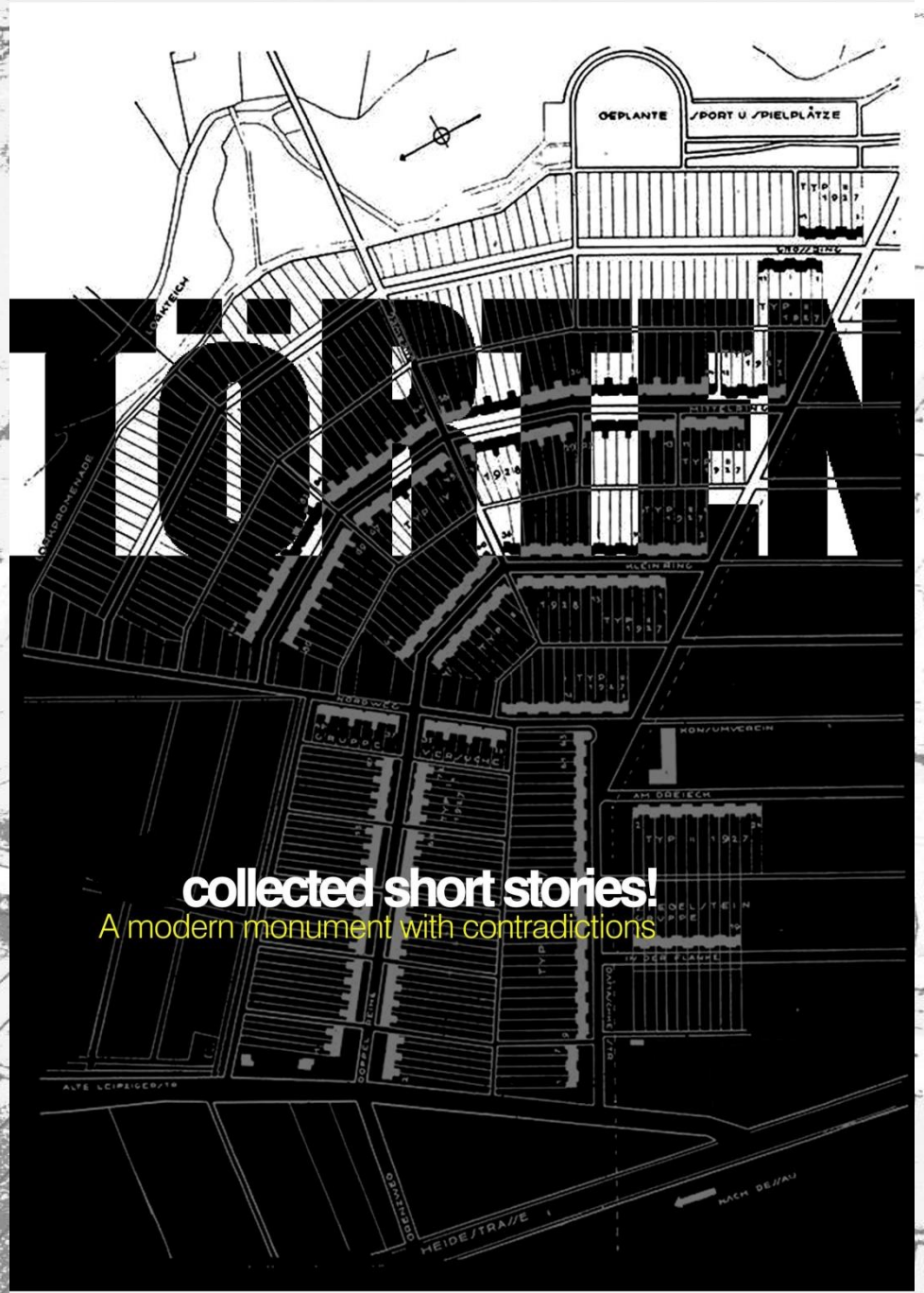


TÖRTEN

collected short stories!

A modern monument with contradictions

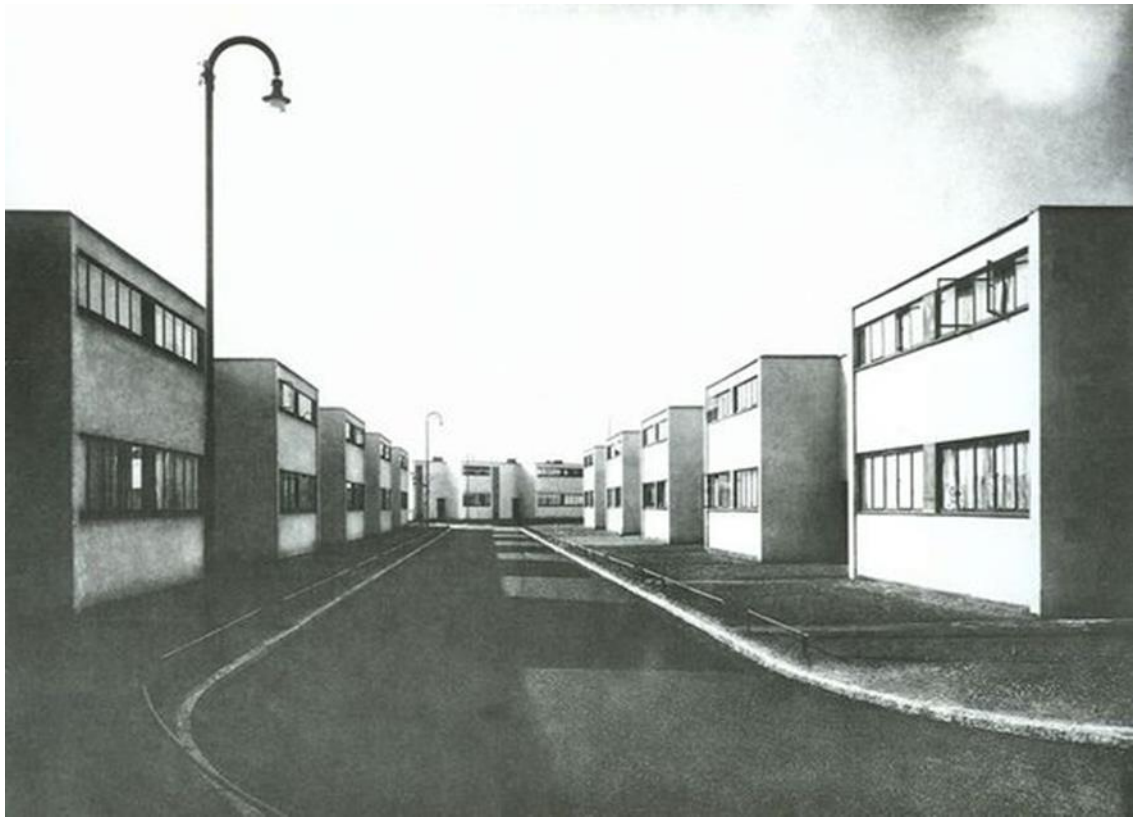
Ar. Sayed Ahmed
Anhalt University of Applied Sciences
Dessau
Germany

The fact

Distinguished eight trends of architectural expression and organization of social housing –

Idealistic showcase model,
Functionalist concept,
Large housing units concept,
Regionalist concept,
Concept of structuralism,
Postmodernist or individualist concept,
Ecological concept,
Realistic concept or “slum upgrading”.

The Törten housing estate in Dessau is the example of functionalist mass-production attitude towards the affordable living space (Turner, 2008)



The objective

1. To analyze the possibility of sustainability into the design and construction of the housing, and to formulate the material proposals for further conservation.

2. The construction of the houses were done with cheap materials like prefabricated slag concrete cavity bricks, reinforced concrete girders etc. The building process were planned with short time activity.

Background

Its is a symbol of the united relation between working class as “Ring-road of the proletariat”. (Tung A. M. 2001).

200 years after the first Gartenreich of Prince von Anhalt-Dessau, Gropius hardly wanted not to inaugurate a new paradisiacal landscape rather than a landscape of hope. (Jean-Francois Lejeune, 1997)

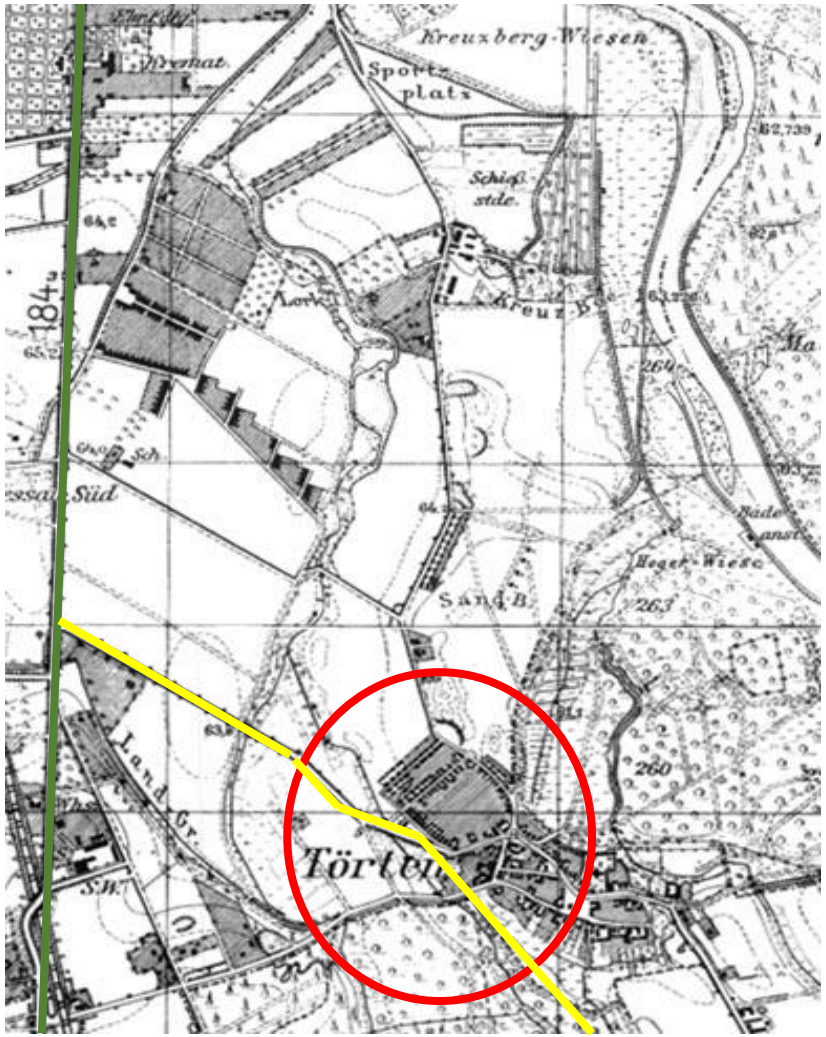
The garden belt of Gropius may be emblem of Mendelssohn’s enlightening movement from this soil.

THE STAGES

1. Prewar situation:
preindustrial core Törten was the starting point for the Stadtrandsiedlung (suburban settlement plan) in 1920s

2. Postwar situation :
full development of the areas between Heidestraße and dump bank by low-storey family houses facing the recess. The transitions to Heidestraße are used structurally to create density and form buffer zones.

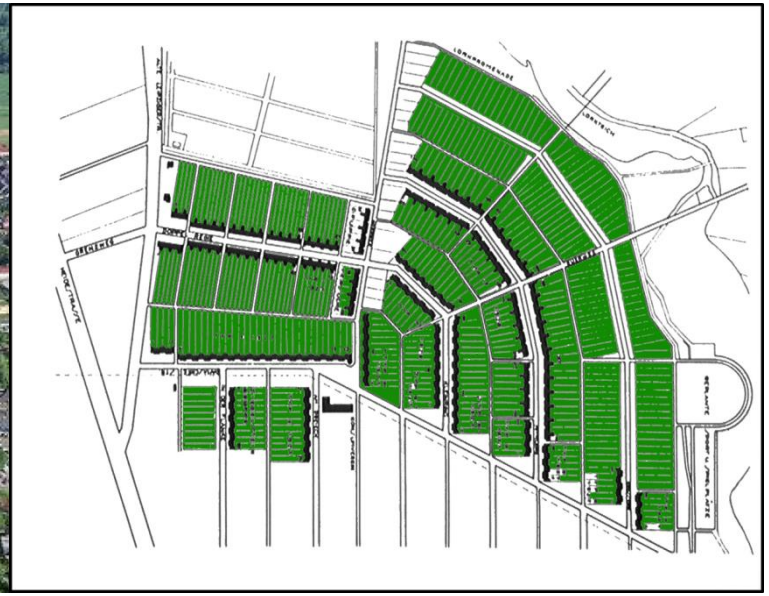
3. Reunification situation:
The dense green and fragmented structured field of the built environment is differentiated without axis. Visual relationships are created by small space expansions. Care services are scattered from central locations. the Bebbaung along Heidestraße shows vacancy and partial decay due to low sound insulation and the traffic load.

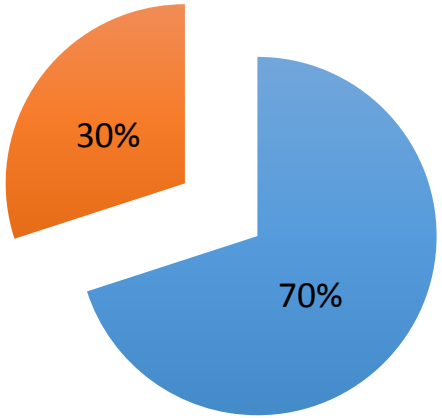


Subspace pre-war situation

Reunification situation

Törten Estate
Walter Gropius
1926-28





The shortage of affordable housing, exacerbated by stagnation during WWI.

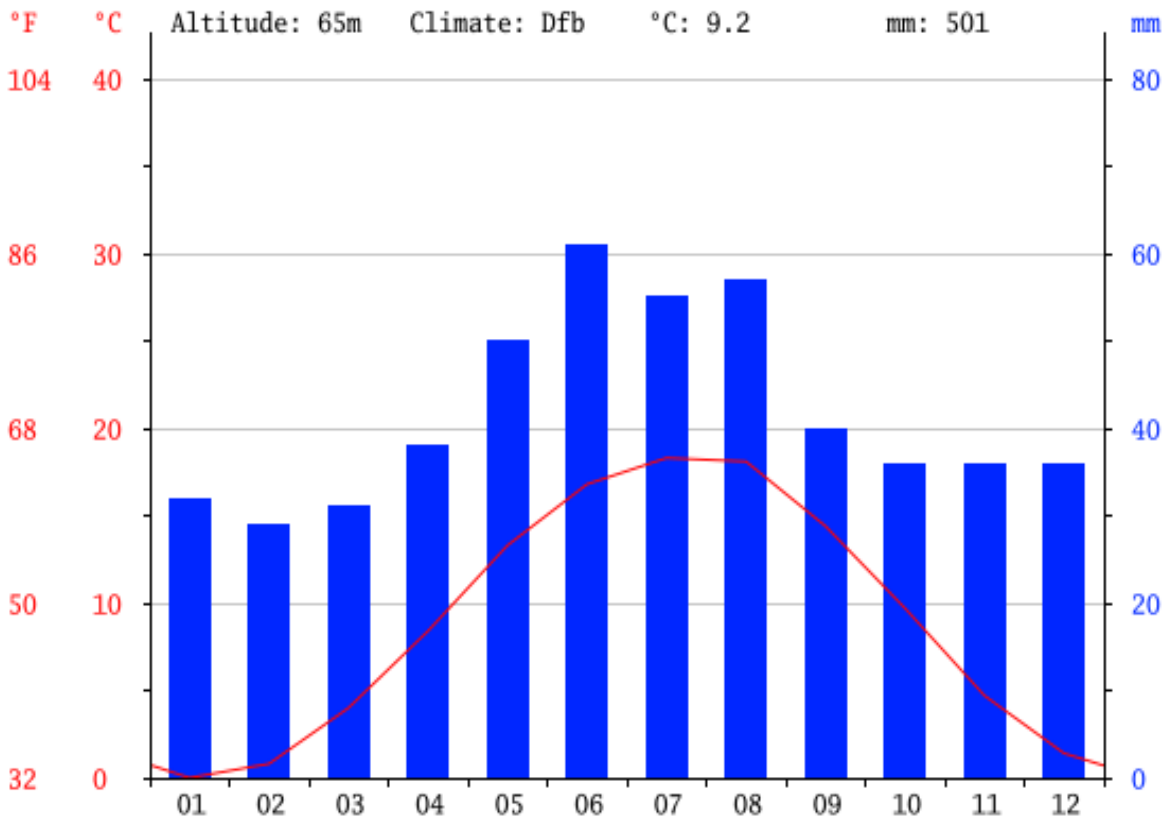
The promise was "light, air and sun"

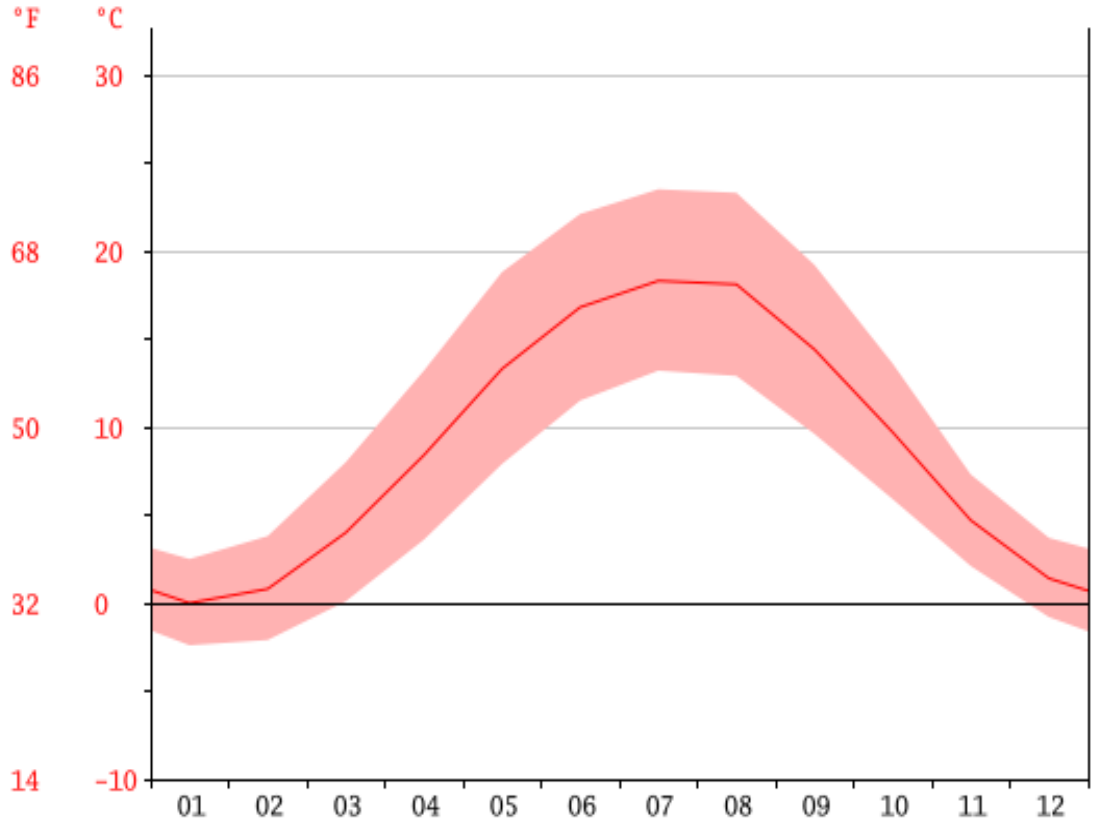
With the "suburban estate", the Bauhaus sought a practical solution to the problem of building affordable housing for the mass workers ;

As a owner occupied houses for the people of low income, these included kitchen gardens measuring between 350-400 sqm where residents can grow vegetable and do small animal husbandry.

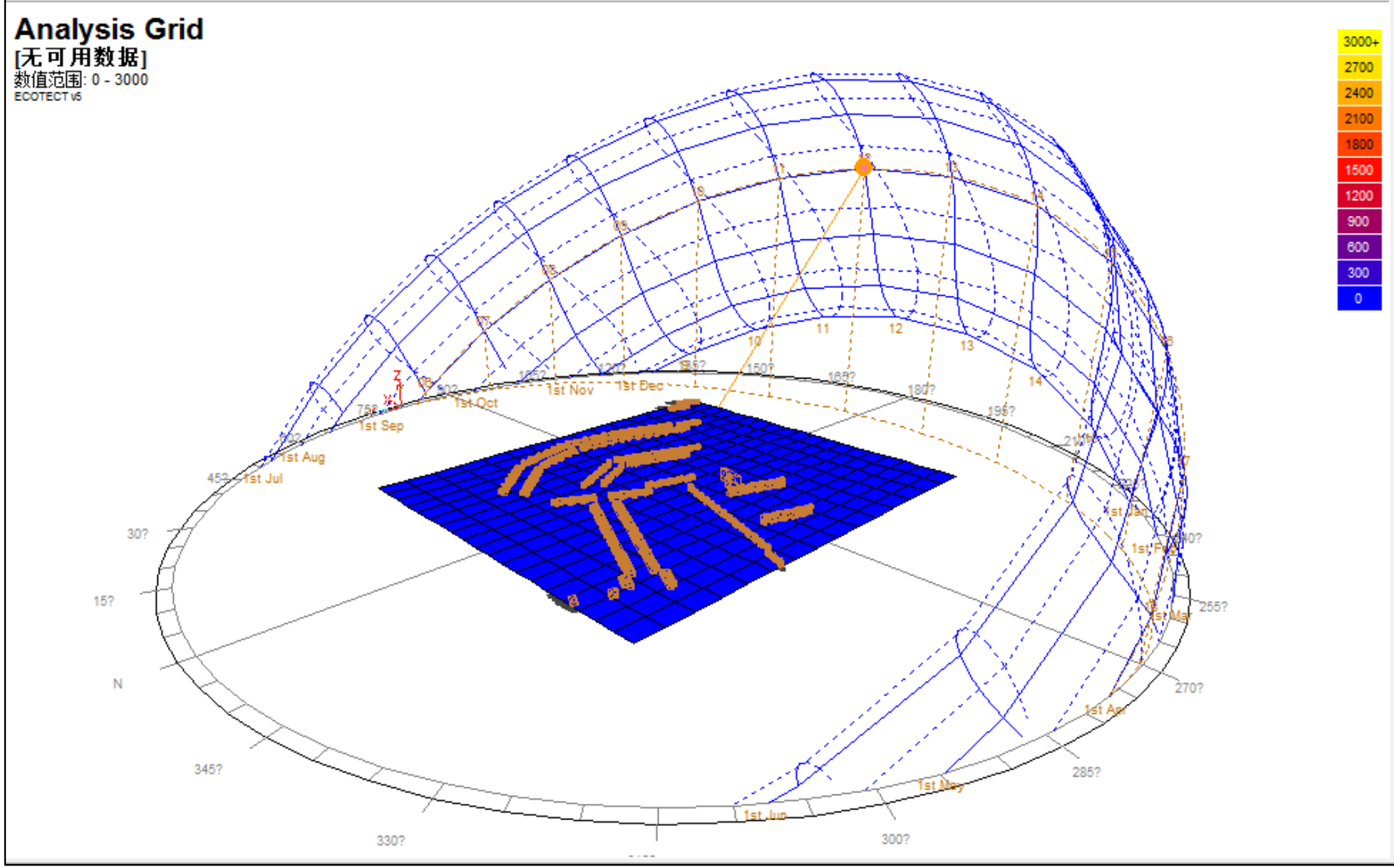
Row houses were built in assembly-line fashion, the effective way to reduce costs.

Climate
Temperature chart for Dessau





Annual solar elevation angle change schematic drawing on ecotect v5 software



Winter solstice Sunlight Analysis

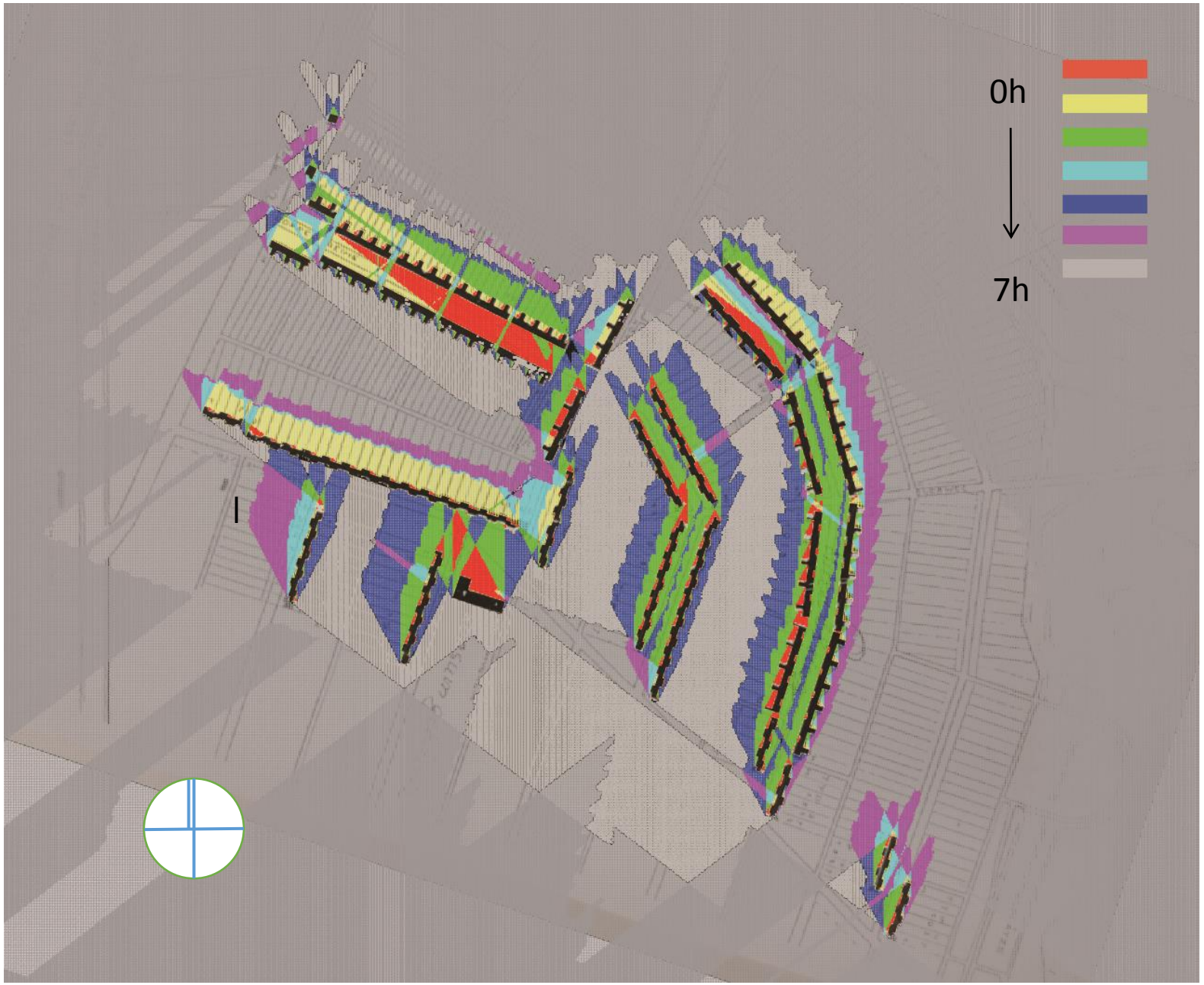
location:
13.25 east longitude, latitude 52 ° 30

time:
start:8:00 over:16:00

date:
Winter solstice

Accuracy:
60mins

grid:
1000



The comparison between phases

1928

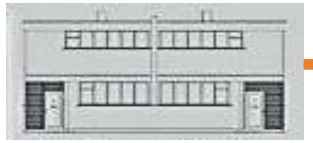
2008

Phase 1 houses have the distinctive strip windows and steel front door. Prismatic glass blocks have been used to one side and above the front door to allow light in hallway.

Phase 2 houses' glass blocks have been used to provide light to the staircase (a little like the large staircase windows in the Masters' houses). These were slightly smaller than Phase 1 houses but had a separate bathroom on the first floor.

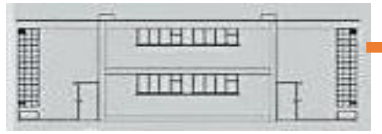
Phase 3 houses were smaller than the houses from the earlier two phases. it has a "split level" design with some of the living rooms in the basement. That's why the strip of windows at the bottom of the facade is actually high up in the room on the lower level. They include the boiler and the earth closet toilet. (https://greatacre.wordpress.com/2014/04/01/the-trten-estate-dessau/)

5 different architectural styles

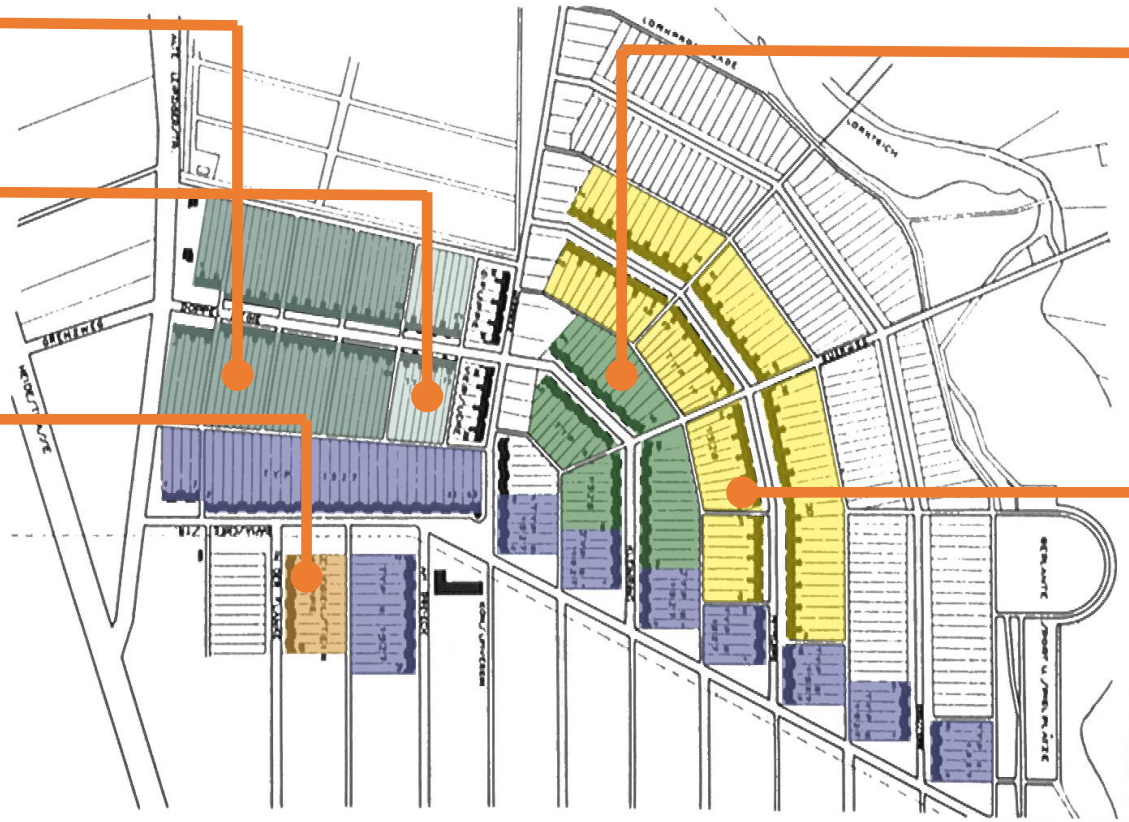


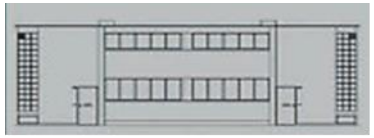
Sietö I 1926

Sietö II 1927



Sietö III 1927

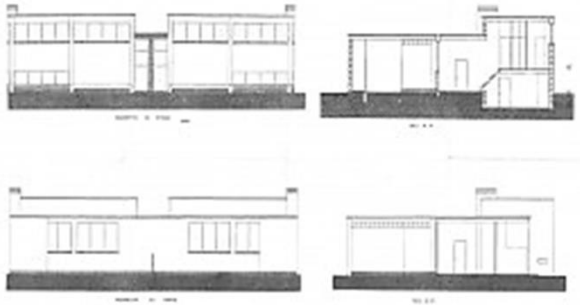




Sietö IV 1928

Sietö V 1928

In three phases of construction, 314 terraced houses were built with a floor space of between 57 to 75 square meter. These cubes, put back-to-back, formed semidetached houses, and are combined in a group ranging from 4 to 12 units. Uniform steel windows and doors were positioned in facades with irregular composition



Terrance house
Built 1926-1928

Interleaved cubic corpora of different heights.

Vertical rows of windows on the side façades

Provided lighting for the stairways , but in master houses the large glass windows for studios.

The façade of the Director’s House was the only one to feature asymmetrically arranged windows.

Both houses are painted in light tones and the window frames, the undersides of balconies and down pipes in stronger colors.

Masters' Houses by Walter Gropius
Built 1925-1926

Construction Materials

Inexpensive construction methods and materials were used.

The construction process was planned to have several activities to overlap to exploit time management

The structural precast concrete joists were prefabricated on- site and transported via small wagons and moved by crane, sand and granite for concrete were collected on-site. Concrete blocks, slab, beams all were produced onsite .

The load bearing walls were made of prefabricated and inexpensive hollow slag-concrete blocks measuring 22.5 x 25 x 50cm and the ceilings with reinforced concrete joists tightly bolted together side by side.

The longitudinal walls were made of non load bearing filling walls consisting of two 6cm thick cinder concrete and block with an air pocket of 1cm between them.

Floors spanning between load bearing walls, external walls were sealed with light concrete block work.

Alternatives would have been to have the concrete prefabricated off-site under controlled conditions. The tight construction schedule did not allow for certain materials, for example bricks, to attain maximum strength causing cracks to occur. The bricks could have been moulded at the beginning of the construction process giving them ample time to dry before usage.

Self-renovation works is being carried out

Decline and Decay

In 1927, the State Research Association for Building and Housing Economy was founded and it ensured that experimental industry products and building materials to be used.

Long after project completion, defects in design and construction became obvious. Bad insulation and cracks in the walls were examples of defects noticed.

Soon after, residents made numerous alterations to deal with the problems. The first changes carried out in 1934 , were to reposition too-high windows, then plans were altered to suit their insulation.

Lets paint!

Economic Facts Of Germany

focused on :

1. Market value of the houses.

2. Demand of the place among the people.
(If the government sanctions any home loan)

3. Economic and social condition of the inhabitants.

4. Suggestions for such social housing.

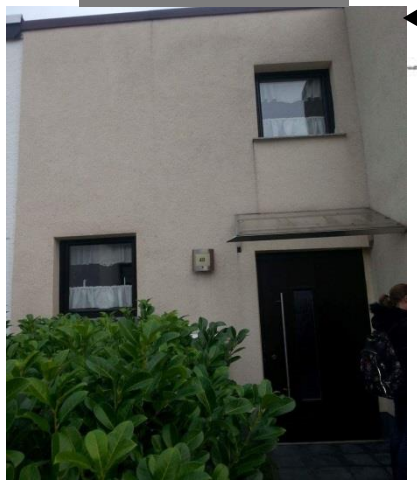
Average Income	Per capita is USD 31 252. the average net-adjusted disposable income of the top 20% of the population is an estimated USD 59 576 a year, whereas the bottom 20% live on an estimated USD 13 444 a year. Courtesy: http://www.oecdbetterlifeindex.org/countries/germany/
The percentage of Germans owning houses	52 percent, it is the lowest in the entire European Union. Germany has only 1/9th as much living space.
The average price per square meter	€ 1,500–2,500 per square metre. at The average price for a 30 square metre property (a small apartment) is EUR 60,000, while a 100 square metre apartment averages around EUR 250,000.
Housing Loan	Banks provides loans regarding checking eligibility. Mortgages typically have a 25 or 30 year period, with interest rates fixed for the first 5 years or so.

Present condition, market Value of House at Gropius Törten, Dessau

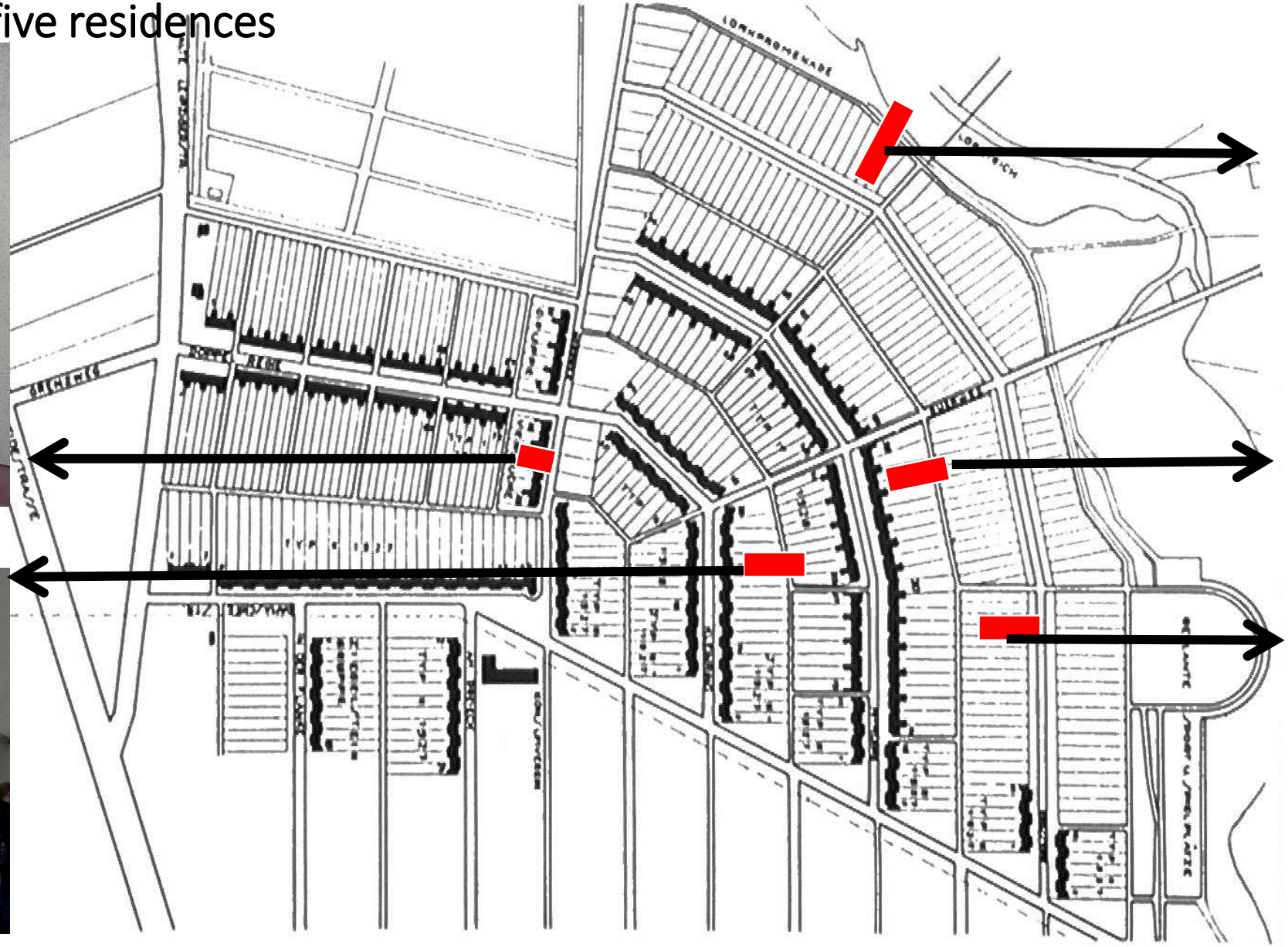
Area	**4.37 km²**
Population	2475
Population density:	566 inhabitants / km²
Social Status	Divided into three classes: Lower middle (Lives in the small ring) class, Middle class (lives in the middle ring) and Upper middle class (lives in the large ring)
Cost of per squire meters	€ 2,250.
57 sqm costs	€ 1,28,250.
75 sqm costs	€ 1,68,750.

Patrick Geddes's community engagement tools
Our survey in five residences

48 Kleinring



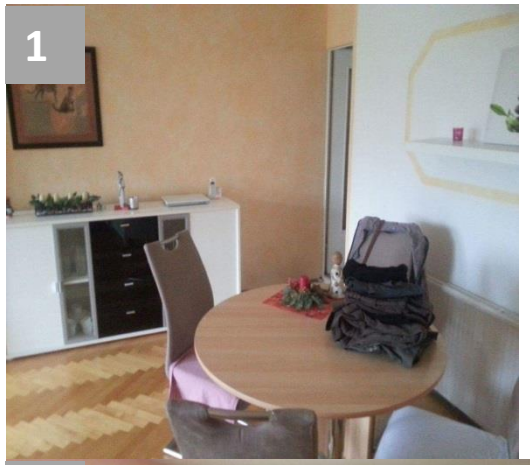
25 Nordweg



106 GroBring

43 Mittlering

59 GroBring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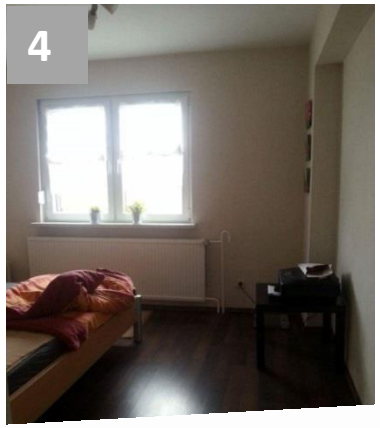
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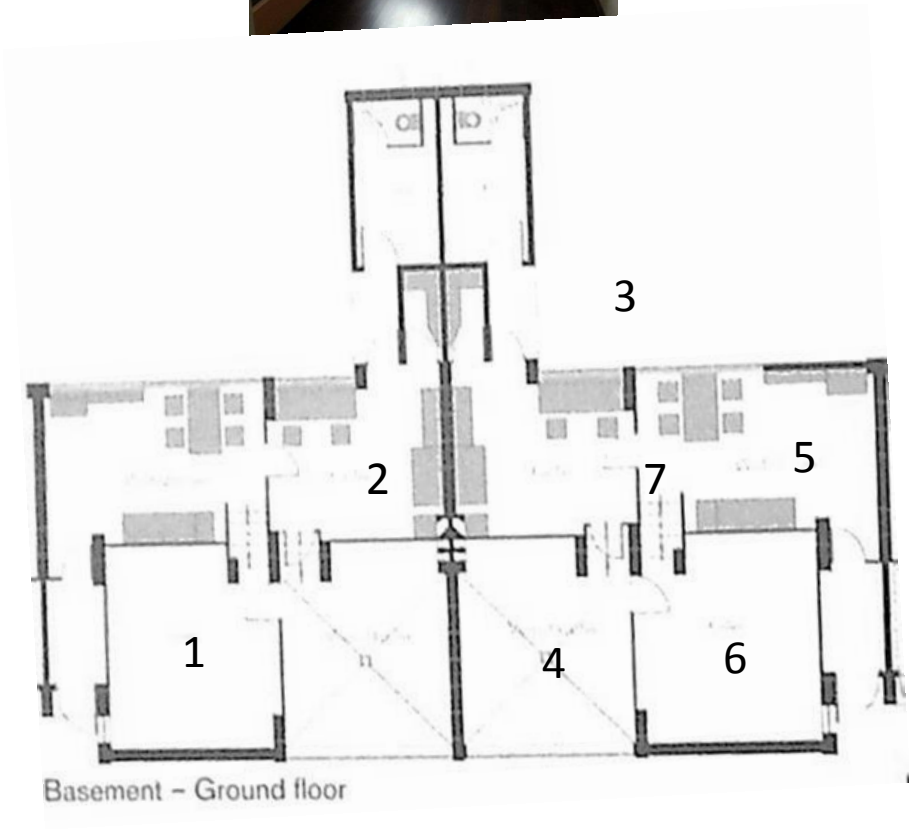

3
2
7
5
1
4
6
Basement – Ground floor


5


7


6

Survey results

1. How many events (sports, religious, cultural) are held here in a year where all the inhabitants do participate?

- 4 events, 2 opinions
- No events due to lack of space and inspiration, 4 opinions

2. How many events (sports, religious, cultural) are held here in a year where all the inhabitants do participate?

- Yes, 1 opinion
- No, 4 opinions

3. Are there any Options for community gathering in this housing? Is it enough?

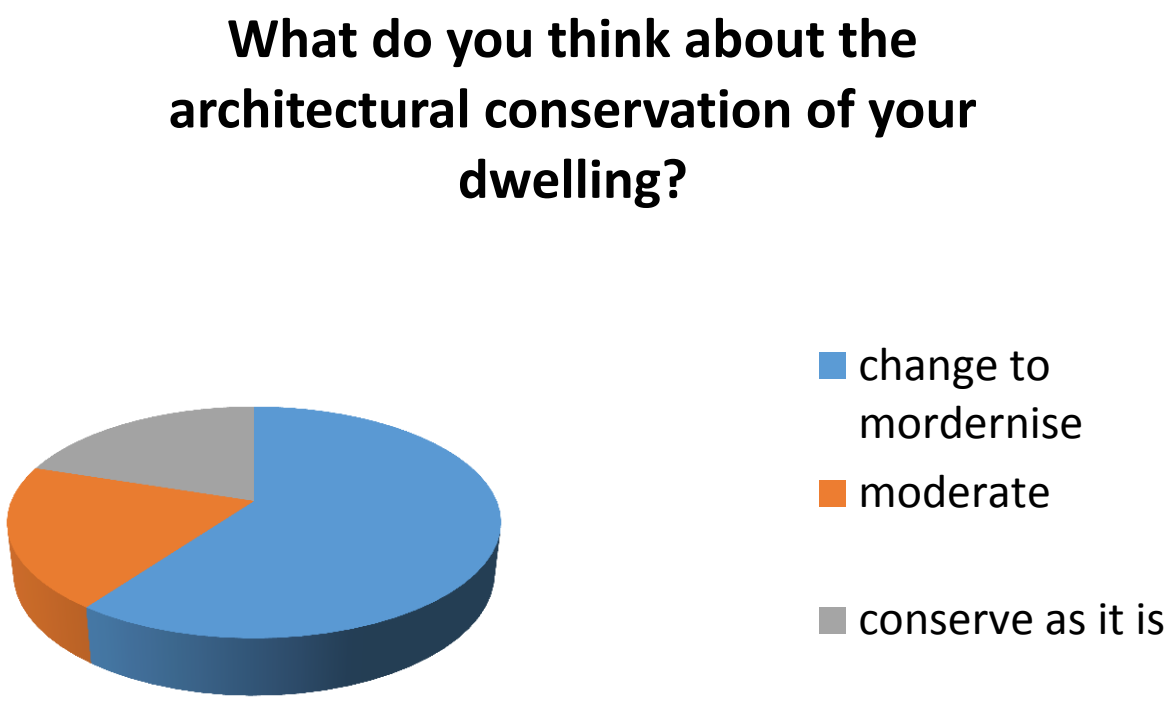
- School - 5 opinions, restaurant - 3 opinions, garden - 2 opinions, sporting event - 1 opinion,

4. Where are the Places where people generally gather in Gropius Torton estate?

- Yes, 5 positive opinions.
- No more service is needed 1 opinion. Additional service needed 2 opinions (Theatre, youth club)

5. Are services here is enough? Do you need the additional community services like hospital, school, gymnasium, playground, senior citizen club, church, restaurant, pub, bar, theatre etc. within this housing? You may propose by your own.

- 1 opinion for conservation
- 4 opinions for positive change from initial design.



Survey results

6. What do you think about the architecture of your dwelling? Do you want to conserve it or transform it to a more modern house according to your ability? Tell some positive and negative about your house.
Nature - 3 opinions, garden – 3 opinions, silence – 2 opinions
Community- 2 opinions

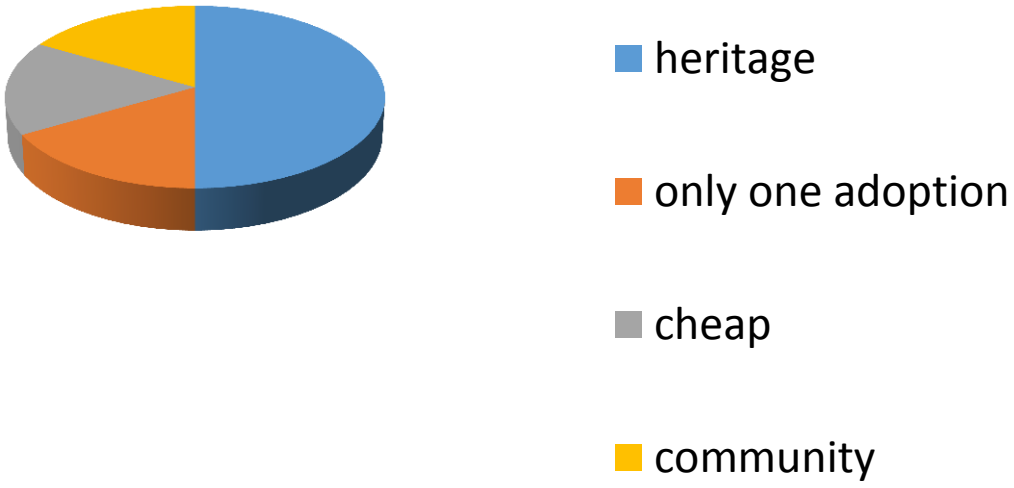
7. What are the things that give you more pleasure living here?
The village character of estate, the nature of surroundings and peace: nobody wants to move. - 5 opinions

8. Suppose, you are not living in this area in future, what will make you nostalgic or you are going to miss a lot?
It's a heritage- 3opinions. Cheap- I opinion, Community service is well enough- 1 opinion. Only one adoption they have - 1 opinion.

9. What is the VALUE of your house? Both (culturally and economically)
No suggestion, things are going well- 4 opinions.

Additional opinion
A Street should be developed, Doppelreihe - 1 opinion.

What is the VALUE (culturally and economically)of your house?



Bauhaus materials

1 Triolin flooring
2 Magnesite flooring
3 Black opaque glass
4 Torfoleum insulation
5 Concrete

Triolin

A plastic floor covering of Bauhaus Buildings and in the Masters' Houses instead of linoleum. Optically, Triolin can hardly be distinguished from linoleum.

Developed in the 1920s in the search for a low price substitute for linseed oil.

mainly composed of nitrocellulose, fillers and gelling agents applied to a hemp fiber fabric, jute from Bengal (todays Bangladesh).

However, the flammability and the development of new materials meant that the production of Triolin was soon abandoned.

Alternative today

Triolin floor in the office of Walter Gropius in Bauhaus Dessau is the only example left today. Instead of organic material, jute some synthetic fibers like Acrylic, nylon, polyamide could be tried to achieve sustainability. This is the only required alternative for conservation of flooring.

Bauhaus materials

1 Triolin flooring
2 Magnesite flooring
3 Black opaque glass
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5 Concrete

Magnesite
Magnesite coating to the surface of the internal floor was regularly used in unit construction and Local Authority housing between 1945 to 1960.

Installed mainly as a leveling compound to provide an adequate level surface to the floor. this is specialised cementitious product which is based on magnesium oxychloride (or magnesium oxysulfate) cements. The most popular form comprises the reaction between magnesium and solution of magnesium chloride. Its appearance is brick red in color and straw yellow too.

they are laid at anything between 15-25mm thick. Typically laid between 10-25mm thick, but two coat applications could be up to 50mm thick.

this is a cork type material thus provides a softer finish to the floor. It is also extremely durable, resistant to oils and grease, lightweight, and even noncombustible and cooler. But it is electrically conducting.

Problems
The problem occurs when water entry leaks, particularly around leaking windows or patio door units like Torten estate. problems appear when on top of magnesite any impervious material is installed. When it becomes damp, or wet, it sets up a chemical reaction with the steel reinforcing to the main part of the concrete structure, or floor. This accelerates rust which attacks the structural core of the floor slab and building. In extreme cases, the floor in the affected areas can noticeably lift and produce awful smells when the filler rots. They are very vulnerable to humidity. magnetite flooring is hydroscopic, absorb dampness.
(Kier SHE Department, 27th February 2014)

Bauhaus materials

1 Triolin flooring
2 Magnesite flooring
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5 Concrete

Alternative today
Polyurethane finish and varnish over it might help to make it durable. The best approach is to undertake an electrochemical assessment of the concrete slab which will reveal the level of chloride in the concrete and identify the level of corrosion of the embedded reinforce bar, which has durability of 10 years. Pigmented sand/cement screed is another option but asbestos flooring tile is more fire resistance and conservation friendly. Another rule is not to cover magnesite flooring with DPM.

Suggestion

Where work is required to a floor screed or laid toppings, check that the Refurbishment Survey has included an investigation and sampling of floor screeds.

Must cease work if there is a reddish color on the screed and obtain confirmation as to the nature of the material.

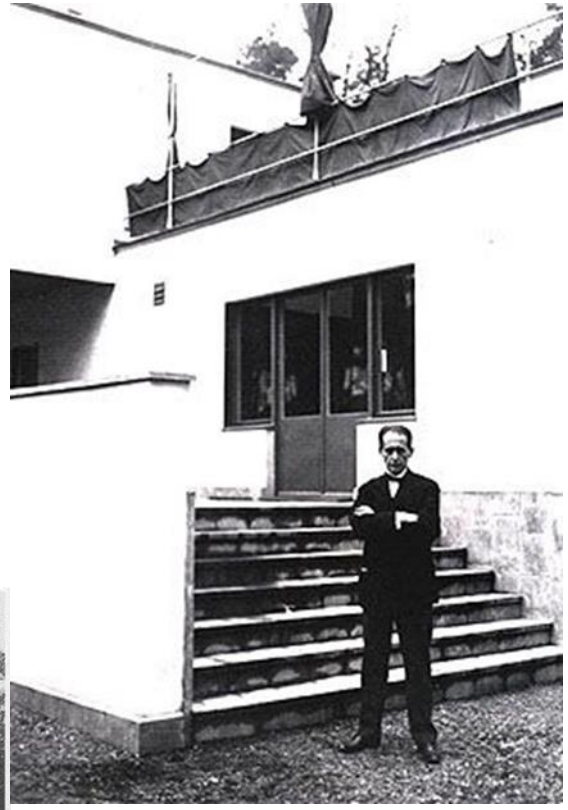
All sampling and testing should follow Asbestos Management Procedure by surveyors or analysts.

Involves major rectification costs and magnesite need to be removed when the unit is refurbished.

EVIzero is an innovative neutral, ecological binder. Produced with an advanced polyolefin mixture which uses polymer materials instead of bitumen thus it is ecofriendly. Also pigments can easily be added to give the surface color, so original color choice could be found.

Bauhaus materials

Black opaque glass cladding
Only a cladding material for column. 25,4 mm thickness.



1 Triolin flooring
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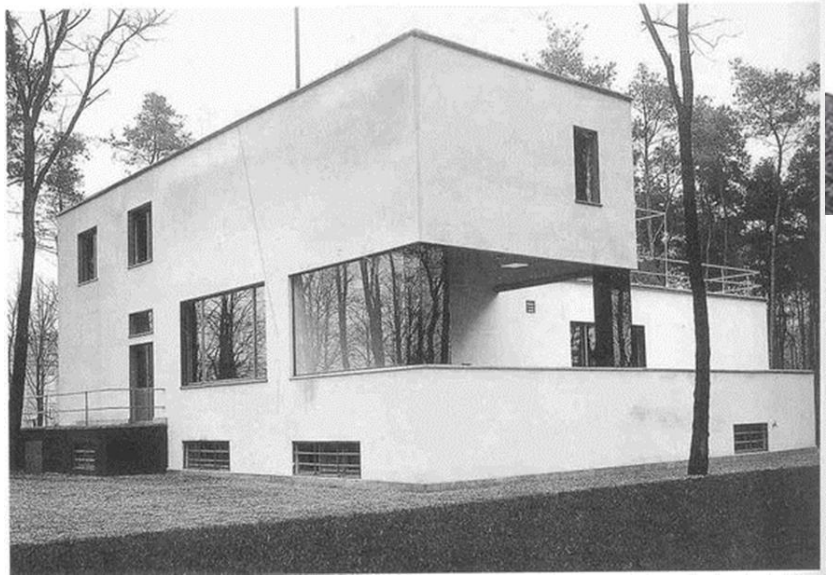


Bauhaus materials

1 Triolin flooring
2 Magnesite flooring
3 Black opaque glass
4 **Torfoleum insulation**
5 Concrete

Torfoleum

The external walls are clad with insulation boards from so called Torfoleum. It is an impregnated pressed peat board with jute fiber and cattle hair. Generally it is of 50 mm, as there are two boards of 25 mm fixed in overlapping bonding. The buildings were insulated external walls of roughly 330 mm.

(L. Maurerová and J. Hirš, Brno; GSTF Journal of Engineering Technology (JET) Vol.3 No.1, July 2014, Villa Tugendhat as a Technical Monument - Elements of Passive Solar Architecture, pp.74-80,)

Alternative today

It was very ecofriendly material. So we can use this without any kind of confusion for conservation.

Bauhaus materials

1 Triolin flooring
2 Magnesite flooring
3 Black opaque glass
4 Torfoleum insulation
5 **Concrete**

Concrete

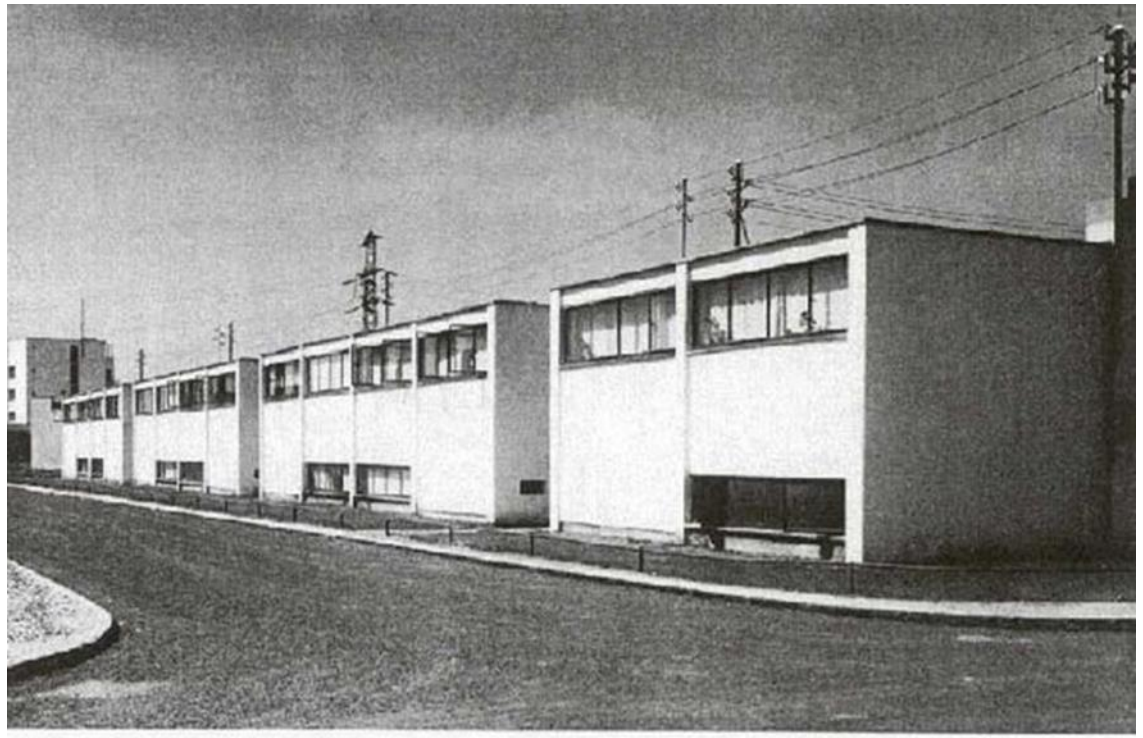
The structural precast concrete joists were prefabricated on- site and transported via small wagons and moved by crane. Load-bearing walls were built using prefabricated slag concrete hollow blocks and the ceilings Rapidbalken (precast concrete joists), prefabricated on- site to reduce the cost of construction. The floors concealed with reinforced concrete beams. Fly ash was real problem on that time. The cement used in the construction was very porous as it contained too much gravel, while the layer which covered the frame of the building had too little, which is why the iron frame has oxidized.

Lime plaster

Hinnerk Scheper took the renovation project while the plastered surfaces of walls and ceilings of the Bauhaus Buildings are mostly covered with a very thin layer of plaster.

Its materiality and structure is very close to the original lime plaster. In doing so, faults in the plaster become smoother and the surface corresponds with the historical figure.

This layer is inexpensive and beneath it the original remains of plaster and paint are secured and protected. Color conforming to the historical example is applied to the surface of this lime wash.



Nordweg. Ansicht von Nordosten, ca. 1928. Haustyp sietö IV. Im Hintergrund das Gebäude des Konsumvereins (Gropius 1928). Auf den Dächern sind die Masten der oberirdischen Stomzufuhr zu erkennen

Challenges

1. Need to follow the latest and sustainable solutions for hiding modern installation to avoid any harm to the original material aesthetics of the building.

2. The façade color should be near the color of white and anthracite for plastering.

3. Biennial characters of a day have great impact over those micro-climate spaces both by lateral and frontal elevations of each block. The building orientation is not the best, half of the building can't get enough hours of sunshine in summer.

Opportunities

1. A participatory Involvement of inhabitants for action plan is needed to convert this housing from mono-disciplinary character to an income generating site without causing any trouble to the community.

2. The three E's: Economic, Equity (social) and Environment are needed for any progress toward sustainability. This site has great opportunity for such experiment.

Suggestions

not to diminish the artistic significance of the building. The exact knowledge of building material– its composition, its aging properties, its physical and static coactions with other contemporary building materials – is the most important for concepts for the future preservation.

"The intention in conserving and restoring monuments is to safeguard them no less as works of art than as historical evidence."

Venice Charter: Article 3

The Venice Charter was passed in 1964 by the International Congress of Architects and Technicians of Historic Monuments and Sites.

Today, Gropius would surely choose vinyl
–prof. Dr. Omar Akber.

Thank you !

Sayed Ahmed