MODERNISM ARCHITECTURE IN GERMANY

 A case-study guide for a sustainable life-cycle management of a former modern building within the built environment

Presentation by Julius Pahl

Hamburg, 05.04.2016







CONTENT

- Introduction
- Theoretical Basics
- Case-study:
 City-Hof Hamburg
- Crucial points for decision making
- Conclusion

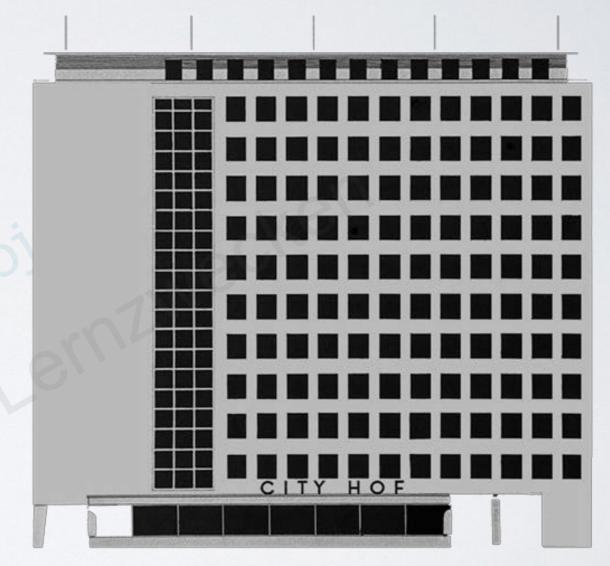


Fig. 1: Illustration of "City-Hof





- Background and Motivation
- Problem defintion
- Scope of work
- Limitation
- Methodology



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Background and Motivation



Background and Motivation

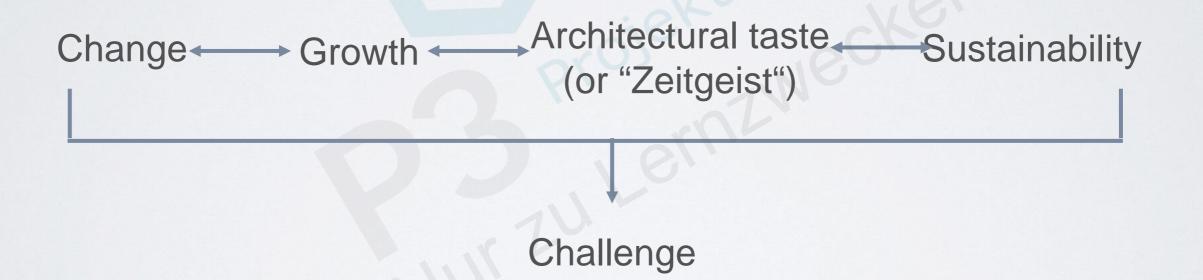


Background and Motivation

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Change Growth Architectural taste Sustainability (or "Zeitgeist")
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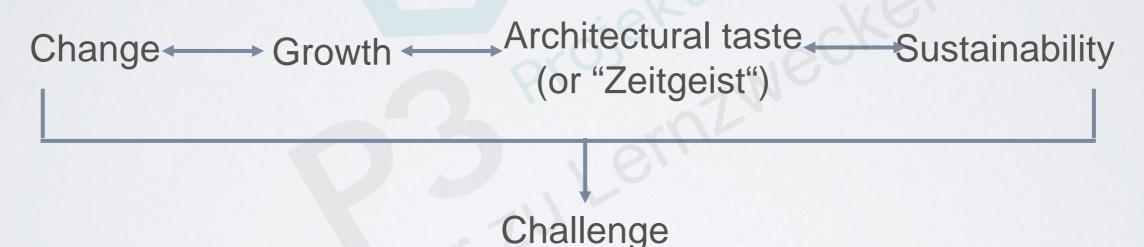
Background and Motivation





Background and Motivation

Urbanism + Cities + Architecture



how to handle this complexity within a sufficient way



- City-Hof (in Hamburg, Germany)
- Built in 1956
- Architect:
 Rudolf Klophaus
- Example of Post-War Modernism



Fig. 2: City-Hof in 1958



- City-Hof (in Hamburg, Germany)
- Built in 1956
- Architect:
 Rudolf Klophaus
- Example of Post-War Modernism



Fig. 3: City-Hof in 2015



- City-Hof (in Hamburg, Germany)
- Built in 1956
- Architect:
 Rudolf Klophaus
- Example of Post-War Modernism



Fig. 4: City-Hof facing an unknown future



Problem defintion





Problem defintion

- Thesis dealt with the issue of renovation or reconstruction of an existing building erected in postwar Hamburg, Germany
- Movement of Modernism still defined and influenced almost every sphere of life spanning from architecture, arts, literature, societal conditions etc.



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- Movement of Modernism still defined and influenced almost every sphere of life spanning from architecture, arts, literature, societal conditions etc.

Main research question

How to handle Modernism Architecture in Germany?



Problem defintion

How to handle Modernism Architecture in Germany?

- 1. Are Modernism architectural characteristics still contemporary relevant?
- 2. What role plays the urban environment / design when it comes down to handle the legacy of Modernism architecture?
- 3. Renovation or reconstruction: which solution is more sustainable facing the life-cycle of a Modernism building in Germany?
- 4. What aspects should a decision-making checklist include?



- Background and Motivation
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- Modernism an overview
- History and theory of Modernist architecture
- Vision and legacy: Modernism today
- Modernist buildings in Germany
- Rennovation or reconstruction and the basic process of decision making



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Modernism - an Overview

- Modernism: a sphere spanning roughly from the 1860s through the 1970s
- A counter movement which rejected the traditional past
- Flourished with industrialization and urbanization
- Modernism meant a striving for new forms (e.g. within literature, art, architecture, social order and conditions)



Modernism - an Overview

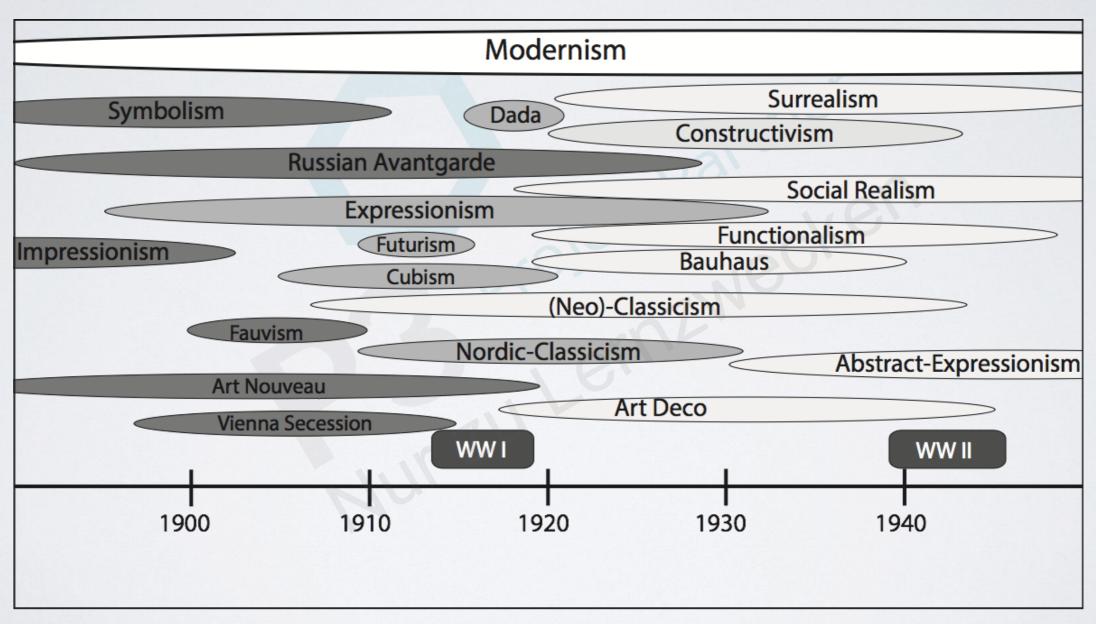


Fig. 5: Different spheres of Modernism



Modernism - an Overview

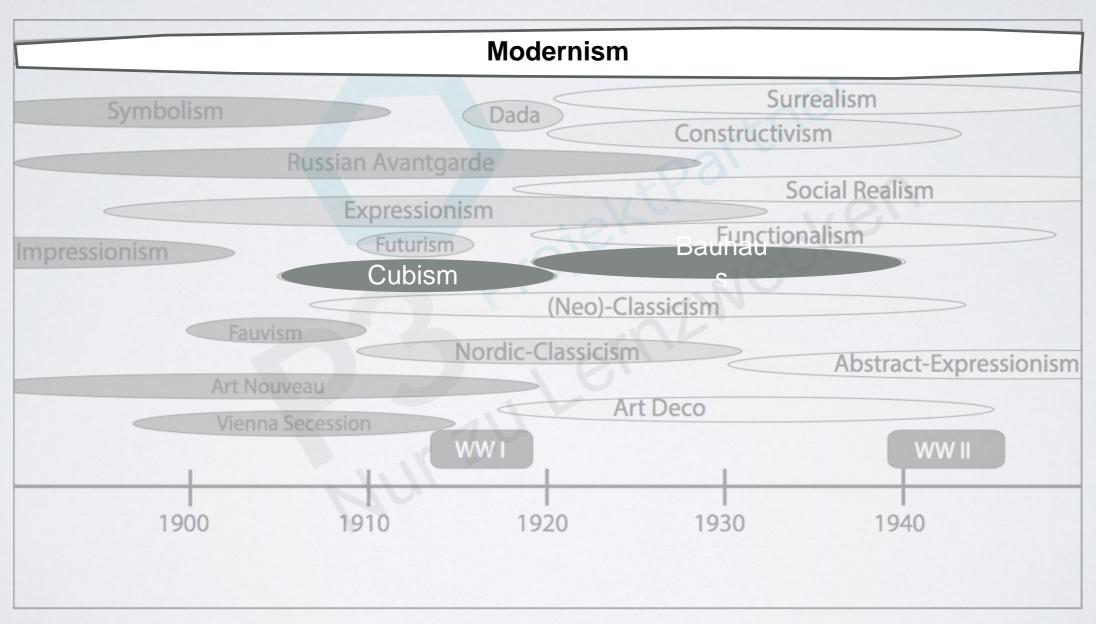


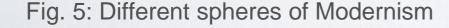
Fig. 5: Different spheres of Modernism



History and Theory of modernist architecture

"As a style it is less coherent, its boundaries looser, than, say, classicism. Many critics would argue that modernism is not even a singular style, that it incorporates a great variety of aesthetics and sensibilities".

Sudip Bose in 2008





History and Theory of modernist architecture

- Key facts about modernist architecture:
 - Rejection from the past with a deep aversion against typical ornamentation used in preceding spheres (e.g. Art Nouveau)
 - Core time: beginning of WWI until end of 1970s
 - Typical materials: concrete, steel, glass
 - Modernist architects: left-wing tendency with stark focus on socialistic values



History and Theory of modernist architecture

- Four buildings to exemplify Modernist architectural aspects
 - 1. AEG-Turbinenwerke (1912)
 - 2. Musterhaus am Horn (1923)
 - 3. Barcelona-Pavillon (1929)
 - 4. Unité d'Habitation (1952)



History and Theory of modernist architecture AEG-Turbinenwerke (1912)

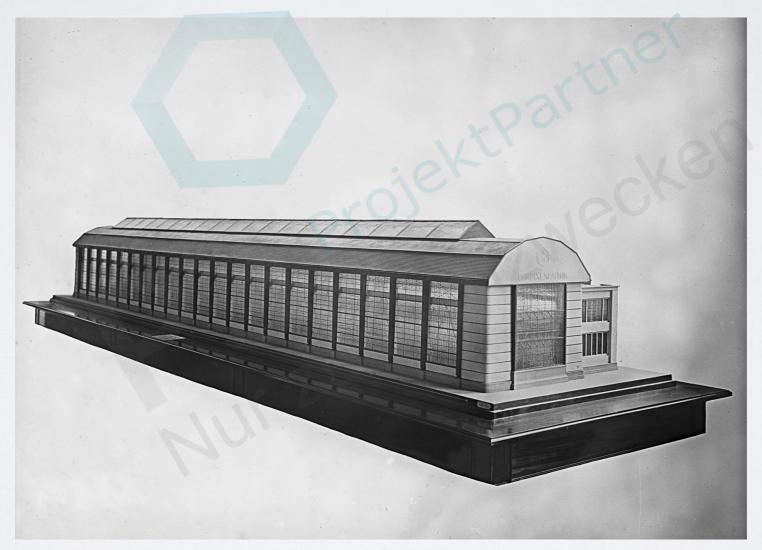


Fig. 6: AEG-Turbinenwerke build by Peter Behrens



History and Theory of modernist architecture Musterhaus am Horn (1923)



Fig. 7: Musterhaus am Horn, build by George Muche in cooperation with all present Bauhaus workshops



History and Theory of modernist architecture Barcelona Pavillon (1929)

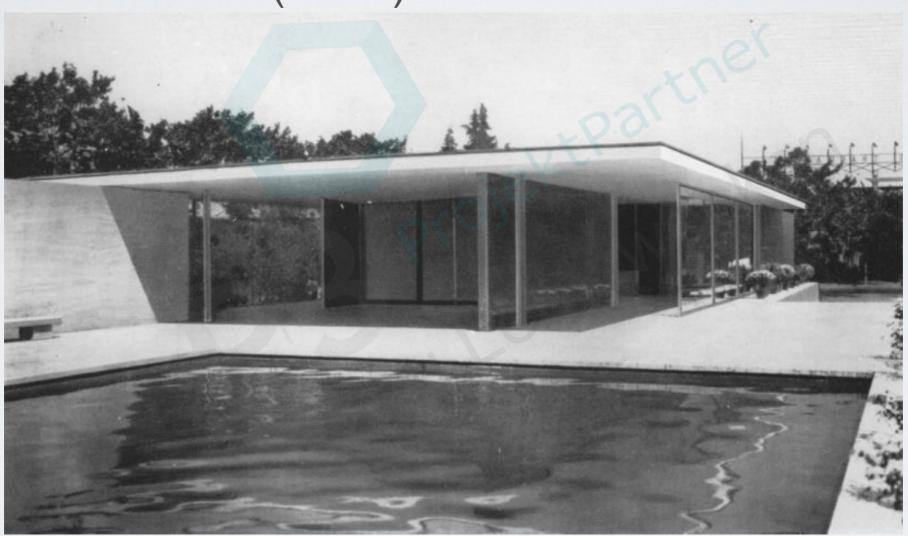


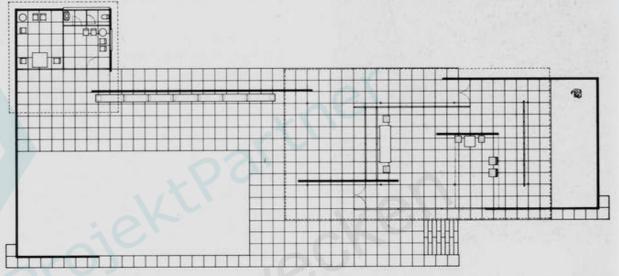
Fig. 8: Barcelona-Pavillon by Ludwig Mies van der Rohe, build for former world exhibition in Barcelona



History and Theory of modernist architecture

Barcelona Pavillon (1929

- Free floor plan
- Floating room
- Floating roof
- Mainly very new materials used; apart from marble wall



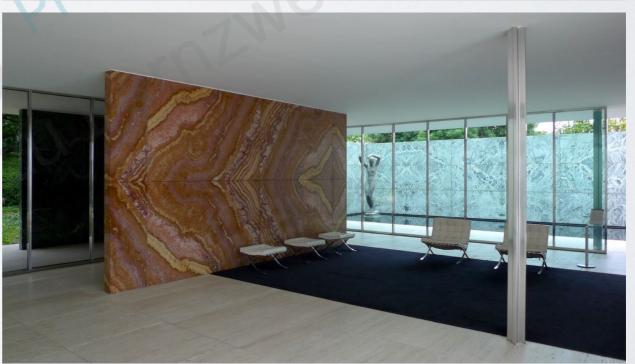


Fig. 9 and 10: Plan of Barcelona-Pavillon and Interior



History and Theory of modernist architecture Unité d'Habitation (1952)



Fig. 11: Finished Unité d'Habitation in Marseille, France



- Modernism an overview
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Vision and legacy: Modernism today

- Critical overview of the legacy
- Timeframe: after Modernism ended and the reminiscence of the buildings produced
- Reflection was made with a treatise about the end of Modernism; beginning of Post-Modernism and International Style
- 2. Reflection of the opinion of Modernism from a contemporary point of view



Vision and legacy: Modernism today First results

- 1. Reason for denial in Modernism lies in nonobservance in correlation to the human-scale
- 2. Functional architecture equated in presence of coldness
- 3. Broad-scale social failure partly happened



Vision and legacy: Modernism today First results

- 1. Reason for denial in Modernism lies in nonobservance in correlation to the human-scale
- 2. Functional architecture equated in presence of coldness
- 3. Broad-scale social failure partly happened
- = Rejection of Modernism Architecture



Vision and legacy: Modernism today

- = Rejection of Modernism Architecture
- = Rise of Postmodernism



- Vision and legacy: Modernism today
- = Rejection of Modernism Architecture
- = Rise of Postmodernism
- Architecture of remembrance
- "Form follows fiction"
- Use of former architectural elements



Vision and legacy: Modernism today



Fig. 12: The Humboldt-Forum in Berlin (currently being erected and replacing the old Berliner Schloss)



Vision and legacy: Modernism today

Modernism seems to be on the rise again, as research results suggested

- Started to be classified as a part of history worth to be protected
- Reasons:
 - Museums and galleries ran Modernism-related exhibitions
 - Growing interest in public (e.g. National Trust in the UK)
 - Interview results (e.g. "taste-building process"; "historical content of a city")



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Modernist buildings in Germany

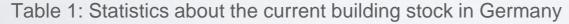
Building stock in Germany	Buildings with living space	among them these are Residential Buildings		
TOTAL	18.922.618	18.259.360		
erected before 1919	2.655.042	2.444.522		
1919 - 1948	2.307.543	2.223.080		
1949 - 1978	7.188.157	6.978.881		
1979 - 1986	1.828.250	1.783.004		
1987 - 1990	736.588	716.906		
1991 - 1995	1.153.484	1.121.640		
1996 - 2000	1.434.704	1.402.653		
2001 - 2004	790.074	776.095		
2005 - 2008	594.658	583.946		
2009 - 2011	234.118	228.633		

Table 1: Statistics about the current building stock in Germany



Modernist buildings in Germany

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Modernist buildings in Germany

Basement Area	(Internal) building area	Roof area	Pollutants	Facade / exterior wall / outer area
Rising humidity (due to nonexistent or defective seal)	Beam heads not viable anymore (timber structures only)	Lacking air seal	Mineral fiber or rock wool insulation	Minimum thermal insulation non-existent
Maceration (timber structures only)	Soundproofing not valid anymore (concerning legal requirements)	Weak beams	Preservatives (only timber)	Original windows not valid anymore (concerning legal requirements)
Rusty steal joists	Microbial pollution		Asbestos	Mold
Non existent or defective horizontal barrier	Thin concrete ceiling (non-sufficient static load)	MIS	Parquet adhesive	
Salts	Mold		Formaldehyd e	
	Cracked plaster		РСВ	
	Cracks in masonry			
	Thermal bridges (triggers sweeping humidity)			



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- Overview: City of Hamburg
- The City-Hof in Hamburg
- History and life-cycle overview of the City-Hof
- City-Hof for sale?
- City-Hof: A building investigation
- Results and first conclusion



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The City-Hof in Hamburg



Fig. 13: The City-Hof in Hamburg in 2015



The City-Hof in Hamburg



Fig. 14: The City-Hof from above, 2010



The City-Hof in Hamburg

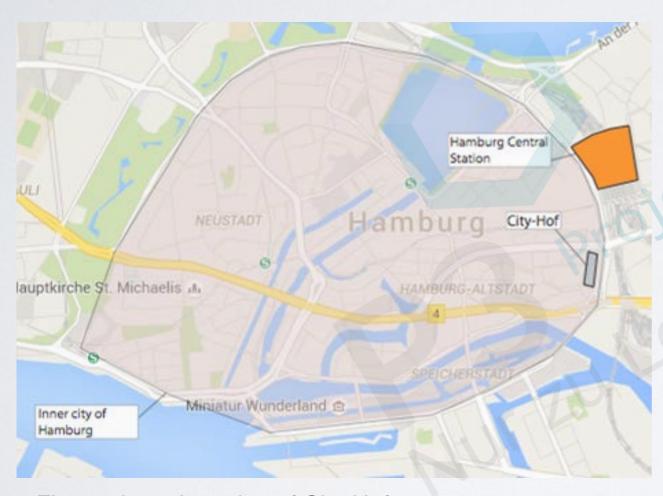




Fig. 15 & 16: Location of City-Hof



History and life-cycle overview of the City-Hof

 Purpose was to give an in-depth overview about the historical developments of the City-Hof



History and life-cycle overview of the City-Hof

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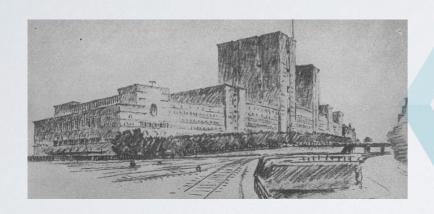


Fig. 17: "St. Johannis" monastery



Fig. 18: Competition entry from Klophaus & Horch

History and life-cycle overview of the City-Hof



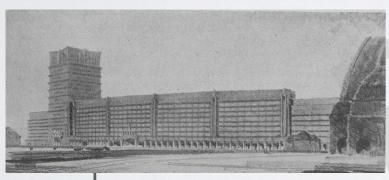


Fig. 19: Winning proposals



Fig. 20: Proposed headquarter for Hamburg Hochbahn by Klophaus

History and life-cycle overview of the City-Hof



Fig. 21: Early design of City-Hof by Klophaus



Fig. 22: City-Hof after its completion

History and life-cycle overview of the City-Hof

- Hard facts:
 - Architect: Rudolf Klophaus
 - Total plot size: 5.700 m2 / GF: 32.000 m2 / usable space: 24.000 m2; office usage
 - 4 high-rise towers with intermediate free space between them
 - Three of these with 11 levels; one with 12
 - Shopping passage on the ground (spanning 140m with 3.000 m2)
 - Underground parking area with 400 parking spaces
 - Newly developed facade material "LECA" (Light Expanded Clay Aggregates)



History and life-cycle overview of the City-Hof



- Life-cycle developments
 - Modification of facade material in 1970s to eternit layer system
 - Change to plastic windows in 1970s
 - Extension of space with use of container for main tenant in the 2000s



History and life-cycle overview of the City-Hof



- (Urban) developments
 - City-traffic planning
 - Resettlement of harbor
 - Decline of neighboring trade markets



History and life-cycle overview of the City-Hof



Leasehold expired: City-Hof fell back to municipal asset



History and life-cycle overview of the City-Hof



Fig. 23: City-Hof in 2015

City-Hof was declared as a heritage building in 2013



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City-Hof for sale?

Overview of reasons

- - 1956 2006: leasehold by "Gemeinschaft der Bauherren Johanniswall"
 - After lease had fallen back, the City-Hof was owned by the City of Hamburg
 - Building seemed to be in devastating conditions (impression of facade and underground parking)
 - Main tenant: Bezirksamt Mitte (Municipal office of Hamburg-Mitte)
 - City of Hamburg had a contractual agreement with a real-estate consortium about a new location for Bezirksamt Mitte



- Analysis of invitation for tender
 - since final overtaking of the plot, two calls for tender were executed
 - 1. March 2012: complete deconstruction and rebuilding of building
 - was withdrawn in October 2012 as "location issues for the new district office were not solved yet"



- Analysis of invitation for tender
 - since final overtaking of the plot, two calls for tender were executed
 - 1. March 2012: complete deconstruction and rebuilding of building
 - was withdrawn in October 2012 as "location issues for the new district office were not solved yet"
 - 2. Second half of 2014 August 2015: two options possible (renovation or reconstruction)
 - although City-Hof is under protection, <u>landlord still offered</u> reconstruction as a <u>possibility</u>



City-Hof for sale?

- Analysis of invitation for tender
 - although City-Hof is under protection, <u>landlord still offered</u> reconstruction as a possibility

"City of Hamburg guarantees on behalf of a declaration made by the Hamburg Heritage Authority a demolition, if the most economical solution will be chosen."

- This particular declaration was not possible to be found.
- Statement by the former executive director of the Hamburg
 Heritage Authority connotes that the Authority had been forced to
 give this statement by the Hamburg Senate (against its
 conviction)

- Analysis of invitation for tender
 - Impression arose that the City of Hamburg aims for a reconstruction:
 - Argumentation about application of heritage protection law
 - Offering of a bigger plot for the option of a new construction
 - Feasibility study by an external party commissioned by the City of Hamburg; negative outcome



- Reflection of commissioned study by the landlord
 - "holistic approach concerning a confrontation of investment costs and revenue potential for a renovation of the existing building"
 - study conducts its relevance from Hamburg Heritage law suit
 - inconsistencies appeared by reflecting the study:
 - 1. Case-study parameters questionable
 - 2. appearance of in-transparency due to concealing of significant results



- Reflection of commissioned study by the landlord
 - "holistic approach concerning a confrontation of investment costs and revenue potential for a renovation of the existing building"
 - study conducts its relevance from Hamburg Heritage law suit
 - inconsistencies appeared by reflecting the study:
 - 1. Case-study parameters questionable
 - 2. appearance of in-transparency due to concealing of significant results
 - Credibility of study in relation to the second tender is questionable

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City-Hof: A building investigation

- Method
 - Rough analysis for a fundamental decision making with minor modifications due to widened focus of research questions
 - Modified method based on condition assessment with selection of collected influential factors



City-Hof: A building investigation

- Discussed topics:
 - 1. Technical overview
 - 2. Economical analysis
 - 3. Ecological particularities



- Discussed topics:
 - 1. Technical overview
 - 2. Economical analysis
 - 3. Ecological particularities
 - 4. Legal framework
 - 5. Urban conditions



- Technical overview
 - Bearing structure
 - Basement conditions
 - Pollutants
 - · Conditions of the facade



City-Hof: A building investigation

Technical overview: Bearing structure

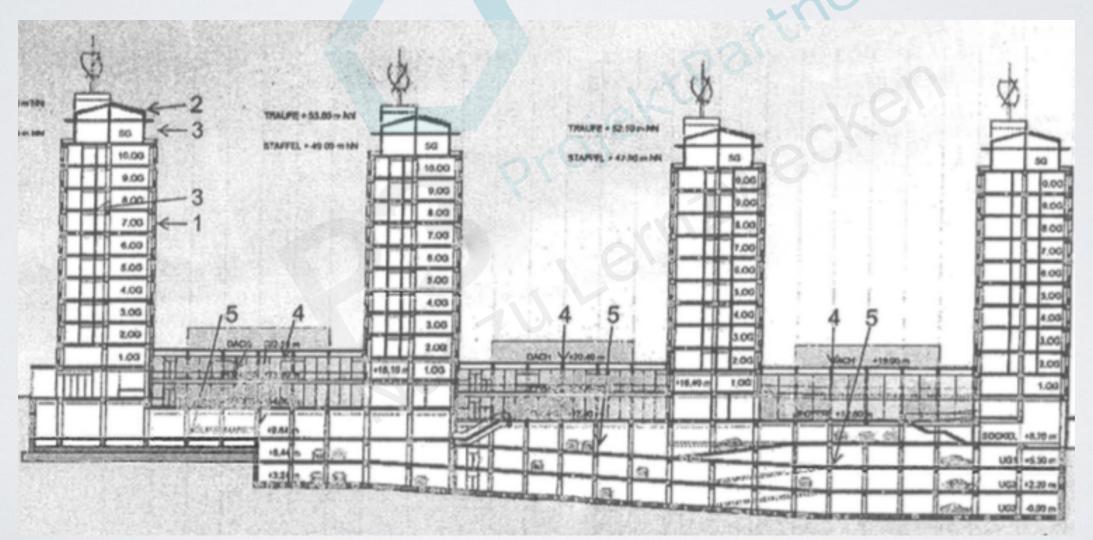


Fig. 24: Adjustment points for bearing structure of City-Hof



City-Hof: A building investigation

Technical overview: Basement conditions





Fig. 25 & 26: Damages in the basement on supports and protection layers



City-Hof: A building investigation

Technical overview: Facade



Fig. 27: LECA-elements attached to the facade



City-Hof: A building investigation

Economical Analysis



City-Hof: A building investigation

Economical Analysis

Rent prices	Prices used by sell horn + hafkemeyer (2014)	Prices related to market statistics (2015)
Office space	14,00 € p. m2	18,00 € p. m2
Residental space	11,50 € p. m2	13,10 €p. m2
Retail space	22,00 € p. m2	22,00 €p. m2
Parking space	90,00 € p. space	90,00 € p. space

Table 3: Rental price comparison



City-Hof: A building investigation

Economical Analysis

	Values used by sellhorn + hafkemeyer (2014)	Values related to market statistics (2015)
Yield	80.113.000 €	93.960.440 €

Table 4: Recalculated yield



City-Hof: A building investigation

Economical Analysis

	Values used by sellhorn + hafkemeyer (2014)	Values related to market statistics (2015)
Yield	80.113.000 €	93.960.440 €

Table 4: Recalculated yield

According to the calculated investment costs of 86.176.000 € the outcome would be positive



City-Hof: A building investigation

Legal Framework



- Legal Framework
 - Hamburger Bauordnung (HbauO)
 - Hamburger Denkmalschutzgesetz (HDenkG)



- Legal Framework
 - HDenkG:
 - actual task of heritage protection is to protect, keep and maintain the heritage buildings
 - City of Hamburg should act as a role model concerning its own building stock



- Legal Framework
 - HDenkG:
 - §4, §7 and §9 state this in detail
 - Denkmalschatzamt (Heritage protection authority) plays a key role



- Legal Framework
 - Authority classifies the City-Hof as worth to be protected
 - Relevance as a representative of post-war architecture
 - Architecture represents the style of Modernism
 - Essential architectural element: white LECA-facade

City-Hof: A building investigation

Urban conditions



- Urban conditions
 - Urban surroundings and special significances



City-Hof: A building investigation

Urban conditions



Fig. 28: A lowering defined with tallness of buildings in correlation to lowering of landscape



· Urbacity reliable building investigation

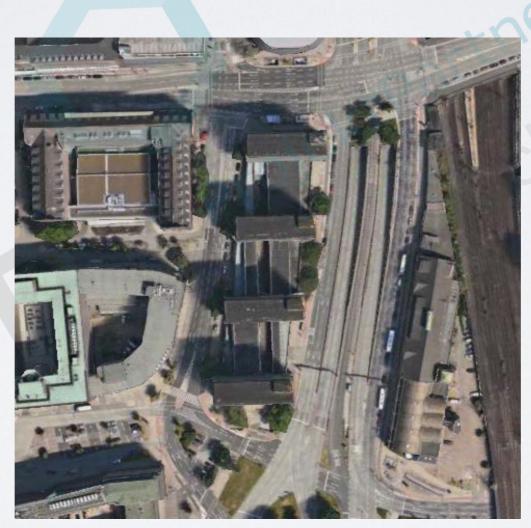


Fig. 29: Diagonal pattern in correlation with a fragment of the former Wallring



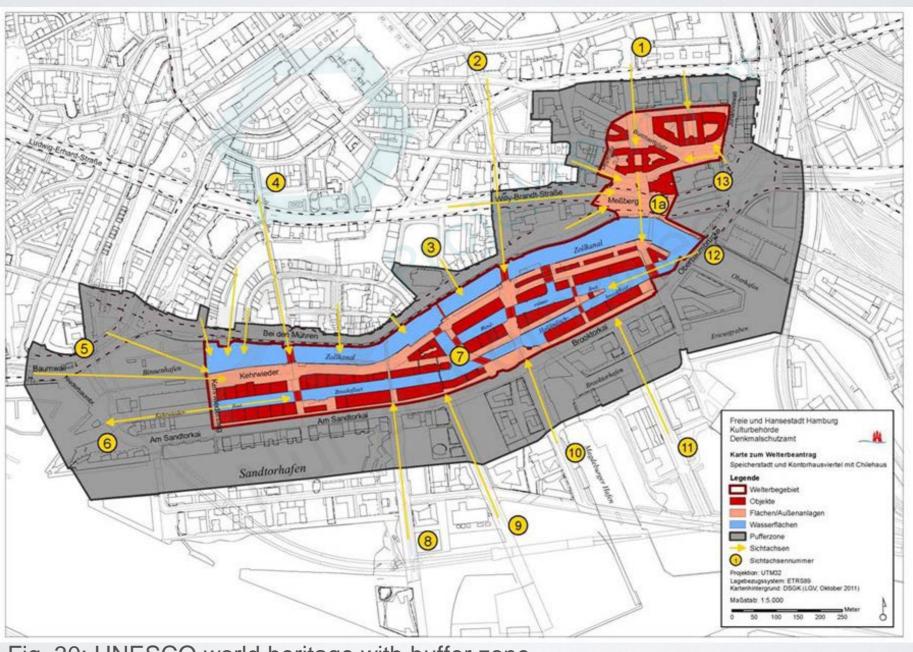


Fig. 30: UNESCO world heritage with buffer zone



- Conclusion
 - the building can and should be kept (=renovation)
 - City-Hof is a contemporary witness of Modernism
 - Building substance is in sufficient condition
 - Heritage protection law applies fully due to the economical viability
 - The City of Hamburg as a landlord acts in a way that is legally untenable



CRUCIAL POINTS FOR DECISION MAKING



CRUCIAL POINTS DECISION MAKING

- Technical overview
- Pollutants
- Thermal related building components
- Economic analysis
- Ecological particularities
- Legal framework
- Urban conditions





- Overview
- Research questions
- Outlook



- Overview
- Research questions
- Outlook



Research questions

- 1. Are Modernism architectural characteristics still relevant?
- 2. What role plays the urban environment / design when it comes down to handle the legacy of Modernism architecture?
- 3. Renovation or reconstruction: which solution is more sustainable facing the life-cycle of a Modernism building in Germany?
- 4. What aspects should a decision-making-checklist include?



Research questions Overall question: How to handle Modernism Architecture in Germany?

- Modernism enjoys a critical position within the built environment
- Modernism (architecture) is part of a significant historical timeframe and should be preserved and handled in the same way others are treated
 - accounts especially for the awareness and respect of applied law-suites in correlation to the credibility of defined societal core values



OUTLOOK ProjektPalecken

OUTLOOK

For further and deeper investigation of the studied topic, the following points should be examined more deeply:



OUTLOOK

For further and deeper investigation of the studied topic, the following points should be examined more deeply:

- Technical overview
- Economical analysis
- Current building stock



CURRENT AFFAIR



CURRENT AFFAIR



Stand: 01.03.2016 23:25 Uhr - Lesezeit: ca.5 Min.

City-Hof: Gegenwind für Abriss-Plan

von Marc-Oliver Rehrmann, NDR.de



Die Passage im Hamburger City-Hof bietet seit Jahren ein trostloses Bild. Was wird aus den denkmalgeschützten City-Hochhäusern am Hamburger Hauptbahnhof? Eigentlich will der Senat das Grundstück in bester Innenstadtlage für 35,2 Millionen Euro an einen Investor verkaufen, der das Ensemble aus den 50er-Jahren abreißen lassen will. Aber dieser Plan kommt bei Architektur-Experten und Stadtplanern nicht gut an.

Fig. 31, 32 and 33: The City-Hof in Hamburg is still discussed



09.02.16 Stadtentwicklung

Das Parlamentstheater um den City-Hof

Im März debattiert die Bürgerschaft über die in allen Fraktionen umstrittenen Abriss-Pläne der City-Hof-Hochhäuser. Es geht um Denkmalschutz und Transparenz. Doch das Ergebnis scheint festzustehen. Von Olaf Dittmann



UNESCO MISCHT SICH EIN

Streit um Abriss der City-Höfe: Hamburg droht ein Polit-Krimi

vom 3. März 2016

Aus der Onlineredaktion

Der Abriss des denkmalgeschützten Gebäudeensembles naht. Nun meldet die Unesco Bedenken an – und findet viel Unterstützung.

HAMBURG | Der umstrittene Abriss der denkmalgeschützten City-Höfe am Hauptbahnhof entwickelt sich zum Polit-Krimi. Vier Wochen vor der Schlussabstimmung in der Bürgerschaft drängt nun auch die <u>Unesco</u> auf den Erhalt der vier schmucklosen Hochhäuser aus den 1950ern.



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THANK YOU!

