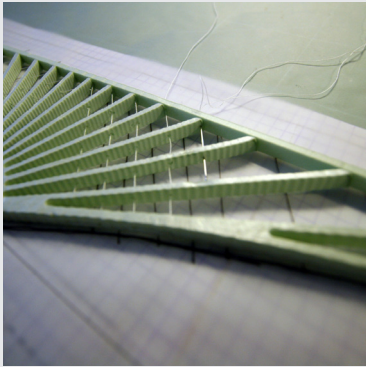
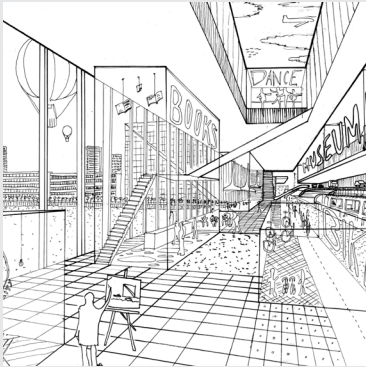


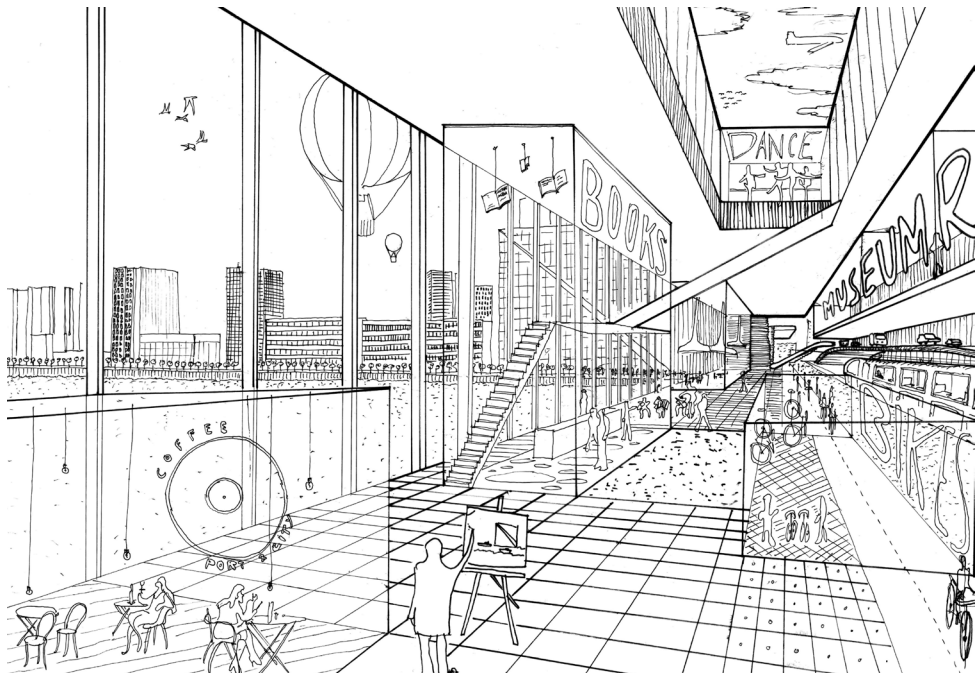
Frank Loer *Reflection*



REFLECTION 'THE LOBBY OF THE METROPOLE'

The Fusion of Architecture and Infrastructure in Tomorrow's Megalopolis

This text is a reflection on the research and design process of my graduation project in the Faculty of Architecture at the TU Delft. The studio Explore Lab 15 offered me the possibility to formulate my own graduation project in the Architecture track of the academic year 2012-2013. My fascination for the combination of architecture and infrastructure formed the base for my research 'The Fusion of Architecture and Infrastructure in Tomorrow's Megalopolis' (Msc3). The fascination for the habitable bridge combined with the results of the research formed the base for my design 'The Lobby of the Metropole' (Msc4). This text reflects on the process of my research and design considering the used methods and its results. Special attention is given to the chapter in which the project is positioned in its wider social context.



1. First sketch presented during the P2 presentation on 17 January 2013

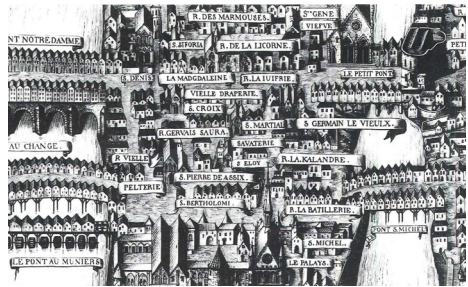
RESEARCH (MSC3)

The habitable bridge and the city centre throughout history

The research started with a fascination for habitable bridges and the historical development of city centres. At first hand a typological comparison between historical precedents of occupied bridges seemed the main theme of my research. Without formulating a research question, I investigated the history of Paris, Rotterdam and London. The existence of a correlation between the habitable bridge and the location of the city centre formed the base of my P1 submission. The absence of a strong research question and therewith a clear direction, led to critical questions at the presentation. Those questions made me doubt the relevance of researching the history of Paris and London. I started to question the nature of my fascination. Framing the research theme and specifying the research question became urgent.



2. Paris, 1630



3. Paris, île de la Cité 16th century

The fusion of architecture and infrastructure

Through writing a short essay about my interests, and discussing my investigations with Felix Madrazo (research mentor) and Mark Pimlott (architecture mentor) I discovered that it was not the habitable bridge specifically that interested me, but the fusion of architecture and infrastructure. The new framing of my theme led to studying the architectural heydays of the 1960s and a focused analysis of the development of Rotterdam.

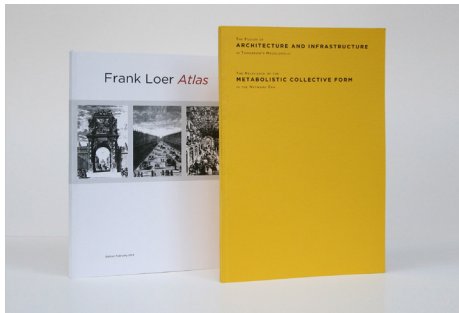
Metabolistic collective form and the infrastructural history of Rotterdam

In a rather late stage of the Msc3 I narrowed down the research theme through formulating research questions and determining the required sources for my investigations. The Japanese Metabolists, and more specifically, Fumihiko Maki's 'Investigations in *Collective Form*'¹, formed the base of my research the 'The Fusion of Architecture and Infrastructure in tomorrow's megalopolis'. The historical analysis of Rotterdam was used through relating it to the notion of collective form.

1. Fumihiko Maki. *Investigations in Collective Form* (Washington: School of Architecture, Washington University, 1964)

The fusion of architecture and infrastructure

The formulation of the research question and the selection of sources should have been determined earlier in the course of the Msc3. About six weeks before the P2 presentation I was three weeks behind on the schedule that I presented at my P1. The analytic wanderings through Paris and London had their consequences. The gap of two weeks Christmas holidays was replaced by two weeks of writing through which the problem had to be solved. In addition to this decision I decided not to consult any additional sources, forcing myself to stick to the notes and texts that I gathered up till that moment. In contrary to my broad investigations in the beginning of the semester, this method paid off. One week before the P2 presentation I finished a comprehensive essay with a presentable conclusion. The remaining week I used for graphic design and manual binding to present the research in its best possible way.



4. Atlas and Research 'The Fusion of Architecture and Infrastructure in Tomorrow's Megalopolis'



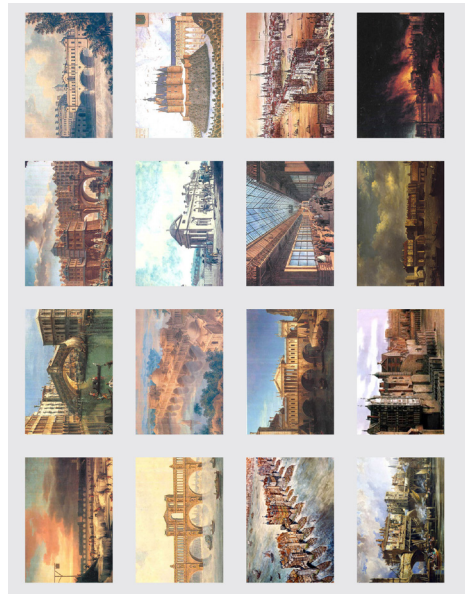
5. Browsing through 'The Relevance of the Metabolistic Collective Form in the Network Era'

Tools: the Atlas

The successful P2 presentation generated confidence for the continuation of my graduation year. But despite the accomplishments, I still experienced dissatisfaction about the P1 which I partly considered as a *false start* of the project. The seemingly undirected investigations during the beginning of the semester did not provide the input for my P2 as envisioned. It was not the richness of the analysis, but the limited outcome that frustrated me. A solution I found in the creation of an appendix as addition to the finished essay. Inspired by Gerhard Richter's Atlas² I compiled a booklet full of visual matrices, documenting the imagery that influenced the process of the research. Here I found a place for the enormous collection of habitable bridges, the historical maps of Paris and the other imagery that I considered essential for the research. The collection of more than 500 images, the 'Frank Loer - Atlas', became a valuable appendix as bulky as the essay itself. The composition of this atlas was a self-contained challenge, forcing me to draw relations between its parts. What began with the intention to solely print my library, became a useful tool to document historical correlations. The making of the atlas emphasized the importance of the careful documentation of my research and design process. The recording of precedents will remain a worthwhile method throughout my career. The atlas marked the satisfactory end of my research and enabled me to fully focus on the design part of my thesis.



6. Gerhard Richter's Atlas (1972). Page 32, 48 portraits



7. Frank Loer's Atlas. Page 4, Living Bridges

2. Gerhard Richter, Helmut Friedel (ed.), Atlas (London: Thames & Hudson, 2006)

DESIGN (MSC3/MSC4)

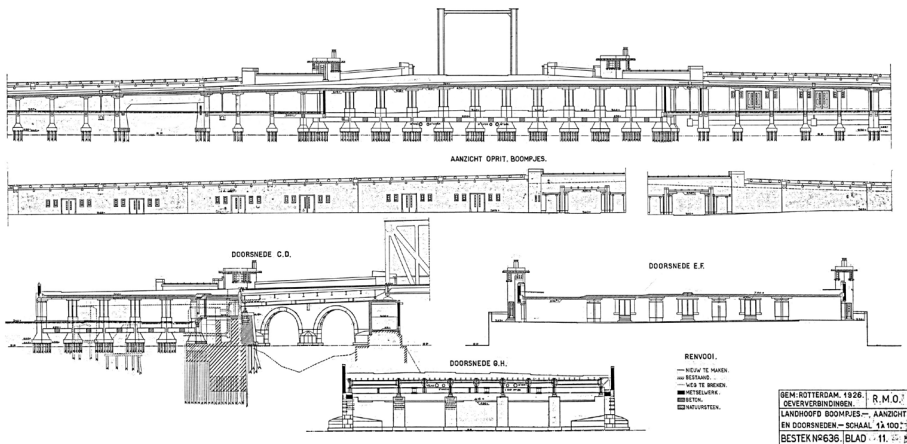
Urban dimension

Parallel to the research, I started the first investigations on the design of a habitable bridge in Rotterdam. Since the impact of a bridge on the urban fabric is significant, my first steps concerned urban studies. Through testing different locations in plan I explored the urban dimension of the project. It became ever more clear, that not only the 300 meters of my bridge would change the face of the city, but that stretches of similar size at both ends of the river could change the urban fabric for good. This conclusion was as valuable for the research as the design itself. The urban studies enabled me to explain the historical impact of infrastructure like the Boompjes and the Koopgoot and made me understand the possible impact of my own design.

Technical dimension

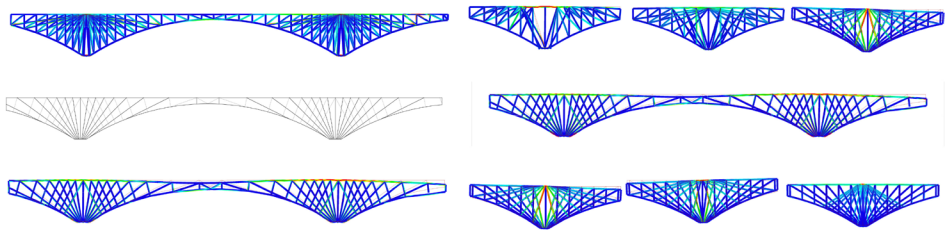
In the analysis of municipality masterplan, I discovered the requirements for shipping traffic on the river. The 12.5 meter clearance between water and bridge became from that moment the most important parameter for the urban implementation of my project. The minimum width between the supporting pillars in the Maas was distilled from old bridge drawings found in the archives of the municipality. Those drawings inspired me to study historical bridges and their construction methods.

The preliminary design as presented during the P2 was partly premature, since the necessary knowledge for construction and its application was not present. The comments were critical about the technological foundations of the project, despite the implemented conclusions of a consult with Rob Nijse



8. Willemsbrug, technical drawings 1926

(structural design department). I underestimated the technological component of my project, and the expectations of my mentors concerning this theme. In the months after my P2 I consulted Hans Daane (explore lab responsible, structural design department) several times for consultation. During the first conversation he supported me in defining the construction principle. But despite his interminable enthusiasm I did not find the answers I was looking for in the meetings that followed after. This development made me decide to buy my own construction software to explore the complexity of my project. The result was twofold: on one hand I found answers to my design questions, on the other hand I spent a considerable amount of valuable time. Looking back to this process, I strongly doubt the efficiency of my strategy. A consultation at the Faculty of Civil Engineering would probably have been a smarter move than testing a hundred options with my own software. The insights were nevertheless unpriced.



9. Small selection of construction studies in *Karamba (Grasshopper/Rhino)*

Historical and architectural dimension

The determination of the added value of a habitable bridge in Rotterdam was supported by the historical analysis of the port city that I did during my research. In particular the investigations of the Boompjes throughout history catalysed ideas for the design of a new waterfront. Not only the devastating war, but also the reconstruction plans ever since still give urban planners and architects reasons to rethink the city. This perception forced me to position my project in the history of Rotterdam.

The nature of the project required comprehensive studies in urbanism and construction. Many design studies analysed the architectural implications of those fields. Instead of taking architecture as a starting point with urbanism and construction as means, most issues had to be solved the other way around. It was not the design of a building as bridge, but the investigation of a bridge as building. Without expecting this development in advance, the project rather explores the possibility of making architecture out of infrastructure than making infrastructure out of architecture. The problematic relationship of infrastructure and city in Rotterdam, has been the driving force for this

direction. The dignification of infrastructure, as an answer to its overwhelming and offensive character in Rotterdam, has been one of the challenges in this project. In a landscape of dikes and rivers, the bridge is a perfect opportunity for the *domestication* of infrastructure. Like the seventeenth century Dutch interior was the cradle of domesticity³, the habitable bridge provides an opportunity for the humanization of urban infrastructure. Taking the fusion of architecture and infrastructure as urban device for the orchestration of the city, a new paradigm comes to existence that opens up the public building and dignifies the road.



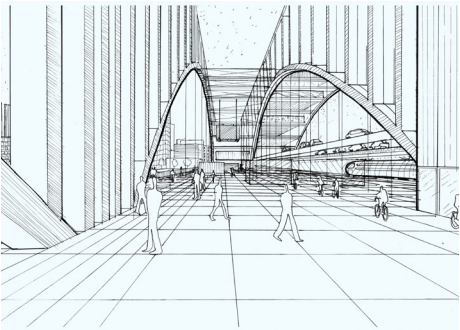
10. Pieter de Hooch, De Slaapkamer 1659



11. Giuseppe Martelli, Ponte Vecchio (proposal) 1850



12. Rotterdam 'City Racing', 2012

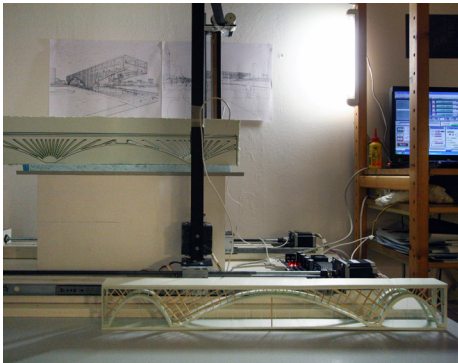


13. Preliminary sketch habitable bridge 15 March 2013

3. Heidi de Mare. *Domesticity in Dispute, a Reconsideration of Sources*. Irene Cieraad (ed.) *At Home: An Anthropology of Domestic Space (Space, Place, and Society)*. (New York: Syracuse University Press, 2006) p 13.

Tools: CNC Foam Cutting Machine

After a decade of technological innovations *rapid prototyping* has been widely incorporated into architecture. The ease of producing customized elements informed new forms of architecture, of which blob architecture is most known. To my surprise rapid prototyping is chiefly exploited for sculptural geometry. The use of this technique for producing a multitude of options is to my opinion underutilized. To enable myself to test this presumption, I built my own CNC foam cutting machine. The utilisation of this tool remained useless during the first semester of my project. But after studying construction principles, the machine turned practicable when arches appeared in my sketches. Through using one shape for a multitude of foam models, I was able to quickly test different designs. The thirty models that I made enabled me to make short-cuts in my process and offered a great tool for communication in the conversations with my mentors. The elaboration of my design on a bigger scale exploited the possibilities of my machine for the examination of structural configurations. Although the use of my digital CNC foam cutter remained limited compared to its possibilities, the used techniques enabled me to imagine future applications. The examination of more options in less time could strengthen my designs. My supposition is that this will rather inform the quality of its outcome, than the change of its geometry.



14. Self built CNC Foam cutter at work



15. Rapid prototyping: multitude of options

POSITION

20th century

If architecture is 'the will of an epoch translated into space'⁴ as stated by Mies van der Rohe in 1923, one could wonder which volition has to be construed in our era, anno 2013. Studying the architecture of the 20th century, looking back to Mies and the decades that followed after, I came across two significant moments that captured my interest. The first moment concerns the one of the lyrical sixties. When in 1960 John Cook asked Paul Rudolf for the dominant tendency in architecture, Rudolf answered: 'after Mies, the *Megastructure*⁵'. Influenced by the oil crisis in 1973, the all containing architectural container died because 'recognition and exhaustion arrived together'⁶. The second moment that struck me was Rem Koolhaas' *Delirious New York*⁷ written in 1978. It seems that every since the architectural interests shifted from the traditional *genius loci* towards an implicit embracing of the *genius logo*⁸. The branding of architecture overruled its contextuality without significant objections. Increasingly not the building, but the brand and its creator were celebrated. The collective memory is now permeated with images like the shiny skin of the Guggenheim museum in Bilbao and the name of the *Starchitect* who made it. Everyone knows Frank Gehry, but only a few will know the architectural interiors he created. But unlike the oil crisis informed the death of the megastructure in 1973, the *Global Financial Crisis* of 2008 does not seem to execute the interest for iconic architecture. Nevertheless it is unlikely that this obsession will last to infinity. Considering the 50 year *Super Cycles* in economy as analysed by Kondratieff⁹, it is plausible that cycles of a similar time scale occur in architecture. Like the megastructure followed after Mies, so did the icon followed after the megastructure. The question I asked myself is what will restore the icon. Through a reading of our epoch I tried to imagine what architecture could be these days. Despite my limited understanding of the complexity involved in such an analysis, I tried to translate the possible outcome of a new era.

4. Quote found in Reyner Banham's *Theory and Design in the First Machine Age* (Boston: The MIT Press, 1980) p 271.

5. Reyner Banham, Nigel Whiteley (ed.), *Megastructure: urban futures of the recent past* (New York: Harper and Row, 1976) p 12.

6. Banham, *Megastructure: urban futures of the recent past*. p 196.

7. Rem Koolhaas. *Delirious New York: a retroactive manifesto for Manhattan*, (New York: Monacelli Press, 1978)

8. See also: Boris Brorman Jensen. *Dubai: Dynamics of Bingo Urbanism* (Copenhagen, Arkitekturforlaget, 2007)

9. Andrey Korotayev, Sergey Tsirel. *A Spectral Analysis of World GDP Dynamics: Kondratieff Waves, Kuznets Swings, Juglar and Kitchin Cycles in Global Economic Development, and the 2008-2009 Economic Crisis* (Structure and dynamics 4, 2010)

21st century

Although we still sleep at home, large parts of our lives now take place in the public interior. The call for comfort shifts from the house to the terminal once breakfast and lunch are taking place in a sequence of destinations. Within this development, the region became more relevant than the city. This is the world of the commuter, the reality of the new mass. We make trips to destinations like office and home and use cars and trains as means to get there. These travels are dominated by two paradigms: architecture and infrastructure. Despite the potential of its fusion, those two worlds are increasingly clashing. The road seems incompatible with the building and vice versa. In the worst case architecture and infrastructure are even devaluating each other. During the past decades new infrastructure frequently destroyed the habitable quality of its surrounding city. Post-war Rotterdam can be considered as a striking example. The public space of the Boompjes, once the public heart of the city, got replaced by a multi lane boulevard for cars expelling its citizens to elsewhere. Eliminated from the magnificent riverside, the public ends up with similar problems in the city centre where architecture and infrastructure meet again in places like the *Koopgoot*. The ongoing increase of mobility will cause a multiplicity of such moments in the city; places where architecture and infrastructure meet. Architectural answers to this reality are pressing. The autonomous development of the two most important paradigms that shape the city is unacceptable. The fusion of architecture and infrastructure calls for a paradigm shift, exploring its undiscovered potentials. It might provide solutions for the spatial problems of the metropole. Considering our epoch as the network era with an obsession for connectivity and a continuous quest for comfort, the potential of merging architecture with infrastructure seems obvious. Like the train station became a living room and the coffee bar turned into office, the bridge could become a melting pot of public activity hosting both infrastructural streams and architectural program. The habitable bridge is therewith taken as the analogy for a new paradigm in which architecture and infrastructure merge, providing a new form of spatial comfort in the city.

Navigating modernity

Despite the big differences between the architectural projects of the last century, modernity is a recurring theme in all developments. If we compare the works of Mies van der Rohe with the Metabolists we can find endless differences. Nevertheless their similarities seem to be more interesting. The faith in technological possibilities is its most striking example. Although the sixties are considered as revolutionary in architecture, the works of the Metabolists could also be considered as evolutionary, continuing a search that started decades before. In addition to a technological fascination by architects like Mies, the Metabolists fully exploited the possibilities of a mobilized society. Despite the decrescent popularity of its physical outcome, their theories concerning large scale urbanism and flexibility seem relevant to this day. It is not surprising

that Rem Koolhaas drew inspiration from the Japanese collective¹⁰ for his projects with OMA concerning the very same themes of mobility, *globalization*, architecture and infrastructure. In the case of OMA, the physical outcome once again totally differs from its predecessors, but nevertheless elaborates notions of previous decades.

Through the sensation of this historical analysis I came to understand that a true contribution to culture should be found in the power of evolution, rather than the compulsive need for revolution. If the Metabolists formed the prelude for an architecture embodying a mobilized society and OMA showed us a generic solution of its physical outcome, it will be the task of our generation to redefine, specify and elaborate the notions of those predecessors. The fusion of architecture and infrastructure will not be new, but requires the reconsideration of its physical outcome. The elaboration of a new paradigm can provide a framework that exploits the lightness of modernity, the technological possibilities of our era and the ecstasy of a mobilized society.

Continuous change

Besides their belief in technology, the Metabolists firmly believed in the possibilities of a flexible, durable architecture. Drawing inspiration from biology and Buddhism, they proposed structures in which architecture could easily adapt change as if it was a living organism. This notion combined with the concept that good architecture consists of a balance between the generic and the specific, still provides a valuable concept for lasting architecture. The acknowledgement of a time factor in architecture still seems hard to face for architects. Shrinking or expanding program is rarely taken beyond the freedom of the *plan libre* while the need for such flexibility has never been bigger. I consider the theories of Fumihiko Maki a framework for an architectural infrastructure of meaning. Besides the fusion of architecture and infrastructure, it provides room for continuous change. Although we might question the physical heritage of the Metabolists, their noble theories can provide inspiration for a truly flexible architecture. Fascinated by the notion of collective form, I tried to incorporate the concept of continuous change in my design. As in the case of the Metabolists, the critical equilibrium between the generic and the specific will only show its value over time. Through relating my proposal to contemporary examples I can only predict a possible future.

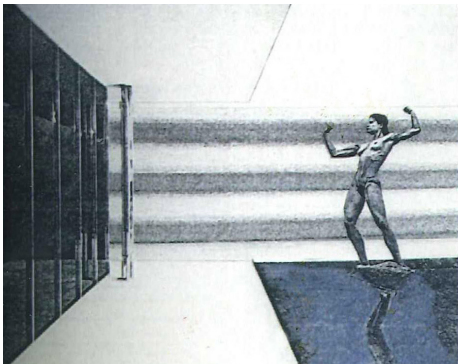
10. Rem Koolhaas, Hans Ulrich Obrist. Project Japan. Metabolism Talks (Cologne: Taschen, 2012)

Imagination

If we consider the era of iconic architecture as ending, assuming that we passed its zenith, we should be optimistic and agitated to design the epoch that will follow after. Facing reality in our turbulent times, does not preclude idealism and optimism. The architectural answer might not be found in a counter movement, nor will it succeed through adjusting its current state. Selectively wandering through history might provide us valuable tools for a direction that will continue to navigate the evolution of architecture. The optimism of the sixties can be mixed with the lightness of Mies, the lyrical theories of Koolhaas can be cross-fertilized with the profound ideas of Maki.

Acknowledging a visually orientated world, I tried to create a powerful image that draws sufficient concentration. This attention could potentially create a stage on which a narrative can be told. Contrary to recent developments in which the skin is the story, I nevertheless regard the underlying principles and narrative qualities of good architecture. I believe in an architecture that favours the interior over the facade, flexibility over determination and specificity over the generic.

My design for a habitable bridge envisions the evaporation of the borders between architecture and infrastructure exploiting their mutual benefits. With my proposal for the for *The Lobby of the Metropole* I tried to design a public building inspired by utopian ideas elaborated in modest gestures. The idealistic character is inevitable, the realistic execution undeniable. It brought me back to the 'fundamental nature of our work: to imagine what is not there'¹¹. While embracing the will of our era through fusing architecture with infrastructure, I tried to show that the wildly imaginative is surprisingly realizable.



16. OMA, Body Building House, Milan Triennale 1986



17. Collage, wing of the Louvre crossing the Maas

11. Rem Koolhaas, Bruce Mau. *S, M, L, XL* (New York: Monacelli Pres, 1995) p 199.

The future and the futuristic

The thrill of my historical analysis created dedication and energy, an ingredient essential for the master thesis. Instead of considering my position as historically complete and responsible, its relevance should be read in light of an exaltation necessary for the design of architecture in a propelling process. This leads to the paradox that architecture should be both anchored in society, but also keeps distance to leave room for the sublime. The Metabolists painfully show that great ideas not necessarily guarantee great buildings. The challenge of finding a balance between utopia and reality will from me never lose its relevance. I would like to consider the dissertation as my first try to find a meaningful equilibrium. The insights and sensations of my graduation project are hopefully a modest start of a bright future.

Frank Loer, 6 May 2013

SOURCES IMAGERY

2. *Paris 1540*. Mislin, M. Die überbauten brücken von Paris, ihre bau- und stadtbaugeschichtliche entwicklung im 12.-19. jahrhundert (Dissertation: Stuttgart, 1978)

3. *Paris, île de la Cité 16th century*. Mislin, M. Die überbauten brücken von Paris

5. *Browsing through 'The Relevance of the Metabolistic Collective Form in the Network Era'*. Own works

6. *Gerhard Richter's Atlas (1972). Page 32, 48 portraits*. <http://artblart.com/tag/portrait-of-gerhard-richter/> (accessed on 5 May 2013)

8. *Willemsbrug drawings 1926*. Archive Municipality Rotterdam (accessed on November 2012)

10. *Pieter de Hooch, De Slaapkamer (the sleeping room) 1659*. <http://kunsthistoriened.wordpress.com/schilderkunst-17/genre/pieter-de-hoogh/pieter-de-hoogh2/> (accessed on 5 May 2013)

11. *Giuseppe Martelli, Ponte Vecchio (proposal) 1850*. David Cadman, Jean Dethier, Ruth Eaton, Peter Murray (ed.), Mary Anne Stevens (ed.), Stuart Lipton (ed.) *Living bridges: the inhabited bridge, past, present and future* (München: Prestel, 1996) p 64.

12. *Rotterdam 'City Racing', 2012*. <http://www.360cities.net/nl/image/rotterdam-cityracing-willemsbrug> (accessed on 22 December 2012)

16. *OMA, Body Building House, Milan Triennale 1986*. 2G N.48/49. Mies van der Rohe - Houses (Gustavo Gili SL, 2009) p 11.

Images 1, 4, 5, 7, 9, 13, 14, 15 and 17 are own works