

MATERIAL MAP

Introduction -the PhD project-

The overall PhD project, “The works of the Danish architect Hans Christian Hansen (HCH, 1901-1978): materials, materialization and context”, aims at documenting and analyzing the built works by HCH developed under the policies of the Danish Welfare State between the late 1930’s and early 1970’s as a project leader at the office of the City Architect in Copenhagen. The purpose of the project is 1) to provide knowledge of a little known Danish architect and body of work, which is material and tectonic-wise extraordinarily rich, and quite unusual in its geographical, historical and cultural context and 2) to situate HCH’s works within a general tectonic discussion from a bottom-up approach.

The PhD project is developed following a Research through Design methodology. Experiments, of different nature and duration, are supposed to expand on the overall knowledge of the project (Krogh, Peter Gall G. & Markussen, Thomas & Bang, Anne Louise. “Ways of Drifting - 5 Methods of Experimentation in Research through Design”, 2015). In this way, the specific methodologies differ according to each experiment. However, as a general perspective, the project starts out at the building site, rather than the archive. In the one hand, this is due to the lack of HCH’s personal information, and in the other hand, due to the author’s believe on the capacity of the built works to provide with relevant data (Forty, Adrian. “Concrete and culture: A material history”, Reaktion Books, 2016)

Summary -material map-

Although “material map”, as an artefact, is constructed to be a rather “demonstrative experiment”, that should prove and communicate material continuities and discontinuities, on the side it also turned out to be a “generative experiment” (Berlotti, Tommaso. “Generative and Demonstrative Experiments”, 2015), which unfold new issues within the scope of tectonics.

The dissection and mapping of the 19 built works -which corresponds to the number of HCH’s built works counted up to date- through 5 materials -concrete, ceramic, wood, eternit and metal- divided in sub-categories such as material format, structural or non-structural implications, cladding or in-fill purposes and finally its specific application in form of, e.g a wall, a slab, window, a handrail, pillar-beam structure,... should support and communicate the hypothesis that HCH uses rather few materials within the same building and throughout the 19 buildings, giving shape to the same or/ and different elements in which it is possible to recognize the primary material format. If we look at it from another point of view, we also realize that sometimes, the same element/ detail is solved with different materials or material formats or that, what aesthetic-wise looks as the same has different structural/ construction implications.

Considerations -changes from the abstract-

The above mentioned is the main purpose of the map. Contextualization into similar built works by other contemporary architects, which was mentioned in the abstract, has been left aside. After trying it, the result felt inconsistent, unreachable and vague, since connections were fully based on self-interpretation and the coincidence of having seen or heard about similar works. This is, among others, the reason why the triangular format of the photos, which allowed for more connections has changed to a squared format. However, the contextualization of HCH’s works will happen in a broader theoretical level concerning tectonic issues.

Tectonic related questions which emerged while producing the map will be evaluated in one or more written pieces. The paper “An interpretation of Hans Christian Hansen’s built works through the tectonic notion of kerneform and kunstform”, divided in part one, “From Brick to Concrete” and part two, “Concrete Drifts”, is one of the discussions.

(1st experiment) “Taxonomy” -the process-

The choice to depict the works within materials wasn’t decided in advance and it wasn’t either the first attempt to investigate them. At first, what seemed reasonable was to investigate the number of works as one life work, under the same umbrella, instead of seeing each work independently: After seeing the works for the first time, there seemed to be certain continuities and therefore also discontinuities, according to different issues: façade composition, choice of materials, certain vertical rhythm, common gestures, (over)exposure of joinings,...

The first trial to find more specific relations among the works actually took R. Koolhaas Venice Biennale exhibition in 2014, “Architecture elements”, as point of departure. Some of the suggested categories were applied as such and some more were added in a rather heterogeneous manner. The result was some photo booklets mounted as a “leporello” which could be unfolded to expose connections or be kept as a small booklet. The following “taxonomy” was provisionally applied to each booklet: façade generator (as the minimum module repeated on the façade), window, base -part of the façade-, top -part of the façade-, skylight, brise-soleil, balcony, door, corner, joining -detail-, water drain, lamp, ventilation, chimney, clock, stair, cladding and bathrooms.

(2nd experiment) Material map -how does it work-

After the first experiment, intuitively the investigation took one step backwards and decided on a categorization based on the minimum constituent parts of any buildings: “materials” in its specific formats. Following this, relations among materials and building should be set up as a wall map comprised of 2 axis: The horizontal one which is comprised of the 5 materials, subdivided with structural and none structural implications, classified with material formats and finally divided into different elements. And the vertical axis, which is comprised of the 19 built works organized chronologically from top to bottom. Therefore photos are placed according to a specific material format and purpose in a specific building.

As a first trial, in order to decide what categories should comprise each material, photos were printed within the frame of an hexagon and placed on the floor. It just worked as a game of trial and error which should be placed in the most coherent constellation. Once categories were decided those first photos were bind together in their different material groups and helped to better frame and select the image for the last step, in which frames changed to a squared geometry to follow a better relation with the 2 axis.

According to the photos: Side A of the paper is printed with an image of the specific material that represents. Side B of some of the photos is left white, meaning that the specific material is only left exposed in one of the sides of the architecture element. In some other cases, side B is also printed showing how the material is perceived from the interior or the other side of the room. In other situations, both sides are left white, which means that the material is none exposed, which happened sometimes when trying to find traces that should reveal the structural material/system.

Methodology -the built-

The investigation is based on traces revealed by the series of photos together with the author’s memory of being on-site. Photos were taken without focus, other than materials, structure and construction issues during 2013, 2018 and 2019. Once off-site, in the one hand, photos acted as “notes” or registration of what had been seen on-site, and on the other hand, the act of looking and playing with the photos several times unfolded new issues which weren’t visible on-site. Thus, photos themselves became the material to discuss about the works. Sometimes, construction drawings were checked to contrast some doubtful data and the decision was proved by another site visit and a new photo.

Discussion -the underlying value of the material map-

Evaluating the process some months after initiating this experiment, what I realize is that what the first experiment, the “taxonomy”, mostly illustrated was continuities -and discontinuities- from a rather aesthetic perspective -what is perceived at first glance-. However, the 2nd experiment, “material map”, unfolds that, even though some aesthetic features appear as similar or repeated on the outer part of the facade, the underlying material and construction logic is different. Sometimes, exterior skins act as a cladding material with its own construction and aesthetic logic, while main structure relates to program demands and the interior side of the façade is designed according to some other aesthetic preferences, e.g. Hanssted school. Others, in HCH’s mid career, structure becomes more engaged with the cladding, e.g.transformer stations. In a few, structure and exterior appearance was actually the same element, e.g. Ringbo psychiatric hospital. Therefore, there are a lot of variations of relations between structure and both exterior and interior expressions which should be further investigated by situating the discussion in relation to the “Kerneform” and the “Kunstform” (Bötticher, Karl, “Die Tektonik der Hellenen”, Potsdam: Verlag von Ferdinand Riegel, 1852) and complementary discussions that appeared later.

In terms of materials, an investigation that looks into the relation of structure and ornament, from the 30’s till the late 60’s indicates concrete as the main material to consider. HCH’s first works correspond in time to the introduction of reinforced in-situ concrete for building purposes. However at the beginning concrete was only used for mere structural functions, which remained almost invisible, since brick was still the dominant well-known traditional material. Around the late 50’s, HCH starts using concrete for non-structural means, moreover the number of available formats increases considerably.

5 MATERIALS, guidelines

CONCRETE

works	CONCRETE STRUCTURAL IN-SITU					PREFABRICATED STAIRCASE	SLAB/ WALL	PILLAR BEAM	NON-STRUCTURAL				
	CHIMNEY, CLOCK, BELLS	STAIRCASE	BASE (MENT)	BALCONY/ OVERHANG	PILLAR/ BEAM/ SLAB				PREFABRICATED (WALL) WALL (FILL-IN)	WALL (CLADDING)	LIGHTWEIGHT BLOCKS WALL	BLOCKS WALL/ DETAIL	
Emdrup Overgaard		X	X		X*								
Laundry building in Sundholm		X			X a								
Nårrebro Vænge housing		X	X										X
Hilgards plads housing		X	X	X		X b							X
Skydebanehaven childcare		X	X			X*							
Næstved chapel			X			X b							
Hanstved school			X			X*							X
Gadekærvej-blankavej housing		X	X			X*							
Nyborggade transformer station		X	X			X c							
Bellahøj transformer station		X	X	X		X c				X			
Bellahøj garage						X a						X	
Ringbo psychiatric hospital	X	X	X	X								X	
Bremerholm transformer station		X	X	X		X c					X		
Brandbylund psychiatric hospital	X		X				X				X		
Amager transformer station		X	X	X		X c				X			
Svanemølle transformer station	X	X	X			X c				X			
Tagensbo church	X	X	X	X		X c				X			
Gas pressure regulator			X										
Gasværksvejens school			X				X	X			X		

CERAMIC

works	STRUCTURAL BRICK FACADE					NON-STRUCTURAL (CLADDING) BRICKS FACADE			GLAZED TILES INTERIOR WALL		CURVED TILE ROOF	CHALK BRICKS WALL	BOND	FLAT TILE FLOOR
	BONDING	DETAIL	INTERIOR WALL	BONDING		FLOOR	FENCE							
Emdrup Overgaard	X	X	X	0							X			
Laundry building in Sundholm									X					
Nårrebro Vænge housing	X	X	X	0							X			
Hilgards plads housing	X	X	X	0				X			X			
Skydebanehaven childcare	X	X	0											
Næstved chapel	X	X	X	X	X	X			X		X			X?
Hanstved school	X	X	X	X	X				X		X			X
Gadekærvej-blankavej housing	X	X	X	0					X		X			
Nyborggade transformer station									X					
Bellahøj transformer station														
Bellahøj garage														
Ringbo psychiatric hospital			X	X					X			X	X	
Bremerholm transformer station														
Brandbylund psychiatric hospital									X					
Amager transformer station									X					
Svanemølle transformer station									X					
Tagensbo church						X	X	X	X	X	X	X	X	X
Gas pressure regulator														
Gasværksvejens school						X		X	X					

WOOD

works	STRUCTURAL PROFILES				NON-STRUCTURAL PROFILES							
	CLOCK, BELL	ROOF	SLABS	PILLARS	SUB-STRUCTURE	WALL/ SLAB (LATTICE)	WALL/ SLAB (CLADDING)	WINDOWS	SQUARED WINDOWS	HANDRAILS	PROFILES AND PANELS DOORS	PANELS WALLS AND DOORS
Emdrup Overgaard		X						X	X	X		X
Laundry building in Sundholm								X		X		X
Nårrebro Vænge housing		X	X			X		X	X	X	X	X
Hilgards plads housing		X	X					X	X	X	X	X
Skydebanehaven childcare		X				X	X		X	X	X	X
Næstved chapel	X	X				X	X		X	X	X	X
Hanstved school		X			X	X	X		X	X	X	X
Gadekærvej-blankavej housing		X						X	X	X	X	X
Nyborggade transformer station		X							X			
Bellahøj transformer station					X				X		X	
Bellahøj garage											X	
Ringbo psychiatric hospital	X	X		X	X		X		X	X	X	X
Bremerholm transformer station									X			
Brandbylund psychiatric hospital		X		X		X			X		X	X
Amager transformer station					X				X		X	
Svanemølle transformer station		X			X*		X*		X		X	
Tagensbo church		X				X		X			X	
Gas pressure regulator		X								X	X	
Gasværksvejens school		X			X	X		X	X		X	X

ETERNIT

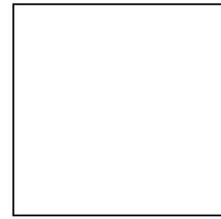
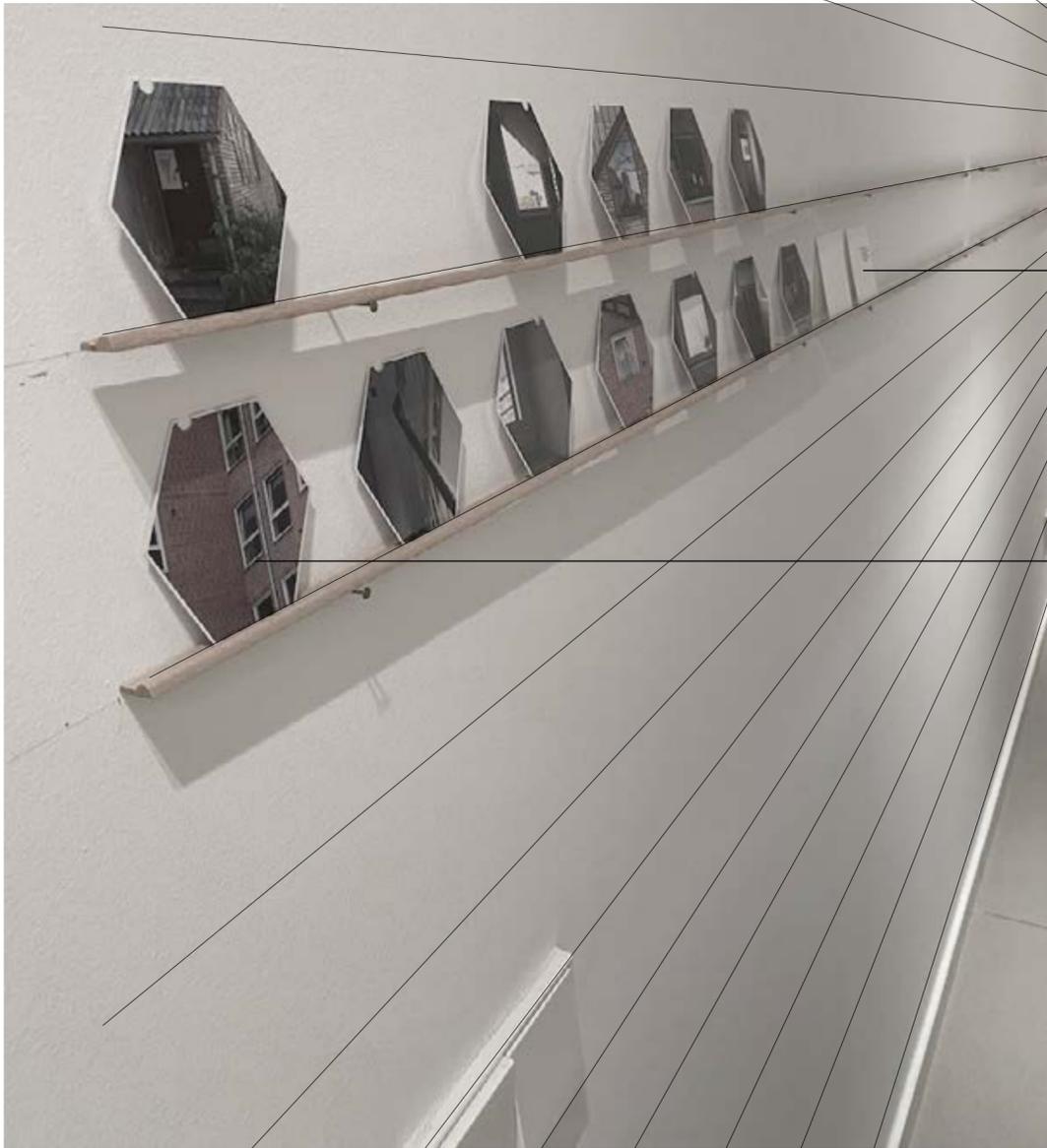
works	ETERNIT NON-STRUCTURAL		ONDULATED PLATE (CLADDING)		PERGOLA	TILES (SINGLES) ROOF
	FLAT PLATE (CLADDING) FACADE	ROOF	FACADE	ROOF		
Emdrup Overgaard						
Laundry building in Sundholm						
Nårrebro Vænge housing						
Hilgards plads housing						
Skydebanehaven childcare				X		
Næstved chapel						
Hanstved school	X			X	X	
Gadekærvej-blankavej housing						
Nyborggade transformer station				X		
Bellahøj transformer station	X (NOT ORIGINAL)		X	X		
Bellahøj garage						
Ringbo psychiatric hospital					X	
Bremerholm transformer station						
Brandbylund psychiatric hospital				X		
Amager transformer station			X	X	X	
Svanemølle transformer station						
Tagensbo church						
Gas pressure regulator				X		
Gasværksvejens school			X	X	X	

METAL

works	METAL STRUCTURAL PROFILE			NON-STRUCTURAL PLATE DRAIN		VENTILATION FACADE		DOOR	FACADE PANELS	WINDOW	PROFILE HANDRAIL	RAILING	SCREWS/ NAILS/ CONNECTORS
	CHIMNEY, CLOCK	PERGOLA/ LOW WALL	SUB-STRUCTURE FACADE/ ROOF	STAIRCASE									
Emdrup Overgaard													
Laundry building in Sundholm				X		X						X	
Nårrebro Vænge housing		X				X						X	
Hilgards plads housing						X					X	X	
Skydebanehaven childcare		X				X	X					X	X
Næstved chapel	X					X						X	
Hanstved school	X	X				X	X			X	X	X	
Gadekærvej-blankavej housing		X				X						X	
Nyborggade transformer station			X			X		X				X	X
Bellahøj transformer station	X		X			X						X	
Bellahøj garage						X							
Ringbo psychiatric hospital						X		X			X		X
Bremerholm transformer station			X			X		X			X	X	X
Brandbylund psychiatric hospital		X				X					X	X	
Amager transformer station		X	X			X		X				X	
Svanemølle transformer station						X		X			X		X
Tagensbo church	X					X						X	
Gas pressure regulator										X		X	
Gasværksvejens school	X		X	X						X		X	X



PROTOTYPE



NEW FORMAT
8 X 8 MMM
250 GR
PRINTED ONE OR TWO SIDES

TEST FORMAT

SET UP



	CONCRETE	CERAMIC	WOOD	ETERNIT	METAL
Emdrup Overgaard					
Laundry building in Sundholm					
Nørrebro Vænge housing					
Hülgårds plads housing					
Skydebanehaven childcare					
Næstved chapel					
Hanssted school					
Gadekærvej-blankavej housing					
Nyborggade transformer station					
Bellahøj transformer station					
Bellahøj garage					
Ringbo psychiatric hospital					
Bremerholm transformer station					
Brøndbylund psychiatric hospital					
Amager transformer station					
Svanemølle transformer station					
Tagensbo church					
Gas pressure regulator					
Gasværksvejens school					

HEIGHT 19 X 10 CM = 190 CM
 + 10 CM HEADLINES = 200 CM
 AND PLACED 20 CM FROM THE GROUND

WIDTH 9 X 80 CM = 720 CM
 + 10 CM HEADLINES = 730 CM

Slender wooden battens placed horizontally along a white wall correspond to each building. Those battens have a length of 80 cm -they are originally 240 cm but need to be cut in three pieces to be transportable- and are supported by 2 nails each. The total dimension of the map is 190 x 720 cm and should be placed about 20 cm above ground. Photos of 8 x 8 cm printed in 250 gr paper are placed according to material format and purpose in a specific building line.

People is encouraged to touch the photos. Often, there is more than one material situation in a building, which means that beneath the first photo there are other similar examples or repetitions. People is also encouraged to take one photo close to another one to see similarities in the way that two different materials address the same construction situation.

