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The works of an architect

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Publication date: 2023

Document Version: Publisher's PDF, also known as Version of record

Link to publication

Citation for pulished version (APA): Español Vilanova, A. (2023). The works of an architect: Tectonic matters.

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Designskolen Kolding



The works of an architect Tectonic matters

PhD Dissertation by Aida Espanol Vilanova

ARKITEKTSKOLEN AARHUS

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The works of an architect Tectonic matters

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Abstract English

This PhD thesis presents the built works of the Danish architect Hans Christian Hansen (HCH, 1901-1978) who worked at the office of the city architect in Copenhagen between the late 1930's and early 1970's. The hypothesis is that HCH's works are characteristic from a tectonic perspective and quite unique in its geographical and historical context. Therefore, the purpose of the project is to provide documentation on HCH's built works, who is rather unknown to a larger audience. At the same time, it aims at explicating the works with a focus on tectonics. Finally the research situates HCH''s work within theories and practices of tectonics.

HCH did not write about his architecture and it was not possible to gather much written documentation related to his life. This challenged the writing of a typical monography and led to investigate other formats and methods. The research is based on a bottom-up approach in which *the built*, besides being the object, becomes the medium. Analysis of works through investigations based on drawing and photo emerge as key elements in the process of generating and communicating embedded tectonic knowledge. The relation between tectonic characteristics -seen as interactions and ambiguities among construction, structure and expression- and its depiction through drawing and photo instruments lays in the dialogue among the *concealed* and the *exposed*. Whereas detailed section drawings should disclose rather *concealed* issues most connected to the technical; photo fragments should focus on the *exposed* by revealing material matters and details -considered as joints that reinforce the construction integrity.

Abstract Danish

Denne ph.d.-afhandling præsenterer værker bygget af den danske arkitekt Hans Christian Hansen (HCH, 1901-1978), som arbejdede på stadsarkitektens kontor i København fra slutningen af 1930'erne til begyndelsen af 1970'erne. Min hypotese er, at HCH's værker er karakteristiske set ud fra et tektonisk synspunkt og helt unikke i deres geografiske og historiske kontekst. Derfor er formålet med projektet at tilvejebringe dokumentation af HCH's byggede værker - for et bredere publikum en ret ukendt arkitekt. Samtidig søger afhandlingen at forklare værkerne ud fra en praksisbaseret tilgang, der har fokus på tektonik. Endelig positionerer min forskning HCH's værker inden for tektonikkens teorier og praksis.

HCH skrev ikke om sin arkitektur, og det var ikke muligt at indsamle ret meget skriftlig dokumentation omkring hans levned. Dette var en udfordring i forhold til at skrive en typisk monografi og førte til at jeg undersøgte andre formater og metoder. Forskningen baserer sig på en bottom-up tilgang, hvor det byggede, udover at være objektet, også er mediet. Undersøgelser af værker gennem eksperimenter baseret på tegninger og fotografier fremstår som centrale elementer i den proces, der genererer og kommunikerer indlejret tektonisk viden. Forholdet mellem tektoniske egenskaber - set som interaktioner og tvetydigheder mellem konstruktion, struktur og udtryk - og disses skildring gennem tegninger og ved hjælp af fotografiske instrumenter placerer sig i dialogen mellem det skjulte og det afslørede. Hvor detaljerede snittegninger har til formål at afsløre problemstillinger der er ret skjulte, og overvejende knytter sig til det tekniske, fokuserer fotografiske fragmenter på det afslørede ved at blotlægge materielle forhold og detaljer - der betragtes som samlinger, som styrker konstruktionens integritet.

Acknowledgements

This journey would have not been possible without the support and collaboration of many people:

To start, I would like to give a big thanks to my principal supervisor Ruth Baumeister for her guidance, not only on research but on life in general. I especially appreciate her critical eye, honesty, perseverance and valuable comments throughout the entire investigation. I would also like to thank my secondary supervisor Mogens A. Morgen for his insights, endless patience and confidence. To both of them, thanks for awakening interest in the subject of writing.

Many thanks to the Aarhus School of Architecture, and especially to Claus P. Pedersen, Mia M. Flodager and Thomas B. Jensen, for giving me the opportunity to develop this research project, and facilitating the conditions to finalize it. Thanks to the library and the bookshop, *Architegn*, for their collaboration, patience and efficiency. Also thanks to Michael Andersen who has helped me to print several copies of this PhD dissertation. I appreciate his generosity and our conversations on the production of the book. And a general thanks to all my colleagues of the School of Architecture for their informal comments. Finally, thanks to Karen Kjærgaard for inspiring the choice of title of this PhD thesis.

I would like to acknowledge Anne Beim for her support during the last part of the investigation. Her profound expertise on tectonics and thorough remarks have been crucial for the development of the discussion chapters of this thesis. Also thanks to all the dedicated people of CINARK (Centre of Industrialized Architecture) for their interest and valuable comments.

And many thanks to Niels P. Nygaard who encouraged me to start this PhD thesis. He helped me to formulate and refine an application to pursue such investigation. He has closely followed the research process, encouraged me and showed true interest to the theme. A very especial thank you goes to Rued M. Andreassen for his continuous commitment, refined work and enriching discussions along the way. And also many thanks to Albin A. Frech for his accurate observations and Danish- English translations. Thanks to Rasmus Dale, Signe Rahbek and Anna Baumann for their help during the last weeks of the PhD project.

Also thanks to Jeppe Steen Andersen for his very relevant observations on construction and structure issues regarding the set of buildings investigated here.

Thanks to Kim L. Hansen and Frank Bundgaard for contributing with some anecdotes on the architect, HCH. And thanks to Kristian Seier for sharing his knowledge on HCH and related context.

Many thanks to Byggesagsarkiv (construction archive) in Copenhagen and to Danmarks Kunstbibliotek (Danish National Art Library) for their help in finding and scanning some archival information. And also thanks to all the occupants of the different buildings I have visited in different occasions for their kindness.

Besides, I would like to give my biggest thanks to my parents for their unconditional support, generosity and help throughout the years -before and during the progress of his project. Also many thanks to my partner Carsten Gjørtz for his confidence, help and informal comments on the topic. And beyond everyone I would like to thank our children, Maria, Josef and Johan for their love, fun moments and tons of patience while mama was 'writing a book.'

Beyond a traditional monography

Beyond a traditional monography





A traditional architecture monography has usually been perceived as a "signifier of wealth and taste"¹. André Tavares, in the article "Architecture brought to book: the monograph" states that the establishment of architecture books, monographies and others, were coincident with the recognition of the profession in the XV c. Architects, willing to differentiate themselves from mere builders, would disseminate their ideas and designs to educated patrons in order to show their skills, and to ensure future work. In regards to this idea, it seems challenging to write a monography about an architect who worked under the principles of equal opportunities and distribution of wealth within the policies of the Danish Welfare State. Besides that, a collective institution within such context would not promote renowned architects. However, it would probably secure a long-term career, while supporting individual voices and cultivated uniqueness:

A young architect named Hans Christian Hansen (HCH, 1901-1978) became an employee at the office of the city architect in Copenhagen at the age of 27 and left the institution about 46 years later². He developed his first works together with Poul Holsøe³, city architect at that time, and later became the right-hand man of F.C. Lund⁴, who succeeded Poul Holsøe. As leader of one of the two architecture departments, HCH was in charge of a number of technical facilities as well as social works that have left an imprint at the city landscape of Copenhagen⁵. Whether fortunately or not, such works and the architect miss an aura of recognition and have remained rather unknown for the wide architecture audience. From the perspective of a traditional monography such anonymous condition of the architect doesn't provide with the best candidate. Since a monography has through the history of architecture been the medium to disseminate, and mythologize the life and works of an acclaimed architect: Usually a male star architect who is depicted as the single genius behind the complex development of architecture projects.

Writing a monography involves to create a story about a person and oeuvre, and to think about what is the format that best communicates it.

Selected material might include texts, photos, finished drawings, as well as process material that show intermediate stages of the works. But somehow, it is always a rewritten story about the architect and works. And therefore, it is a way to revise and reflect upon others' works. Besides that, such examination leads to see the works from a new perspective and to recognize relations across works that weren't obvious.

At first, I approached this research project on an architect and related works as a traditional monography. I tried to contact HCH's family and friends, and access archives and libraries, though I didn't succeed in acquiring solid information, such as sketches or verbal/ written statements, that would reveal HCH's working process and design intentions. An anecdote is that when checking information listed under "Hans Christian Hansen (1901-1978)" in the Danish Design Museum what came out of two big folders was drawings from the well-recognized historicist Danish architect Hans Christian Hansen (1803-1883), that share the exact same name as the architect of this thesis. Among others, these circumstances made me focus on what was available and accessible.

Early in the research project I was able to put together a list of HCH's works, found in Arkitekten and Arkitektur magazines. If not mentioned in the text, I could somehow deduct the location of each work and use such address information to 1) visit the works 2) and find, select⁶ and digitalize⁷ a set of original construction drawings available at the *Byggesagsarkiv* (construction archive) in Copenhagen. Therefore, the investigation that is presented here is not primarily a rewritten story, based on existing texts and/ or architecture documents as drawings and photos. Instead, I investigate and share stories of HCH's works starting from something else. Missing written sources on HCH's life and oeuvre have encouraged me to investigate HCH's built works, by utilizing my own experience at the works and revising existing construction drawings, as an alternative to the theoretical discourse most chosen by architectural historians that has traditionally influenced the discipline⁸.

Besides that, as an architect, I am more inclined to operate within buildings than texts. As explained by the architecture historian Adrian Forty ⁹, I also consider it a relieve to be able to get out and work with physical objects as buildings. Particularly, I am interested in how buildings are made and appear, regarding materials and construction methods. And I consider these initial conditions and motivation as an opportunity to unveil HCH's heritage. Such process demands my own interpretation. I believe, as a piece of text would require to be interpreted. Anyhow, why should a written text, or a person's oral manifestation, have more value in terms of evidence than the comprehensive character of a built work, in which architects have synthesized their ideas? I reckon that the material presence of buildings should be as reliable as writings. And If any doubt, we should consider that written/ verbal statements could be susceptible of an architect's manipulated reality.

Once this said, we might question how much does the building tell about the architect/s that have been involved in the design process. In the past, it has been assumed that the leader of an office was the one author, even though he/ she wasn't regularly involved in the project development. Though obviously, there are several architects being active behind the scenes, besides external forces that influence the final material presence of the architecture project. This alludes not only to knowledge delivered by other specialists than architects, but also to the role of politicians, consultants and contractors. As well as unforeseen everyday circumstances. It actually would require a complementary analysis to precisely prove 'who has done what' or what has coincidentally occurred and changed the architect's plans. And sometimes, especially when dealing with historical cases as the one here, and within the framework of a PhD project, this kind of detective work is unfeasible. Regardless of HCH's signature, what convinced me that he had some authorship in the different projects presented here are certain features and materials that kept repeating and iterating across works.

I examined the built by employing architecture based tools, such as drawings and photos, and derived methods, by continuously insisting on a cross interpretation of the works through a tectonic lenses - an overarching concept that is employed here to refer to materials, construction, structure and expression, and particularly its interaction. The reason of applying a tectonics focus is connected to the works' features. obvious from the start, and also my own interest. Works were equally taken into account, regardless construction date, program, size and location. Such transversal analysis of buildings through the use of drawings is also applied at the book Ten Canonical Buildings 1950-2000¹⁰. The author, the architect Peter Eisenman, depicts a total of ten works, in this case each one designed by a distinct architect, through a formal analysis by using abstract diagrams. Different to this investigation, in which I stay close to the built, Eisenman's black and white axonometric drawings keep the reader rather distant to the works. Such format is probably coherent with his selection of built, but also unbuilt works. Besides that, his ten choices are on works signed by well-known worldwide acclaimed architects. Peter Eisenman's framing contrasts with the basis of this project, that depicts a number of works developed by the same little-known Danish architect.

Missing publications on HCH, besides scarcity of archival information, first required to develop a survey about his oeuvre. After searching for and locating a list of built works, basically in *Arkitekten* and *Arkitektur* magazines, I visited the buildings several times following HCH's footprints in Copenhagen. A first trip gave me confidence to keep close to the built. Not only by means of the project's subject, but also the medium. On the side, I was able to access documentation of the built projects, as technical drawings of plans, sections, facades and details, at *Byggesagsarkiv* in Copenhagen. Such collected archival information - basic data, drawings and photographies- is mounted here as an architecture guide in the form of seventeen removable cards, corresponding to seventeen built works (see chapter 3, *Hans Chr. Hansen's footprint*). In this way, I hope to encourage the reader to pull out

a set of cards and a map to track HCH's built works in a similar way as I first discovered them.

Once I had visited the buildings, the question was how could I analyze a set of built works by staying close to them? Concerning the collection and analysis of data I used mediums common from the architecture discipline. And also, what is considered situated within "art/ design research" methodologies. Here such mediums employ a combination between the phenomenological hermeneutical and the empiric analytic modes. Whereas the phenomenological hermeneutical mode is based on direct experience -observation, collection through photography by being at the buildings and interpretation; the empirical mode implies examination of technical drawings from the construction archive in Copenhagen, *Byggesagsarkiv*, as well as revision of the collected data on-site. The knowledge gained from these two modes is put together by using architecture based tools, as drawing and photo, through a set of three investigations.

The twofold approximation to the works -the phenomenological hermeneutical and the empirical- could be seen in connection to Colin Rowe's suggestion for a dialectic analytical methodology. Collin Rowe suggested to unify seemingly antagonistic ways of analyzing: the conceptual (through thought) and the experiential (through vision). He showed the first signs of such mode of historical interpretation in his PhD thesis," The theoretical Drawings of Inigo Jones: Their sources and Scope" (1947). He developed it throughout his career as an architectural historian, critic and educator, and especially provided with a comprehensive description of it in his article "La Tourette" (1960). The article is written after Collin Rowe's short stay at the monastery soon after its construction. The choice of La Tourette to analyze the built reality of architecture is not a coincidence. Rowe would defend that Le Corbusier's conceptual understanding of architecture was in contradiction to the sensorial content of the book Vers une Architecture. Therefore, the object of analysis provides with a well-founded case for unveiling Collin Rowe's proposed methodology based on the conceptual and the experiential. Therefore, the importance of his article "La Tourette" lays on the interpretation of a unique work of architecture, designed by Le Corbusier, as well as on a new integrated approach to investigate architecture history¹¹. As mentioned, I use a comparable mixed way of exploring architecture works in this research project: My own impression through interpretation and empirical evidence through analysis. Besides that, the investigation approach through a set of tectonic investigations (as method) is also decided according to certain tectonic features of HCH's works (as subject). In a similar way to how Collin Rowe applies his own methodology to a specific building that he assumes is relevant to be discussed through such approach. However the process is reverse. Whereas Collin Rowe choses a building in regards to a certain methodology, I decided the methodology in relation to HCH's buildings, and other circumstances.

I propose an exploration of HCH's built works through the development of three investigations, Cuts, Crops and Faults (see chapter 4, Investigations). Initially, I decided on the techniques, drawings and photos, and derived methods according to: 1) The hypothesis that HCH's works, and specially the surface and depth of the facades, were significant from a tectonic position. Thus, it was considered essential to put together a series of detailed section drawings of enclosures to reveal matters related to construction and structure and 2) the appropriateness of registering works while being on-site following a rather unstructured way of proceeding, at a fast pace and spontaneously, to capture materials and expression. Later, such intuitive decision developed into Cuts and Crops, accordingly. And the results of these two investigations were further investigated in Faults. In regards to this, an explanation and contextualization of the methodological approach, that besides "archival research" navigates between the tradition of architecture analysis and ways of "research through design" is provided (see chapter 1, Methodological framework).

The three investigations provided with a cross analysis of the works from a tectonic focus. However, the knowledge gained from Cuts, Crops and Faults required to be put into a relational context, broader than HCH's works in themselves (see chapters 7 and 8, Fragility and Robustness: The tectonics of facades' layerings and Frameworks and Ready-mades: The tectonics of facades' coverings). On-site work and examination of construction drawings, analyzed through the three investigations, is the core part of the project, whereas contextualization within relevant tectonic theories and practices becomes the end point of the research process. However, the objective is not to distill the works into theory, but to use theory to better understand HCH's tectonics, and the other way around¹². The Catalan architect and critic Carlos Martí Arís explained that the relation that exists between a curve and an arch in a construction process is comparable to the one that happens between theory and practice, in the field of the architecture project. The curve, as theory, shouldn't be more than an auxiliary construction. Once the arch has been constructed, the curve, discreetly disappears to allow the arch to shine. This comparison concedes theory a relevant role, however situating it at the work's service, which is considered the authentic key of knowledge in the artistic field.¹³ In a comparable manner, here the focus is HCH's works and tectonic theory is subordinated to it. However, according to the bottom-up approach of this PhD thesis, the process explained by Carlos Martí Arís reverses: The researcher task is to somewhat deconstruct, in means of analyzing and interpreting the works (arch), instead of constructing them. And theory (curve), that here appears at the last stage of the research project, supports a better understanding of the works.

Though before engaging with the analysis and interpretation of HCH's built works, initially my interest turned towards its 'uniqueness'. My first encounter with HCH was through an advertisement that showed one of his technical buildings, Bremerholm Transformer Station, while reading through an issue of the Danish journal *Arkitekten*¹⁴. Right away, I got astonished about the extraordinary expression of that façade: The choice of materials and how these were put together through delicate though

rough joining details. After, through the same local journals, I found publications on his other works that just increased my fascination, also in the direction of tectonics.

Still, how could I state that HCH's works were sort of an exception within the works of other contemporary Danes? Maybe HCH was just one more within an unrecognized group of Danish architects that had a similar approach to building? Somehow, I felt that by keeping attached to such local issues for some more time I could get an approximate idea about HCH's position within his close architecture panorama. And for a period, I became submerged in the pages of old journals, *Arkitekten* and *Arkitektur*, and I used the ways of an architect when looking for references. I followed a bottom-up approach by visually establishing relations among works as inspiration, instead of reading about architecture theories and use such abstract ideas as the driving force. Besides that, I tried to put myself in the situation of HCH when developing his works. What buildings would he walk nearby when going to work? What would he look at when reading local architecture journals? What would he learn from his colleagues at the office of the city architect in Copenhagen?

Although it would of course be poor speculation to believe that works' alikeness should prove HCH's inspiration and therefore works' references. However, such affinities provide with an impression of a variety of buildings that show similarities, from one perspective or another, to HCH's works. But then, what makes something comparable? How alike do works have to be? And within what terms should such similarities be evaluated? Is it about materials, expression, context, program, etc.? According to this, I decided on some categories,¹⁵ in order to easily select data as well as to classify it into different folders for later revision. Unless particularly stated, connections were based on self- interpretations. Besides that, such relations happened in both directions: Buildings that might have influenced HCH, as well as architects that might have gotten inspiration from HCH's works. The challenge was then how to communicate this large amount of information. A traditional written medium wouldn't fit into a

logic way to connect and explain it, as relations were happening in too many directions. Besides that, most relations were better explained through photos than texts. Taking this into account, it seemed more appropriate to take advantage of the multiple reading directions of a diagram - comprised of a combination of text, image and photo- in order to document and hereby create an awareness on HCH's contemporary context (see chapter 2, A chronology).

Besides showing some similarities with a very small group of Danish architects, HCH's works appear to be quite exceptional within the Danish architecture context. However, they show affinities with some architecture works positioned within the Italian and Spanish 20th century Realism. Especially considering my Spanish-Catalan background, and from my point of view, HCH's works show strong connections with a local interpretation of *Realism*¹⁶ most represented by *Grup R* (1950-1960, Barcelona)¹⁷. The idea of Realism -as stated by O. Bohigas also known as 'Critic Realism' or 'New Realism'- was an alternative to the characteristic idealism of the orthodox Modern Movement¹⁸. Though in what way is HCH connected to *Grup R*? Is it through tectonics that HCH's works are comparable to *Grup R*'s works? Is it the use of traditional building systems and everyday (poor) materials together with early industrialized materials what makes them alike? And especially the way those are put together in new configurations and expressions?

Such mindset -about materials, construction and expression- is not just a historical approach to the practice of architecture. About 50 years later, corresponding to the millennium crisis similar values and ways of doing architecture seem to come back. At the 2012 Venice Biennale, curated by David Chiperfield with the concept 'Common Ground', a new generation of Catalan and Balearic architects presented some of their works which seem to be an evolution of the principles of *Grup R*. Under the name 'Vogadors/ Architectural Rowers: Hard materiality for a permeable architecture', as stated by the curators, the exhibited works displayed an "[...] architecture that is sober and constructed out of very

simple materials, yet endowed with enormous technical and intellectual sophistication, and imbued with a solid ethical and social basis, capable of building with a conscious permeability with its surroundings, people and life, without renouncing the more abstract and plastic values of emotion. The aim is to show that this type of architecture is not only an automatic response to an economic crisis, but that it is also a cultural and aesthetic trend that connects an entire intellectual, technical and social tradition of architecture in Catalonia and the Balearic Islands, which has been maintained even when the international context demanded more formal and expressive approaches. It also connects with international trends in which one could already see the excesses of some styles of architectures in recent years. Now its appropriateness is recognized due to the context of contemporary sensitivity, the result of the current economic and environmental situation". The curators also cited a text by the Spanish artist Jorge Oteiza, that is inspired by the Mediterranean sea. It separates and unites Catalonia and the Balearic Islands and encapsulates the philosophy of Vogadors/ Rowers: "Whoever goes forward creating something new, does so like a vogador, moving forward, yet rowing backwards, looking towards the past, towards what exists, to reinvent its essence". Such quote fits well with the quote mentioned in the article on 'Critical Regionalism' by Kenneth Frampton¹⁹ when referring to the French philosopher Paul Ricoeur: "How to become modern and to return to sources; how to revive an old, dormant civilization and take part in a universal civilization". Following such attitude, the works of the new generation of Catalan architects exhibited at the Venice Biennale show clear references to some of Grup R's works. Though, such situation is not corresponding to the Danish context yet, since HCH's works still miss recognition within a new generation of Danish architects.

Reader's guide

Throughout the investigation process the object, approach and format of each chapter have been considered as equally important matters and well interrelated concepts. In each chapter I have questioned, what is its purpose, how do I gather data in relation to it, how do I analyze it and finally how do I explain and represent it as part of the PhD thesis? Most of the times, I have intuited that text wasn't the best format, and instead, I have chosen other mediums: A diagram, an architecture guide, a photo map, a set of photocollages, a series of technical drawings and also text. Such variety of elements have been put together as a cluster of connected elements in the PhD thesis, that attempts at taking the form of an unfolded book. While each chapter functions as an autonomous element that can be read and understood by itself, it is also one relevant piece of the complex process of getting to know and creating a story about HCH's built works.

Chapters have been organized according to the development of the research project. However its autonomous character also makes them easily interchangeable, and therefore readers are invited to approach them in a different order. The first chapter introduces the methodological context, that is situated within an established tradition in architecture and ways of "art/ design research". The second chapter is mounted as a chronology. It sheds light on HCH's works and life, HCH's contemporary context and publications on his works. Its diagram form, besides its textimage composition, should reinforce connections among the content. The third chapter explains HCH's built oeuvre, and presents his built works as an architecture guide. The fourth chapter shows the three keys, or investigations, through which I have entered, navigated, got lost, though finally identified the tectonic characteristics of his built works. This chapter is fully developed and displayed through non-written mediums, as photo and drawing. Such large visual formats require the reader to interact with such material. A text-based translation of the investigations' outcome is intentionally not provided, since a description would just turn off the investigations' expression and subordinate them to the text format. Chapter five unfolds and contextualizes the different steps and arguments regarding the development of the three investigations. And an interpretation and contextualization of the knowledge gained through the investigations is provided in chapters six and seven. While reading these two last chapters, the reader is invited to continuously revise the three investigations. However, references to specific photos/drawings are not stated, as connections seem obvious and references would just fill the text with redundant information. Besides that, arguments often refer to information deducted from several drawings and photos. Chapter eight summarizes and discusses the fragmented character of the previous chapters into one continuous piece of text, and chapter 9 provides with a conclusion.

Briefly, the main structure of the PhD thesis is comprised of a first part that presents a collection of existing data in relation to HCH's works and context (see chapters 2 and 3); a second part that displays the analysis through three investigations, interpretation and contextualization of the acquired knowledge (see chapters 4, 5, 6 and 7), and finally a summary discussion and conclusion (see chapters 8 and 9) are provided. Such structure is also correspondent to the methodological approach. Whereas chapters 2 and 3 employ "archival research", chapters 4, 5, 6 and 7 apply a methodology that is an interpretation of "research *through* art/ design" adjusted to the discipline of architecture, as well as techniques common from the tradition of architectural analysis.

State of research

Even though HCH's oeuvre has not yet been part of a comprehensive publication, his works have briefly been disseminated within a few Danish books and journals. A search into *Arkitekten* and *Arkitektur* issues from the period between 1928 -HCH's graduation from the Royal Danish Academy of Fine Arts- and 1978 -HCH's death- provides with most of HCH's architecture works²⁰. In general, articles present a description of HCH's built projects, based on the use of certain materials, construction methods and program. However, in most cases buildings miss a relation of basic data and complete set of drawings of the project. Besides that, an explanation of the projects' development and architectural meaning is not provided.

Among those, we find two publications that pay special attention to the architect and several of his built works: An article written just after HCH's retirement as project leader at the city architect's office²¹, "Arbejder af Hans Chr. Hansen"; and a publication produced by the architecture department of Copenhagen municipality that presents a selection of works developed during the first hundred years: From 1886 -the establishment of the office of the City Architect- to 1986 -near to the dissolution of the department in 1998-, "Stadsarkitekten i København 1886-1986". Within the period of 1943-1973 several of HCH's works are mentioned and HCH is recognized among staff members and referred as having "designed a series of noteworthy buildings"²². Both articles are written by the Danish architect and critic Jørgen Sestoft (1934-1996).

In addition, during the last twelve years, HCH's works seem to have raised some interest. Recent publications consist of:

An interview about a thesis project by the architecture student Even Brænne Olstad that proposes a transformation and extension of Hanssted School²³. The author starts by analyzing some of HCH's works, from which he extracts some principles to make his own thesis design as a contemporary version Hanssted School. A very fine approximation to some of HCH's works, though the analyses lacks prove and the methodological approach is not provided. Besides that, the investigation is initially based on five and finally only two of HCH's works.

An article by Anne Beim and Marie Frier Hvejsel that analyses two of HCH's buildings from an "urban tectonic" position²⁴. A new perspective which develops principles studied by E. F. Sekler: Through a didactic exercise he suggested that architecture and city structures should be considered in relation to the human body. In addition, following the notion of *arrière-garde* stated by Kenneth Frampton, the aim is to evaluate whether HCH's works could be used as an example for one of today's architecture challenges: "The growing inability to utilize construction elements as spatial features that link the urban fabric to the human scale". Such idea

of tectonics seen from the perspective of the human scale has inspired some of the themes mentioned at the interpretation and contextualization chapters of this PhD thesis.

Photos and informal discussions on HCH's works can be found at an architecture blog by Kristian Seier (Seier+Seier)²⁵. The author, an architect fascinated by HCH as "one of the few true originals in Danish architecture", shares a set of very well captured photos of the works, which he has visited since 2010. Comments are added, in terms of the author, as "repetitious and opinionated", nonetheless accurate and relevant. Moreover, this expands to some interesting discussions among some blog followers. Such informal insights provided with some hints for the analyses and contextualization of the works.

A recent discussion concerning the preservation of one of HCH's works, Ringbo Psychiatric Hospital, which has been decided for demolition, appears in different media²⁶. Some architects argument against qualifying Ringbo as an obsolete building. They claim that both the building, its relation to the landscape and the landscape itself presents outstanding architecture features of a certain historical context, as well as possibilities for transformation/ extension from a present perspective.

Besides the recent publications and architecture blog mentioned above, technical drawings corresponding to the construction phase of the projects have been found through examining Copenhagen's Byggesagsarkiv²⁷. Nineteen built works have been located: One orphanate, one sports tribune, two schools, two daycares, three housing blocks, one church, two psychiatric hospitals, five transformer stations and one gas pressure regulator. However one of the projects, Idrætsparken Football Tribune, has been demolished (1990) and Empdrupgaard Orphanate has not been possible to visit due to privacy rights. Besides that, documentation on the competition and built work of Næstved Chapel, the only building placed outside Copenhagen, has been found at The Danish National Art Library (Study room at Søborg).

Research questions

After the first stage of this research project, in which I gathered information on HCH's works primarily through existing written sources and drawings, I realized that his oeuvre misses a proper documentation and therefore recognition. Such condition leads to the first research question (RQ) and is addressed in chapter 2 and 3:

What is HCH's oeuvre comprised of?

In addition, my lack of awareness on HCH's Danish contemporary context, besides HCH's works apparently uniqueness motivated to set works side by side to the works of other local architects. This exploration provides insight into potential correlations between works, that indicate intended as well as coincidental situations. Such investigation is addressed as the second RQ and depicted in chapter 2:

In which architectural milieu did HCH's works emerge?

Once information on HCH's oeuvre, built and unbuilt works, and related context had been collected, the project focused on dissecting HCH's built works. Initial circumstances, besides my own experience and motivation, have incited a way of proceeding that is common from within the architecture field. The analysis employs architecture based tools and derived methods and is also framed within "art/ design research" methodologies. In this regards, three investigations provide tectonic knowledge about the works. The investigation process, as well as development and contextualization of the analysis' tools and methods is tackled through the third RQ, showed in chapter 4 and explained in chapter 5:

How to embed HCH's built works into a tectonic discussion?

Knowledge obtained through the three investigations is fully dependent on the particularities of the seventeen built works, and it is communicated through different visual formats (Cuts, Crops and Faults). In order to further interpret the acquired knowledge and position HCH's works into a larger tectonic perspective it is necessary to reframe and focus the discussion into another stage that leads to the fourth RQ, and is explained in chapters 6 and 7:

What are HCH's works tectonic characteristics?

Thus, what in most PhD projects is formulated as the research question/s (RQ) that the investigation should give an answer/s to, here occurs the other way around, RQ emerge from within the process of the research project: The bottom-up approach, besides the unknow character of the subject requires to work in a different way, and to develop an approach that revolves around the built. If one is ready to venture 'into the built', one should also be prepared for the unexpected, coincidental, adverse and amazing to happen. While eagerness for knowing situates one closer and closer to the built, patience and uncertainty guides the way of the adventure.

Tectonic matters

The tectonic focus of this investigation aims at addressing issues in regards to materials, construction, structure and expression, and its synthesis, from a holistic perspective. As mentioned, my motivation and HCH's works' features indicated that committing the research process through such themes would disclose some kind of logic beyond the works. Even though initially it was not possible to foresee what was particularly significant within those themes, however one could intuit that an analysis to shed light on such topics would unfold some thorough insights of the works.

My interest instigated some early doubts towards the complexity of HCH's works. Such doubts would refer to uncertainties and ambiguities between what is concealed and revealed, even emphasized. Consequently a series of questions arose: What is the reason of HCH's elaborated and expressive enclosures? Is it something added to the main construction, or

is it a direct visible result of putting materials together as a response to structural and construction requirements? Else, what is its purpose? And what do enclosures represent? Are those surfaces an add-on? And how do they relate to the primary construction? What lies beyond what is visible? How does the depth of a façade change and in regards to what? How do the different characters of the enclosures, interior and exterior sides, relate? And why are interior and exterior so differently composed?

The above questions are situated within the continuing discussion about the ontological - as the built form that corresponds to the act of construction- and the representational – as the built form that alludes to something that is absent and belongs or not to the own construction character of architecture works. However, what makes HCH's works, and enclosures, intriguing is that they can't be situated into one of the these two apparently strict contraries: Whereas they fully commit to the act of construction and its full visibility, they also show highly elaborated enclosures that present themselves rather detached from the primary construction and its structural principles, yet expression-wise still unrecognizable in means of representation. It is in the article "Rappel à l'ordre: The case for the tectonic"28 (1990) that the architecture critic Kenneth Frampton writes "the tectonic lies suspended between a series of opposites, above all between the ontological and the representational"29. And he argues this condition through an etymological, cultural and historical revision of the term tectonics. In regards to this, the summary below attempts at making reference to the tectonic ideas that have been found significant to contextualize HCH's works:

The word tectonic derives from the term *tekton* in Greek, that means carpenter or builder. The meaning of *tekton* develops from mere carpentry to a broader notion of construction that will later embed a poetic connotation. Later, in the XIX c. two German architects, first Karl Bötticher and after Gottfried Semper, would adopt and define the term within the modern context, by analyzing Greek architecture and vernacular building cultures. Bötticher recognizes two elements within a

construction, what he refers to as coreform and artform. Such terms aim at explaining a building by distinguishing the (construction) elements that intent to emphasize a structural principle in a straightforward way, from the (decorative) elements that attempt to represent a structural condition that is present, but not apparent. The artform is in this way seen as a kind of enrichment or imitation of architecture's own logic. Semper would develop and articulate such concepts as the structural-technical and the structural-symbolic, accordingly. Though, the difference is that while Bötticher would insist on the primacy of the coreform, Semper would defend that the structural-symbolic was more important than the structural-technical. Such idea relates to Semper's notion of dressing, that emerges from the idea of defining an enclosed space through walls - initially carpets produced through branches and textiles. According to Semper, the dressing appears more important than the supportive elements concealed behind. According to the primacy of textiles, Semper would identify the minor structural unit of signification as the knot, or the joint. Later, the architect Marco Frascari explained that the joint, seen as a detail, was the place where the construction and the construing of architecture occurs. Both, the notion of dressing and joint are crucial to interpret HCH's enclosures, and unfolded in chapters 6 and 7.

Besides the ontological and representational discussion, that iterates throughout history, Semper would also categorize buildings through tectonics and stereotomics. While the first construction is comprised of joined frames, the second one refers to mass compression. And traditionally very different materials have been attached to each category. This way of understanding construction is also relevant to depict HCH's works and discussed in chapter 6 and 7.

Frampton addresses tectonics as an alternative to "the current tendency to reduce architecture to scenography"³⁰. As summarized above, he argues it by seeing architecture history through the lenses of tectonics. Also, he considers it as an opportune attitude to fight the recent emergence of the Post-modern. Besides that, one of the motives that

supports tectonics over scenography, and that is still very relevant today, alludes at its potential concerning environment issues. Even though only superficially, Frampton writes "Among the advantages of the scenographic approach is the fact that the results are eminently amortizable, with all the consequences that this entails for the future of the environment"³¹. In addition to HCH's works resonances with some of the tectonic theories and practices of architecture history, it is such environmental character what makes his works relevant for a current notion of tectonics. The selection, treatment, modification and assembly of materials demonstrates HCH's early awareness towards environmental questions.

The book Towards an Ecology of Tectonics: The need For Rethinking Construction In Architecture³² (2014) aims at discussing such environmental dimension of tectonics. And by using the word ecology the intention is to embrace a wider notion of environment from today's perspective. Aside environmental conditions, ecology refers to the life cycle of materials, its social organization, and its durability. Even though material's life cycle, concerning reuse and recycling issues as an answer to scarcity and waste, is a rather new concept, in some situations HCH demonstrates a consciousness towards it. Besides that, the choice of materials (both durable and temporary) and the way to put them together, that supports weathering and replacement, but also endurance, shows HCH thorough attention to time within the construction process and the lifetime of a building.

Before Frampton's article, the architectural historian Eduard Sekler, published the article "Structure, Construction, Tectonics"³³ (1965). The text aims at arguing the distinction of such three terms, that he claims are very often used indistinctively. Such three concepts are often addressed in this PhD thesis when interpreting and contextualizing HCH's works (see chapters 6 and 7) and therefore also need some clarification. Sekler writes that construction is about putting materials together in a concrete way and through specific materials, and structure is an abstract concept that

refers to a system which deals with the forces at work in a building. Whereas one type of structure can be carried on through different types of constructions, a structural change to pursue a more efficient distribution of forces would always require a new type of construction. Finally he explains tectonics as the following: "When a structural concept has found its implementation through construction, the visual result will affect us through certain expressive qualities which clearly have something to do with the forces and corresponding arrangement of parts in the building, yet cannot be described in terms of construction and structure alone. For these qualities, which are expressive of a relation of form to force, the term tectonic should be reserved"³⁴. According to this, one could probably tackle structural issues without mentioning construction and tectonics; however, it would be complicated to discuss construction without referring to structure; and it is not possible to deal with tectonics without having knowledge on structure and construction matters, besides expression. And construction becomes tangible through materials, and takes form by joining materials together. Therefore, from a comprehensive perspective, as the one used in this PhD thesis, the term tectonics involves material, construction, structural and expressive consciousness. And construction requires joining materials together.

The prior discussion presents an approach to tectonics, as well as construction and structure, basically from a theoretical and historical point of view. However, tectonics has also been approached from a more practical perspective. By practical I mean that it addresses such topic mostly through other mediums than pure text, such as technical drawings, diagrams, charts, inventories and images that refer to general concepts, as well as specific built examples and technical data of materials that is well-known within the domain of architecture practice, that is mostly occupied with the act of building. Such emphasis on the built, on what is tangible, discussed through HCH's built works and related data, through text as well as drawing and photo, has also been the primary concern of this PhD thesis. A significant example that takes that approach is the book Constructing Architecture: Materials, Processes and Structures; A handbook³⁵ (2005). It contributes with a comprehensive summary of building techniques, from a cultural, historical and technical position. The book is organized according to materials-modules, elements and structures, following an architecture hierarchy that corresponds to vocabulary, grammar and syntax in the field of language. As described by Andrea Deplazes it should be seen as "[...] a foundation that allows us to think about the complex métier of architecture"³⁶.

² On the side, he had a private office together with Viggo S. Jørgensen, who, at the same time as HCH, was in control of the other architecture department of the city architect's office. Together they developed some competition projects that received 1st and 2nd prizes, however only a few of them got to be built.

³ Poul Fiedler Holsøe (1873-1966) is a Danish architect who worked as a private architect and also held several public positions. He was Copenhagen's city architect (1925-1943) and thus became head of the country's largest collective architectural firm, where he and his competent employees came to decisively influence both Copenhagen's public buildings and Danish architecture in general, with an architecture aligned with the functional tradition. In addition to this, his origins as a student at the Academy of Fine Arts and at the office of the architect Hack Kampmann promoted a deep attachment to the classic tradition, which in different ways is recognizable throughout his career.

⁴ Frederik Christian Lund (1896-1984) was employed by city architect Poul Holsøe, succeeded him (1943) and held this position until 1966. He belongs to a group of architects who formed the first opposition to neoclassicism aesthetics and started the foundation of a Danish functionalism (Functional Tradition).

⁵ "Despite the hierarchical and collective character of the Department, Hansen had the possibility as a project leader to put a significantly independent mark on the cityscape of Copenhagen." Anne Beim and Marie Frier Hvejel, "The Ecology of Urban Tectonics – Studied in Everyday Building Culture of Hans Christian Hansen: Beyond Their Limits," in Structures and Architecture: 5.

⁶ Byggesagsarkiv organizes the information regarding buildings through its addresses. Therefore, the information saved below one address corresponds to all buildings (if more than one) and transformations of that location. It is then the researcher that should select the right building and project among all folders.

⁷ When I started this PhD thesis construction drawings corresponding to each of HCH's built works at Byggesagsarkiv in Copenhagen were still waiting to be digitalized. However they are now available at https://public.filarkiv.dk.

⁸ "Concrete and Print; Buildings and Words." Lecture held by Adrian Forty during the Environment Review Days 10 April -- Friday 12 April 2013 focusing on "The Project". Arranged by the strong research environment Architecture in the Making, (School of Architecture, KTH, 2013).

⁹ The architecture historian Adrian Forty explains that he started thinking about his next book about concrete at the last stages of his former book *Words and Buildings: A Vocabulary of Modern Architecture.* He claims that there were two reasons that made him think about writing a book on concrete: 1) He had been writing his former book from the library, sitting in a room, and he aimed at getting out more and going anywhere 2) and that he wanted to scape from working with the fugitive world of language, and instead work with something that had substance. And concrete seemed to offer that.

Lecture held by Adrian Forty "Concrete and Culture" (30-01-2012) within Mark Cousins' Architecture & Education series (AA School of Architecture, 2012).

¹ André Tavares, "Architecture brought to book: the monograph," in *The Architectural Review Issue* 1457, (December 2018/ January 2019) https://www.architectural-review.com/essays/architecture-brought-to-book-themonograph.

¹⁰ Peter Eisenman, Ten Canonical Buildings: 1950-2000 (Rizzoli International Publications, 2008).

¹¹ Raúl Marínez Marínez, "The methodological approaches of Colin Rowe: the multifaced, intellectual connoisseur at La Tourette," in Arq. Architectural Research Quarterly, v. 22, no. 3 (2018, Cambridge University): 205-213.

¹² "[...] part of the pleasure of architectural history comes on the one hand from examining the work and using that experience to test out theoretical propositions; and on the other hand, from bringing theories to interrogate the work. It's a twoway process, as a result of which both works, and theories are enriched [...] Thinking through objects and seeing through theory"¹². Adrian Forty, "Future Imperfect." Adrian Forty's Inaugural Professorial Lecture, delivered at UCL in December 2000, in Forty Ways To Think About Architecture. Architectural history and theory today (Ed. John Wiley & Sons. Ltd, 2014): 20.

¹³ Carlos Martí Arís, La Cimbra y El Arco (Fundación caja de arquitectos, 2005): 9.

¹⁴ Dansk Portafabrik, in Arkitektur 12 (1968): 286-287.

¹⁵ Categories: 1: Building types as, churches, daycares, schools, industrial buildings and housing, the types HCH was in charge of, 2: works positioned under the functional tradition, as what appears to be the background of HCH's works, 3: vernacular works, that might have influenced some of HCH's designs, 4: works developed by the City Architect's office and finally 5: works that use alike materials/ construction methods to HCH's works.

¹⁶ "Realism in Barcelona developed around a group that originated in 1951 and that was called *Grup R*. The group was committed to making exhibitions and political, economic, social, ... conferences, and above all to spread and discuss the Modern Movement in its second expansion phase". Oriol Bohigas, "Realismo, Urbanidad y Fracasos,"in *Lecciones/ documentos de arquitectura* (T6 ediciones S. L. Escuela Técnica Superior de Arquitectura. Universidad de Navarra, 2003): 11.

¹⁷ The "R" of *Grup R* stands for 1) Renovation, in continuity to the rationalist principles and avant-garde character of the GATPAC; 2) Revolution, against a certain type of conservative and monumental architecture identified with the Spanish political regime 3) and also Restoration, concerning local ways of building and the use of traditional materials represented through the Catalan Modernism and the vernacular Mediterranean architecture. Basically, the intention was to make architecture accessible -economically and culturally- for the population in relation to the Spanish delayed -industrial- development compared to other European countries.

¹⁸ "We started to formulate the ideal of realism -or critic realism- as an alternative to the idealism that we considered characteristic of the orthodox rationalism. All the Modern Movement -basic, fundamental, without one could do nothing- was a movement that had the problem of idealizing the realities of the world around us". Oriol Bohigas, "Realismo, Urbanidad y Fracasos," in *Lecciones/ documentos de arquitectura* (T6 ediciones S. L. Escuela Técnica Superior de Arquitectura. Universidad de Navarra, 2003): 8-9.

¹⁹ Kenneth Frampton, "Towards a Critical Regionalism: Six Points for and Architecture of Resistance," in *The Anti-Aesthetic. Essays on Postmodern Culture* (1983, Bay Press).

²⁰ Specific references on each publication about HCH's works are provided at chapter 1. Chronology under the column "dissemination".

²¹ Jørgen Sestoft, "Arbejder af Hans Chr. Hansen," in Arkitektur no. 4 (1972): 156-173.

²² Jørgen Sestoft, "Stadsarkitekten i København 1886-1986," in Arkitektur no. 6/7 (1986): 302-322.

²³ Martin Keiding, "Hvad Hvordan og Hvorfor. Interview med Even Brænne Olstad ved Martin Keiding," in *Arkitekten, no.* 8 (2013): 39-55.

²⁴ Anne Beim and Marie Frier Hvejsel, "The ecology of urban tectonics – Studied in everyday building culture of Hans Christian Hansen," in *Structures and Architecture:* Beyond their limits (Taylor & Frances, 2016).

²⁵ Kristian Seier, "Hans Chr. Hansen. Architect," Flickr 2010 https://www.flickr.com/photos/seier/sets/72157626209273636/with/5503278206/).

²⁶ Marie Kraul, "Fredningsforslag for Ringbo afvist: Vi kigger ikke på arkitektens navn, men på værket," in Byrummonitor, February 2022 https://byrummonitor.dk/Nyheder/art8613658/»Vi-kigger-ikke-på-arkitektens-navnmen-på-værket«.

Anne Pind, "Arkitekter mener: Red Ringbol," in Arkitekten no. 03 (2019) https://arkitektforeningen.dk/arkitekten/arkitekten-mener-red-ringbo/.

Nanna Urhbrand, "Kan vi Redde Ringbo?," in Landsforeningen for bygnings -og landskabskultur (December 2021) https://byogland.dk/nyhed/kan-vi-redde-ringbo/.

Mogens A. Morgen, Thomas Bo Jensen, Dorte Mandrup, Lars Juel Thiis og Kristian Seier, "Arkitekter i øpror: En skjult og umistelig perle skal nu rives ned- det er dumt og uetisk," in Berlingske (October 2021)

https://www.berlingske.dk/kommentarer/arkitekter-i-oproer-en-skjult-og-umistelig-perle-skal-nu-rives-ned-det.

²⁷ Data of the buildings are accessible at the building archive in Copenhagen and the database https://public.filarkiv.dk. Original drawings and memories, besides later transformations of the buildings can be found by introducing each address at the website. Unless information on Ringbo Psychiatric Hospital that is only accessible through the archive in Copenhagen.

²⁸ Kenneth Frampton, "Rappel à l'ordre: The Case for The Tectonic," (1990) in Theorizing a New Agenda for Architecture: An Anthology of Architectural Theory, ed. Kate Nesbitt (Princeton Architectural Press, 1996): 518-528.

- ²⁹ Ibidem: 526.
- ³⁰ Ibidem: 518.
- ³¹ Ibidem: 518.

³² Anne Beim, "Introduction: An Ecology of Tectonics," in Anne Beim, Charlotte Bundgaard, Karl Christiansen, Ulrik Stylsvig Madsen, ed., Towards an Ecology of Tectonics: The Need for Rethinking Construction in Architecture (Edition Axel Menges, January 2015): 20-23

³³ Eduard F. Sekler, "Structure, Consstruction, Tectonics," in Gypgy Kepes, ed., Structure in Art and in Science (New York: Braziller, 1965): 89-95.

³⁴ Ibidem: 89.

³⁶ Ibidem: 10.

³⁵ Andrea Deplazes, ed., Constructing Architecture: Materials, Processes and Structures; A handbook (Ed. Birkhäuser, 2005).

Methodological framework

"Recognition of the drawing's power as a medium turns out, unexpectedly, to be recognition of the drawing's distinctness from and unlikeness to the thing that is represented, rather than its likeness to it, which is neither as paradoxical nor as dissociative as it may seem."¹

Robin Evans, 1986

An established tradition in architecture

Drawings have provided architects with other mediums than text to analyze architecture history. Analytical, interpretative, and also speculative drawings have been employed to describe and discover characteristics of buildings that were or not intended by the architect, and therefore have developed new knowledge. The purpose of such drawings is divers. In some cases, drawings are mere descriptions or documentations, others its hypothetical character reaches beyond representation, and others bring up new realities. However, the analytical process always entails some level of interpretation of such reality, the built work, that is approached by the researcher and, in addition to the work's properties, depends on her interest and focus of attention. Besides architects, and art historians, architecture photographers have also provided with a way to look into architecture history. The next paragraphs aim at providing an overview of such scenario through an account of XX c. significant architectural historians and practitioners, as well as photographers, that investigated architecture works through drawing and photography. In continuity to this, the three investigations included in this PhD thesis -Cuts, Crops and Faults- that use architecture based tools as drawing and photography to explore HCH's built works through analytical and interpretative approaches should be recognized as one more contribution to an established tradition in architecture, and also in architecture photography.

Within the XX c. architecture context we should first introduce the art historian Rudolf Wittkower (1901-1971) and his investigations on the proportional system of Alberti's churches (1940's). Through diagrammatic single line drawings he intended to analyze and prove that Alberti's architecture was founded in rational and scientific criteria from the ancient classical architecture. Wittkower would base the proportional analysis on existing theory on proportion and apply it to his own drawings. However, it has been discussed that proportion differs from dimension: Whereas the first one is based on abstract principles and is related to geometry and can therefore be studied from distance; the second one relies on archeological findings and its irregularities, though needs to be examined on-site. Still, proportions and geometry should be based on some reliable measurements, that were not always accessible for Wittkower, since the IIWW made it not possible to travel².

Besides that, he also showed that the purpose of such drawings was beyond analyzing Alberti's architecture. Since with a focus on proportion one could produce comparable drawings of buildings that belonged to different historical times, with different expressions, though responded to the same mathematical rules³. In continuity to this, Wittkower used his studies on proportion and applied them to Andrea Palladio's architecture. Though again he had to base most of his drawings on published survey measurements available to him, instead of visiting the works. Wittkower recognized that by producing diagram drawings of plans, sections and elevations he could avoid archeological examinations and tectonic evidence, and still analyze what was of his interest, as proportions and harmony. Wittkower's studies had an influence in the architecture theory and practice of that time: Besides shedding light on the architect Andrea Palladio, he proved that renaissance architecture could also be acknowledged for its timeless principles, besides ornament and style. Through a series of line plan drawings on Palladio's Villas, he demonstrated that Andrea Palladio developed a generative project system that allowed him to design his villas according to variations of a nine square grid4.

The circumstances of the IIWW would not allow Wittkower to be on-site and therefore he had to deal with published sources to pursue his investigations. Besides that, because of his interest in something that was intangible, as composition and proportion, visiting the building was not essential. Alternatively, I could almost not find any published sources and archival information on HCH, however built works were in this case possible to visit. And different to Wittkower's condition, my focus of interest corresponding to HCH's works features, that is tectonic matters, made it almost a requirement to conduct this investigation from being on-site. Whereas other existing sources, as construction drawings, supplemented such approach.

The architecture historian and critic Collin Rowe (1920-1999), a student of Wittkower, would continue some of his investigations. He focused the comparative drawing analysis, through plans and elevations, on the geometry, composition and proportional system of modern and neoclassical architecture, such as Le Corbusier's and Andrea Palladio's Villas. that is explained in his seminal essay "The Mathematics of the Ideal Villa"5. Rowe starts with an analysis between Villa Savoye (1929) and the Villa Capra-Rotonda (1566-1569). After, he proceeds with Villa Stein (1927) and Villa Foscari, the Malcontenta (1550-60). And in 1973 he extends his essay with a comparison between Schinkel and late Le Corbusier, through the Altes Museum (1825-1828) in Berlin and the Palace of Assembly at Chandigarh (1951-1965). Distinct to Wittkower, it seems that Rowe did visit the buildings, or at least some of them, as the above mentioned essay also includes some photographies of the works. However, both the character of the text and the type of photographies put attention to abstract and contextual themes accordingly, that do not require a close examination of the built work.

Later, the architect Peter Eisenman (1932), who was influenced by the work of Rudolf Wittkower and his pupil, Collin Rowe, also Eisenman's teacher, focused his interest in the diagram as an analytical tool. However, Eisenman's diagram drawings are not represented through two dimensional plan drawings, as Wittkower and Rowe showed, but through volumetric constructions. In his PhD thesis⁴, *The Formal Basis of Modern Architecture* (defended in 1963 and published in 2006) Eisenman employs such analytical method to interpret eight masterpieces of modern architecture from the first half of the XX C. Later, he published the book *Ten Canonical Buildings: 1950-20007* in which he refines his analytical method and extents it to ten buildings of the second half of the XX c. In both cases, Eisenmann dissects the buildings through text, photos and diagrammatic drawings (in the last one basically through axonometric

drawings) willing to stress its hermeneutic character disconnected from program and context. Alternatively, he attempts at explaining that architectural form can be defined by four essential properties, such as volume, mass, surface and movement. In addition, whereas Wittkower and Rowe would only develop an interpretative analysis, Eisenman will also work with the generative role of such diagrams. As a practitioner architect he used similar diagrams as a generative tool for his projects. His experimental housing projects are shaped as a sequence of formal transformations, developed through axonometric diagrams, in which the final result is not possible to foresee in advance.

Such generative purpose of the mediums has not been part of this investigation. However, one could imagine that as a projective exercise the principles of three investigations could be employed as catalyzers to develop new proposals. In this way, through *Crops* or by defining a limited amount of materials an formats and also ways of putting them together one could suggest material continuities, and discontinuities, to be considered in one or more buildings; through *Cuts* or section drawings one could define a series of façade situations that should include the list of materials defined by *Crops*; and through *Faults*, one could interact with some intended inconsistencies and coincidences between distinct situations in one or more buildings, taking into account *Cuts* and *Crops*.

The architect and artist John Hejduk (1929-2000), who together with Peter Eisenman was part of the architecture group The New York Five, was also influenced by the work of Collin Rowe, who he got to know when teaching at Cooper Union. Hejduk inherited the nine square grid analytical diagram, initiated by Wittkower, and turned it into a generative tool to evaluate timeless problems of architecture such as center-periphery, fluidity-containment, and structure-plane in his series of houses "Texas Houses". Besides that, Hejduk was specially known for his didactic commitment and engaged his students at Cooper Union with some analytical, interpretative and generative exercises. He transformed the nine square grid analysis into the exercise "The Nine Square Problem". Students should first build a nine square model and after make a series of specific alterations⁸. In addition, he also developed the exercise "The problem of analysis". In this case, students were asked to choose one of the selected examples and analyze it by following their own focus of interest, with corresponding mediums, techniques and materials, in order to explicate something particular about the work. Such architecture work should be first studied from different positions in order to comprehend it, and after manipulated in means of formally dissecting it and assembling it again to gain an understanding of its means - which were or were not intended by the architect. Therefore students were asked to invent and create within the process of analysis: The analysis becomes a seed or a searching tool and process for the exploration and discovery⁹.

Again, this didactic role is not taken into account in this investigation, though it could be explored in the future. Since the three investigations have the potential to become didactic devices to analyze architecture built works. This would provide with a bottom-up and more interactive way to understand architecture history with a focus on tectonic issues.

Whereas the previous historians and critics of architecture seem to revolve and expand around the same issues, that originate with Rudolf Wittkower's nine square grid, the architectural historian and theorist Robin Evans (1944-1993) introduces a new focus into the relation between architecture and drawing. At his last book *The Projective Cast: Architecture and Its Three Geometries*¹⁰ he looks at the notion of *projection* from three positions: As the intellectual task of designing; as the drawing technique that basically adopts principles of geometry; and as the different realities of the *projection*. In regards to it, in his earlier essay "Translations from Drawing to Building"¹¹ he discusses the preconceived subordination of drawings, as *projection*, to the final built work. Instead, he claims that architects never get to work directly with "the object of their though", but with another in-between medium, usually the drawing. And such indirectness made architects' way of working, distinct to painters and sculptors¹². However, Evan's interest in drawing matters should not be misunderstood as an interest in the constitution of the drawing in itself, that apparently was the tendency in Evan's teaching environment at the AA School of Architecture in the 80's. Instead, his interest lays in the relations and transactions between the drawing and what it represents¹³.

Even though Evans refers to projective drawings, the discussion about the role of drawings is still valid for analytical drawings, and other mediums in general. If such mindset is adopted by this PhD thesis it should be stated that even though the reader might be tempted to evaluate the outcome and composition of the three investigations through their own features, this was never its primary intention. As it is explained in chapter 5, An *interpretative and analytical approach*, the main purpose of each investigation is to translate, and therefore transform, some of the built works' features into another medium that enables to see further than wandering around the buildings.

Moreover, Evans states that projective drawings historically have been usually dealt through orthographic projection drawings such as plans, sections and elevations. Something that he connects with the composition of ancient classical buildings, and he says it has later been embraced by the architecture of the Modern Movement, even though in some cases its composition principles might differ. In regards to this, he chooses the Berlin Philharmonic as an extreme example to discuss about the appropriateness, or not, of such orthographic drawing projective principle.

This type of orthographic drawings have deliberately been avoided in this investigation. Indeed, *Cuts* uses orthographic drawings, though these are of another character. Whereas Evans most probably refers to rather diagrammatic drawings that describe spatial or volumetric compositions and proportions of buildings, instead here drawing lines differentiate materials and building components and display how these are put together. In continuity to Evan's explanation, the believe is that there should be a correspondence with the chosen technique and tool, the features of the building to be analyzed, and the intention of the researcher.

Besides orthographic projective drawings of plan, section and elevation, Evan's later essay "The Developed Surface: An Enquiry into the Brief Life of an Eighteenth-Century Drawing Technique"14 sheds light on a drawing technique developed in XVIII c. baroque architecture that deal with the representation of interiors and consists of a plan and fours folded elevation drawings positioned in each side of the plan. Alternatively to other projective drawings, Evans sees such drawings as a total concept of design that integrate distinct elements the room is comprised of and that in general might not be considered within architecture: Wall coverings, plasterwork, floor, carpets and furniture were merged into each other and therefore equally contribute to the creation of a microclimate. He acknowledges that such type of projective drawings include and unify two often divided concerns, such as the materiality of the room and its experiential qualities, by employing a more phenomenological approach to designing that considered modes of occupation. The developed surface carried information about an interior in more detailed ways than general sections or elevations, and offered an opportunity to saturate the interior surfaces of each room with ornament.

It is precisely an interest in decoration and phenomenology what distinguishes Evans' investigations on baroque architecture and its drawings from the analytical, interpretative and generative drawings of Wittkower, Rowe, Eisenman and Hejduk. In a comparable way to the Developed Surface, *Crops* presents a material map that embrace occupation, but also transformation and decay, by showing things as found. Even though *Crops* is not a *projective* tool, but an analytical and interpretative device, however it manifests my own predisposition to consider within architecture also what is added through time and use, and that affects the tectonics of the building.

Rather dissociated to the previous architects' analytical and projective methods stands the work of the architect and artist Gordon Matta-Clark (1943-1978). His physical interventions into abandoned buildings seem relevant as a particular way to investigate architecture. First, such direct operations, even though not common within architecture as Robin Evans argued, are here considered as another choice into ways of investigation. Second, Matta-Clark addresses built works of architecture, though in this case abandoned or/ and unknown. Third, he documents such interventions through drawing, photography and photomontage, and also video, which adds other mediums than drawing to the discussion. He initiated such interventions because in need of finding workspaces in abandoned buildings, though such practices soon developed into an act of criticism against the capitalist use of architecture. Beyond Matta Clark's agenda, the execution of cuts and perforations would demand certain skills and a thorough analysis of the building, specially referring to construction, in order to avoid the building to collapse, or to make it collapse in an intentional way. Besides moving and exhibiting some of the manipulated materials from the building site to art galleries, Matta-Clark recorded such actions and processes very often through photomontages. Probably not intended by the artist, those images reveal construction matters and materials that become exposed through the physical action of cutting/ extracting. Such documentation that initially aimed at giving continuity to an action, would finally become the art piece in substitution to the action and the demolished building.

Matta-Clark's direct actions into built works, usually unknown, appear significant considering the main information source of this investigation, HCH's built works. Whereas previous examples employed the works or built works as subject of investigation, Matta-Clark employs them basically as mediums, and this PhD thesis uses them as both, subject and mediums. However, physical actions are here replaced by conceptual actions that produce *Cuts*, *Crops* and *Faults*. Besides that, photographic documentation of Matta-Clark's actions unveil ordinary materials and construction systems that were initially concealed in the integrity of the

built work. And this is similar to how Crops collects through photography a variety of ordinary materials put together in different configurations. The difference is that such photos conceal certain material dispositions and construction/ structural systems that require complementary data and skills to be unfolded.

Matta-Clark's approach is just an example of how the discussion of architectural analysis through drawing could also be extended to the artistic field. In this regards, architecture photography opens up another domain that has certainly contributed to the way we see, and therefore comprehend architecture history. In a similar way to Matta-Clark's registrations, that turned into an art piece in substitution of the real action and work, often the visual construction of a building through photography, and its reading, has also substituted the experience of the real built work. In this regards, a photography can be discussed through the image it creates, independent to what it represents, and through the message it communicates in relation to the thing it represents, in this case a building, that might or might not be aligned with the intention of the architect¹⁵. Something similar occurs with analytical/ projective architecture drawings, though such autonomy of the drawing is arguable. As explained before, Evans claims that the drawing's value lays in its relation to the built work.

The architect and photographer Ezra Stoller (2015-2009) is well known for his black and white photographies of modern movement architecture. What seems relevant to explain in regards to the development of *Crops* is the protocol Stoller developed before shooting in order to produce very carefully studied photographies. The day before he would approximate the building without a camera. He would look at how the sun affected the building, with its different shadows, and contemplate other changing factors. Then, he would create a shooting plan similar to a story board. In this way, he acknowledged that most of the task was done before the shooting day, when he took very few and well prepared photos, and made sure to leave chance and intuition out of it. Crops was developed following the opposite direction of Stoller's protocol. Without any preparation I visited the building with a camera in hand and shooting happened simultaneously to walking in a rather intuitive way. The viewfinder, as the hole to look through at the back of the camera, was kept close to the eye and employed as a framing device to select different materials and building components. Besides that, whereas Stoller used wide-angle and normal lenses to capture the full scope of architectural subjects, I took close up and normal photos in order to capture tectonic related issues.

Keld Helmer-Petersen (1920-2013), one of the best known Danish photographers shows a very distinct approach to Stoller. Through very thorough observation and an exercise of fragmentation he transformed everyday objects into rather abstract patterns and compositions. He concentrated on the mundane and saw photography as an artistic expression, situated next to paintings and graphics. He was inspired by the realism of the new objectivity that originated in Germany in the 1920's as a reaction against expressionism, and also by the ideas of the Bauhaus.

There are several coincidences between the character of Helmer-Petersen's photographies and the ones comprised in *Crops*. Both aim at capturing the ordinary, such as drains, cracks, wires, lamps, doors and other devices. The nature of those found objects within the city landscape, or within HCH's works, when decontextualized through the camera lens become new graphic and abstract compositions with its own attributes. Besides that, Helmer-Petersen would often use color photography, specially at the beginning of his career in a time where photography was still thought in black and white, and Crops is also displayed in color¹⁶. Certainly, this artistic quality of the photos is better explored and successfully achieved in Helmer-Petersen's photographies¹⁷, however the outcome of *Crops*' photographies also contain some of these aspects. It might be a coincidence, or not, that Helmer-Petersen took most of HCH's works photos presented at chapter 3, Hans Chr. Hansen's footprint. Though, in such case photos show rather complete images of the work within its close context, instead of fragments of the ordinary. A general revision of some of Kelmer-Petersen's architecture photographies show that he probably chose the fragmented approach when dealing with non-designed themes, such as industrial landscapes and harborsides in the outskirts of the city. Whereas when dealing with works designed by architects, he would usually aim at capturing its totality or a big part of it. "How can I tell what I think till I see what I make and do." $^{\!\!\!18}$

Christopher Frayling, 1993

Research into and through architecture

Besides contributing to the tradition of architectural analysis, that uses "non-verbal thinking"¹⁹ to investigate architecture works, the methodological approach of this PhD thesis should also be situated within ways of "art/ design research". On the one hand, the use of drawing and other mediums distinct to text, besides the fact of investigating architecture history through built works, positions this investigation into the context presented in the previous paragraphs. On the other hand, as a piece of research, it uses art/ design methodological approaches. In this regards, the following paragraphs intent at presenting such methodological framework, and to argue in what ways it shows deviations and correspondences with the employed methods of this investigation. This contextualization also pretends to discuss the approach of this project with a rather recent research methodology that incorporates a diversity of disciplines, though uses methods more common of the art/ design fields.

The object of study of this PhD thesis is HCH's architecture works. This situates the overall subject of this investigation in "research *into* architecture". Such suggested denotation should be seen as a variation of "research *into* art and design"²⁰, as one of Frayling's three categories within "art/ design research". In connection to this, HCH's set of architecture works should indeed be considered part of the history of architecture. However, this investigation does not primarily focus on pursuing a "historical research" of such works, defined by Frayling as one common theme of study within "Research *into* art and design", often pursued by other disciplines. Instead, it puts most attention into investigating HCH's built works of architecture from within the discipline of architecture itself, as described in the previous subchapter, and particularly focuses into the logic of building in regards to materials, construction, structure and expression, and its interaction.

Traditionally, it was common that the study of art/ design subjects was carried on by other disciplines, distinct to design and art²¹. In this case, one

could think of engaging with a "historical research" -into art and designfrom the discipline of art history developed through its own research methods -e.g. iconography, formalism, social history, biography and critical theory-. Nevertheless, in this case the investigation is approached by using architecture based methods, that derive from drawing and photography techniques, and have a special focus on the making. In this regards, the analytical process could be argued within "research through architecture". And again, this term should be seen as an interpretation of what was first defined by Frayling as "research through art and design".

By replacing "art/design" for "architecture" in regards to 1) subject and 2) method, the aim is to stress that 1) even though the materialization of architecture works might conceal and reveal distinct themes, not even pertaining to the field of architecture, however what is at stake here is fundamental to architecture; and 2) the applied tools, and related methods, to depict HCH's works are also essentially architecture based - even though those show some connections to the artistic and scientific domain, as explained throughout the description of the subchapter Crops in chapter 5. An interpretative and analytical approach.

Besides that, what applies to collecting and presenting existing information employs methods of "archival research". Though methodological pluralism, involving different methods and techniques, is rather common in such artistic practices, and those are considered embedded within the principle of this type of research²².

Today, within "design through research", it is acknowledged that experiments play an important role in generating knowledge. Such experiments can take the form of "explorations with mock-ups, prototypes, scenarios, models, design games, probes, artefacts, etc."²³ In this case, knowledge generation about HCH's works is pursued through a set of three investigations -*Cuts, Crops* and *Faults*- that take HCH's existing and accessible built works as point of departure. In addition, construction drawings available at Byggesagsarkiv in Copenhagen are also taken into

account. The decision to focus on the built, and construction drawings, which was determined since it was not possible to find documentation on HCH's life and working process, is already framing the character of such investigations. And this kind of "framing" is what in "research through design" is identified as a program²⁴.

Within research design practices it has been proposed to work with a program as an alternative to an hypothesis. Even though it has a more suggestive character, it also addresses some key issues, not only about the subject, but often also about the importance of how to approach it and with what materials/ mediums should it be formulated²⁵. Its open character acts as a framework which is somehow established at the beginning of the project, though it should be reformulated, expanded and made more specific, in close connection and almost simultaneously to the analysis, that is developed through a set of experiments. On the one hand, those experiments are not supposed to confirm or reject the program. Rather, experiments are expected to interpret the openness of the program, to better understand and reformulate it and unfold new experiments to sharpen knowledge generation²⁶. And it is common that several experiments are developed since this enables to interpret the program from different angles. On the other hand, a program gives some kind of intention and direction to the experiments²⁷. Finally, it is the continuous interaction between program and experiments that provides the definition of the research questions.

In this case, program and experiments, that are here addressed as investigations, have also arisen simultaneously, and as described above, one should not be understood without the other. However, alternatively to reformulating the program according to the progress and findings of the investigations, that is common in art/ design practices, here the *program* has remained rather stable, and because of that it has assisted in delimitating the scope of such investigations. In this way, the intuitive and unpredictable progress of each investigation has found some safe ground in the premises of the *program*. Another distinction is that often in art/ design research ways, the *program* is something given from the starting point to the researcher/s, which then changes according to each situation/ individual researcher. However, here it has been defined and developed as one of the tasks of this PhD thesis.

As already indicated, dealing with a specific set of built works, not only as subject, but also as main information source already sets up a framework to get started with the three investigations. However, the integrity of a built work could not be analyzed from direct experience on-site. There was a need to transform it into another type of format and material that one could interact with and reflect upon from off-site without physically manipulating the integrity of the built. Besides that, one could early identify that some features kept reiterating in each of HCH's works and across them. This fact probably inspired a certain way to proceed with the three investigations. Furthermore, it was considered appropriate to treat built works equally, independently of their program, location, construction date and size. Such approach would also promote comparison among works. Therefore, the same procedures were repeatedly practiced in each different work. In this regards, built works, and the notions of "transformation" and "repetition" have been crucial for the definition of a program, and therefore the development of the three investigations. In means of transferability, such program is what could be applied to other contexts, or alternatively be given to different researchers as a way to investigate the same/ similar subject, within the same common framework, though through a different set of investigations in each case²⁸. Finally, the analysis should be understood within the framework or program described below. The notions of "transformation" and "repetition" are further unfolded in two sub-chapters of chapter 5, An interpretative and analytical approach.

- Built works as main information source:

Using the existing built works, and construction drawings, not only for a descriptive purpose, but as a primary material source to unfold some reasoning beyond the works.

- "Transformation" of the built works (on-site) into manipulative and comparable mediums (off-site):

Utilizing architecture based tools, as drawing and photography, to depict the works in search of tectonic logic. This mediums should not be mere translations of the findings, but be considered "non-verbal thinking"²⁹ mediums.

- "Repetition" as subject and method of investigation:

Repetition of materials, formats, rhythms and compositions is found in HCH's works, specially within enclosures. Besides that, the notion of repetition entails a systematic way of approaching the analysis, that should be consistent across the investigation process.

Within architecture studies, "on-site work" should be seen in comparison to "field work" within social sciences. Here, "on-site work" has been approached through direct experience, or "bodily knowledge"30, situated within phenomenological studies. Besides that, empirical research has also been employed when dealing with the reality of the built as well as the corresponding construction drawings. According to Koskinen³¹, within "design research" there are three methodological directions: "the lab", "the field" and "the show-room". And such categories refer to traditional research traditions; natural sciences, social sciences and art, accordingly. This three categories have been later referred as establishing different relations between methodologies and experiments by Bang and Eriksen³². In relation to this, the three investigations -Cuts, Crops and Faults- should be considered in connection to "the field" and therefore "contextual knowledge generators". However, the common methods within this category, as ethnography and anthropology³³, differ from the architecture methods used in the three investigations here, as phenomenology and empiricism.

Besides having to do with "on-site work", the question is what is the role of the three investigations? The reason beyond such investigations is first to organize the collected data, and after to provide a description of the works, explore and analyze its features, and facilitate its interpretation. Two investigations emerged rather close together -Cuts and Crops- with a an exploratory and explanatory character, whereas Faults developed later after the findings of the first two and shows merely explanatory attributes. Besides that, the relation between Cuts and Crops is that they offer a complementary investigation of one topic: to reveal the invisible parts of the enclosures and to track material continuities, accordingly. In terms of building knowledge a typology of experiments has been suggested by Krogh, Markussen and Bang³⁴. In regards to this, Cuts and Crops, provide with an expansive³⁵ method of experimentation. As its name suggests their aim is to extend and broaden the knowledge on a certain topic. While Faults, in relation to the first two investigations, has a synthesizing³⁶ character by establishing a visual comparison between fragments of works.

There has also been an attempt to relate experiments' intentions to the different stages of a research project³⁷. The discussion is weather experiments have the purpose of guiding the research -exploratory-, making theory -move testing- or generating knowledge -hypothesis testing-. As mentioned above, *Cuts* and *Crops*, started with an initial exploratory objective, though in this case the development of each investigation, also lead to generating contextual knowledge about the works, with no need to start another type of investigation. The difference is that whereas *Cuts* uses a very well-known architecture method, as section drawings, *Crops* started in an undefined manner by dealing with an unexplored territory. Since making a material categorization and a map was not decided in advance, but it became apparent by interacting with the collected photos. Besides that, making theory was not considered at this stage, yet. Instead, it has been after, and by reflecting upon the development and results of the three investigations,

that HCH's works features have been discussed according to relevant tectonic theory.

Moreover, The Community for Artistic and Architectural Research (Ca2Re) has defined three parameters in Design Driven Doctoral research DDDr and state that one of them, "the systematic use of the design media and representational techniques", should be referred as "design driven research technique" - in difference to the other two parameters that have been suggested as "design driven research approach" and "design driven research method". And within this "family" of "techniques" three levels have been distinguished, depending on the objective of such techniques: 1) analytical or descriptive aims, 2) speculative or prepositive dimension and 3) a mix of the first two³⁸. Thus, it is clear that within the family of analytical or descriptive purposes, the researcher is not designing anything, as common within "arts/ design research". Though, the researcher imagines and provides with a tool/s to analyze/ interpret something that already exists, in this case HCH's works. According to such definition, the investigation Cuts has a rather descriptive focus, since most of the data could be obtained from the construction drawings and/ or checked on-site. Whereas the other two, Crops and Faults have a descriptive as well as interpretative character. Still, none of them should be considered a speculative tool. The believe is that one thing is to acknowledge the open character and visual outcome of the investigations and to imagine what could now emerge out of it, or how could those influence current practices. Whereas another thing is to recognize its original purpose: Data collection, analyzes and interpretation of the works from specific focuses through drawing and photography tools. In such visual story there is no room for speculation. It is only later in the investigation process when such findings are reinterpreted and discussed within theories and practices of tectonics (see chapter 6 and 7) that speculation -which is different than speculative design³⁹- is used to relate data and speculate on potential reasons/ scenarios behind certain tectonic approaches and features.

Therefore, investigations adopt an hermeneutic character, the one of offering three perspectives to look into HCH's works. Even though what the investigations contain is fragments of the built works (through drawing or photography), they succeed in providing new insights that one could not perceive while being on-site. Their intention is to concentrate in a rather small two dimensional space features that are already embedded in the reality of the works, though are difficult to distinguish from their entire and complex entity. Moreover, they enable comparison among works which are located in different contexts and therefore complicated to point at from direct observation. Thus, it is through an ongoing and playful interaction and dialogue between the researcher and the material itself (photos and drawings) that it is possible to establish connections by which certain patterns start emerging till a final version of each investigation succeeds⁴⁰. Such engagement with the material itself -the three investigations- is known through the concept of "material thinking", as an alternative to conceptual thinking⁴¹. It claims that materials are not passive objects, but have their own intelligence that come into play in interaction with the researcher's creative intelligence. Besides that, such visual character of the materials do not only represent or materialize an idea, though even more important, materials and processes are productive of such idea. Therefore it is through engaging with those materials that development and knowledge emerges.

Such idea of practicing with or using the materials has been connected with Heidegger's idea of manipulating things and putting them in use, what he referred as the notion of "handling"⁴². He stated that we do not know the world theoretically through contemplative knowledge, but we get to know it after we have come to understand it through active use, for example using/ handling a tool. This indicates that the success of understanding and referring HCH's works to some theories happens through first knowing about the specifics of his works, that were developed through a sustained architecture practice – HCH's practice.

Furthermore, it is also my practice experience, or tacit knowledge, on similar topics and ways of working that suggests a specific way to look into the works⁴³, or a special kind of "sight"⁴⁴. This type of ordinary practical knowledge is difficult to be articulated, intuitive and relies on improvisation learned by practice. And it has been referred as knowing-in-action⁴⁵.

The three investigations are referred with terms that indicate the outcome of an action that has (conceptually) provoked them -cutting, cropping, cracking-. Heidegger's idea of performing an action in order to get to know something, besides the ambition of making, has inspired the investigation's names. Cuts shows detailed facade section drawings that provide with different insights about the construction, structure and material composition of the enclosures; 2) Crops contain photo fragments that have been cut off from the original photo and formed into a two axis map. It reveals the reiterative use of five specific materials/ formats within one building and across buildings; 3) and Faults, which name refers to the two sides and fault line of tectonic earth cracks, demonstrates that HCH had a preference for some similar expressions which would then be constructed with different materials/ formats. Whereas others, it shows that he would design very different expressions through similar construction methods that remain rather concealed. However, here the process of a geological tectonic fault reverses.

The specificities of the investigations' outcome should be possible to read through its visual character, with no need to replicate such meaning into words. And the original version of such investigations, with minor format adjustments, have been included in the PhD thesis⁴⁶. With the intention to challenge the traditional format of a monography, as subject and approach have already been contextualized in the introduction chapter, there has been an attempt to put together the different materials comprised in this thesis as one folded/ unfolded compilation, that is referred as the PhD book. Following such investigations (see chapter 4), a description and reflection regarding its development has also been attached (see subchapters On cuts, On crops and On Faults in chapter 5), though this has a different character than a replica of its visual outcome.

As explained before the different investigations have already generated knowledge, however such insights are fully specific of the works. In this regards, this PhD thesis also aims at seeing such knowledge from a metalevel in order to situate the works into a broader discussion on tectonics. By looking into the investigations' findings again, together with the construction drawings of the projects, it was possible to detect that some tectonic themes reoccurred within the same works and across. And that such themes were relevant within discussions in the history of tectonic theories and practices.

Besides that, such reinterpretation of the findings and contextualization of the works would not have been possible without engaging with the notion of speculation (see chapter 6 and 7), as specifically described by the critic and architect Collin Rowe. He once explained that the British architect Gilbert Scott (1880-1960) said: "If you see a building with windows of a size to admit an appropriate amount of light, it may or may not be a work of architecture; but, if the windows are definitely too big or definitely to small, then you can be almost certain that you are in the presence of an architectural endeavor"47. And Rowe adds "I find this remark very relevant because, surely, architecture always involves an element of theatrical distortion or exaggeration [...]". Then, such not scientifically measurable condition -in this case the windows' dimensions- can only be addressed through the power of speculation. As one has to imagine what factors could have made such windows bigger or smaller other than light, or/ and other measurable conditions. Research into the built should provide the critic with some hints of the principles that made someone think and design those windows' proportions. However, interpretation often leads to more than one right answer, as designing is a continuous compromise among several wills, facts and conditions. Rowe says that " [...] the prelogical condition of architecture (which is its "mode of being" or its "existential predicament") should be a cause for satisfaction rather regret.

Architecture requires conjecture, and for this reason, those many characters who spend their lives in the attempt to render it independent of speculation should be regarded with intense suspicion".

Indeed, the uncertain and conditional qualities of speculating are not the cause of dealing with the remaining built, as an alternative to other sources, as for example an architect's statements or written sources on his/ her life and works. Definitely speculation is related with interpreting the open nature of design practices as architecture. Therefore, the source material, the critic's intuition and well-founded argumentations become key in the investigation process. Once this said, speculation should not ask for fantasy and myth. On the contrary, the need to reason through speculation here relates to staying as close as possible to HCH's built works, and to engaging with the different processes that lay beyond them by reading beneath the mere visible. And ultimately, probably getting to know some of HCH's way of thinking and making that, to some degree, has influenced an intricate design process materialized into built works of architecture⁴⁸.

What has been discussed here aims at methodologically contextualize most part of this PhD thesis. It applies to what refers at analyzing, interpreting and contextualizing HCH's works (chapters 4, 5, 6 and 7) and should be framed within an established tradition of architectural analysis and also within "research *through* design", as it has been presented in these two sub-chapters. Research questions three and four are connected to it: "How to embed HCH's built works into a tectonic discussion?" is an overall question related with the analysis of the works that is addressed through the three investigations (see chapter 4). Whereas "What are HCH's works tectonic characteristics?" aims at interpreting such investigations and contextualize the findings within relevant tectonic concepts (see chapters 6 and 7).

Besides that, chapters 2 and 3 are situated within "archival research" methodology. Research questions one and two are connected to it:

"What is HCH's oeuvre comprised of?" is answered through a brief account of HCH's works, both built and unbuilt, together with a review of the works' dissemination in local magazines and a few books (see chapter 2). Following this, a series of cards display HCH's 17 built works through basic data, construction drawings and photography (see chapter 3). While the research question "In which architectural milieu did HCH's works emerge?" is addressed by briefly describing potential relations between HCH's works and other local works, basically found in Danish magazines (see chapter 2). Even though chapters 2 and 3, developed through "archival research" are also mostly presented through visual mediums, its development should not be compared with the visual character of chapter 4. While the visual result of chapter 4, Investigations derives from an exploratory process of interaction, already referred as "material thinking", the visual result and alternative formats of chapter 2, A Chronology and chapter 3, Hans Chr. Hansen's footprint aim at merely explaining and presenting some archival information, by using more successful mediums and layouts than formal written text.

² Francesco Benelli, "Rudolf Wittkower versus Le Corbusier: A Matter of Proportion," in Architectural Histories, 3 (2015): 1.

³ A pencil drawing from 1940 shows a comparison between the façade of Santa Maria Novella and the Pantheon. Francesco Benelli, "Rudolf Wittkower versus Le Corbusier: A Matter of Proportion," in Architectural Histories, 3 (2015): 2.

⁴ Rudolf Wittkower, Architectural Principles in the Age of Humanism (Alec Tiranti, London, 1967).

⁵ Collin Rowe, "The Mathematics of the Ideal Villa," in The Mathematics of the Ideal Villa and Other Essays (The MIT Press, 1976): 2-28.

⁶ Peter Eisenman, The Formal basis of Modern Architecture (Lars Mueller Publishers, London, 2006).

⁷ Peter Eisenman, *Then Canonical Buildings*, 1950-2000 (Rizzoli International Publications, 2008).

⁸ Lisseth Mireya Estrella Cobo, PhD thesis, John Hejduk y la pedagogía de proyectos arquitectónicos: Cooper Union 1964-2000 (Escuela Técnica Superior de Arquitectura de Madrid, 2021): 61-69.

⁹ Ibidem: 77-79.

¹⁰ Robin Evans, The projective Cast. Architecture and Its Three Geometries (The MIT Press, 1995).

¹¹ Robin Evans, "Translations from Drawing to Building (1986)," in Translations from Drawing to Building and Other Essays (The MIT Press, 1997).

¹² Robin Evans, "Translations from Drawing to Building (1986)," in Translations from Drawing to Building and Other Essays (The MIT Press, 1997): 154.

¹³ Joseph Bedford, "In Front of Lives That Leave Nothing Behind," in AA Files n. 70 (2015): 6.

¹⁴ Robin Evans, "The Developed Surface: An Enquiry into the Brief Life of an Eighteenth-Century Drawing Technique (1986)," in *Translations from Drawing to Building and Other Essays* (The MIT Press, 1997): 195-232.

¹⁵ Julius Shulman, Photographing architecture and interiors (Balcony Press, 2000).

¹⁶ The color palette of HCH's works is not discussed in this investigation. However, intentionally photos comprised in *Crops* are printed in color, since color and color configurations appear to be one of the chosen materials.

¹⁷ Keld Helmer-Petersen, Keld Helmer-Petersen – 122 Color Photographs (Errata Editions, 2012).

¹⁸ Referring to the quote "How can I tell what I say till I see what I say", the Swedish sociologist Richard Swedberg mentions that "it is probably this vague but suggestive link to creativity that explains why the aphorism has been so popular

¹ Robin Evans, "Translations from Drawing to Building, 1986" in *Translations from* Drawing to Building (The MIT Press, 1997): 154.

with writers and scientists". Christopher Frayling uses a modified version of such quote "how can I tell that I think till see till I see what I say" to exemplify the character of "research into art and design" and modifies it to "how can I tell what I think till I see what I make and do" to refer to the second category "research through art and design.

Christopher Frayling, "Research in Art and Design," in Royal College of Art Research Papers, v.1, no.1 (1993/4): 5.

¹⁹ Javier Giron, "Seeing The Invisible. Analytical Drawings by Construction History Pioneers. Research Filed Overview," in Architecture and Engineering Vol. 6, no. 1 (2021): 3-4.

²⁰ Christopher Frayling defined three types of research in art and design as "research into art and design" (art/design as the object of research and often pursued by other disciplines); "research through art/ design" (the research process provides knowledge that is independent of the actual art object/s, which can be related to the art discipline or others, as an alternative way to more established research disciplines); and "research for art and design" (art/ design is the proper goal of the research. The art process and final object or artefact is a central component of gaining knowledge in the art/ design field).

Christopher Frayling, "Research in Art and Design," in Royal College of Art Research Papers, v.1, no.1 (1993/4): 5.

Christopher Frayling develops such categories based on Tom Jones'article "A discussion Paper on Research in the Visual Fine Arts Prepared for the Birmingham Polytechnic, England, in 1978," in *Leonardo*, v.13, no.2 (Pergamon Press, 1980): 89-93.

²¹ Jones initially clarifies that one thing is "research through/ for art", which both use artistic methods and tools, while another thing is "research into art", as the subject of research, and this can be achieved from a historical, philosophical, social and phsycological focus. The particularity is that in such cases the research process is more common of each one of such disciplines, and therefore has little to do with the discussions between design/ art and research.

Tom Jones, "A discussion Paper on Research in the Visual Fine Arts Prepared for the Birmingham Polytechnic, England, in 1978," in *Leonardo*, v.13, no. 2 (Pergamon Press, 1980); 91.

²² Edite Rosa and Joaquim Almeida, "Conclusions and reflections from the Book 2 and for the CA2RE/CARE+ program," in 2 Evaluation of Design-Driven Research (2022): 519.

²³ Anne Louise Bang and Mette Agger Eriksen, "Experiments all the way in programmatic design", in Artifact: Journal of Design Practice, v. 6, no. 1 & 2 (2019):
 2.

²⁴ Ibidem: 3.

²⁵ Eva Brandt, Johan Redström, Mette Agger Eriksen and Thomas Binder, *XLAB Documenta* (The Danish Design School Press, 2011): 35.

- ²⁶ Ibidem: 25.
- 27 Ibidem: 35.

²⁸ Eva Brandt, Johan Redström, Mette Agger Eriksen and Thomas Binder, *XLAB Per.Form* (The Danish Design School Press, 2011): 5.

²⁹ Javier Giron, "Seeing The Invisible. Analytical Drawings by Construction History Pioneers. Research Filed Overview," in *Architecture and Engineering* Vol. 6, no. 1 (2021): 3-4.

³⁰ "The theme of unreflective action, non-conceptual content and embodied knowledge is explored in phenomenology, which, starting with Husserl and continuing via Heidegger and Merleau-Ponty, has focused attention on the nature of perception and the constitution of intentionality and normativity, beyond an ontology in which the world was thought to be independent of our situatedness. In the work of Maurice Merleu-Ponty, embodied knowledge is also concretely "bodily knowledge". The *a priori* of the body assumes the place of the *a priori* intellectual knowledge, making the pre-reflective bodily intimacy with the world around us into the foundation of our thinking and acting. By virtue of our bodily constitution and our bodily situatedness in the world, we are capable of 'getting a grip on the reality' as we observe, learn and act, and of 'acting and flow' prior to any reflection and without any rules".

Henk Borgdorff, "The production of knowledge in artistic research," in The Routledge Companion to Research in the Arts (Routledge, 2010): 59.

³¹ Categories were thought within "constructive design research", suggested by Kostinen et al. (2011) as a development of the concept of "research through design" by Frayling (1993/4).

Anne Louise Bang and Mette Agger Eriksen, "Experiments all the way in programmatic design", in *Artifact: Journal of Design Practice*, v. 6, no. 1 & 2 (2019): 3.

³² Ibidem: 3.

33 Ibidem: 4.

³⁴ Peter Gall Krogh, Anne Louise Bang and Thomas Markussen, "Ways of Drifting – 5 Methods of Experimentation in Research through Design", in ICoRD 15 International Conference on Research into Design, Indian Institute of Science, Bangalore, 7-9 January (2015).

³⁵ Ibidem: 7-9.

³⁶ Such type is not suggested by Krogh, Bang and Markussen. Ibidem.

³⁷ These categories were suggested by Donald Schön (1983).
 Anne Louise Bang and Mette Agger Eriksen, "Experiments all the way in programmatic design", in *Artifact: Journal of Design Practice*, v. 6, no. 1 & 2 (2019):
 4.

³⁸ Edite Rosa and Joaquim Almeida, "Conclusions and reflections from the Book 2 and for the CA2RE/CARE+ program," in 2 *Evaluation of Design-Driven Research* (2022): 532-535.

³⁹ The term 'speculative design', first popularized by Anthony Dunne and Fiona Raby, considers and draws on provocative future scenarios in order to initiate discussions on future challenges. And the term 'speculative research' refers to a broader concept that embraces alternative research approaches within the field of social sciences. Besides that, within architecture practices we refer to 'speculative design' when dealing with imaginative and radical practices that generate ideas/ works that challenge the current state of architecture. In common, these existing concepts on 'speculative design/ research' address the future state of things and themes, whereas this PhD thesis aims at employing an alternative approach to look at the architecture history. ⁴⁰ "As usual in practice-based research in Art and Design, there is no 'right way' to analyse research findings. Coffey and Atkinson urge us to be 'artful' and 'imaginative' but also 'rigorous'. Qualitative analysis is 'intellectual craftmanship' playful but methodical and intellectually competent". Carole Gray and Julian Malins, Visualizing Research. A Guide to the Research Process in Art and Design (Ashgate, 2004): 132.

⁴¹ Paul Carter, Material Thinking (Melbourne University Press, 2004).

⁴² Barbara Bolt, "Materializing pedagogies," in Working papers in Art & Design, v.4 (2006).

⁴³ "Especially in artistic research - and entirely in line with the creative process- the artist's tacit understandings and her accumulated experience, expertise and sensitivity in exploring uncharted territory are more crucial in identifying challenges and solutions than an ability to delimit the study and put research questions into words at an early stage. The latter can be more a burden than a boon". Henk Borgdorff, "The production of knowledge in artistic research," in *The Routledge Companion to Research in the Arts* (Routledge, 2010): 56.

⁴⁴ Barbara Bolt, "Materializing pedagogies," in Working papers in Art & Design, v.4 (2006).

⁴⁵ "[...] when we reject the traditional view of professional knowledge, recognizing that practitioners may become reflective researchers in situations of uncertainty, instability, uniqueness, and conflict, we have recast the relationship between research and practice. For on this perspective, research is an activity of practitioners. It is triggered by features of the practice situation, undertaken on the spot, and immediately linked to action [...] the exchange between research and practice is immediate, and reflection-in-action is its own implementation. Donald A. Schön, The Reflective Practitioner: How Professionals Think in Action (Basic Books, 1983): 308–309.

⁴⁶ "[...] the sole use of written language for many disciplines is restricting: It is 'language doing the work of eyes' or ears for the matter. Inevitably when an idea is translated from one medium to another it loses some of its meaning and power. The verbal description of a Mozart symphony is obviously qualitatively different from hearing the actual music. The closer one can get to the medium of the original idea or experience the more likely it is to have impact and meaning. The word 'idea' is closely related to the Greek verb 'to see' -how often do we say 'see what I mean'?

Carole Gray and Julian Malins, Visualizing Research. A Guide to the Research Process in Art and Design (Ashgate, 2004): 95.

⁴⁷ Collin Rowe, "Questions For Collin Rowe," in Any 7/8 Form Work: Collin Rowe (1994): 34.

⁴⁸ "[...] the real critic considers the same problems as the author, both formulate the same questions, share the same interests [...]". Carlos Martí Arís, La Cimbra i El Arco (Fundación caja de arquitectos, 2005): 17.

A chronology

73 Biography

Works

1901 • 22nd September: Hans Christian Hansen (HCH) born in Odense. Son of Peter Christian

Hansen and Karen Marie Rasmussen. Weilbachs Kunstnerleksikon

1919 • HCH graduates as a carpenter from Odense Technical School. Weilbachs Kunstnerleksikon.

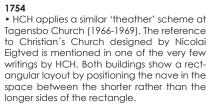
1923 • HCH travels to Germany. Weilbachs Kunstnerleksikon. • HCH enters The Royal Danish Academy of Fine Arts. Weilbachs Kunstnerleksikon.

1925 • HCH travels to Sweeden. Weilbachs Kunstnerleksikon. Contextualization

Around 1650 • Usually HCH's works embrace different programs beneath a regular facade covering. In a similar way, the uniform expression of the facade of this Danish vernacular building conceals a sequence of different housing units in Samsø.



Around 1750 • HCH uses a resemblant plaster and color at the north facade of Skydebanehaven Child-care (1948-1950) to this one seen in several houses from XVII c. along the canal in the center of Copenhagen.





1904

 HCH's Svanemølle Transformer Station (1966-1968) exposes the wooden formwork employed during the construction of the reinforced in-situ concrete shell. The architect's choice to utilize process materials and techniques as part of the expression of the building is also seen at Otto Wagner's Post-al Savings Bank in Vienna. In this case, the brick bearing structural facades are covered with granite slabs in the base part and thin stone panels in the upper part. Both are fixed with aluminum and iron bolds to the brick wall beneath. Such fastenings, that allowed marble slabs to be applied faster since the fixation guaranteed their positioning during the mortar's long drying time, are also part of the building's expression today.

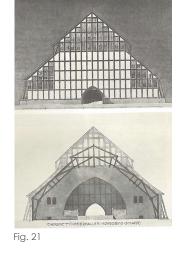


1908 • The tripartite composition and leaning fa-cade gesture exposing a rhythm of pillars with different depth at HCH's Nyborggade

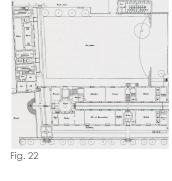
Peter Behrens' AEG Turbine Factory. Both facades show references to the convex curve of Greek columns, known as Entasis.



• HCH's facade logic between brick/ Eternit and wood profiles seen in Skydebanehaven Childcare (1948-1950)/ Hanssted School (1954-1959) is comparable to the half-tim-



1915 HCH's Gasværksvejens School (1969-1971) shows a similar organization of volumes and program -classrooms and staircases- as Karl Johan School in Göteborg designed by E. G.



1923 • Even though HCH's first works appear similar to the contrast between massiveness and fenestration of Hornbækhus housing by Kay Fisker, and other buildings postioned within the Danish 'Functional Tradition', however later works show a different character of the facades. In this case, light coverings embrace the structural layer beneath and components, as windows and doors, within the same veil. Expression-wise the prefabricated character of wall and

windows seems blured.

Dissemination

Transformer Station (1958-1961) resembles

Fig. 20 1914

bered facade of the project for the Baltic exhibition in Malmo by P. V. Jensen and Kaare Klint.

Asplund.

1926 HCH exhibits at the Charlottenborg Spring Exhibition. Weilbachs Kunstnerleksikon.

1927 • HCH receives L. Sørensen and Architect A. Sørenesen's Scholarship. ₩eilbachs Kunstnerleksikon.

1928 • HCH graduates from The Royal Danish Academy of Fine Arts. Weilbachs Kunstnerleksikon.

• HCH is employed at the office of the City Architect in Copenhagen (P. Holsøe). Weilbachs Kunstnerleksikon.

1930 • HCH receives KA Larssen Scholarship. Weilbachs Kunstnerleksikon.

1931 • HCH travels to Czechoslovakia Weilbachs Kunstnerleksikon. • HCH marries Valborg Henriette Laurine Hougaard Jensen. Weilbachs Kunstnerleksikon.





Fig. 2

1934 HCH and VSJ. Competition project of a tribune for Idrætsparken football field (1st prize). Demolished in 1990. Jørgen Sestoft, "Arbejder af Hans Chr. Han-sen," in Arkitektur 4 (1972): 156-173.



1936 • Between 1936 and 1942 HCH and VSJ designed different furniture and cutlery pieces. Danish Design Museum.



1937 • HCH & P. Holsøe. Buitl project. Emdrupgaard orphanate.



• HCH receives the "Academi Lille Guldsmedalje" for the design of a single family house, "Honorary residence for a skilled man" Weilbachs Kunstnerleksikon.

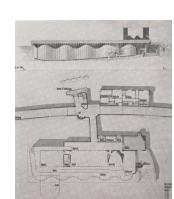


Fig. 6

1938

hæfte (1938).



1926 • HCH uses fiber cementeous plates at Hanssted School's facades. Materials and uniform expression relate to the photo of a warehouse advertising the potentials of the new material *-Martinit-* in one of the issues of a Danish journal, Krytisk Review, as an alternitve to brick and wood vernacular constructions.



• HCH's transformer stations large facades show the repetition of certain tectonic details to scale down the magnitude of such technical facilities. Amager Transformer Station, also built by the City architect's office a few years before, elaborates with the detailing of brick stacking to provide the flat large facades with an horizontal texture. Besides that, the position of windows just below the cornice is often seen in HCH's works.



1928

• HCH's transformer stations often exhibit profiled reinforced in-situ concrete loadbearing facades. Such tectonic feature relates to the concrete shell of Brønshøj Water Tower designed by Ib Lunding and Poul Holsøe.



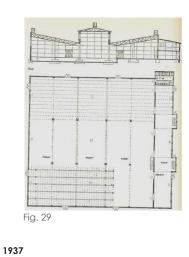
1931 • HCH employs round glass blocks inserted in prefabricated concrete elements at the back facade of Bellahøj Transformer Station (1961-1968). Descent Towers at the underground water reservoir in Tinghøj (Gladsaxe) designed by Ib Lunding uses similar glass blocks to provide light to the underground program.



1932 • HCH's laundry building in Sundholm (1938-1941) exhibits a comparable concrete structure and roof profile to the buildings of the Meatpacking district in Copenhagen designed by Poul Hølsoe, Curt Bie and Tage Rue. However, while the first one shows a facade with an exposed concrete structrure filled in between with yellow brick work, the second one exposes smooth white plastered facades.



1936 • HCH's Laundry facility in Sundholm (1938-1941) presents a plan geometry which resembles Poul Henningsen's Laundry building.



• HCH employs fiber cementeous plates in several occasions. As a young architect travelling to Paris he might have been inspired by the Swiss Pavilion at the "International Exposition of Art and Technology in Modern Life", where he exhibited some furniture. Besides employing fiber cementeous plates, the pavilion shows a vertical rythm of slender structural profiles inclined at the cornice. Such fetaures are present in some of HCH's works.



 $\ensuremath{\cdot}$ While in Paris, HCH possibly saw the Finish Pavillion designed by Aino and Alvar Aalto. In that same year, HCH proposes a 'free' and onlaulated facade geometry for a housing project that received the "Academi Lille Guldsmedalje" which resembles the stag-gered facade of the pavilion.

• HCH receives C. F. Hansen's medal Weilbachs Kunstnerleksikon.

• HCH exhibits at the Charlottenborg Spring Exhibition. Weilbachs Kunstnerleksikon. • Between 1935 and 1941 HCH and VSJ design pieces of furniture. Design Museum Danmark.

1935

1938

• HCH receives the Zacharias Jacobsen

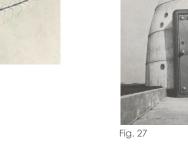
• HCH travels to Germany, Yugoslavia, Greece, Italy, Switzerland, Holland and Bel-

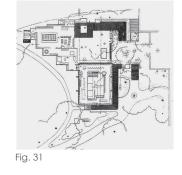
Scholarship. Weilbachs Kunstnerleksikon.

gium. Weilbachs Kunstnerleksikon.

1937 • HCH travels to Sweeden and England. Weilbachs Kunstnerleksikon. • HCH exhibits at the Charlottenborg Spring Exhibition. Weilbachs Kunstnerleksikon.







• While in Paris HCH probably also visited the Pavillion Des Temps Nouveaux designed by Pierre Jeanneret and Le Corbusier. HCH's lightweight coverings and horizontal fragmentation seen at Bellahøj (1961-1968) and Amager (1966-1968) Transformer Stations relate to the canvas covered facade and composition of the French pavilion.



• HCH uses exposed hollow concrete blocks at Bellahøj Garage (1961-1968) and Ringbo Psychiatric Hospital (1961-1963). Similar blocks are seen at Poul Henningsen's family home, designed by himself and Viggo Møller- Jensen.



 HCH's Tagesnbo Church clock tower (1966-1969) shows an alike expression to the Aarhus City Hall clock tower designed by Arne Jacobsen and Erik Møller. The main difference is that HCH employs in situ casted concrete instead of stone.



• HCH's experimentation with concrete and light materials is seen at Systemhuset housing. While HCH totally or partly conceals concrete by covering it with weightless materials, Mogens Lassen exposes the concrete skeleton and fills it in-between with



Fig. 34

light materials.

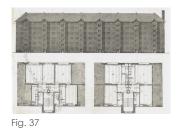
1939HCH utilizes horizontal and inclined facade compositions at Bellahøj (1961-1968) and Amager (1966-1968) Transformer Stations which remind of vernacular industrial buildigns as Lilleskov tegleværk near Tommerup. A building deisgned to dry clay building materials. While the vernacular example is built of wood and with the purpose of allowing ventilation through the building, transformer stations are built of Eternit plates and such inclined disposition of the covering part of the facade relates to issues of scale and context.



• HCH's use of exposed concrete mixed with squared concrete blocks in Bellahøj (1961-1968) and Amager (1966-1968) Transformer Stations is seen at a housing block and post office in Vesterbro designed by Edvard Thomsen.



1940 • HCH's housing project in Hulgårds Plads (1943-1945) shows a sequence of vertical elements corresponding to the balconies that provide rythm to the long facade. A similar feature is used at Stefansgaarden housing block designed by Kay Fisker and Eske Kristensen, though here related to the position of staircases.



1939 • HCH receives the Zacharias Jacobsen Scholarship. Weilbachs Kunstnerleksikon. • HCH exhibits at the Nord Grafik Union, Helsingfors.

Weilbachs Kunstnerleksikon. • HCH travels to Sweden, Finland, Russia and Estonia.

• HCH writes a review of the furniture exhibi-tion "Snedkerlauget". The writing shows that he is familiar with the carpentry works of that time. Hans Chr. Hansen "Snedkerlauget 13. Møbe-

1941

tower.

• HCH writes a review of the Charlottenborg

Spring Exhibition. Overall the author seems

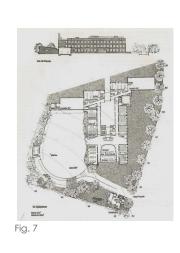
pleased with the quality of the materials exposed. One of the comments is in regards The Aarhus Townhall. In a personal level he points at the bad placement of the clock

Hans Chr. Hansen "Foraarsudstillingen paa Charlottenborg," Arkitekten u (1941): 73-74

holm.

• HCH & P. Holsøe. Laundry building for Sund-

• HCH and VSJ. Competition project for a School in Herning (2nd prize). "Gymnasium i Herning" in Arkitekten uge-



Church in Copenhagen. Weilbachs Kunstnerleksikon.

1939

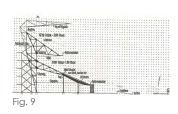
ludstilling," Arkitekten u (1939): 189-141

Danmarks Kunstbibliotek.

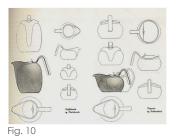
HCH and VSJ. Competition project for a



1940 • HCH's analysis of a stadium facility visited during a study trip in Rotterdam. Feijenoord Stadium, designed by Brinkmann and Van der Vingt. Hansen, H. Chr., "Et Stadionanlæg," in Arkitekten Ugehæfte 4 (1940): 17-18.



1941 HCH and VSJ. Design of a coffee and tea set for A. Michelsen. "Arkitekter som Sølvsmode," in Arkitekten ugehæfte (1941): 9-10.



1942 • HCH and P. Holsøe. Nørrebro Vænge Housing.

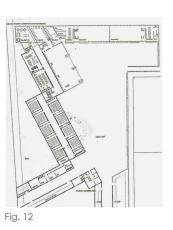
1942 • HCH's Skydebanehaven Childcare (1948-1950), Hanssted School (1954-1959) and Ring-



• HCH and VSJ. Competition project for a Church in Munkebjerg neighborhood in Odense (1st prize). Møller E., "Konkurrencen om en Kirke i Munkebjergkvarteret, Odense," in Arkitekten Ugehæfte 36 (1942): 193-198



• HCH & VSJ. Competition project for Mosegaard School in Gentofe (2nd prize). Lund, F.C., "Konkurrencen om Mosegaardssi Gentofe" in Arkitekten Maaned nalan shæfte 5 (1943): 65-80.



1943 • City architect P. Holsøe is replaced by F.C. Lund.

 HCH receives Ckersberg Medal. Weilbachs Kunstnerleksikon.

 HCH exhibits at the Charlottenborg Spring Exhibition. Weilbachs Kunstnerleksikon.

1944 • A discussion about the similarity between 1) HCH's and VSJ design of a first prize com-petition project for a Church in Munkeb-jerg neighborhood in Odense 2) and Erik's and Aage's Holt design and built project of Hyltebjerg Church in Vanløse. Thomas Havning, "Bygningspredning", Arkitekten Maanedshæfte 19 (1944): 85-88.

1943 • HCH, P. Holsøe and F.C. Lund. Hulgårds Plads Housing



1944 • HCH, VSJ and Henry Luckow-Nielsen. Competition project for a memorial for the astronomer and physicist Ole Rømer in the Park next to Aarhus City Hall (2nd prize). "Konkurrencen om et Minde for Ole Rømer," in Arkitekten Ugehæfte 11 (1945): 45-47.



1946 • HCH. Project for an orphanate at bakkegaardens, Bagsværd.



1948 • HCH, P. Holsøe and F.C.Lund. Skydebanehaven Childcare.



1949 • HCH and VSJ. Næstvæd Chapel, Næstved.



1950 • HCH and F. C. Lund. Competition project. Langelinie pavilion.

Fig. 15

bo Psychiatric Hospital (1961-1963) facades monotony, rhythm and colors besides the use of large roofs connect with the drawing of a library project to be built as a memorial to Vitus Bering and designed by Kaare Klint. While probably Klint's facades would have been made of traditional materials as wood and brick, HCH's facades experiment with distinct materials, a combination of traditional and new ones.



1943 • HCH's Hulgårds Plads housing blocks (1943-1945) are built with balconies framed within two vertical brick walls. Such framing makes the balconies appear as niches. We see a comparable example at Dronningegåarden housing designed by F.C. Lund, C.F. Møller, Kay Fisker and Svenn Eske Kristensen. However here the framing is given by the the horizontal and vertical axis.



• HCH's use of ordinary and cheap materials as Eternit, wood and brick is seen at Atelierhusene, a housing and studio compound for artists designed Viggo Møller-Jensen. "Atelier-Huse ved Uterslev Mose," in Arkitekten m (1943): 134-140



1943 Hulgårds Plads Housing is mentioned in a list of projects developed in the Copenhagen's municipality during 1925-1943. Poul Holsøe "Arbejder udført af Stadsarkitekten i København 1925-1943," in Arkitekten m 11 (1943): 170.



• Nørrebro Vænge Housing and Sundholm Laundry building are mentioned in a list of projects developed in the Copenhagen's municipality during 1938-1943. Poul Holsøe "Arbejder udført af Stadsarkitekten i København 1938-1943," in *Arkitekten m* 10 (1943): 146, 156.



Fig. 57

1949 • HCH utilises Eternit tiles for the roofing at Bremerholm Transformer Station (1962-1963). Such material is used for the covering of the balconies at Voldeparken housing blocks designed by Kay Fisker.



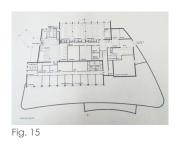
1950 • HCH's Hanssted school (1954-1959) belongs to a low scale type of school popular in Denmark during the post war period. Hower HCH uses a more cost-effective scheme than other similar schools by putting two sections, one on top of the other. Such typology and cost awareness relates to New Østensgård School in Valby designed by F.C. Lund and Knud Holmgård. In this case, the low-cost character is implemented through the reuse of old barracks placed in a new configuration.





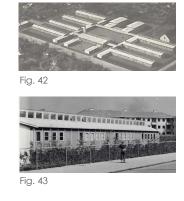


1950 • HCH and F. C. Lund. Competition project. Langelinie pavilion.

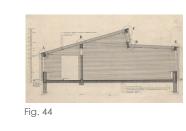


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1950



1951 • HCH's Hanssted school (1954-1959) low scale scheme and section connect with Munkegård School in Gentofte designed



with Arne Jacobsen.

1952

 HCH's interest in investigating with concrete and light materials makes it comparable to different projects by Viggo Møller-Jensen, as this housing block at Falkoner Allé, Copenhagen. Whereas HCH applies concrete as a concelaed shell and light materials as coverings, usually corresponding to the design of technical facilities, Viggo Møller- Jensen employs concrete as a skeleton and light materials as in-fill, in relation to housing projects. Tobias Faber, Dansk Arkitektur(Arkitektens Forlag, 1963): 245.





1954 • A reference to Skydebanehaven Child-care. The author writes "Just as Kay Fisker's works present a full body of work, so does the Childcare building in Skydebanehaven by Hans Chr. Hansen, a work created at the cit offee that they up handle to big Coldmand city office, that take us back to his Goldmed-al proposal in 1937. The goldmedal project has not been published anywhere, but the architecture is present in the childcare work. An architecture with scenic shapes, through sharp contrasts of shadows and a clear framework. A total opposite of Kay Fisker's shadowless architecture of flat planes, Hans Chr. Hansen's architecture is more in family with a Viggo Moller-Jensen's three city houses in Fredericksberg". Erik Morthorst, "National Status. Anmeldelse af arkitekturafdelingen på Charlottenborgs forårsudstilling," in Arkitekten m (1954): 91-94.



1956 • A reference to three works of HCH and VSJ: A school in Gentofte, 1930 (2nd prize), a Church in Copenhagen, 1939 (2nd prize) and a church in Munkebjerg neighborhood in Odense, 1942 (1st prize). A general re view of Danish architectural proposals from 1905 to 1956. HCH and VSJ are credited for a change into a more expressive architec-ture. The authors mention that Munkebjerg's church competition entry inspired Kay Fisker and Esker Kristensen for the rooofs configurations at Dronningegården housing blocks. Svend Lmkilde og Ole Thomassen, "Med 8B og 6H. En billedkronik med tegnestifter," in

Arkitekten Jule- og Nytårshæefte (1956).

1954 • HCH exhibits at the Charlottenborg Spring Exhibition. Weilbachs Kunstnerleksikon.

• HCH exhibits at the Charlottenborg Spring

1956

Exhibition.

Weilbachs Kunstnerleksikon.



• HCH. Project for a Church in Odense.

1954

• HCH, Agner Christoffersen and F.C. Lund. Hanssted School in Valby.



• HCH and F.C. Lund. Gadekærvej- Blankavej housing, Valby.



signed by Edvard Thomsen.

• HCH's Bellahøj Transformer Station (1961-

1968) profiled concrete structure and the overhanging office floor at the top relates to Jægersbrog Water Tower in Gentofte de-

Fig. 45

1954



1956 • HCH's sequence of gables besides the

in Bogø.

contrasting expression of roof and base at the patients' units in HCH's Brøndbylund Psychiatric Hospital (1965-1966) is similar to the student housing units' composition at Askov Højskole designed by Viggo Møller-Jensen and Tyge-Arnfred. Jorgen Bo, "Askov Højskole," in Arkitektur 4 (1969): 165-178



• The first prise competition project, a Tribune for Copenhagen's Idrætspark football field, is mentioned in the book: Kund Miller and Kay Fisker, Danske arkitekturstrømninger 1850-1950 (Østifternes Kreditforening, København 1951): 310.

1951

1958 • HCH and F.C. Lund. Nyborggade Transformer Station, Østerbro.





1957 • HCH's choice to built five transformer stations with a loadbearing concrete shell covered with light materials references a new type of railway substations. In Denmark, during the 50'ies substations would change from loadbearing brick constructions to metal framework constructions covered with metal panels. The example below is located





• Hanssted School is mentioned in an article about the Charlottenborg Spring Exhibition. The author is pleased with the overall quality of the exhibition and with the expressions of the ordinary everyday life. In regards to Hanssted School it says "With exception for the missing children (in the picture), one of the most interesting (living) buildings in the exhibition was the school for Copenhagen municipality by F.C Lund and Hans Chr. Hansen. A work that captures you by its use of unconventional shapes. A seldom insightful work. How many dare to work with such details as those shown in the roof and wall meeting and the chimney?". Besides, it also points at a similar materiality and architectural ideal of a previous work by HCH, Skydebanehaven Childcare. "Arkitekturen på Charlottenborg," in Arkitekten m (1956:) 155-156.



• An article about Skydebanehaven Childcare. "Børneintitution i Skydebanehaven," in Arkitekten m 11-12 (1956): 177-183.



1960 cle about Hanssted Sch "Hanssted Skole," in Arkitektur 3 (1960): 97-



1961

107.

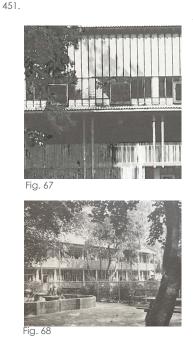
• The author writes about the new school law and its consequences upon architecture. He also proposes some solutions but without references to existing buildings. He writes that the new law is aimed for creating democratically aware and socially prepared youths. He puts this as the argument for re-shaping the architecture. And aims for a democratic and social school architecture. The picture of HCH's Hanssted School is not particularly noted in the text, though it is the only chosen picture. Svend Andersen, "Hvordan skal skolen væren?," in Arkitekten årgang (1961):14-15.



 An article about Nyborggade Transformer Station. "Nyborggade Transformerstation," in Arkitek-tur 3 (1961): 93-97.



• F.C. Lund and HCH receive the Træpris-en for two of their works, Skydebanehaven Childcare and Hanssted School. "Træprisen 1961," in Arktitekten 25, 1961: 449-





• A note about F.C. Lund and HCH getting the træprisen prise (1961). They are awarded with an amount of 10000 dkk. in Arkitektekn årgang (1962): 211.

1962

1960 HCH exhibits at the Charlottenborg Spring Exhibition. Weilbachs Kunstnerleksikon.

1961 • HCH exhibits at the Charlottenborg Spring Exhibition. Weilbachs Kunstnerleksikon.

• HCH and C.F. Lund receive the "Træprizen" for the projects Skydebanehaven Childcare and Hanssted School. "Træprisen 1961" in Arktitekten 25, 1961: 449-451.

• HCH and F.C. Lund. Bellahøj Transformer Station.

1961



• HCH and F.C. Lund. Bellahøj Garage.



• HCH, F.C. Lund, Walter Christensen, Knud Iversen, Eivind Lorenzen and Georg Boye, as landscape architect. Ringbo Psychiatric Hospital.



1962 • HCH, F.C. Lund, Walter Christensen, Knud Iversen and Eivind Lorenzen. Bremerholm Transformer Station.



1962 • One of the facades of the common area at Ringbo Psychitric Hospital (1961-1963) is

covered with Eternit undulated plates. And a series of squared windows provide ventilation and light to the rooms attached to it. The same materials and a similar configuration is seen at Herning Højskole, a high-rise building designed by Viggo Møller-Jensen and Tyge Arnfred.





 HCH's facades often manifest as large homegeneous fabrics made of traditional/ new ordinary materials (bricks, wood and

Etenit) together with new industrialized ma-

terials (loadbearing in-situ casted concrete)

1959





1963 HCH will first use of prefabricated concrete elements is at Brøndbylund Psychiatric Hospital (1965-1966). One of the firsts to employ such new material in Denmark is the office Fællestegnestuen (Jørn Ole Sørensen, Vigo Møller-Jensen and Tygge Arnfred) at the housing project Albertslund Syd Housing.



1963 • Hanssted School is referred as a very personal and full of charcater school, in a book by the Danish architect, critic and writer Tobias Faber. Tobias Faber, Dansk Arkitektur (Arkitektens Forlag, 1963): 257.



1964

• An article about Bremerholm Transformer Station. "Bremerholm transformer," in Arkitektur 3, 1964: 120-123.



• An article about Ringbo Psychiatric hospital. "Plejehjemmet Ringbo, Bagsværd," in Arkitektur 6 (1964): 225-237.



1964 • HCH exhibits at the Charlottenborg Spring Exhibition. Weilbachs Kunstnerleksikon. 1965

 HCH exhibits at the Charlottenborg Spring Exhibition. Weilbachs Kunstnerleksikon.

1965 • HCH, F.C. Lund, VSJ and Morten Klint, as landscape architect. Brøndbylund Psychiatric Hospital.



1966 HCH a nd F.C. Lund. Amager Transformer Station.



• HCH and F.C. Lund. Svanemølle Transformer Station.



• HCH. Tagensbo Church.



1967 • HCH and F.C. Lund. Gas pressure regulator next to Bellahøj Transformer Station.



1969 • HCH exhibits at the Charlottenborg Spring Exhibition. Weilbachs Kunstnerleksikon.

1971 • HCH exhibits at the Charlottenborg Spring Exhibition.

Weilbachs Kunstnerleksikon. 1972

• Around 1972 HCH retires as a project leader at the office of the City Architect in Copenhagen.

1978

• 28th June: HCH dies in Hvidovre.

1969 • HCH and F.C. Lund. Gasværksvejens School.



1971 • HCH's low-rise works as Ringbo (1961-1963)and Brøndbylund Psychitric Hospital (1965-1966) and Hanssted School (1954-1959) show some connections to some of the works by Vandkunsten, and particularly their first experimental housing development, Tinggården in Herfølge. Even though the choice of materials as brick, wood and etenit is comparable, Tinggården raises a picturesque character which is very different to HCH's works. Martin Keiding, Danish Architecture since 1754 (Arkitek Architectural Press 2007, Revised and enlarged edition): 315.



1977

• HCH's use of concrete combined with glass surfaces vertically divided with red frames and the use of window elements in-be-tween, as in Skydebanehaven Childcare (1948-1959), Hanssted School (1954-1959) and Ringbo Psychiatric Hospital (1961-1963), is similar to the facade of the Sewage pump station at Svanemøllen designed by Martin Andersen and Sv. H. Baggesen. Besides that, the in-situ casted concrete shows an horizontal pattern as the one used at the balconies of Hulgårds Plads Housing blocks (1943-1945). Jørgen Setoft "1886- Stadsarkitekten i København - 1986," in Arkitektur 6/7 (1986): 326.



1972 • Just after HCH's retirement as project leader at the city architect's office, the Danish architect, professor and writer Jørgen Sestoft writes an article on some of HCH's works: Nørrebro Housing, Hulgårds Plads housing, Skydebanehaven Chidcare, Hanssted School, Ringbo Psychiatric Hospital, Bellahøj, Bremerholm and Svanemølle Transformer Stations and Tagensbo Church. Jørgen Sestoft mentions: "Since that time (1930), it has become a tradition that all the buildings which the City was to erect for its own use should be of exemplary architectural stan-dard. It may be difficult to maintain such tradition, but it is Hans Chr. Hansen who has maintained it most clearly and strongly in recent years". Jørgen Sestoft "Arbejder af Hans Chr. Han-sen," in Arkitektur 4 (1972): 156-173.





₩eilbachs Kunstnerleksikon

1966 HCH shows a special sensibility for colours For example, we see it at the window frames at Bellahøj Transformer Station (1961-1968) and specially at the interior of Tagensbo Church (1966-1969). Such interest for colors is also present at some of the works developed by members of 'Grup R', mentioned above. The image below corresponds to a housing block located at Via Augusta- Brusi- Sant Elies, Barcelona, and desgined by Antoni de Moragas and Francesc Riba. It combines local colored glased tiles with new industrialized materials.



Flg. 52 1986

• The horizontal composition of base, body and top, and the light character of HCH's works' facades, as Bellahøj (1961-1968), Amager (1966-1968) and Svanemølle (1966-1968) Transformer Stations resemble the Ricola Storage building in Laufen, Switzerland, by Herzog & De Meuron. Large Eternit and metal panels are pilled up imitating the vernacular buildings to store wood of the near context. Besides that, HCH's facades reveal as coverings with no structural implications. In a similar way, Herzog & Meuron expose the thin profile of the facade components and

emphasise it at the corner detail.

Fig. 53

1996 Bremerholm transformer Station's facade (1962-1963), built of bronze lamela components shows relations to the facade of Rue Des Suisses Apartment building in Paris by Herzog & De Meuron, built of metal shutters.



1986

Fig. 74

• A 100 years review of the different city ar-chitects and related works since 1886, the establishement of the office of Municipal Architect, till 1986. Several works of HCH's are mentioned in the period of 1943-1973. The author writes "A series of fine projects were designed by the office during these years and a member of his (F.C. Lund) staff, Hans Christian Hansen, designed a series of note-worthy buildings". The following works are described: Hulgårds Plads housing, Skydeba-nehaven Childcare, Hanssted School, Ringbo Psychiatric Hospital, Svanemølle, Bellahøj and Bremerholm Transformer Stations and Gasværksvejens School. Jørgen Setoft "1886- Stadsarkitekten i København - 1986," in Arkitektur 6/7 (1986): 279, 302-321







1991 • A reference to Hanssted School among other local works during 1951-1961 decade. "1951, Fra Isskab til køleskab," in Arkitekten 18 (1991): 542-545.



1998 •Three of HCH's works, Ringbo Psychiatric Hospital and Bremerholm and Svanemølle Transformer Stations are mentioned in an architecture guide. The author concludes Bremerholm description by writing the following curious note "The result suggesting a large Alpine MacDonalds". Christopher Woodward, Copenhagen: The Buildings of Europe Manchester University Press, 1998): 97, 100.

2010 •A series of extraordinary photos of HCH's buildings and inspiring discussions are published in a blog. The author, fascinated by HCH as "one of the few true originals in Dan-ish architecture", shares a set of very well captured photos. Kristian Seier, Seier+Seier, "Hans Chr. Han-sen, architect," Flickr, https://www.flickr. com/photos/seier/5492367733/in/set-72157626209273636.

2013 • An interview about a thesis project by Eve Brænne Olstad that proposes a transformation and extension of Hanssted School.





2016

• An article analyses two of HCH's buildings from an "urban tectonic" position. A new perspective which develops principles stud-ied by E. F. Sekler: Through a didactic exercise he suggested that architecture and city structures should be considered in relation to the human body. In addition, following the notion of arrière-garde stated by Kenneth Frampton, the aim is to evaluate whether HCH's works could be used as an example for today's architecture challenges. Anne Beim and Marie Frier Hvejsel, "The ecology of urban tectonics - Studied in everyday building culture of Hans Christian Hansen" in Structures and Architecture (2016): 242- 249



2020 • Discussions reagarding the preservation of Ringbo psychiatric hospital are published on different media. Marie Kraul, "Fredningsforslag for Ringbo afvist: Vi kigger ikke på arkitektens navn, men på værket," in Byrummonitor (February 2022). Anne Pind, "Arkitekter mener: Red Ringbo!," in Arkitekten 3 (2019). Nanna Urhbrand, "Kan vi Redde Ringbo?," in Landsforeningen for bygnings og landskabskultur (December 2021). Mogens A. Morgen, Thomas Bo Jensen, Dorte Mandrup, Lars Juel This and Kristian Seier, "Arkitekter i øpror: En skjult umistelig perle skal nu rives ned- det er dumt og uetisk," in Berlingske (October 2021).





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Laundry Building for Sundholm

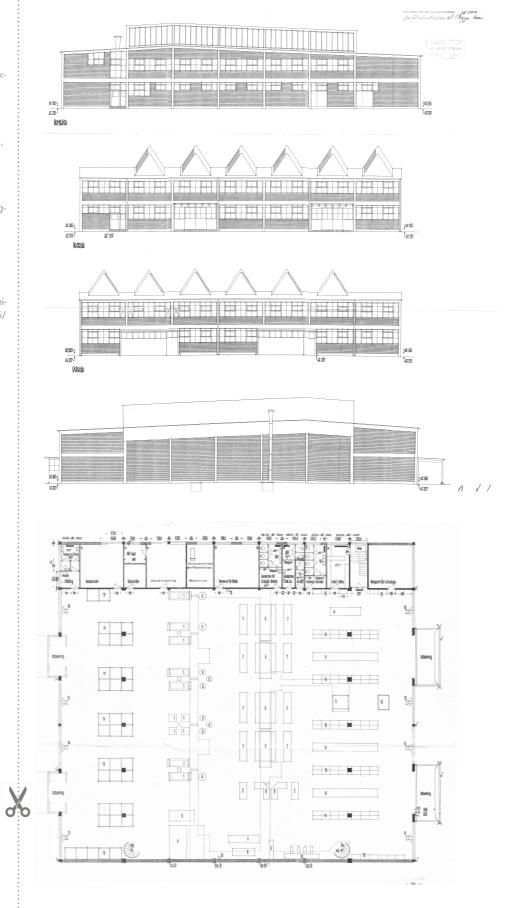
Holsøe, Poul. "Arbejder udført af Stadsarkitekten i København 1938-1943." Arkitekten-Maanedshæfte, no. 10 (1943): 146

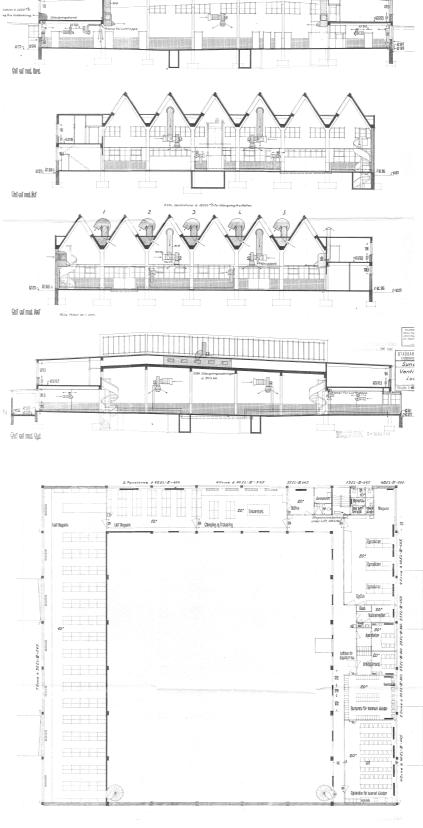
Ejlers, Erik, "Hans Christian Hansen." Kunstindeks Danmark & Weilbachs Kunstnerleksikon, https://www.kulturarv.dk/kid/VisKunstner. do?kunstnerld=8020

Københavns Kommune - Byggesagsarkiv. "Public.filarkiv." Københavns Kommune - Byggesagsarkiv. https://public.filarkiv.dk * Sundhomlsvej, 46

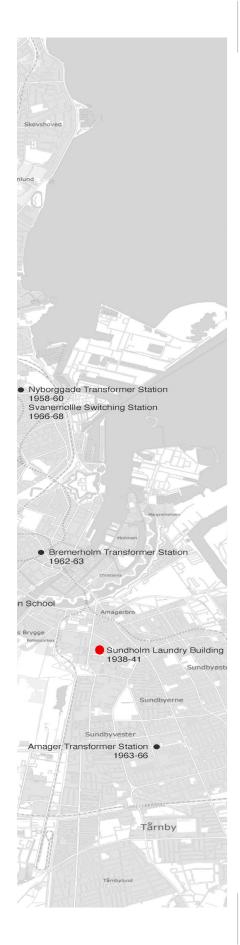
* 1941, Til- og ombygninger (En 2-etages vaskeribygning (1)

Seier, Kristian, "Hans Chr. Hansen, architect." Flickr 2010. https://www.flickr.com/photos/seier/5830754072/in/album-72157626209273636/





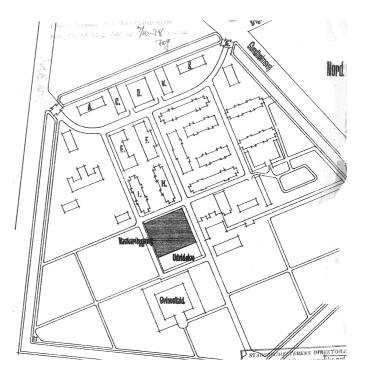
1-100





Laundry building Fabrikken, The factory of Art & Design, since 2000 Date: Built in 1941 Extended in 1971 Transformed in 2000 Type: Public project Architects: H. Chr. Hansen and P. Holsøe Client: Copenhagen municipality Engineers: Engineering department Copenhagen municipality Sqm (approx.): 2600

Program:



Laundry building for Sundholm, 1938-1941

Sundholmsvej 46, Sundholm, 2300 Copenhagen S

Drawings:

Scale 1/500 (A3)

<u>Image</u>

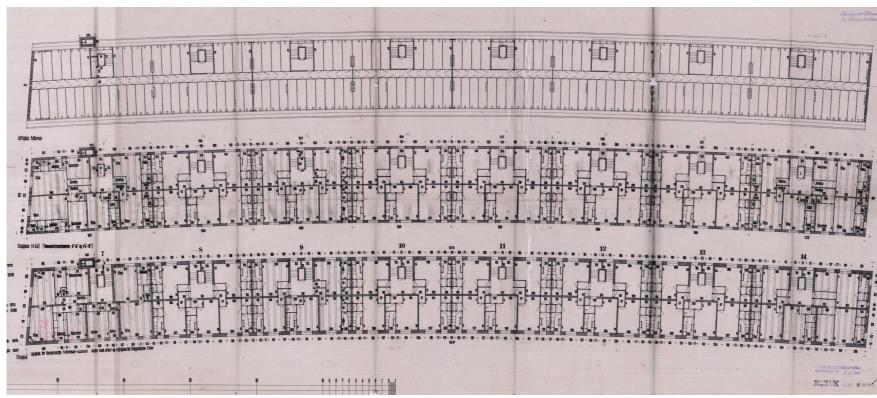
Photographer unknown. In "Fabrikken for Kunst og Design - KBH. S," Kn Tagdækning. https://www.kntag.dk/ referencer/offentlig/fabrikken-for-kunstog-design-kbh-s/

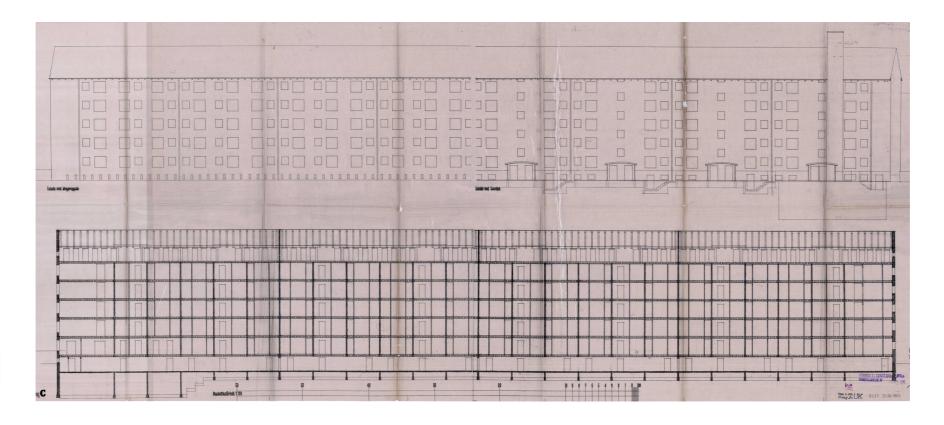
Nørrebro Vænge Housing

Holsøe, Poul. "Arbejder udført af Stadsarkitekten i København 1938-1943." Arkitekten-Maanedshæfte, no. 10 (1943): 146

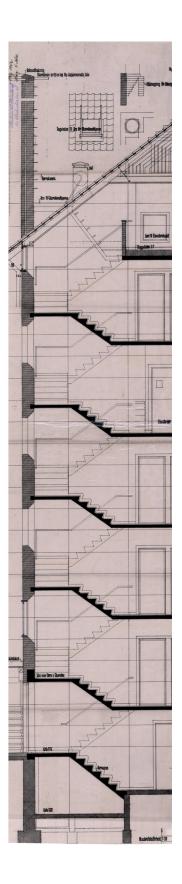
Københavns Kommune - Byggesagsarkiv. "Public.filarkiv." Københavns Kommune - Byggesagsarkiv. https://public.filarkiv.dk * Nørrebro Vænge 2-14, 3-15 * 1944, Nybyggeri (Opf. af tre beboelsesbygn.

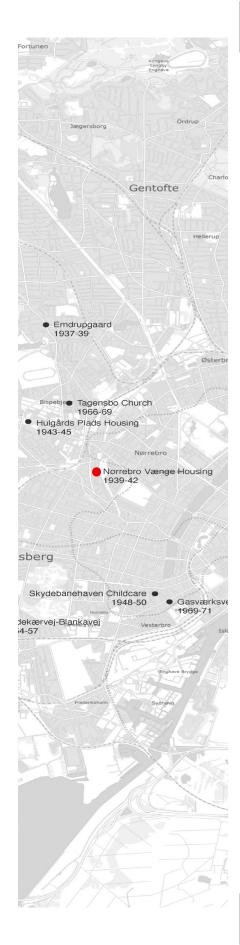
og 14 åbne vindfang (1)





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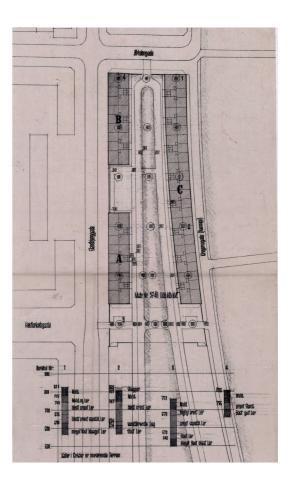




Nørrebro Vænge Housing, 1939-1942

Nørrebro Vænge 2-16, Nørrebro, 2200 Copenhagen

Program: Housing Date: Built in 1942 Type: Public project Architects: H. Chr. Hansen and P. Holsøe Client: Copenhagen municipality Engineers: Engineering department Copenhagen municipality Civil engineer K. Hindhele Sqm (approx.): 16000



Drawings:

Scale 1/500 (A3) Scale 1/100 (A3)

<u>lmage:</u>

Photographer unknown. In Poul Holsøe, "Arbejder udført af Stadsarkitekten i København 1938-1943," in Arkitekten m, no. 10 (1943): 146

Hulgårds Plads Housing

Holsøe, Poul. "Arbejder, udført af Stadsarkitekten i København 1925-1943." Arkitekten Maanedshæfte, no. 11 (1943): 170

Lund, Frederik, Chr. "Arbejder udført af Stadsarkitekten i København 1943-1953." Arkitekten Maanedshæfte, no. 2-3 (1953): 32-33

Sestoft, Jørgen. "Arbejder af Hans Chr. Hansen." Arkitektur, no. 4 (1972): 158

Sestoft, Jørgen. 1886 Stadsarkitekten i København 1986, Arkitektens Forlag, 1986. Special reprint from Arkitektur, no. 6-7 (1986): 279

Danmarks Kunstbibliotek - Arkitekturfotografi. "Boligbyggeri på Hulgårds Plads Fotografier for Hans Chr. Hansen." Danmarks Kunstbibliotek - Arkitekturfotografi. http://www5. kb.dk/images/billed/2010/okt/billeder/object610729/da/

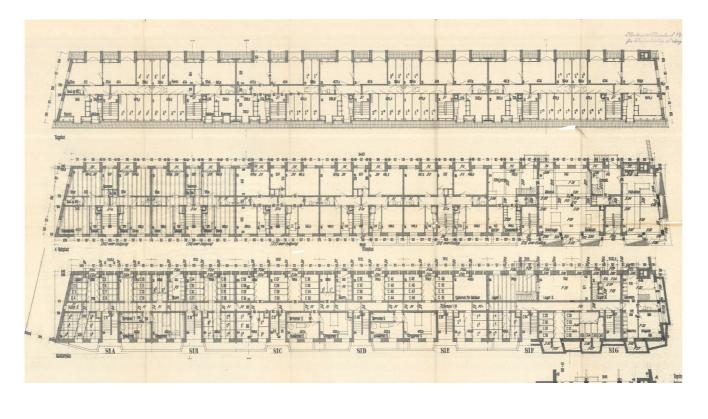
Ejlers, Erik. "Hans Christian Hansen." Kunstindeks Danmark & Weilbachs Kunstnerleksikon, https://www.kulturarv.dk/kid/VisKunstner. do?kunstnerld=8020

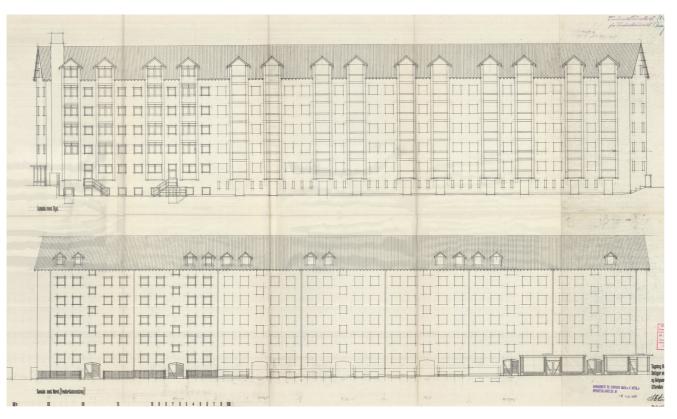
Københavns Kommune - Byggesagsarkiv. "Public.filarkiv." Københavns Kommune - Byggesagsarkiv. https://public.filarkiv.dk

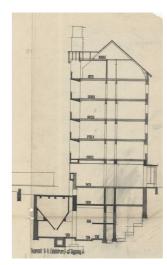
* Hulgårds Plads 1-15

* 1948. Nybyggeri. Opførelse af en 3-etages beboelsesbygning med kælder og delvis udnyttet tagetage (etageareal ialt 4417,5m² + 44m² tagetage) og en 5-etages beboelsesbygning med kælder, underkælder og delvis udnyttet tagetage (etageareal 6227m² + 266m² tageetage) samt en grundmuret gårdpissoirbygning (4,5m²) (1)

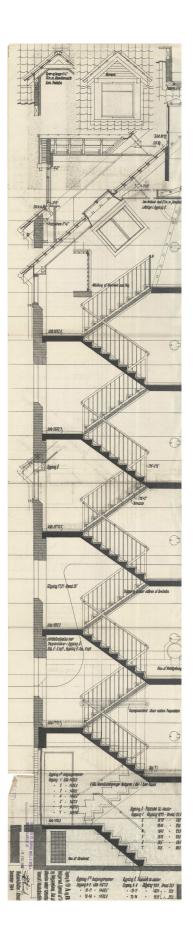
Seier, Kristian, "Hans Chr. Hansen, architect." Flickr 2010. https://www.flickr. com/photos/seier/13521973614/in/album-72157626209273636/

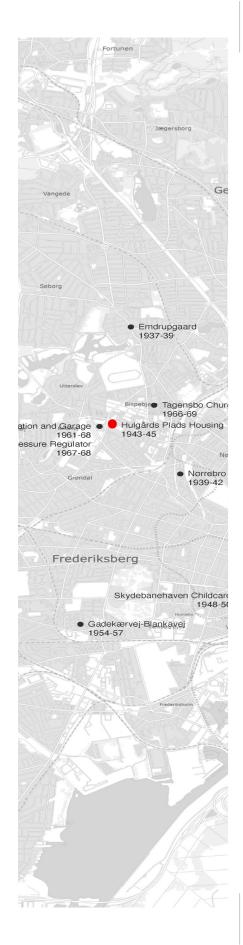






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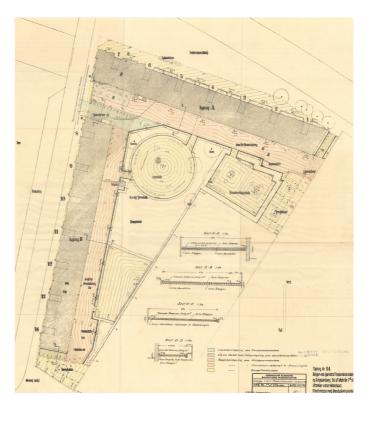




Program: Housing and Daycare Date: Built in 1945 Type: Public project Architects: H. Chr. Hansen, P. Holsøe and F.C. Lund Client: Copenhagen municipality Engineers: Engineering department Copenhagen municipality Sqm: 10644

Hulgårds Plads housing, 1943-1945

Hulgårds Pl 1-13, Frederikssundsvej 81 A-G, 2400 Copenhagen NW



Drawings:

Scale 1/500 (A3) Scale 1/100 (A3)

<u>lmage:</u>

Helmer-Petersen, Keld. In "Boligbyggeri på Hulgårds Plads, Fotografier for Hans Chr. Hansen," Den Kongelige Biblioteket. www5.kb.dk/images/billed/2010/ okt/billeder/object610729/da/.

Skydebanehaven Childcare

Morthorst, Erik. "National Status. Anmeldelse af arkitekturafdelingen på Charlottenborgs forårsudstilling." Arkitekten Maanedshæfte (1954): 91-94

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Sestoft, Jørgen. "Arbejder af Hans Chr. Hansen." Arkitektur, no. 4 (1972): 159

Sestoft, Jørgen. 1886 Stadsarkitekten i Køben-havn 1986. Arkitektens Forlag, 1986. Special reprint from Arkitektur, no. 6-7 (1986): 308

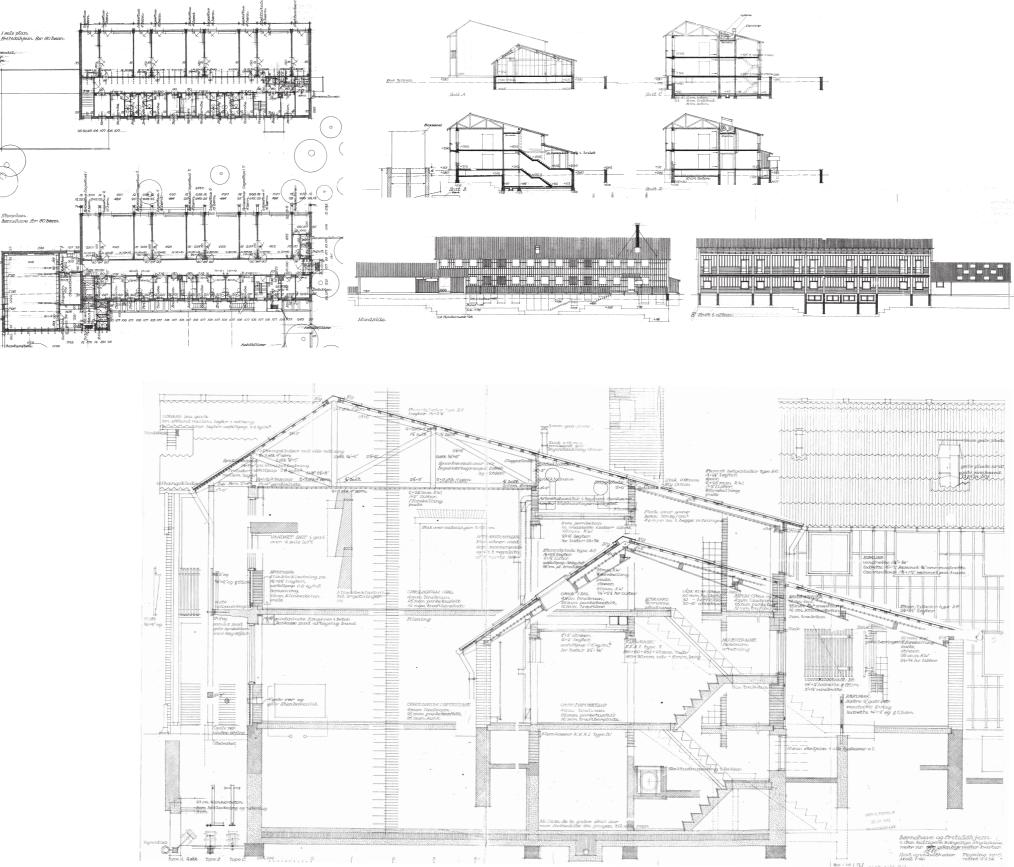
"Børneinstitution i Skydebanehaven." Arkitekten Maanedshæfte, no. 11-12 (1956): 177-183

"Træprisen 1961." Arktitekten, no. 25 (1961): 449-451

Københavns Kommune - Byggesagsarkiv. "Public.filarkiv." Københavns Kommune - Byggesagsarkiv. https://public.filarkiv.dk

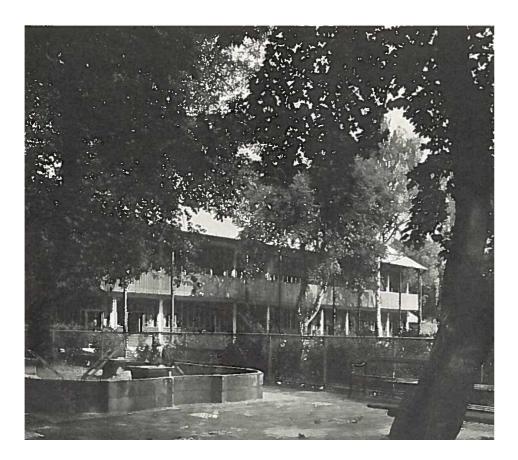
- * Absalonsgade, 10
- * 1954, Nybyggeri. Opf. af en 2-etagers børneinstituion (1)

Seier, Kristian, "Hans Chr. Hansen, architect." Flickr 2010. https://www.flickr.com/photos/seier/5863583646/in/set-72157626209273636



X





Skydebanehaven childcare, 1948-1950

Absalonsgade 10, Vesterbro, 1658 København V

Program: Childcare and Daycare Date: Built in 1950 Type: Public project Architects: H. Chr. Hansen, P. Holsøe and F.C. Lund Client: Copenhagen municipality Engineers: Engineering department Copenhagen municipality Sqm: 825



Drawings:

Scale 1/500 (A3) Scale 1/100 (A3)

<u>lmage:</u>

Strüwing, Aage. In "Børneintitution i Skydebanehaven", Arkitekten m, no. 11-12 (1956): 179

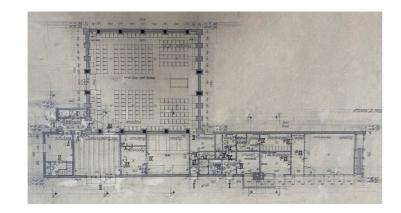


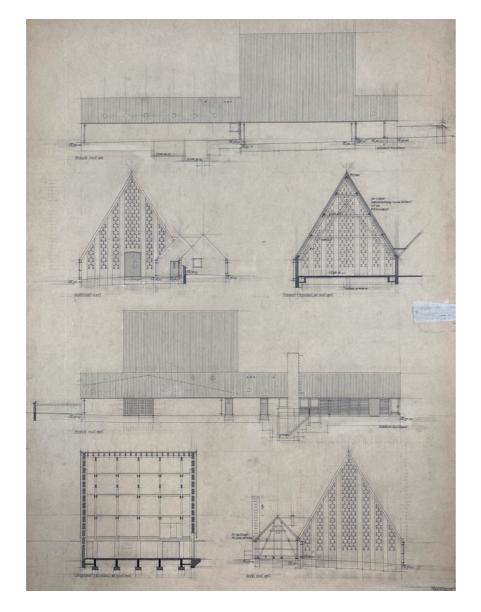
Næstved Chapel

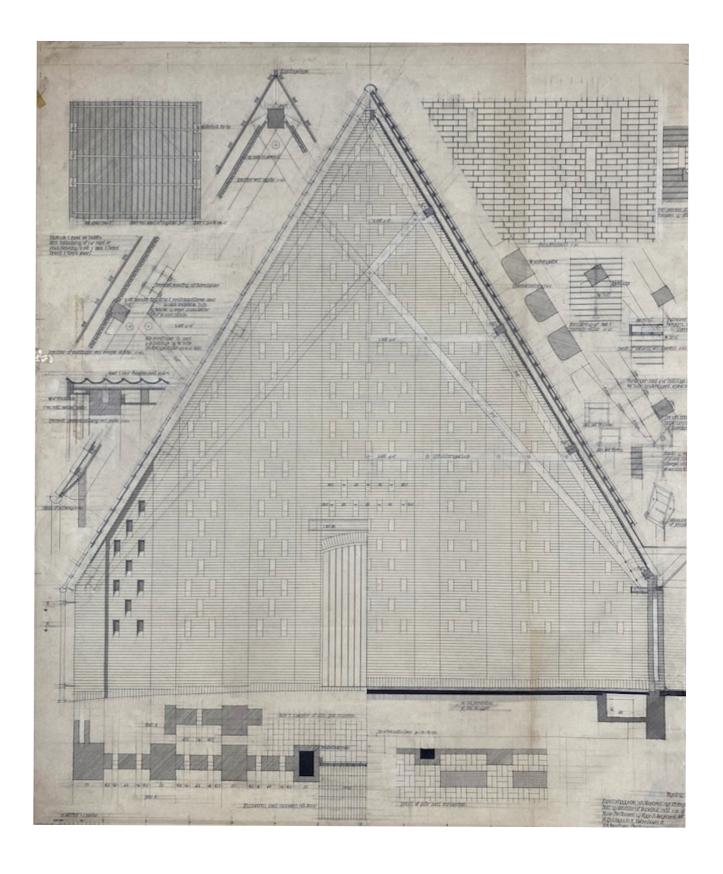
Pedersen, Johan. "Konkurrencen om et kapel og en kirkegård i Næstved." Arkitekten (1949): 45-51

Danmarks Kunstbibliotek

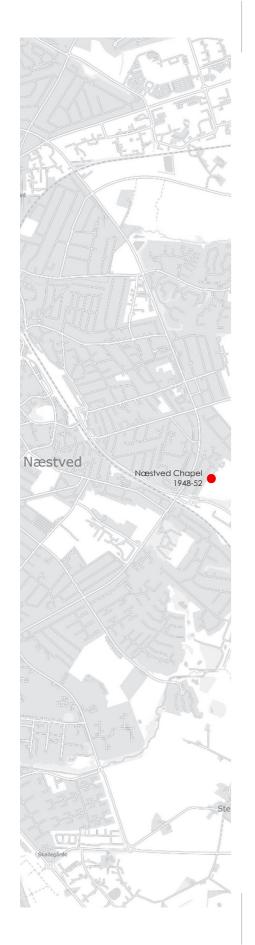
Næstved Billeder. "Næstved Ny Østre Kirkegaård." Næstved Billeder. http://www. naestvedbilleder.dk/naestved/main/thumbnailview/qsr=8696







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Næstved Chapel, 1948-1952

Østre Kapelvej 10, 4700, Næstved

Program: Chapel, crematorium and garden (Only the chapel was built) Date: Built in 1954 Type: Private project, competition (1st prize) Architects: H. Chr. Hansen and V.S. Jørgensen (Chapel) Kund Toftvad (crematorium) Georg Boye and Knud Preisler (landscape) Client:

Engineers:

Sqm (approx.): 850



Drawings:

Scale 1/500 (A3) Scale 1/100 (A3)

<u>Image:</u>

Hansen, Bent L., 1978. In "Næstved ny Østre Kirkegård", Næstved Arkiverne. www.naestvedbilleder.dk/naestved/ catalog/NæstvedBilleder/r/35065/viewmode=infoview/qsr=8696

Hanssted School

Faber, Tobias. A History of Danish Architecture, Det Danske Selskab, Denmark, 1963, 230, 235

Sestoft, Jørgen. "Arbejder af Hans Chr. Hansen." Arkitektur, no. 4 (1972): 160

Sestoft, Jørgen. 1886 Stadsarkitekten i København 1986, Arkitektens Forlag, 1986. Special reprint from Arkitektur, no. 6-7 (1986): 305, 316-317

"Arkitekturen på Charlottenborg", Arkitekten Maanedshæfte (1956): 155-156

"Hanssted Skole." Arkitektur, no. 3 (1960): 97-107

"Træprisen 1961." Arktitekten, no. 25 (1961): 449-451

"1951, Fra Isskab til køleskab." Arkitekten, no. 18 (1991): 543

Det Kongelige Akademi – Bibliotek for Arkitektur, Design og Konserverin. "Hanssted Skole." Det Kongelige Akademi – Bibliotek for Arkitektur, Design og Konserverin. https:// www.arkitekturbilleder.dk/bygning/hanssted-skole/

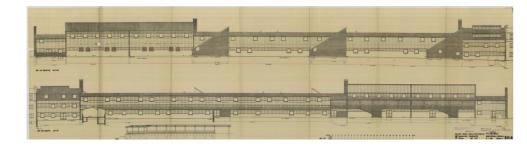
Ejlers, Erik. "Hans Christian Hansen." Kunstindeks Danmark & Weilbachs Kunstnerleksikon, https://www.kulturarv.dk/ kid/VisKunstner.do?kunstnerld=8020

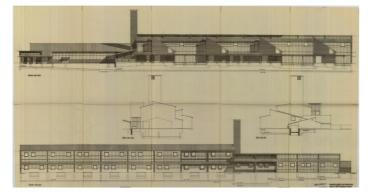
Københavns Kommune - Byggesagsarkiv. "Public.filarkiv." Københavns Kommune - Byggesagsarkiv. https://public.filarkiv.dk * Rødbyvej 2

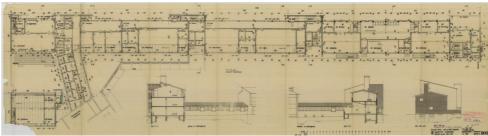
* 1955, Nybyggeri. Opf. af skolebygning (1)

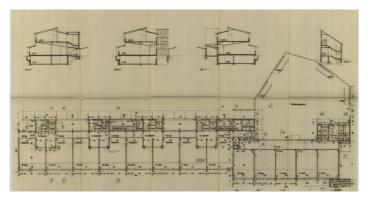
Københavns Kommune - Historie & Kunst. "Hanssted Skole" Københavns Kommune - Historie & Kunst. https://kbhbilleder.dk/ søg?q=hanssted%20school

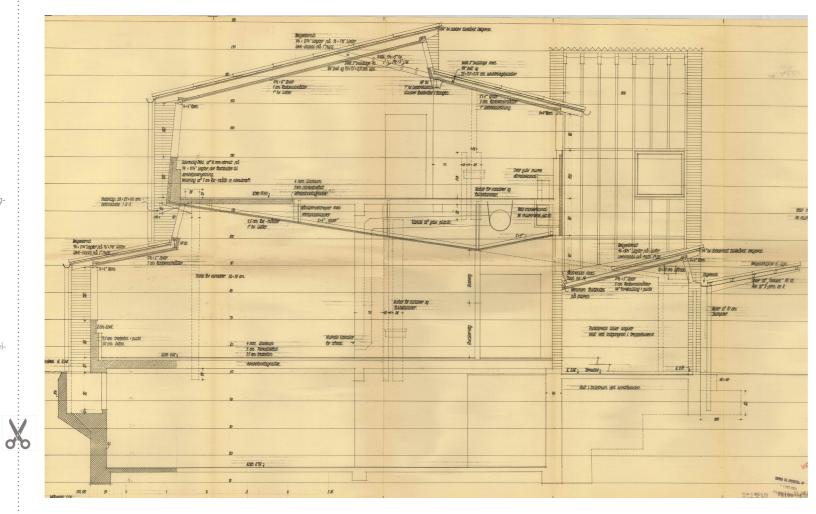
Seier, Kristian, "Hans Chr. Hansen, architect." Flickr 2010, https://www.flickr.com/photos/seier/5576597630/in/set-72157626209273636





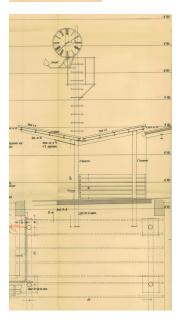














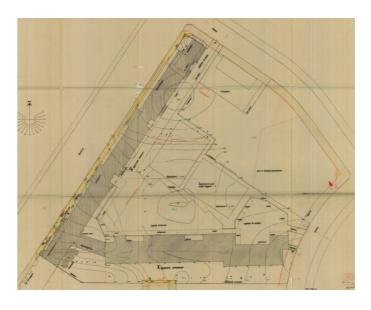




Program: School Date: Built in 1959 Type: Public project Architects: H. Chr. Hansen, F.C. Lund and Agner Christoffersen Client: Copenhagen municipality Engineers: Engineering department Copenhagen municipality Sqm: 5628

Hanssted school, 1954-1959

Rødbyvej 2, Valby, 2500 Copenhagen



Drawings:

Scale 1/500 (A3) Scale 1/200 (A3) Scale 1/100 (A3)

<u>lmage:</u>

Bernild, Bror. In Svend Andersen, "Hvordan skal skolen væren?," Arkitekten årgang (1961): 14.

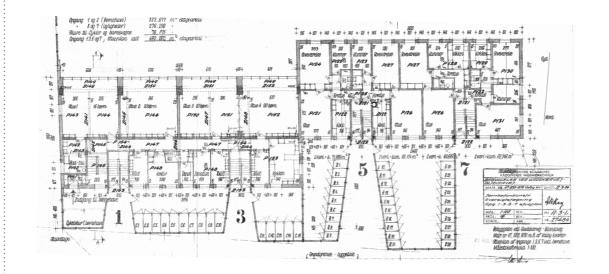
Blankavej Housing

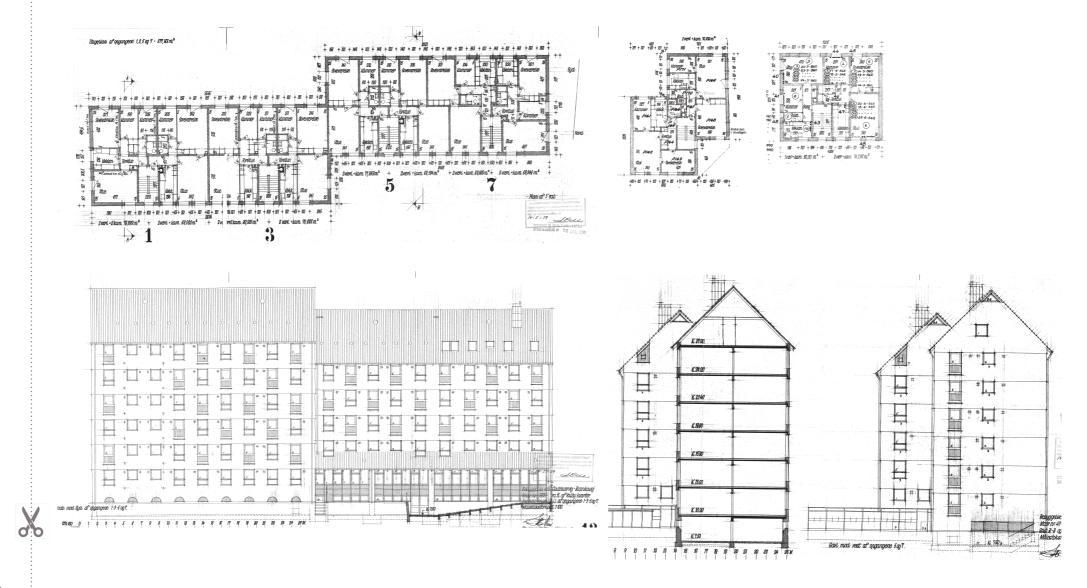
Sestoft, Jørgen. "Arbejder af Hans Chr. Hansen." Arkitektur, no. 4 (1972): 158

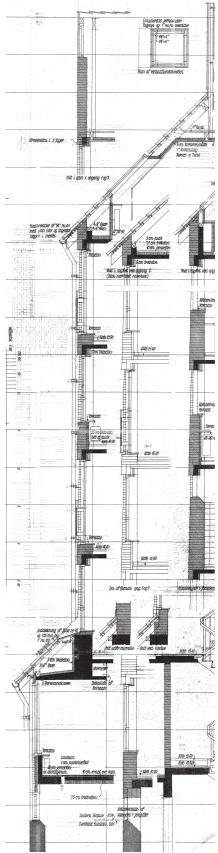
Danmarks Kunstbibliotek - Arkitekturfotografi. "Flere værker, Fotografier for Hans Chr. Hansen." Danmarks Kunstbibliotek - Arkitekturfotografi. http://www5.kb.dk/images/ billed/2010/okt/billeder/object610728/da/

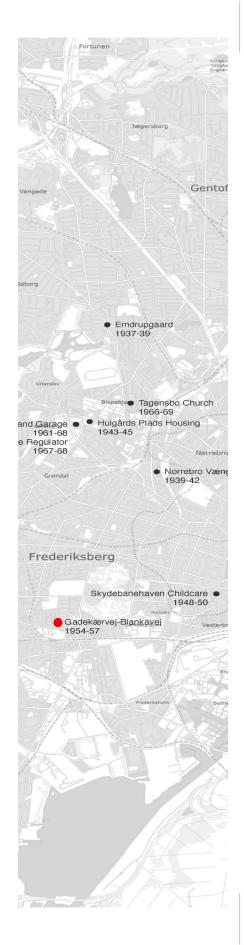
Københavns Kommune - Byggesagsarkiv. "Public.filarkiv." Københavns Kommune - Byggesagsarkiv. https://public.filarkiv.dk * Blankavej 1

* 1959, Nybyggeri. Opf. af Børnehave (1)





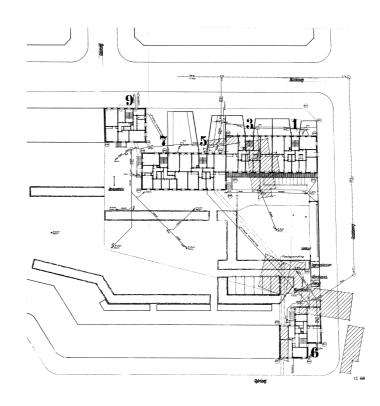






Blankavej Housing, 1954-1957 Blankavej 1, Valby, 2500 Copenhagen

Program: Housing and daycare Date: Built in 1957 Type: Public project Architects: H. Chr. Hansen and F.C. Lund Client: Copenhagen municipality Engineers: Engineering department Copenhagen municipality Sqm: 5420



Drawings:

Scale 1/500 (A3) Scale 1/100 (A3)

<u>lmage:</u>

Helmer-Petersen, Keld. In "Flere værker, Fotografier for Hans Chr. Hansen," Den Kongelige Biblioteket. www5.kb.dk/ images/billed/2010/okt/billeder/object610728/da/.

Nyborggade Transformer Station

"Nyborggade transformerstation." Arkitektur, no. 3 (1961): 93-97

Danmarks Kunstbibliotek - Arkitekturfotografi. "Transformerstation, Nyborggade, fotograferet for Hans Chr. Hansen." Danmarks Kunstbibliotek - Arkitekturfotografi. http:// www5.kb.dk/images/billed/2010/okt/billeder/ object610726/da/ http://www5.kb.dk/images/billed/2010/okt/ billeder/object610722/da/

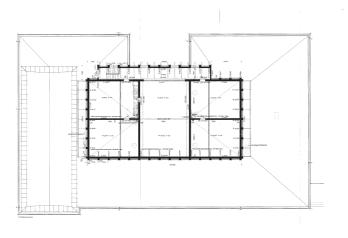
Københavns Kommune - Byggesagsarkiv. "Public.filarkiv." Københavns Kommune - Byggesagsarkiv. https://public.filarkiv.dk

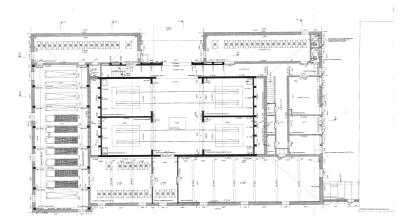
* Nyborggade 13

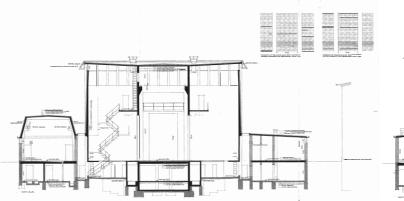
* 1960, Nybyggeri. Opførelse af en hovedtransformatorstation (1)

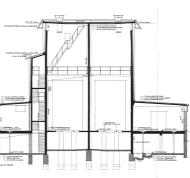
Københavns Kommune - Historie & Kunst. "Nyborggade Transformatorstation." Københavns Kommune - Historie & Kunst. https:// kbhbilleder.dk/søg?q=Nyborggade%20Transformatorstation

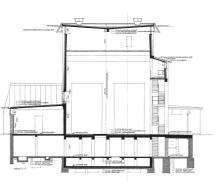
Seier, Kristian, "Hans Chr. Hansen, architect." Flickr 2010, https://www.flickr.com/photos/ seier/5592255900/in/photostream

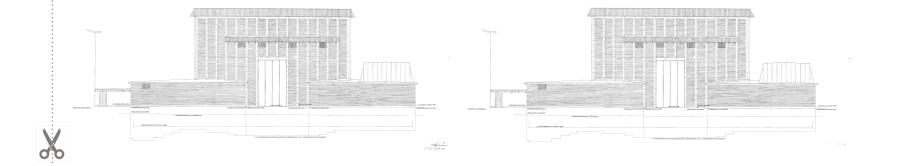


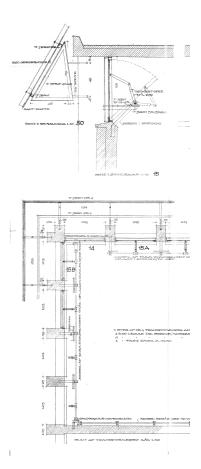














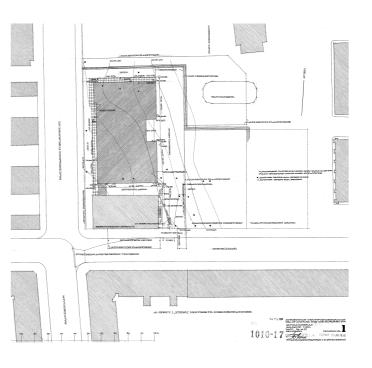




Program: Transformer Station Date: Built in 1960 Type: Public project Architects: H. Chr. Hansen and F.C. Lund Client: Copenhagen light and power authority Engineers: A. J. Moe A/S Sqm: 5420

Nyborggade transformer station, 1958-1961

Nyborggade 13, Østerbro, Copenhagen



<u>Drawings:</u>

Scale 1/500 (A3) Scale 1/100 (A3)

<u>Image:</u>

Børge Mogensen. In "Nyborggade Transformerstation," *Arkitektur* no. 3 (1961): 95.

Bellahøj Transformer Station

Beim, Anne. "Bellahøj Koblingstation, Sen-Moderne byggeskik 1955-1976." kunstakademiets Arkitektskoles Forlag (2006): 29-36

Beim, Anne and Frier Hvejsel, Marie "The ecology of urban tectonics – Studied in everyday building culture of Hans Christian Hansen." *Structures and Architecture* (2016).

Sestoft, Jørgen. "Arbejder af Hans Chr. Hansen." Arkitektur, no. 4 (1972): 163-166

Sestoft, Jørgen. 1886 Stadsarkitekten i København 1986, Arkitektens Forlag, 1986. Special reprint from Arkitektur, no. 6-7 (1986): 320

Danmarks Kunstbibliotek - Arkitekturfotografi. "Bellahøj Koblingsstation, Fotografier for Hans Chr. Hansen." Danmarks Kunstbibliotek - Arkitekturfotografi. http://www5.kb.dk/images/billed/2010/okt/billeder/object610714/da/ http://www5.kb.dk/images/billed/2010/okt/ billeder/object610715/da/ http://www5.kb.dk/images/billed/2010/okt/ billeder/object610712/da/ http://www5.kb.dk/images/billed/2010/okt/ billeder/object610716/da/

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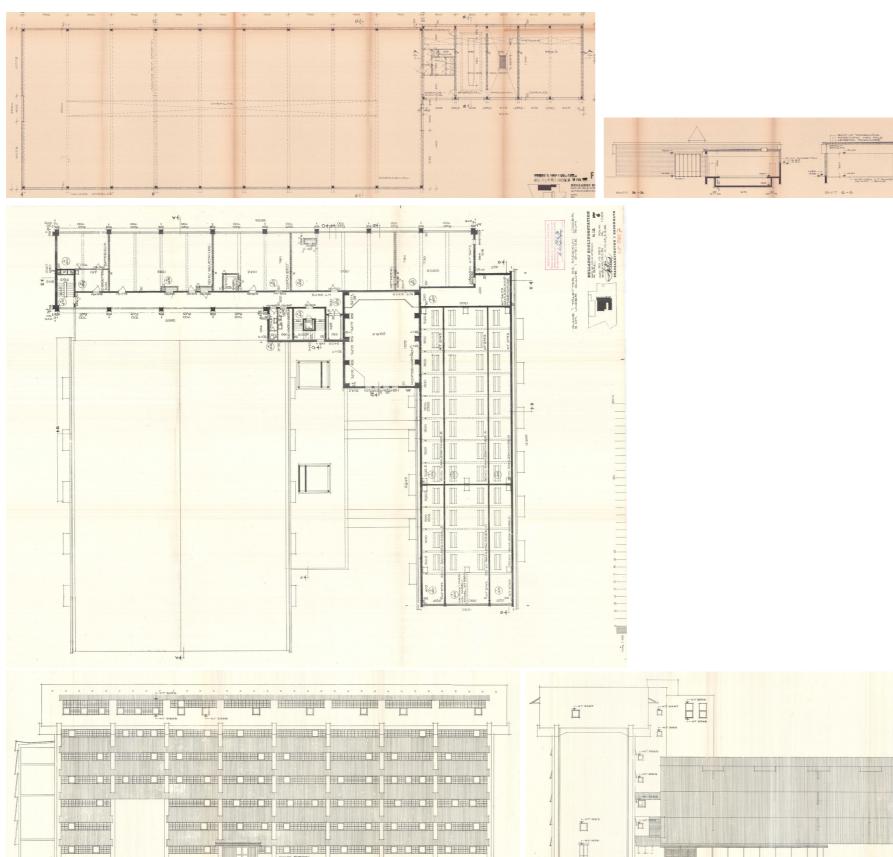
Ejlers, Erik. "Hans Christian Hansen." Kunstindeks Danmark & Weilbachs Kunstnerleksikon, https://www.kulturarv.dk/kid/VisKunstner. do?kunstnerld=8020

Københavns Kommune - Byggesagsarkiv. "Public.filarkiv." Københavns Kommune - Byggesagsarkiv. https://public.filarkiv.dk * Hulgårdsvej, 133

* 1970, Særlige sager. 4-7 etagers koblingsstation, 1-etages servicestation, underjordisk komandocentral m.m. (1)

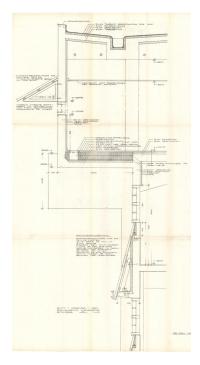
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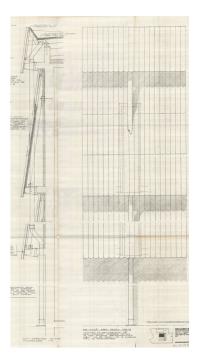
Seier, Kristian, "Hans Chr. Hansen, architect." Flickr 2010, https://www.flickr.com/photos/seier/5764513306/in/set-72157626209273636



FACADE MOD DET









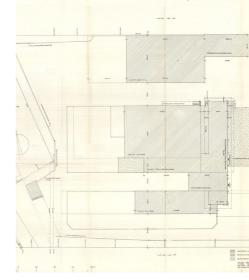




Bellahøj Transformer Station, 1961-1968

Hulgårdsvej 133, Østerbro, 2400 Copenhagen NW

Program: Transformer Station, offices, control area and bunker. Garage Date: Built in 1968 Some facade and interior changes in 1992 Type: Public project Architects: H. Chr. Hansen and F.C. Lund O. Safft (transformation in 1992) Client: Copenhagen light and power authority Engineers: A. J. Moe A/S Sqm: 13061 (transformer station) 1832 (garage)

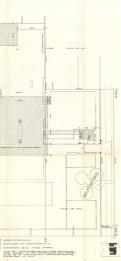


Drawings:

Scale 1/500 (A3) Scale 1/100 (A3)

<u>lmage:</u>

Helmer- Petersen, Keld. In "Bellahøj Koblingsstation, Fotograier For Hans Chr. Hansen," Den Kongelige Biblioteket. www5.kb.dk/images/billed/2010/okt/ billeder/object610712/da/.



Ringbo Psychiatric Hospital

Woodward, Christopher. Copenhagen: The Buildings of Europe Manchester. (University Press, 1998): 97

Keiding, Martin. "Hvad Hvordan og Hvorfor. Interview med Even Brænne Olstad ved Martin keiding." Arkitetkten, no. 8 (2013): 39-55

Morgen, Mogens A., Jensen, Thomas Bo, Manrup, Dorte, Juel Thiis, Lars, Seier, Kristian. "Arkitekter i oprør: En skjult og umistelig perle skal nu rives ned - det er dumt og uetisk." Berlingske, 23 october 2021.

Pind, Anne. "Arkitekten Mener: Red Ringbo!" Arkitekten (2021). https://arkitektforeningen. dk/arkitekten/arkitekten-mener-red-ringbo/

Skriver, Poul E. "Plejehjemmet Ringbo, Bagsværd." Arkitektur, no. 6 (1964): 225-237

Sestoft, Jørgen. "Arbejder af Hans Chr. Hansen." Arkitektur, no. 4 (1972): 162

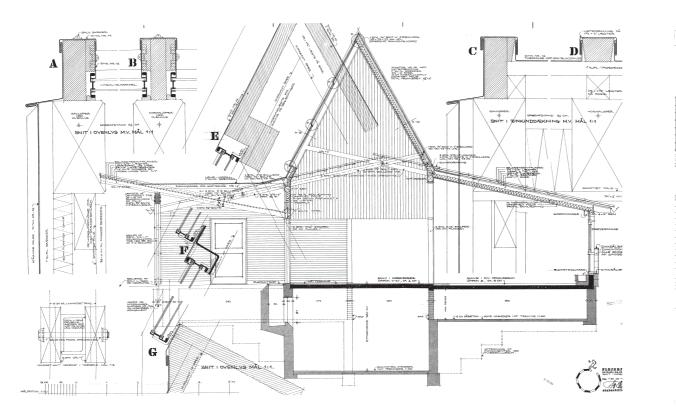
Sestoft, Jørgen. 1886 Stadsarkitekten i København 1986, Arkitektens Forlag, 1986. Special reprint from Arkitektur, no. 6-7 (1986): 317

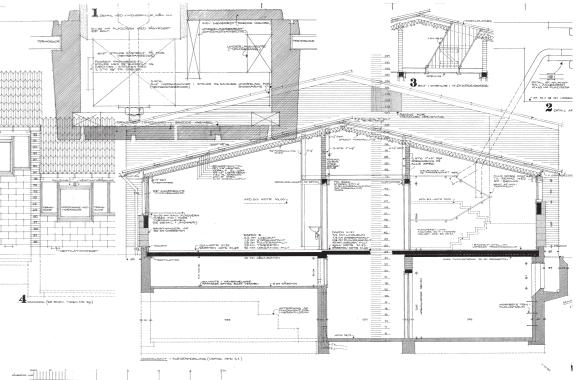
Ejlers, Erik. "Hans Christian Hansen." Kunstindeks Danmark & Weilbachs Kunstnerleksikon, https://www.kulturarv.dk/kid/VisKunstner. do?kunstnerld=8020

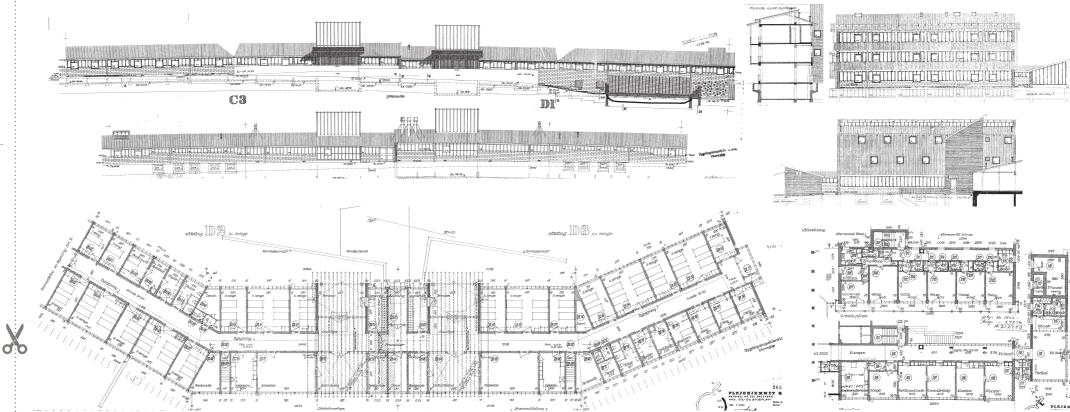
Københavns Kommune - Byggesagsarkiv

Københavns Kommune - Historie & Kunst. "Ringbo" Københavns Kommune - Historie & Kunst. https://kbhbilleder.dk/søg?q=ringbo

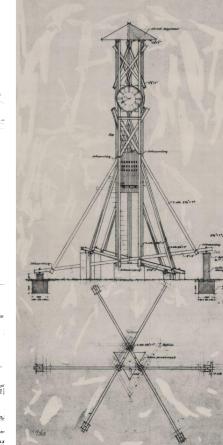
Seier, Kristian, "Hans Chr. Hansen, architect." Flickr 2010, https://www.flickr.com/photos/seier/5541205450/in/set-72157626209273636 https://www.flickr.com/photos/seier/5536404293/in/set-72157626209273636



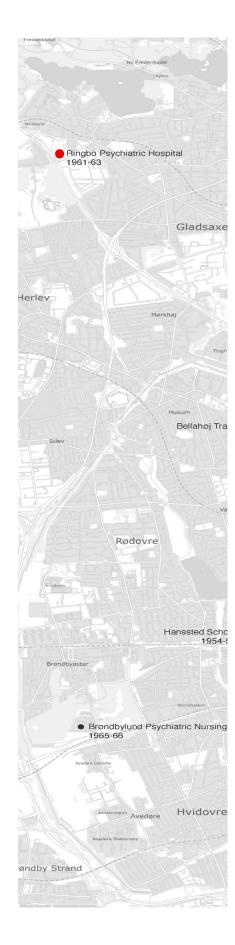


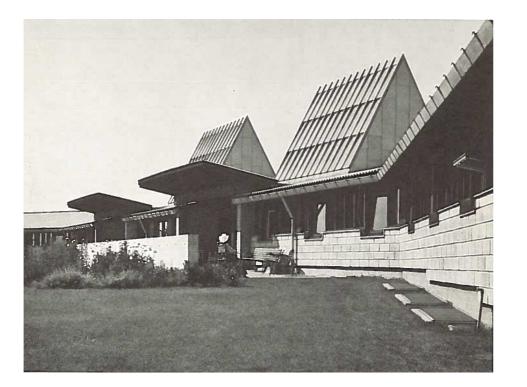


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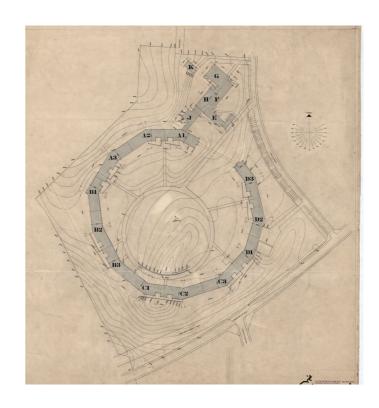




Ringbo psychiatric hospital, 1961-1963

Granvej 12-14, 2800 Bagsværd

Program: Nursing home for elderly psychiatric patients Date: Built in 1963 Demolished Type: Public project Architects: H. Chr. Hansen, F.C. Lund, A. Christensen, K. Iversen and E. Lorenzen. Georg Boye (Landscape architect). Client: Copenhagen municipality Engineers: Engineering department Copenhagen municipality Sqm: 9830



Drawings:

Scale 1/500 (A3) Scale 1/100 (A3)

<u>Photo:</u>

Lunding, Ib. In "Plejehjemmet Ringbo, Bagsværd," Arkitektur, no.6 (1964): 235

Bremerholm Transformer Station

Christopher Woodward, Copenhagen: The Buildings of Europe Manchester (University Press, 1998): 97

Beim, Anne and Frier Hvejsel, Marie. "The ecology of urban tectonics – Studied in everyday building culture of Hans Christian Hansen." Structures and Architecture, 2016.

Sestoft, Jørgen. "Arbejder af Hans Chr. Hansen." Arkitektur, no. 4 (1972): 161

Sestoft, Jørgen. 1886 Stadsarkitekten i København 1986, Arkitektens Forlag, 1986. Special reprint from Arkitektur, no. 6-7 (1986): 320

"Bremerholm transformer." Arkitektur, no. 3 (1964): 120-123

Danmarks Kunstbibliotek - Arkitekturfotografi. "Transformerstation, Bremerholm, Fotografier for Hans Chr. Hansen." Danmarks Kunstbibliotek - Arkitekturfotografi. http://www5. kb.dk/images/billed/2010/okt/billeder/object610711/da/

http://www5.kb.dk/images/billed/2010/okt/ billeder/object610709/da/ http://www5.kb.dk/images/billed/2010/okt/ billeder/object610710/da/

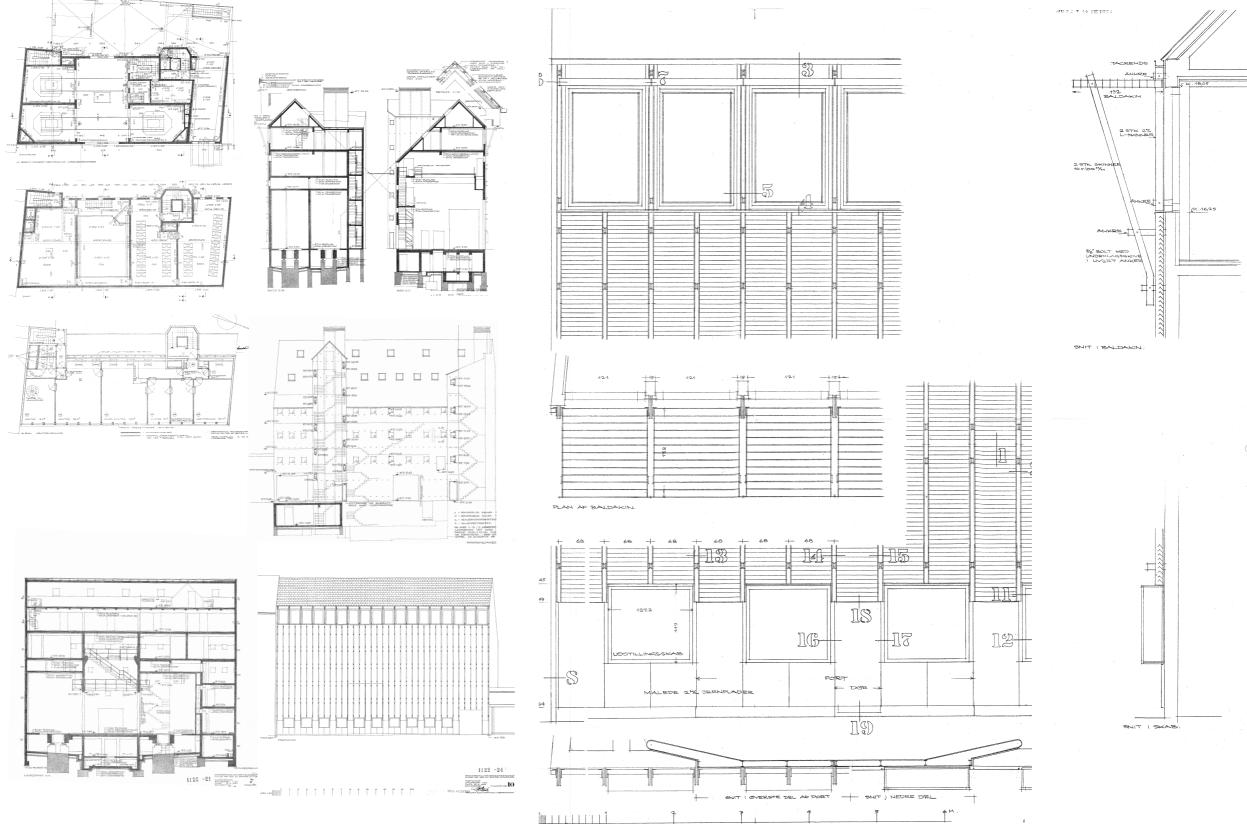
Ejlers, Erik. "Hans Christian Hansen." Kunstindeks Danmark & Weilbachs Kunstnerleksikon, https://www.kulturarv.dk/kid/VisKunstner. do?kunstnerld=8020

Københavns Kommune - Historie & Kunst. "Bremerhol 6" Københavns Kommune -Historie & Kunst. https://kbhbilleder.dk/ søg?q=bremerholm+6

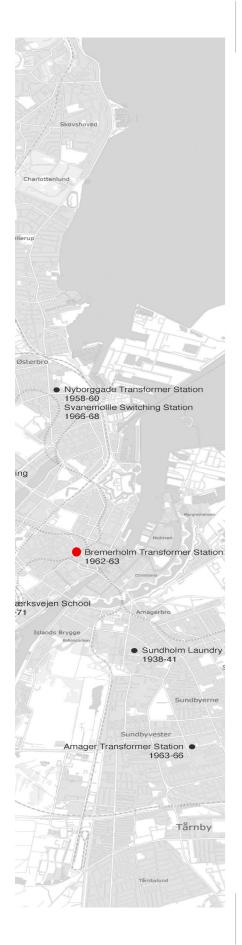
Københavns Kommune - Byggesagsarkiv. "Public.filarkiv." Københavns Kommune - Byggesagsarkiv. https://public.filarkiv.dk * Bremerholm, 6

* 1965, Til- og ombygninger. Opf. af en 5-etages transformer-og kontorbygning (1)

Seier, Kristian, "Hans Chr. Hansen, architect." Flickr 2010, https://www.flickr.com/photos/seier/5517122784/in/set-72157626209273636



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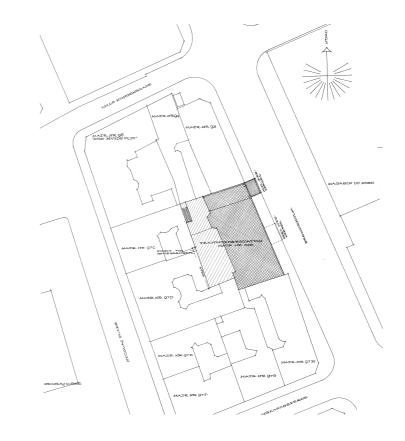




Bremerholm Transformer Station, 1962-1963

Bremerholm 6, 2800, Copenhagen

Program: Transformer station and offices Design hotel, since 2018 Date: Built in 1963 Transformed in 2018 Type: Public project Architects: H. Chr. Hansen, F. C. Lund, Walter Christensen, K. Iversen and E. Lorenzen Dansk Ejendoms Management A/S (transformation) Client: Copenhagen light and power authority Engineers: A. J. Moe A/S Sqm (approx.): 950



Drawings:

Scale 1/500 (A3) Scale 1/100 (A3) Scale 1/50 (A3)

<u>Image:</u>

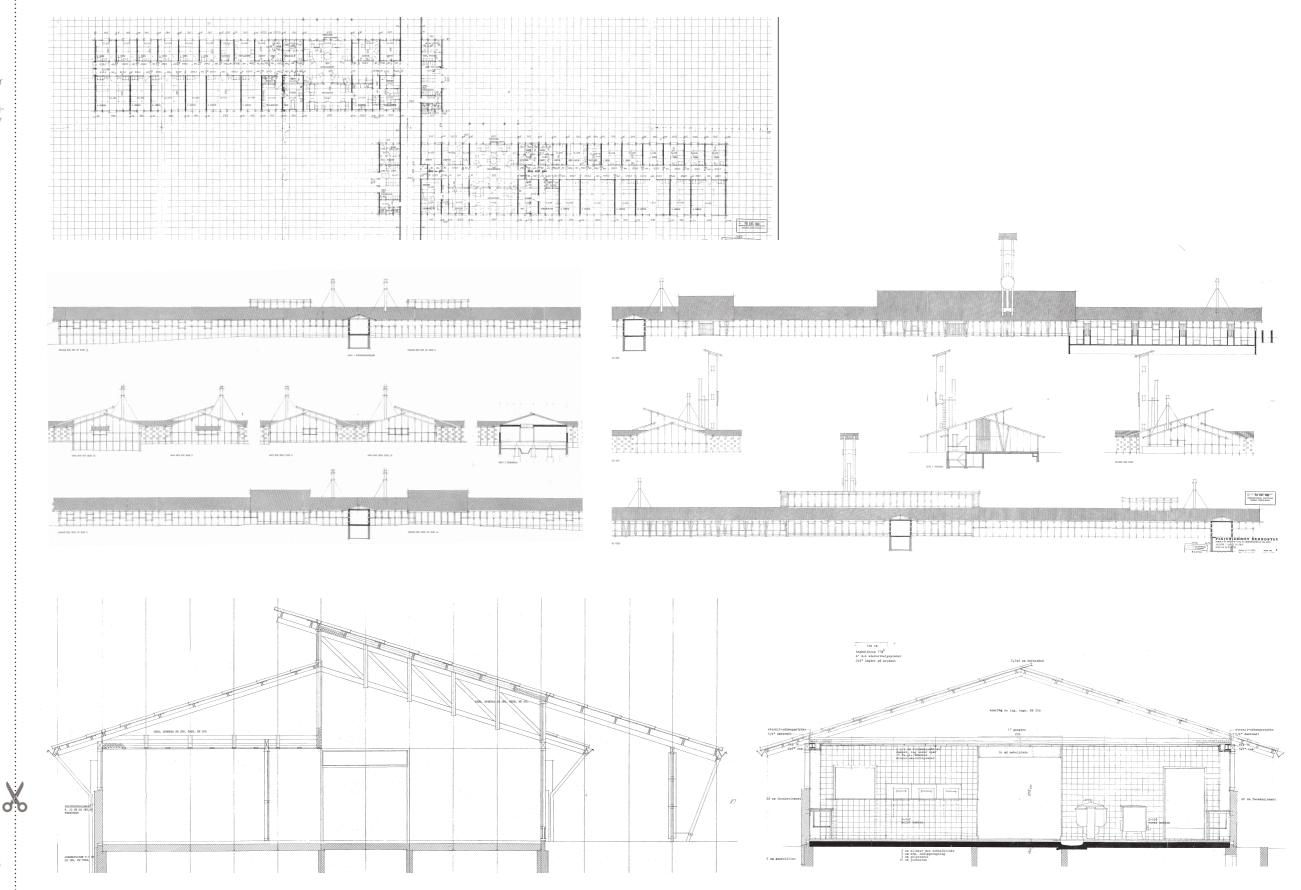
Helmer-Petersen, Keld. In "Transformerstation, Bremerholm, Fotoografier for Hans Chr. Hansen," Den Kongelige Biblioteket. www5.kb.dk/images/ billed/2010/okt/billeder/object610709/ da/.

Brøndbylund Psychiatric Hospital

Danmarks Kunstbibliotek - Arkitekturfotografi. "Plejehospitalet Brøndbylund, fotograferet for Hans Chr. Hansen." Danmarks Kunstbibliotek - Arkitekturfotografi. http://www5.kb.dk/images/billed/2010/okt/billeder/object612455/da/ http://www5.kb.dk/images/billed/2010/okt/ billeder/object612456/da/ http://www5.kb.dk/images/billed/2010/okt/ billeder/object612457/da/

Ejlers, Erik. "Hans Christian Hansen." Kunstindeks Danmark & Weilbachs Kunstnerleksikon, https://www.kulturarv.dk/kid/VisKunstner. do?kunstnerld=8020

Københavns Kommune - Byggesagsarkiv.



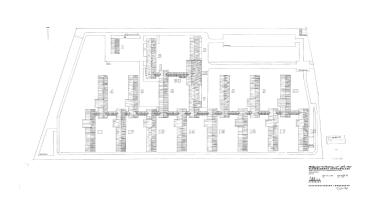




Program: Nursing home and phsychiatric hospital for elderly people Date: Built in 1966 Type: Public project Architects: H. Chr. Hansen, F.C. Lund and Viggo S. Jørgensen Morten Klint (landscape) Client: Copenhagen municipality Engineers: Engineering department Copenhagen municipality Sqm: 14640

Brøndbylund Psychiatric Hospital, 1965-1966

Brøndbyøstervej 160, Brøndby, 2605 Copenhagen



Drawings:

Scale 1/500 (A3) Scale 1/100 (A3)

<u>lmage:</u>

Helmer-Petersen, keld. In "Plejehospitalet Brøndbylund, fotografier for Hans Chr. Hansen," Den Kongelige Biblioteket. www5.kb.dk/images/billed/2010/ okt/billeder/object612457/da/.

Amager Transformer Station

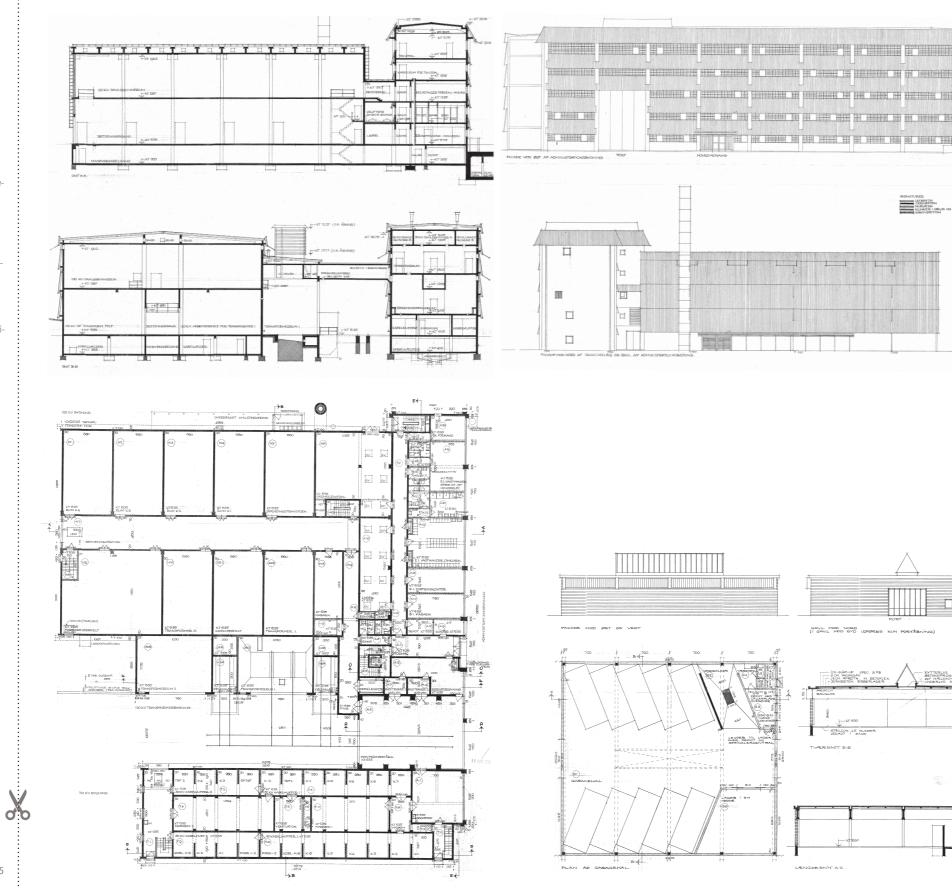
Det Kongelige Akademi – Bibliotek for Arkitektur, Design og Konservering. "Amager Koblingsstation." *Det Kongelige Akademi – Bibliotek for Arkitektur, Design og Konservering.* https://www.arkitekturbilleder.dk/bygning/amager-koblingsstation/

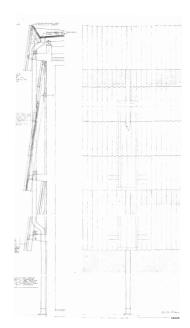
Københavns Kommune - Byggesagsarkiv. "Public.filarkiv." Københavns Kommune - Byggesagsarkiv. https://public.filarkiv.dk * Irlandsvej, 95

* 1971, Særlige sager. Tegningsliste (1)

Københavns Kommune - Historie & Kunst. "Amager Koblingsstation." Københavns Kommune - Historie & Kunst. https://kbhbilleder. dk/søg?q=amager%20koblingsstation

Seier, Kristian, "Hans Chr. Hansen, architect." Flickr 2010, https://www.flickr.com/photos/seier/5492367733/in/set-72157626209273636













Nyborggade Transformer Station
 1958-60

Svanemollle Switching Station 1966-68

Bremerholm Transformer Station
 1962-63

1938-41

Sundbyvester Amager Transformer Station 1963-66

Sundholm Laundry Building

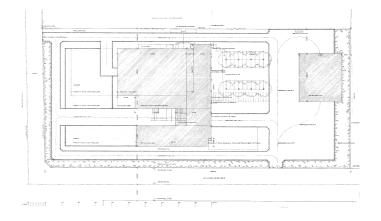
Tårnby

en School

Program: Transformer Station Date: Built in 1968 Extended in 1977 Garage demolished Type: Public project Architects: H. Chr. Hansen and F.C. Lund C. N. Christiansen (extension) Client: Copenhagen light and power authority Engineers: A. J. Moe A/S Sqm: 8997

Amager Transformer Station, 1966-1968

Irlandsvej 95, Amager, 2605 Copenhagen



Drawings:

Scale 1/500 (A3) Scale 1/100 (A3)

<u>lmage:</u>

Photographer unknown. In "Amager Koblingsstation," Museum of Copenhagen. Http://kbhbilleder.dk/kbh-museum/21098.

Svanemølle Transformer Station

Woodward, Christopher. Copenhagen: The Buildings of Europe Manchester (University Press, 1998): 100

Sestoft, Jørgen. "Arbejder af Hans Chr. Hansen." Arkitektur, no. 4 (1972): 167

Sestoft, Jørgen. 1886 Stadsarkitekten i København 1986, Arkitektens Forlag, 1986. Special reprint from Arkitektur, no. 6-7 (1986): 320

Danmarks Kunstbibliotek - Arkitekturfotografi. "Transformerstation, Nyborggade, fotograferet for Hans Chr. Hansen." Danmarks Kunstbibliotek - Arkitekturfotografi. http:// www5.kb.dk/images/billed/2010/okt/billeder/ object610725/da/ http://www5.kb.dk/images/billed/2010/okt/ billeder/object610723/da/

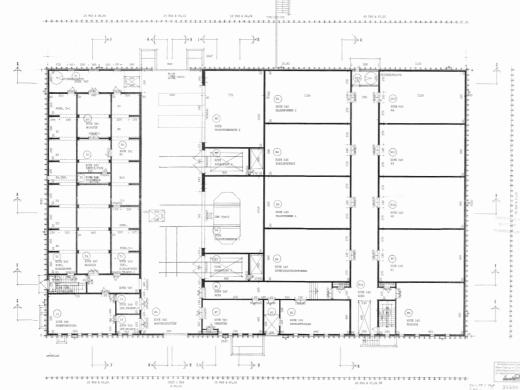
Københavns Kommune - Byggesagsarkiv. "Public.filarkiv." Københavns Kommune - Byggesagsarkiv. https://public.filarkiv.dk * Nyborggade, 15

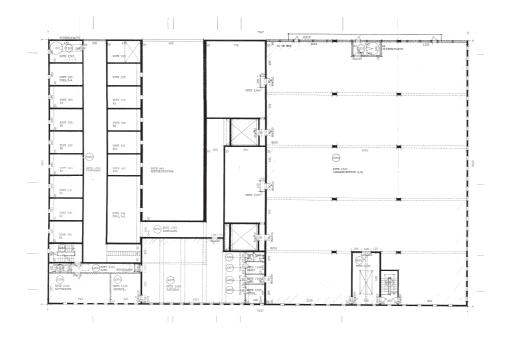
6 7x5 A 50,75

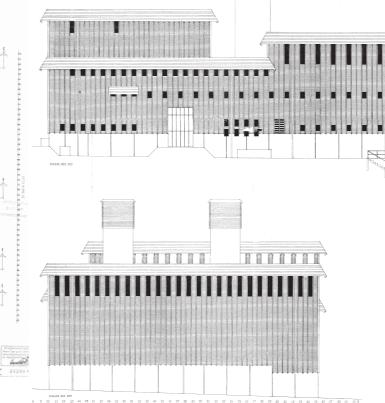
* 1960, Nybyggeri. Opførelse af en hovedtransformatorstation (1)

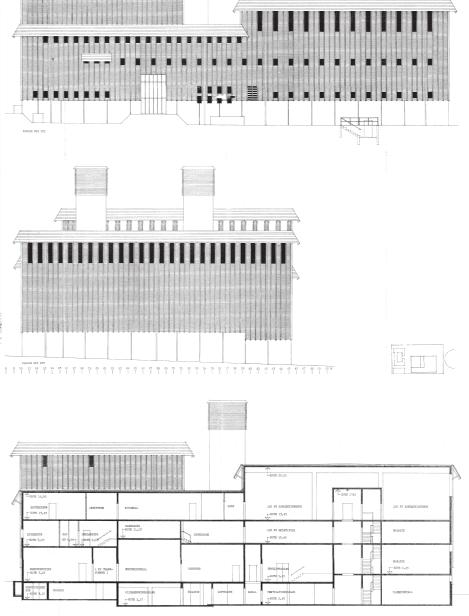
Københavns Kommune - Historie & Kunst. "Nyborggade Transformatorstation." Københavns Kommune - Historie & Kunst. https:// kbhbilleder.dk/søg?q=Nyborggade%20Transformatorstation

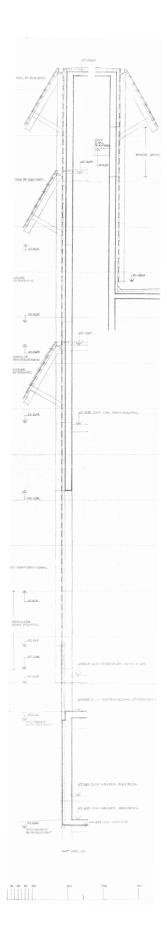
Seier, Kristian, "Hans Chr. Hansen, architect." Flickr 2010, https://www.flickr.com/photos/seier/5692115853/in/set-72157626209273636











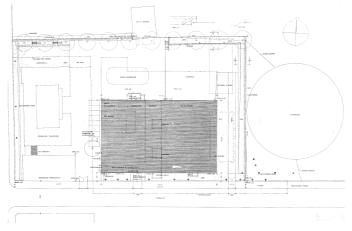




Program: Transformer Station Date: Built in 1968 Extended in 1993 Type: Public project Architects: H. Chr. Hansen, F.C. Lund O. Safft (extension) Client: Copenhagen light and power authority Engineers: A. J. Moe A/S Sqm (approx.): 1950

Svanemølle Transformer Station, 1966-1968

Nyborggade 15, Østerbro, 2100 Copenhagen Ø



Drawings:

Scale 1/500 (A3) Scale 1/100 (A3)

<u>lmage:</u>

Helmer-Petersen, Keld. In "Transformerstation, Nyborggade, fotograferet for Hans Chr. Hansen," Den Kongelige Biblioteket. www5.kb.dk/images/ billed/2010/okt/billeder/object610723/ da/.

Tagensbo Church

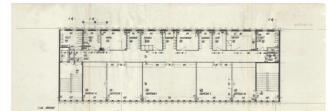
Sestoft, Jørgen. "Arbejder af Hans Chr. Hansen." Arkitektur , no. 4 (1972): 170

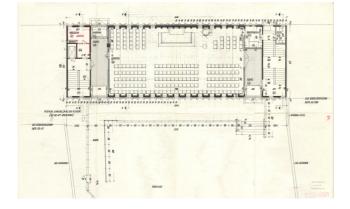
Danmarks Kunstbibliotek - Arkitekturfotografi. "Tagensbo Kirke, Fotografier for Hans Chr. Hansen." Danmarks Kunstbibliotek - Arkitekturfotografi. http://www5.kb.dk/images/ billed/2010/okt/billeder/object610721/da/ http://www5.kb.dk/images/billed/2010/okt/ billeder/object610717/da/ http://www5.kb.dk/images/billed/2010/okt/ billeder/object610720/da/ http://www5.kb.dk/images/billed/2010/okt/ billeder/object610719/da/ http://www5.kb.dk/images/billed/2010/okt/ billeder/object610718/da/

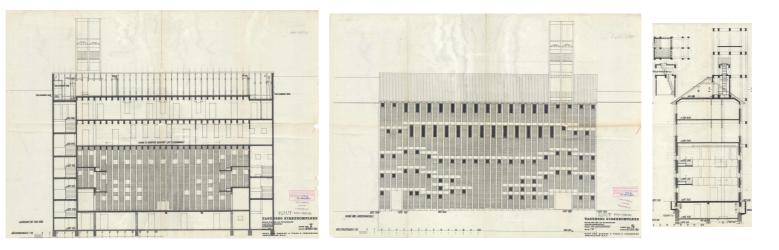
Københavns Kommune - Byggesagsarkiv. "Public.filarkiv." Københavns Kommune - Byggesagsarkiv. https://public.filarkiv.dk * Landsdommervej, 35

* 1970, Nybyggeri. Opførelse af et 5-etages kirkekompleks og anlæg af de ubebyggede arealer

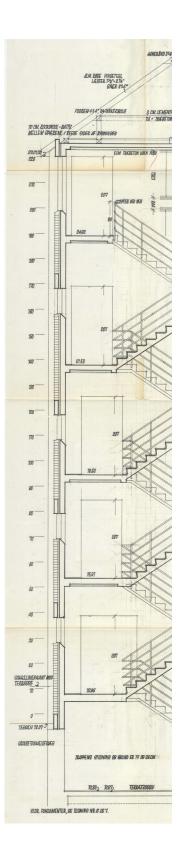
Seier, Kristian, "Hans Chr. Hansen, architect." Flickr 2010, https://www.flickr.com/photos/ seier/14377659449/in/photostream/

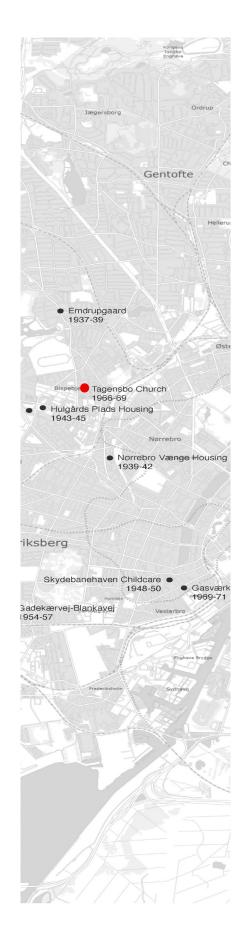






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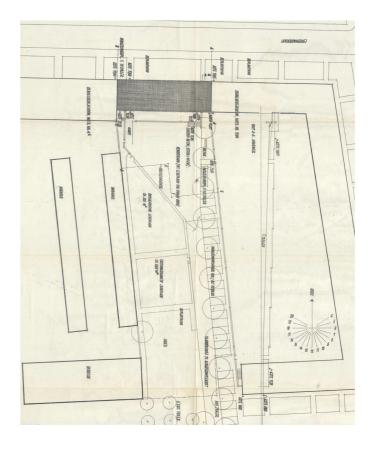




Tagensbo Church, 1966-1969

Landsdommervej 35, 2400 Copenhagen NV

Program: Church and Daycare Date: Built in 1969 Tool Shed and Chapel in 1881 New yard staircase in 2008 Type: Private project Architects: H. Chr. Hansen and V.S. Jørgensen Client: Copenhagen Church Funds Engineers: B. Brendtsen A/S Engineer L. Nielsen Sqm: 1243



Drawings:

Scale 1/500 (A3) Scale 1/100 (A3)

<u>lmage:</u>

Helmer-Petersen, Keld. In "Tagensbo Kirke, Fotografier for Hans Chd. Hansen," Den Kongelige Biblioteket. www5. kb.dk/images/billed/2010/okt/billeder/ object610717/da/.

Gas Pressure Regulator Bellahøj

Sestoft, Jørgen. "Arbejder af Hans Chr. Hansen." Arkitektur, no. 4 (1972): 164

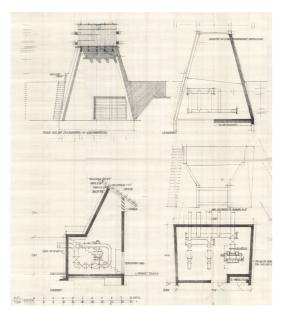
Danmarks Kunstbibliotek - Arkitekturfotografi. "Gasregulatorstation, Bellahøj, Fotografier for Hans Chr. Hansen." Danmarks Kunstbibliotek - Arkitekturfotografi. http://www5.kb.dk/images/billed/2010/okt/billeder/object610724/da/ http://www5.kb.dk/images/billed/2010/okt/ billeder/object610733/da/

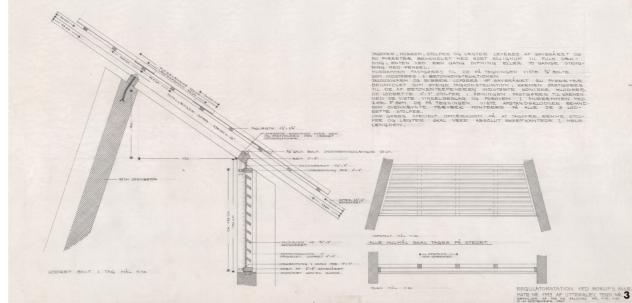
Københavns Kommune - Byggesagsarkiv. "Public.filarkiv." Københavns Kommune - Byggesagsarkiv. https://public.filarkiv.dk * Hulgårdsvej, 133

* 1970, Særlige sager. 4-7 etagers koblingsstation, 1-etages servicestation, underjordisk komandocentral m.m. (1)

Københavns Kommune - Historie & Kunst. "Bellahøj Koblingsstation" Københavns Kommune - Historie & Kunst. https://kbhbilleder. dk/søg?q=Bellahøj%20Koblingsstation

Seier, Kristian, "Hans Chr. Hansen, architect." Flickr 2010, https://www.flickr.com/photos/seier/5507583242/in/set-72157626209273636/





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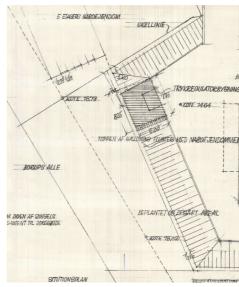




Program: Gas Pressure Regulator Date: Built in 1968 Type: Public project Architects: H. Chr. Hansen and F.C. Lund Client: Copenhagen light and power authority Engineers: A.J. Moe A/S Sqm: 56

Gas Pressure Regulator, 1969-1971

Hulgårdsvej 133,2400 Copenhagen NW Copenhagen



Drawings:

Scale 1/500 (A3) Scale 1/50 (A3)

<u>lmage:</u>

Helmer-Petersen, Keld. In "Gasregulatorstation, Bellahøj, Fotografier for Hans Chr. Hansen. Den Kongelige Biblioteket. www5.kb.dk/images/billed/2010/okt/ billeder/object610724/da/.

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IS OSTFACADE
FREMTIDIG UDV. AF 30 KV.
Dense legsing er i overautsmaste med det scilerte typningsarbeide og her degat grundlag
for algebiaded and the the the
BEFASTET KOREBANEADEAL

Gasværksvejens School

Sestoft, Jørgen. "Arbejder af Hans Chr. Hansen", Arkitektur, no. 4 (1972): 169

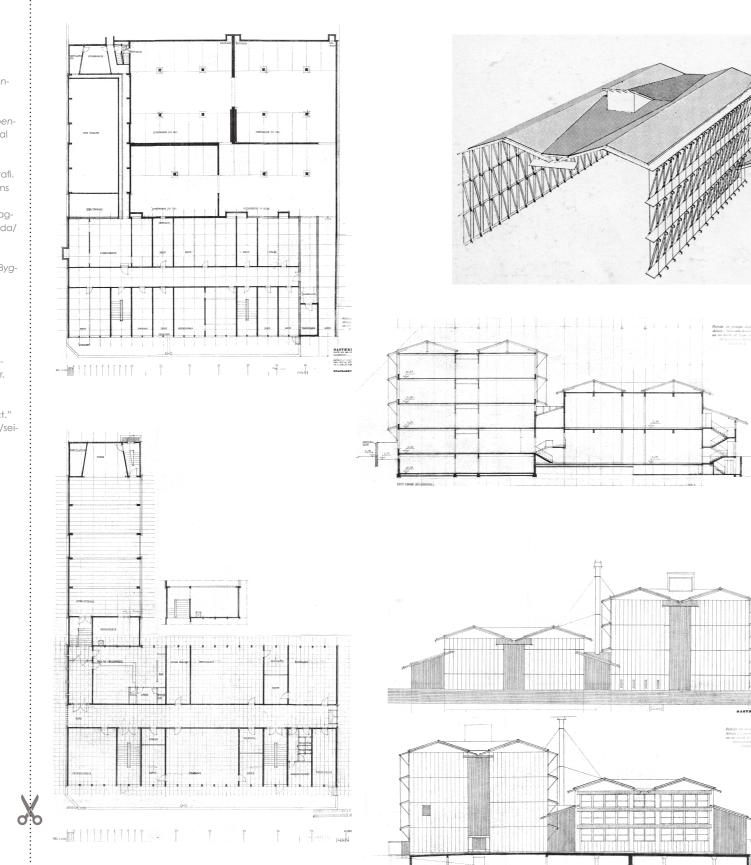
Sestoft, Jørgen. 1886 Stadsarkitekten i København 1986, Arkitektens Forlag, 1986. Special reprint from Arkitektur, no. 6-7 (1986): 321

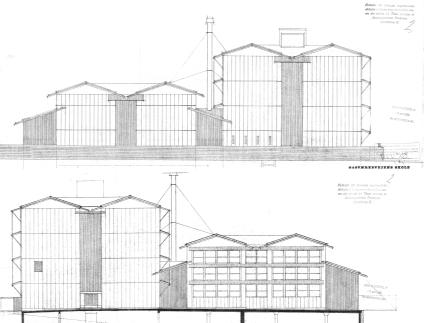
Danmarks Kunstbibliotek - Arkitekturfotografi. "Gasværksvejens skole, Fotografier for Hans Chr. Hansen." Danmarks Kunstbibliotek -Arkitekturfotografi. http://www5.kb.dk/images/billed/2010/okt/billeder/object610730/da/

Københavns Kommune - Byggesagsarkiv. "Public.filarkiv." Københavns Kommune - Byggesagsarkiv. https://public.filarkiv.dk * Gasværksvej, 22 * 1975, Til- og ombygninger. Ombygn. af eksisterende skolebygn. (3)

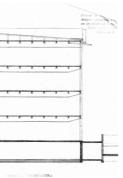
Københavns Kommune - Historie & Kunst. "gasværksvejens skole" Københavns Kommune - Historie & Kunst. https://kbhbilleder. dk/søg?q=gasværksvejens+skole

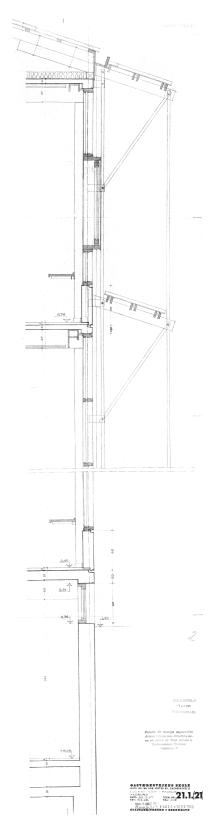
Seier, Kristian, "Hans Chr. Hansen, architect." Flickr 2010, https://www.flickr.com/photos/seier/5550985843/in/set-72157626209273636

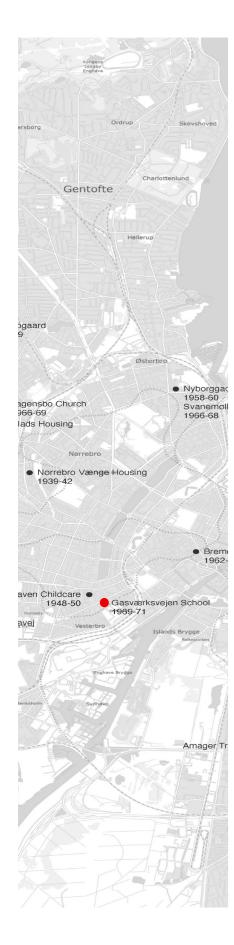










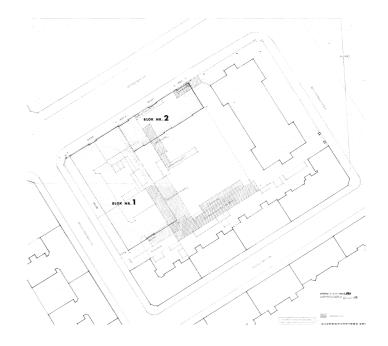




Gasværksvejens School, 1969-1971

Gasværksvej 22, Vesterbro, 1656 CopenhagenCopenhagen

Program: School extension Date: Built in 1971 Type: Public project Architects: H. Chr. Hansen and F.C. Lund Client: Copenhagen municipality Engineers: Engineering department Copenhagen municipality Sqm: 5420



Drawings:

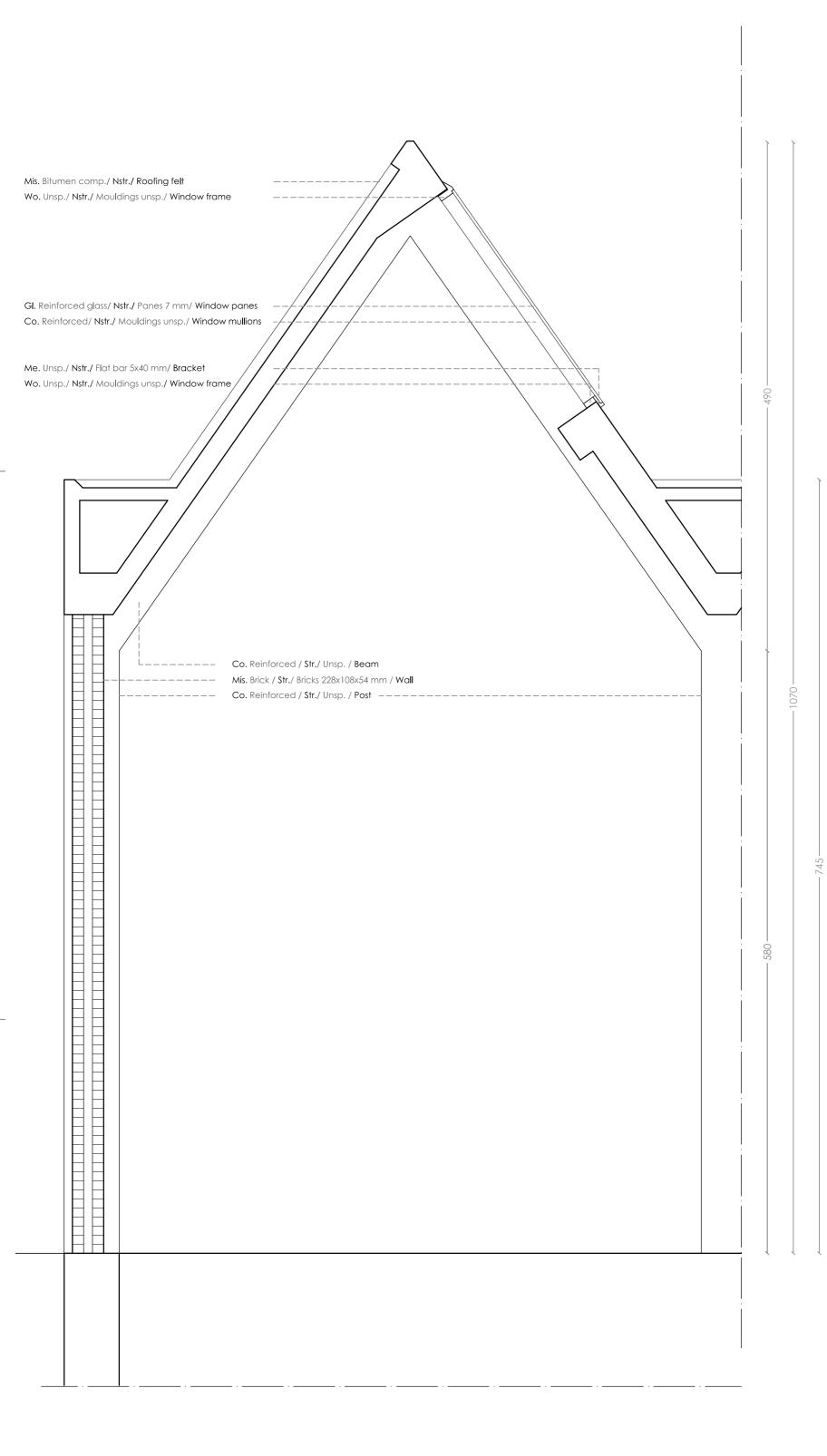
Scale 1/500 (A3) Scale 1/100 (A3)

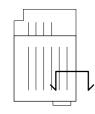
<u>lmage:</u>

Helmer-Petersen, Keld. In "Gasværksvejesn skole, Fotografier for Hans Chr. Hansen," Den Kongelige Biblioteket. www5.kb.dk/images/ billed/2010/okt/billeder/object610730/ da/.

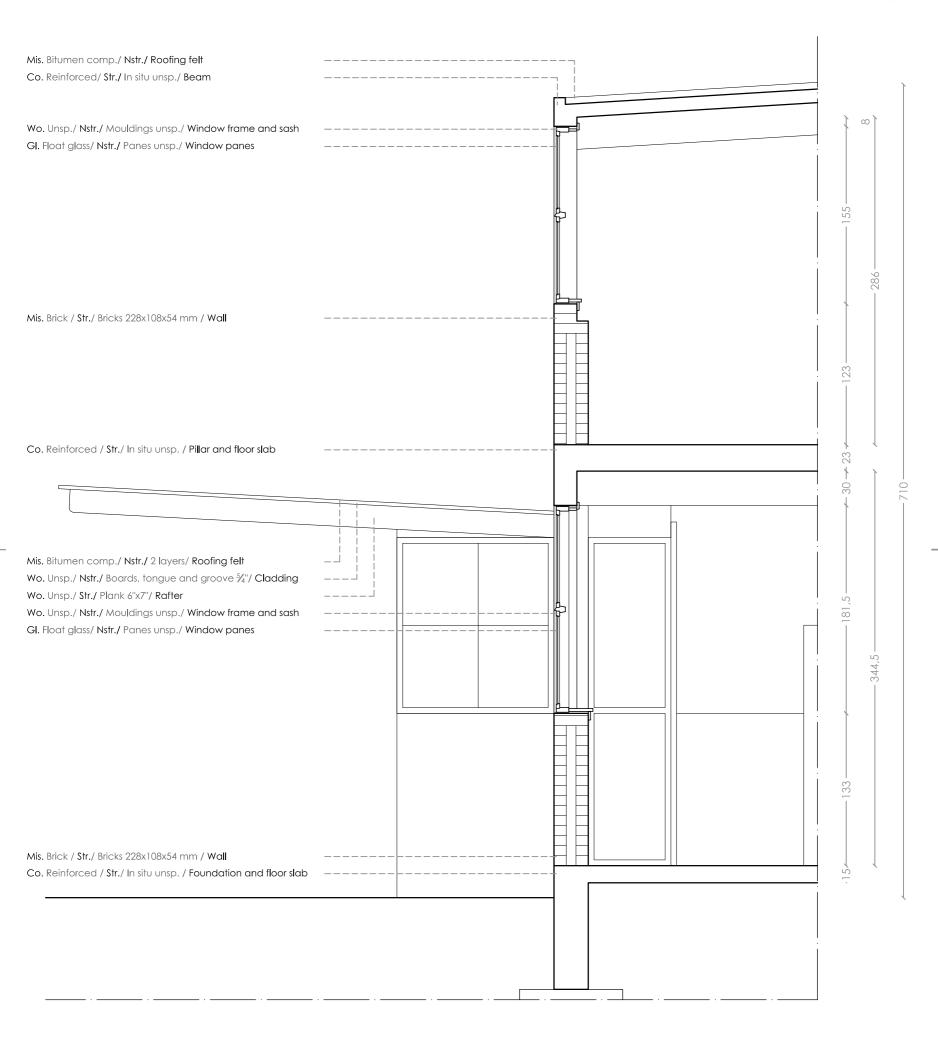


Investigations: Cuts

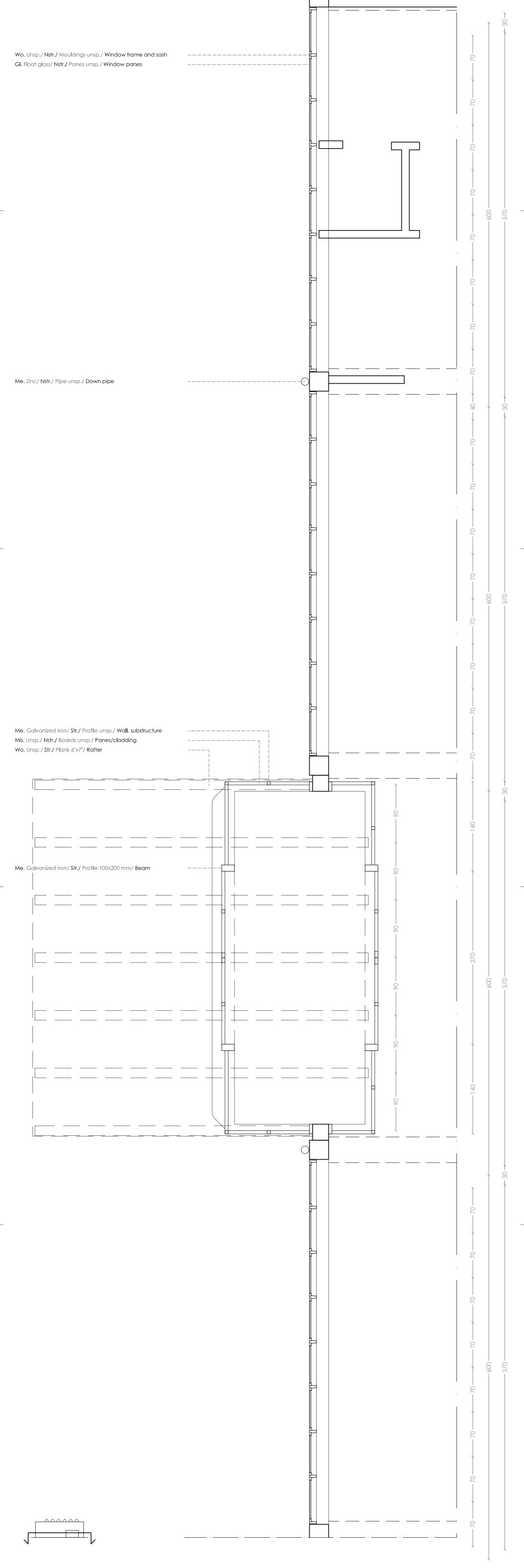




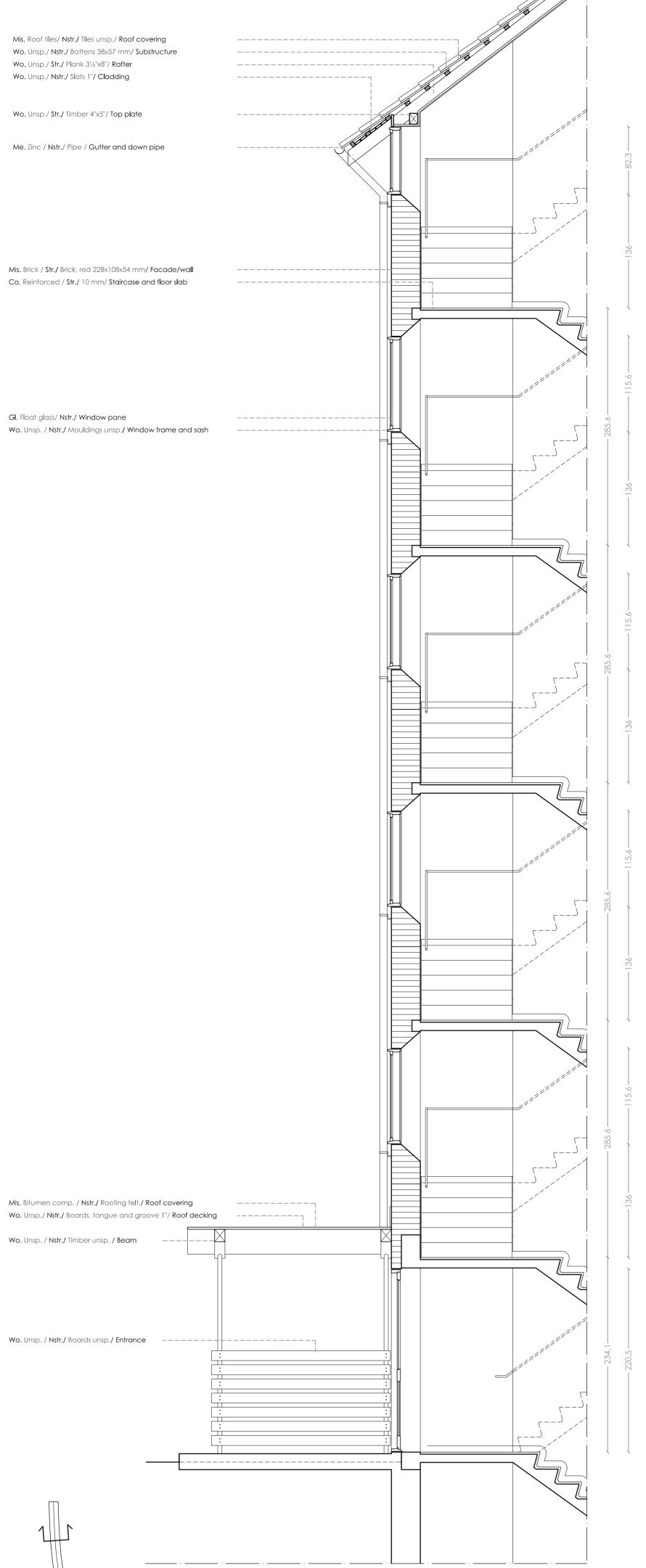
Laundry Building for Sundholm 1938-1941 Vertical section 1/33



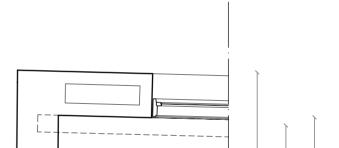
Laundry Building for Sundholm 1938-1941 Horizontal section 1/33



Branking

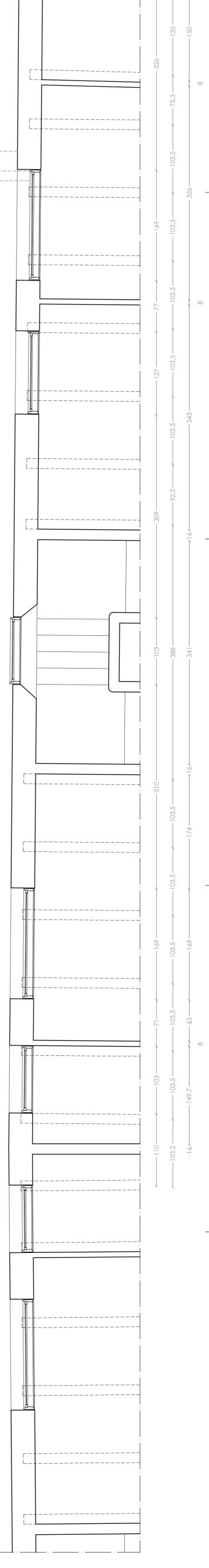


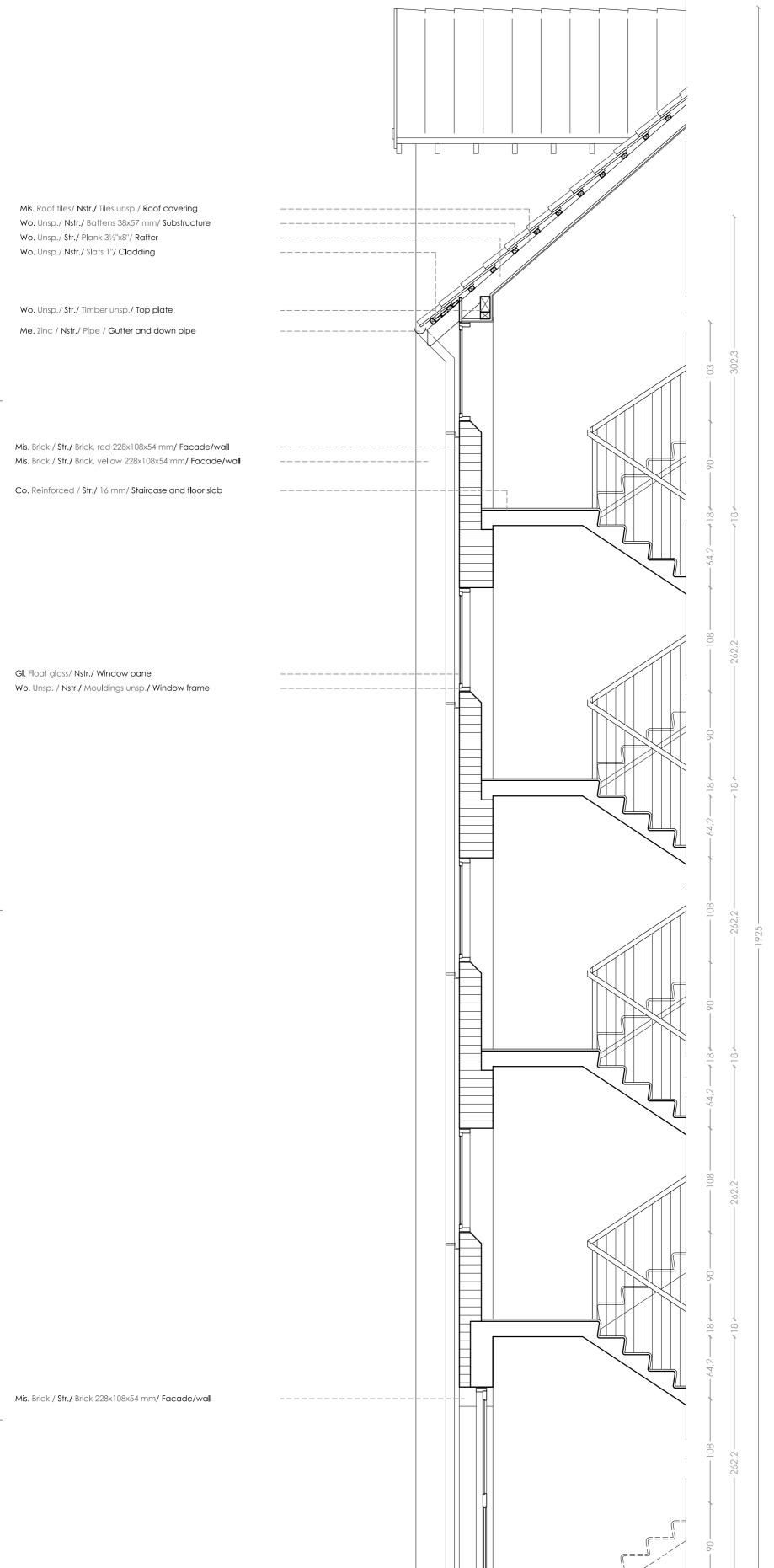
Nørrebro Vænge Housing 1939-1942 Horizontal section 1/33



Mis. Brick / Str./ Brick, red 228x108x54 mm/ Facade/wall

Wo. Unsp. / Nstr./ Mouldings unsp./ Window frame and sash GI. Float glass/ Nstr./ Window pane







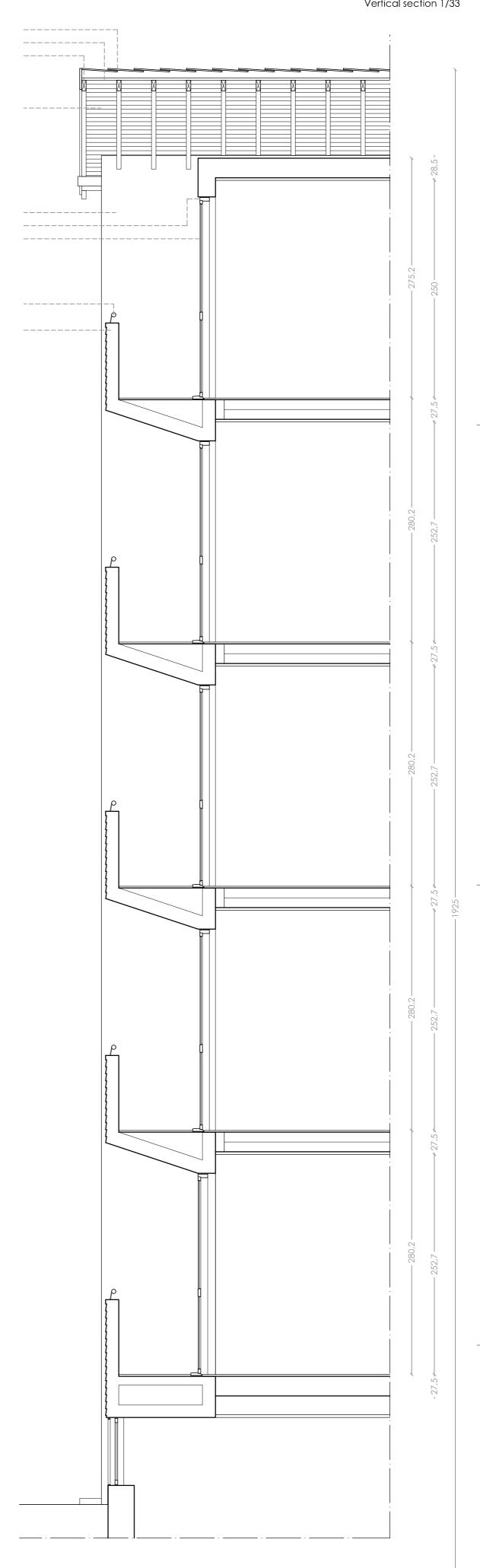
Mis. Roof tiles/ Nstr./ Tiles unsp./ Roof covering Wo. Unsp./ Nstr./ Battens 38x57 mm/ Substructure Wo. Unsp./ Str./ Plank 3½"x8"/ Rafter

Wo. Unsp./ Nstr./ Slats 1"/ Cladding

Mis. Brick / Str./ Brick 228x108x54 mm/ Facade/wall Wo. Unsp. / Nstr./ Mouldings unsp./ Door frame Gl. Float glass/ Nstr./ Door pane

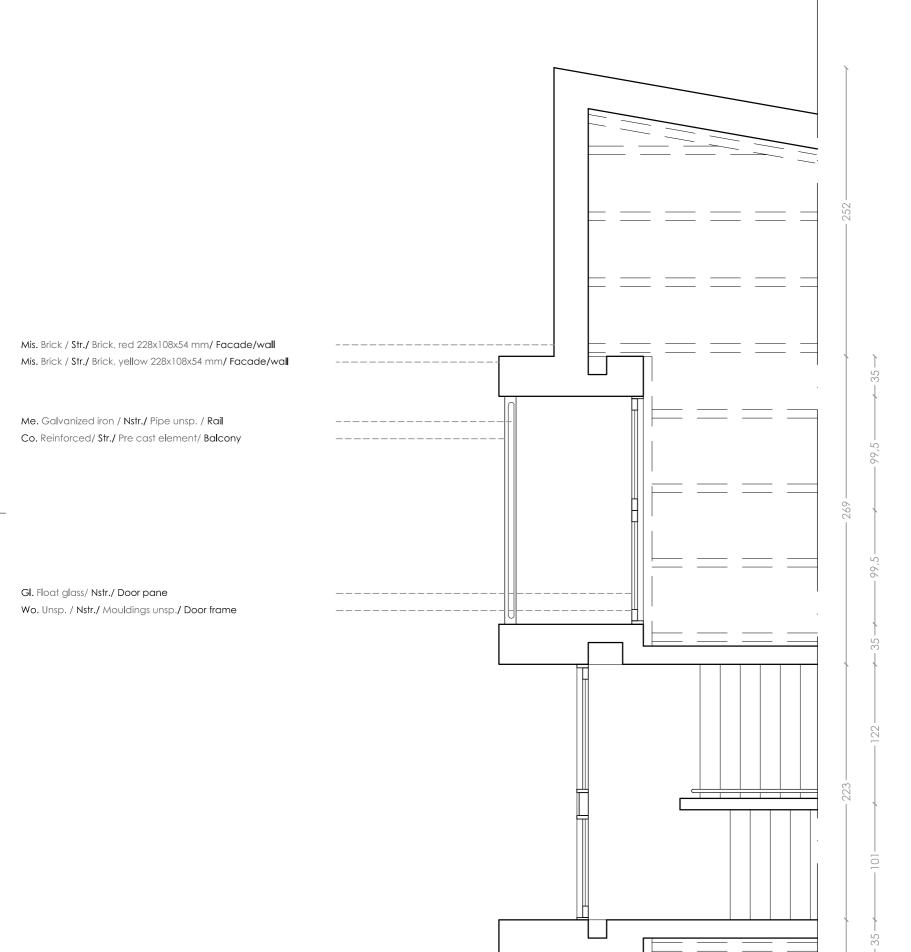
Me. Galvanized iron / Nstr./ Pipe unsp. / Rail

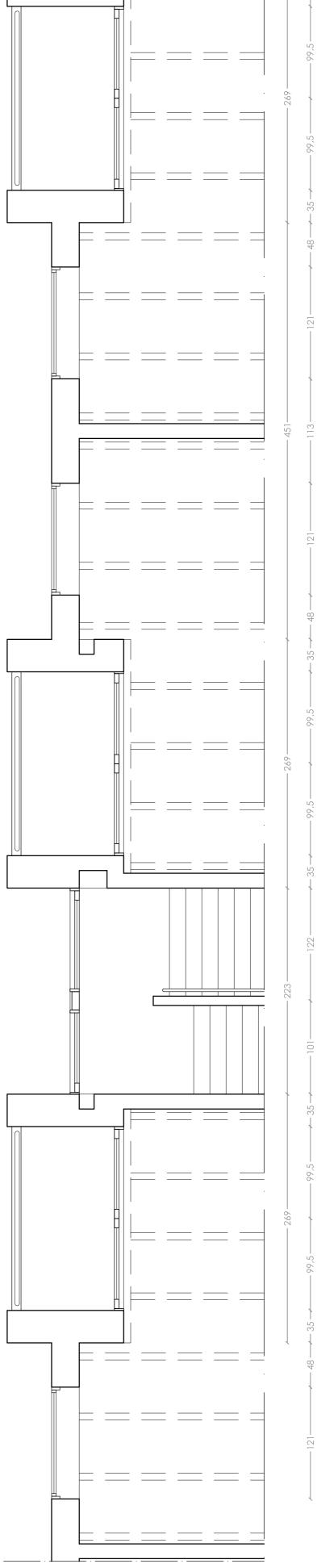
Co. Reinforced/ Str./ Pre cast element/ Balcony

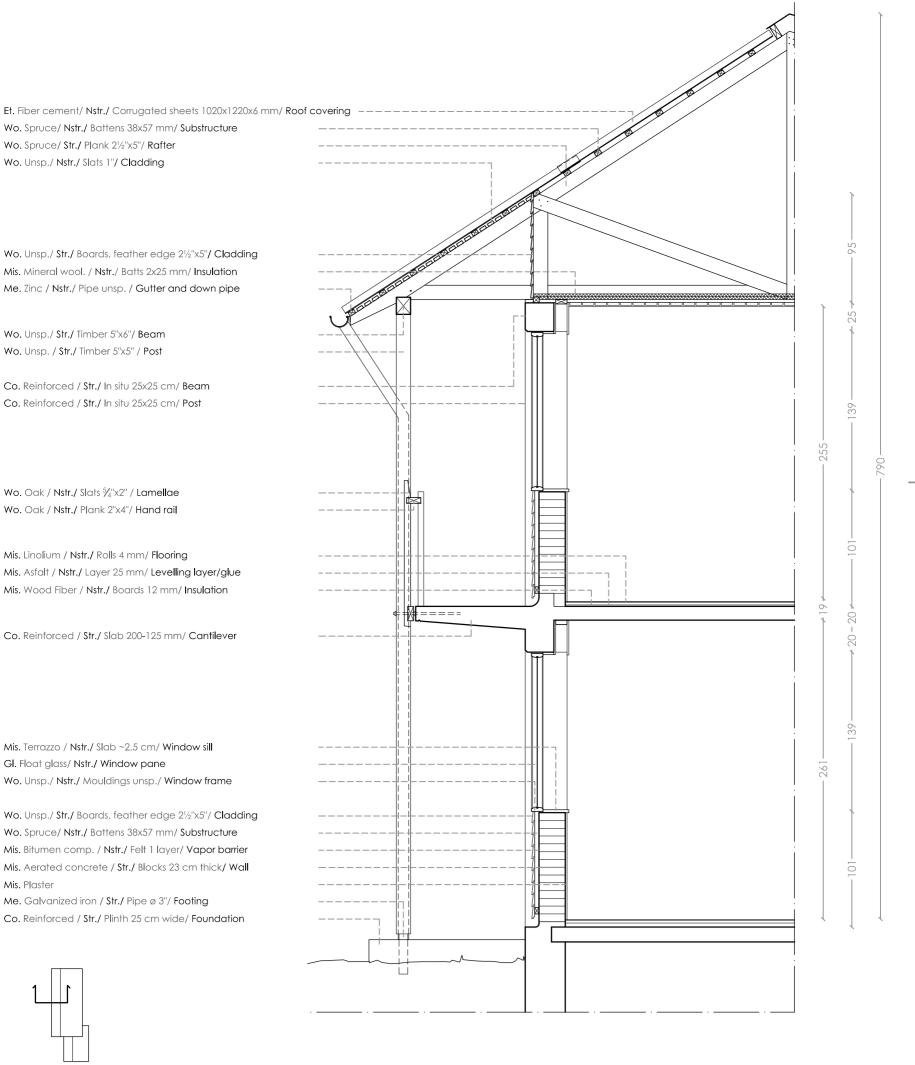


Hulgårds Plads Housing 1943-1945 Vertical section 1/33

Hulgårds Plads Housing 1943-1945 Horizontal section 1/33

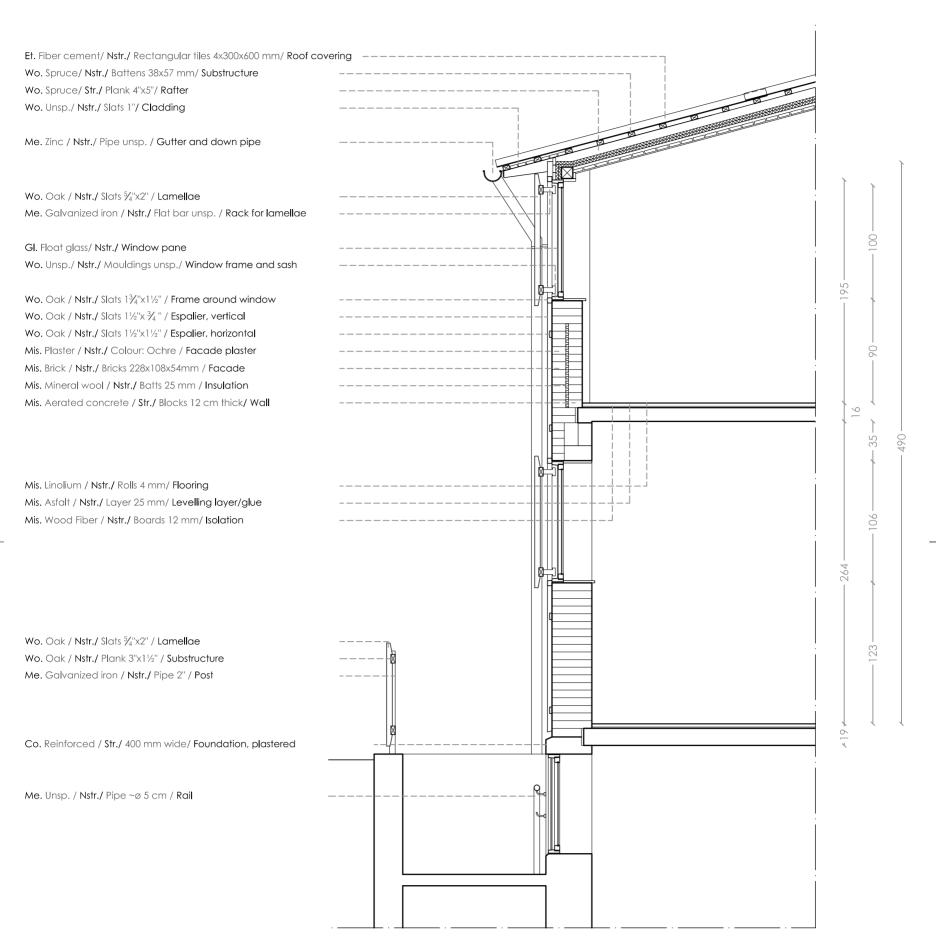






Skydebanehaven Childcare 1948-1950

Vertical section 1/33



Skydebanehaven Childcare 1948-1950 Horizontal section 1/33

29,5

29,5

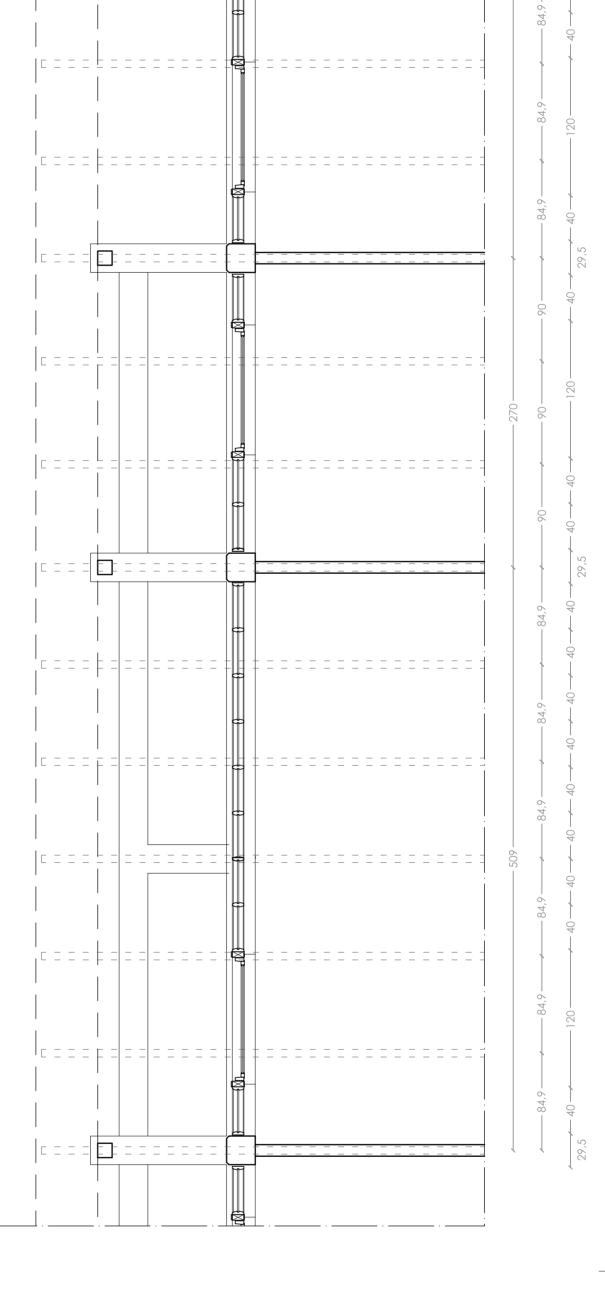
29,5

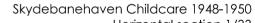
90 _ _ _ _ _ _ 270 90 90 _ - F------84,9 _ _ 84,9 _ \Box _ 84,9 4 509 _ _ _ _ 84,9 _ _ Г 84,9. 84,9 06 _ _ _ _ _ _ _ _ _ _ _ 270. 90 _ _ _ _ 90 = = = = = =_ E F. 9 84,9 _ _ _ _ _ _ 84,9 _ _ _ _ _ _ _ .84,9 509 _ _

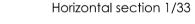
Wo. Unsp./ Str./ Boards, feather edge 21/2"x5"/ Cladding

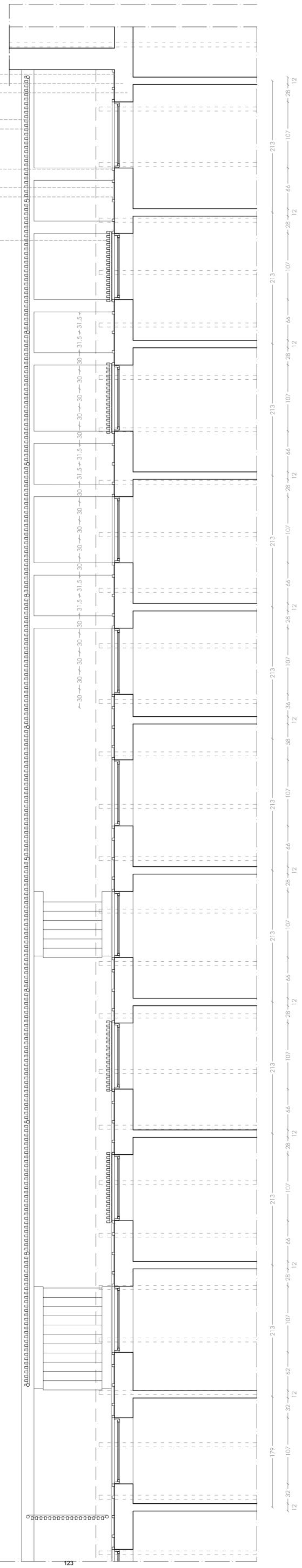
GI. Float glass/ Nstr./ Window pane Wo. Unsp./ Nstr./ Mouldings unsp./ Window frame and sash

Wo. Spruce/ Str./ Plank 21/2"x5"/ Rafter Wo. Unsp. / Str./ Timber 5"x5" / Post Co. Reinforced / Str./ In situ 25x25 cm/ Post Co. Reinforced / Str./ Plinth 25 cm wide/ Foundation









Mis. Brick / Nstr./ Bricks 228x108x54mm / Facade Mis. Mineral wool / Nstr./ Batts 25 mm / Insulation Mis. Aerated concrete / Str./ Blocks 12 cm thick/ Wall

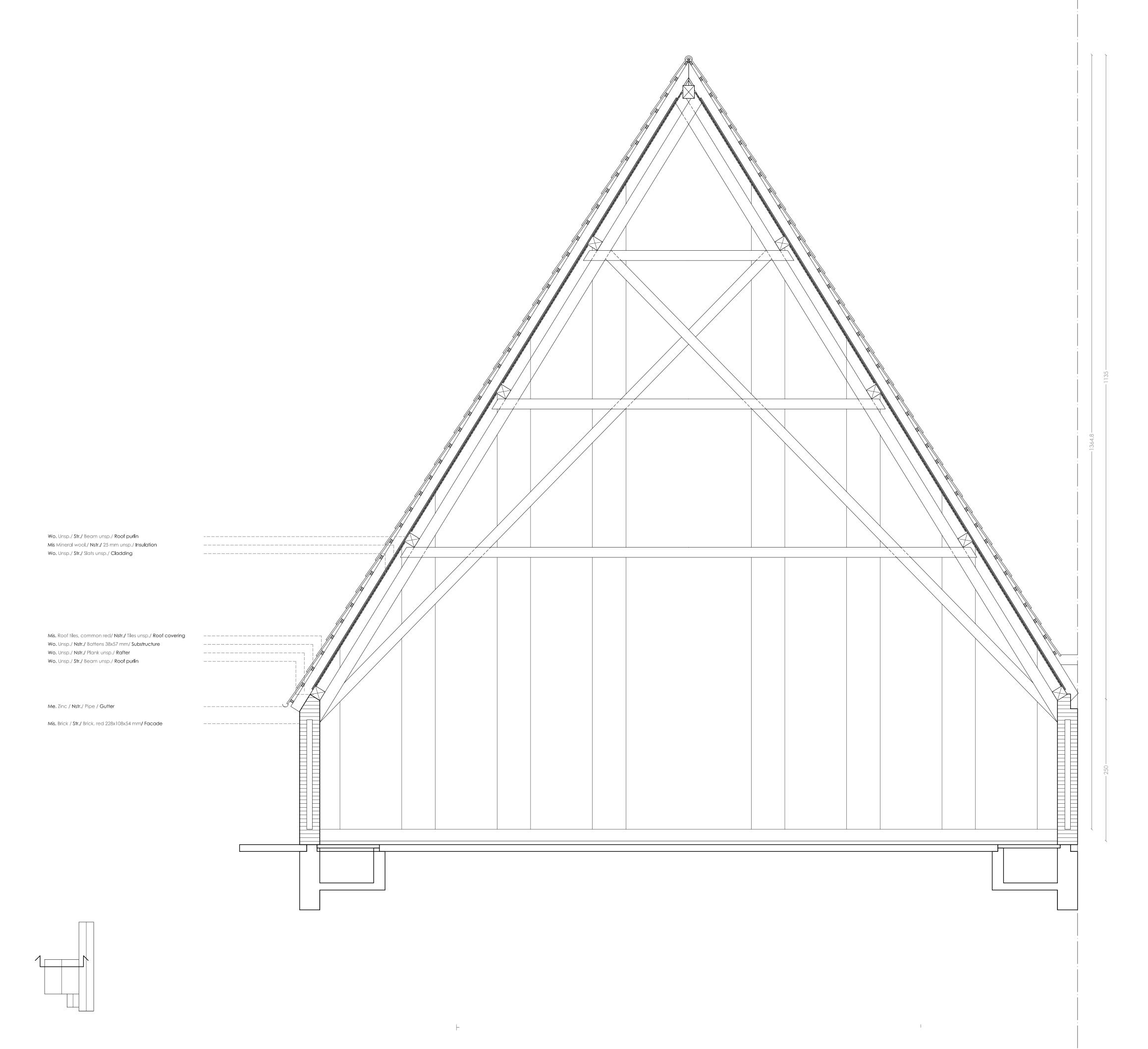
Wo. Oak / Nstr./ Slats ¾"x2" / Lamellae Me. Galvanized iron / Nstr./ Pipe 2" / Post

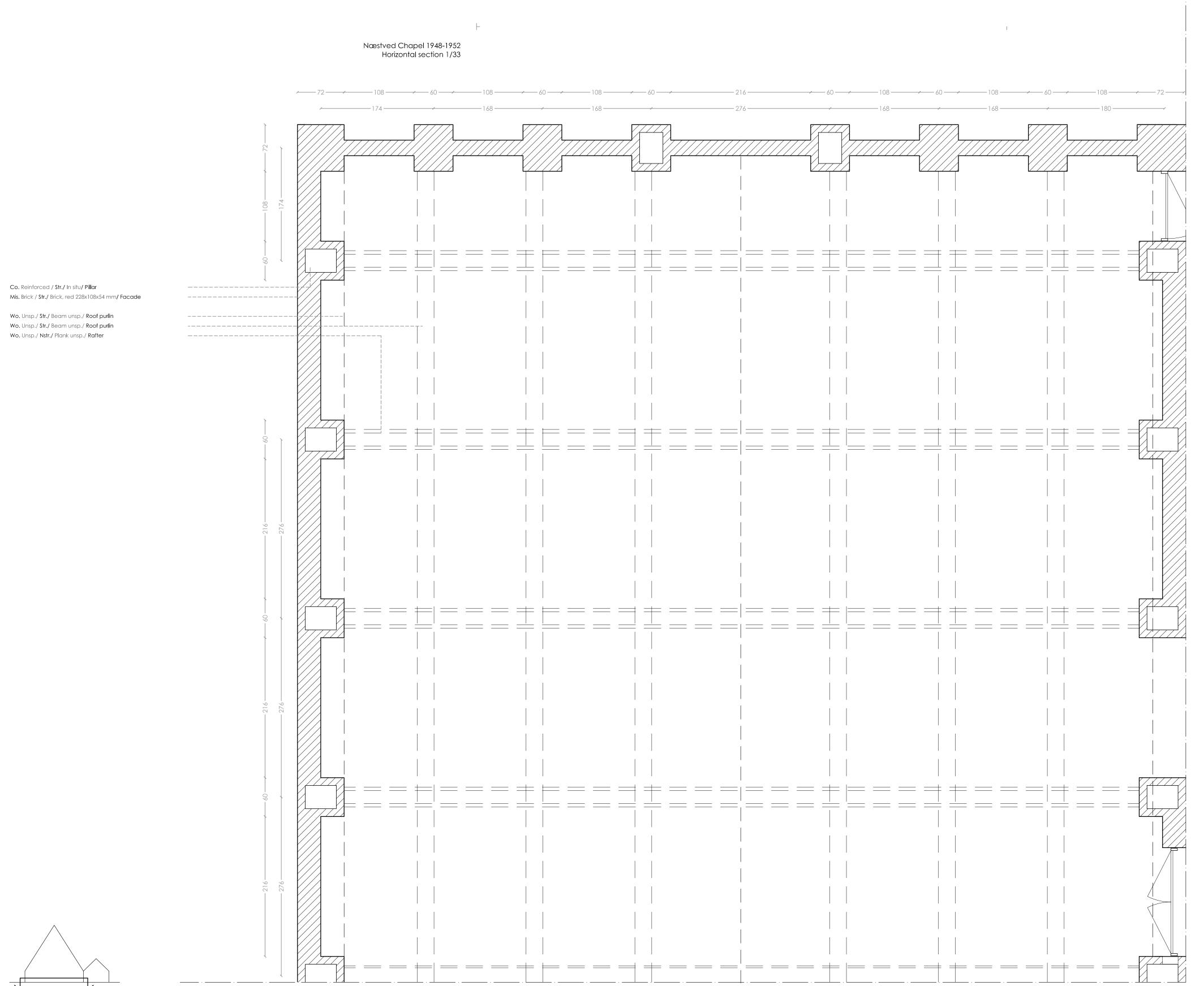
Wo. Oak / Nstr./ Slats 134"x11/2" / Frame around window

Wo. Oak / Nstr./ Slats 11/2"x11/2" / Espalier, horizontal Wo. Oak / Nstr./ Slats $1\frac{1}{2}$ "x $\frac{3}{4}$ " / Espalier, vertical

Wo. Oak / Nstr./ Slats 5/4"x2" / Lamellae

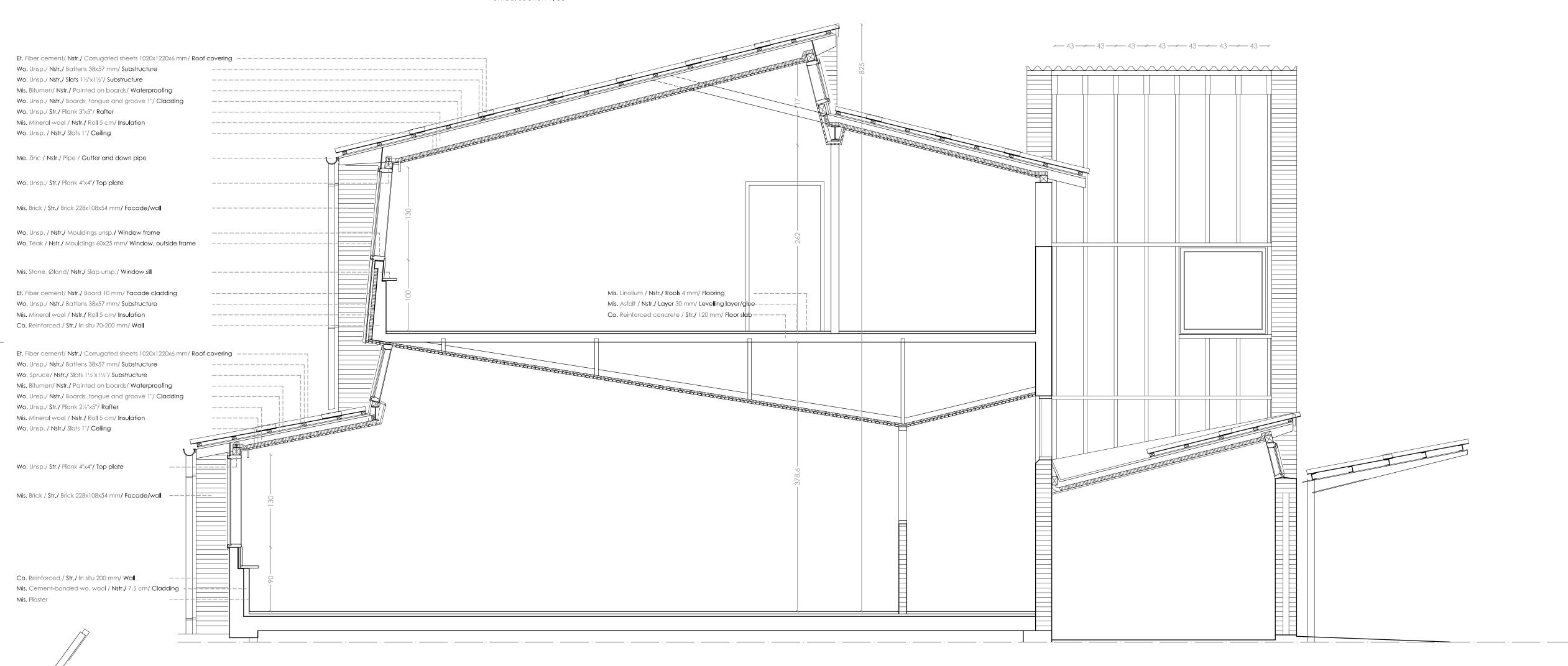
Næstved Chapel 1948-1952 Vertical section 1/33



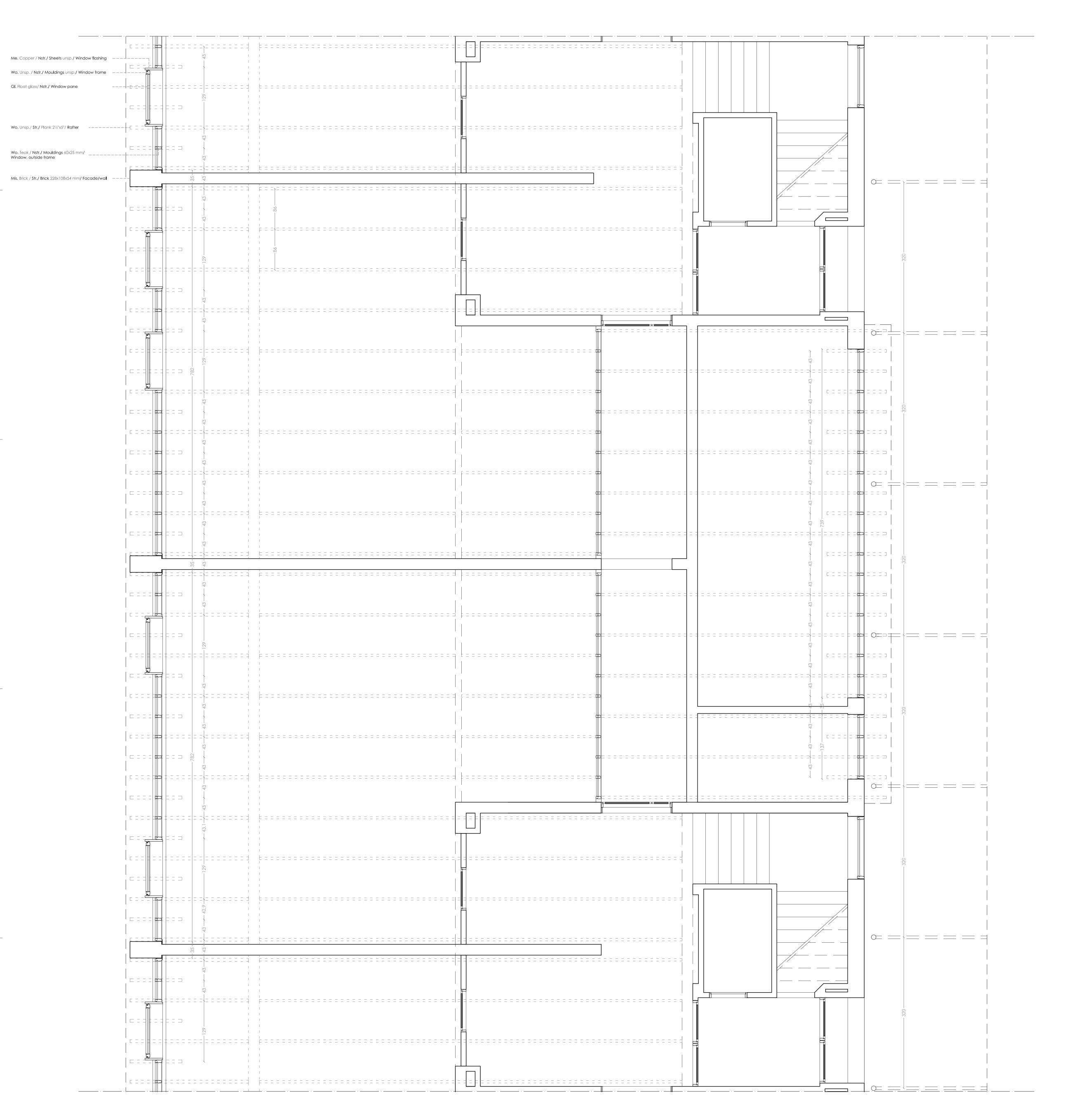


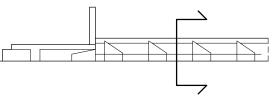


Hanssted School 1954-1959 Vertical section 1/33



Hanssted School 1954-1959 Horizontal section 1/33





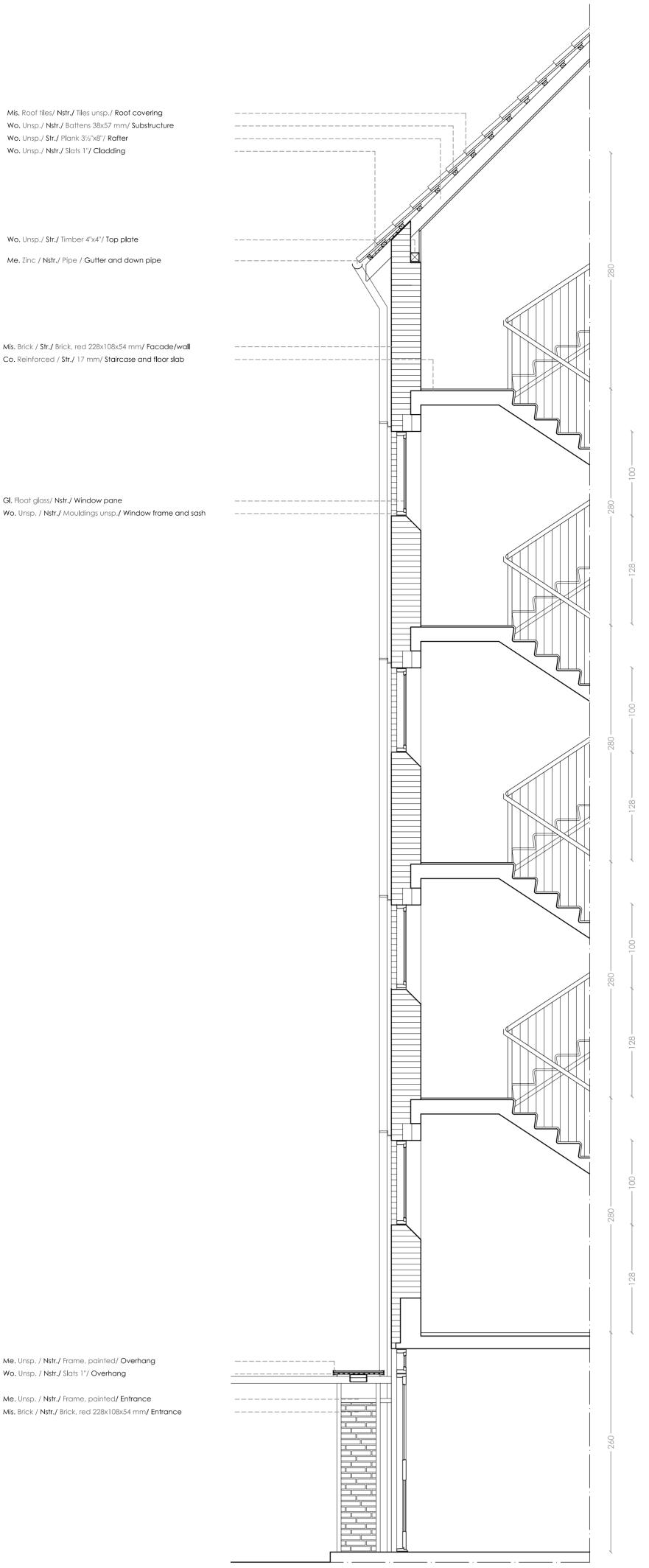
Mis. Roof tiles/ Nstr./ Tiles unsp./ Roof covering Wo. Unsp./ Nstr./ Battens 38x57 mm/ Substructure Wo. Unsp./ Str./ Plank 3½"x8"/ Rafter Wo. Unsp./ Nstr./ Slats 1"/ Cladding

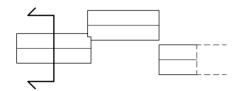
Wo. Unsp./ Str./ Timber 4"x4"/ Top plate

Me. Zinc / Nstr./ Pipe / Gutter and down pipe

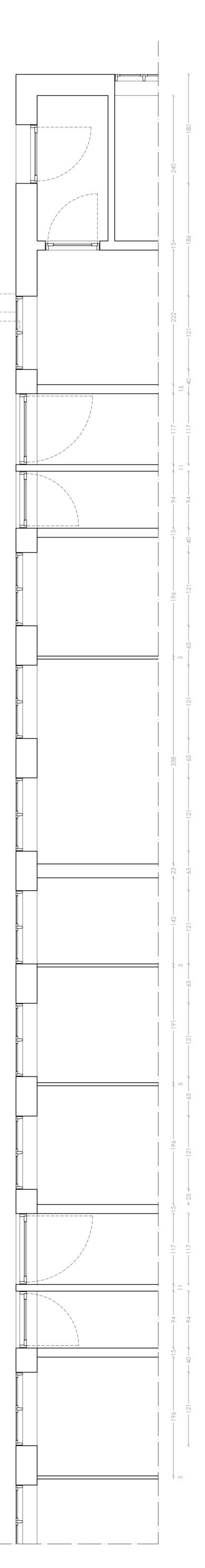
Mis. Brick / Str./ Brick, red 228x108x54 mm/ Facade/wall Co. Reinforced / Str./ 17 mm/ Staircase and floor slab

GI. Float glass/ Nstr./ Window pane





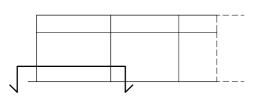
Blankavej Housing 1954-1957 Horizontal section 1/33

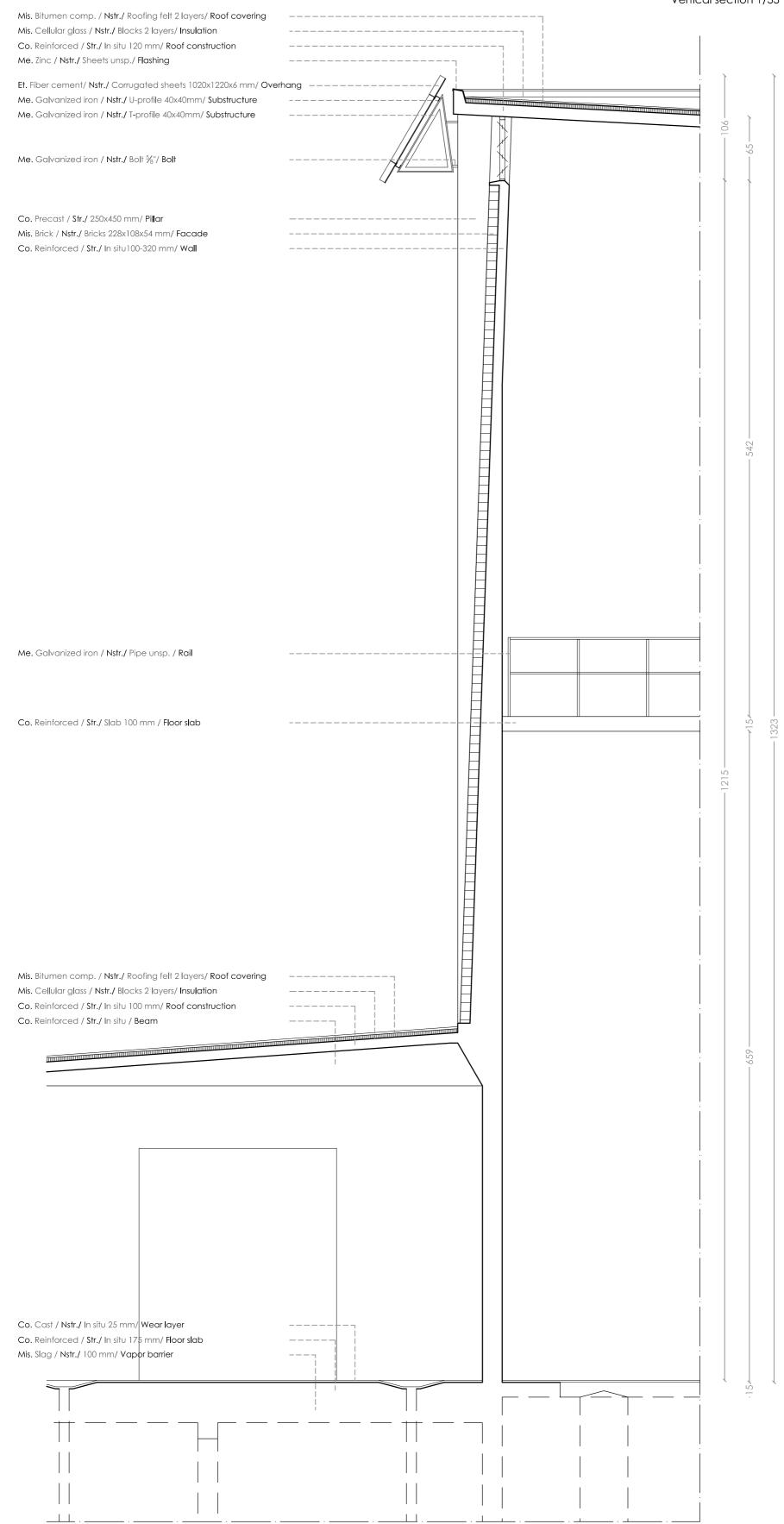


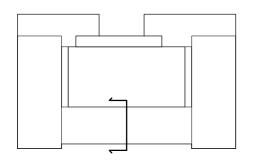
Mis. Brick / Str./ Brick, red 228x108x54 mm/ Facade/wall

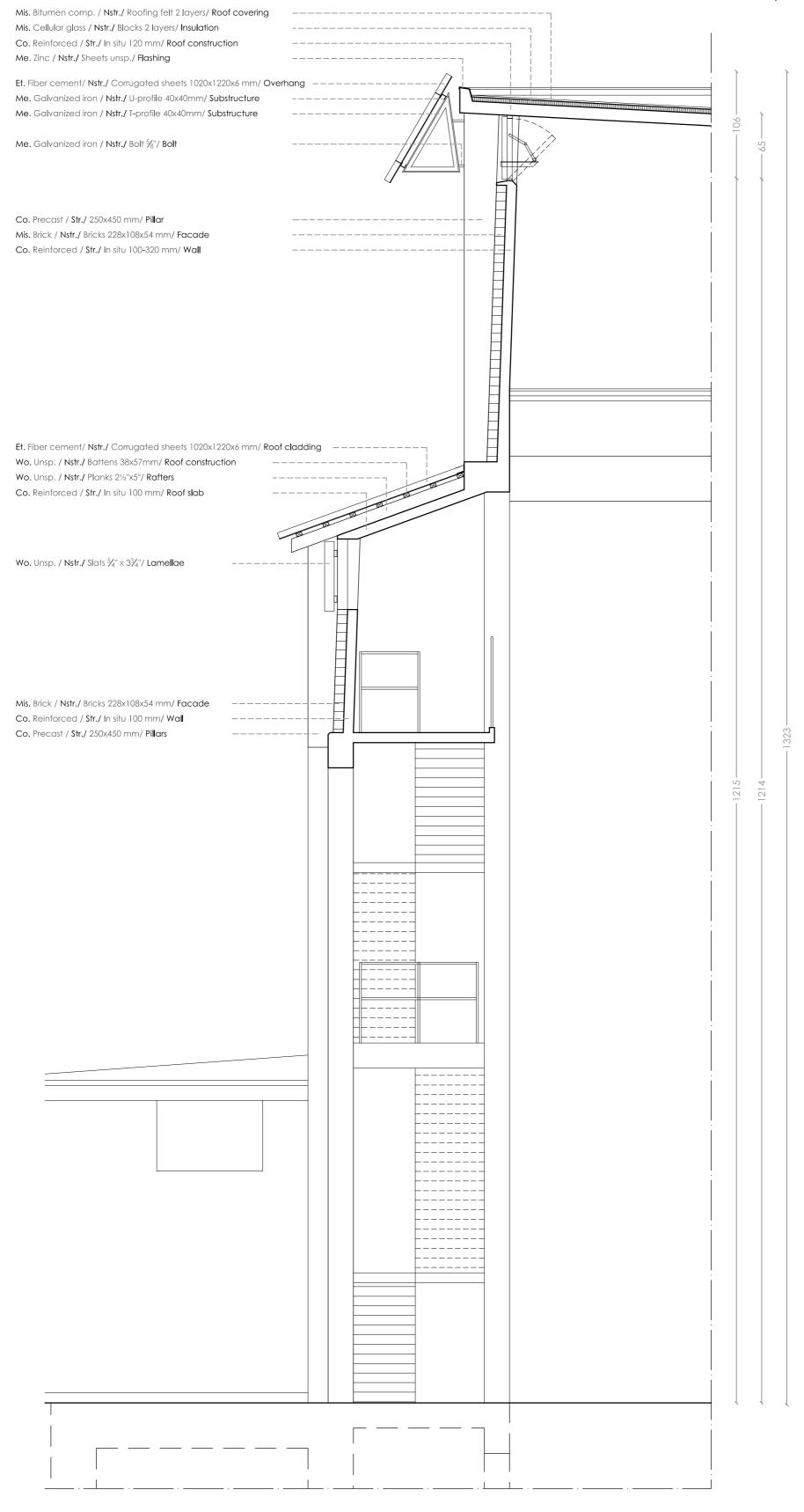
GI. Float glass/ Nstr./ Window pane

Wo. Unsp. / Nstr./ Mouldings unsp./ Window frame and sash

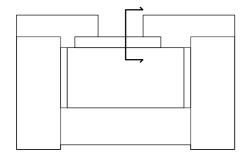




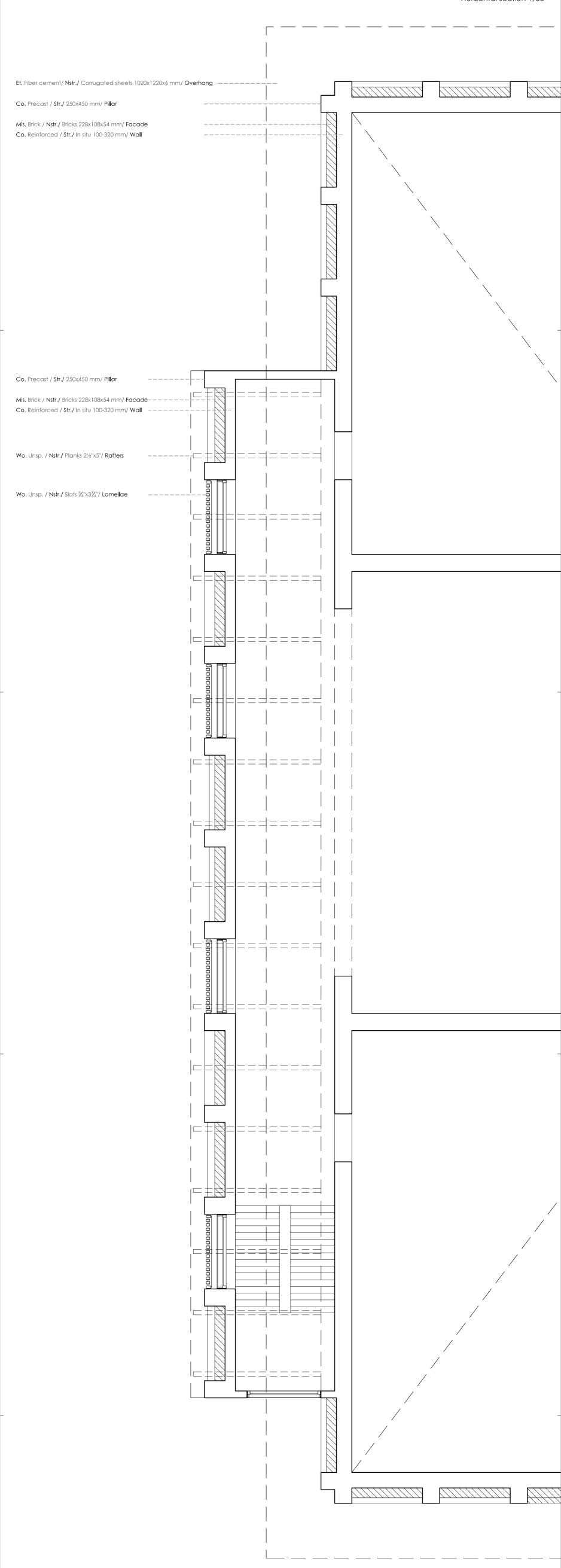


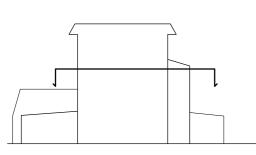


Nyborggade Transformer Station 1958-1961 Vertical section 1/33

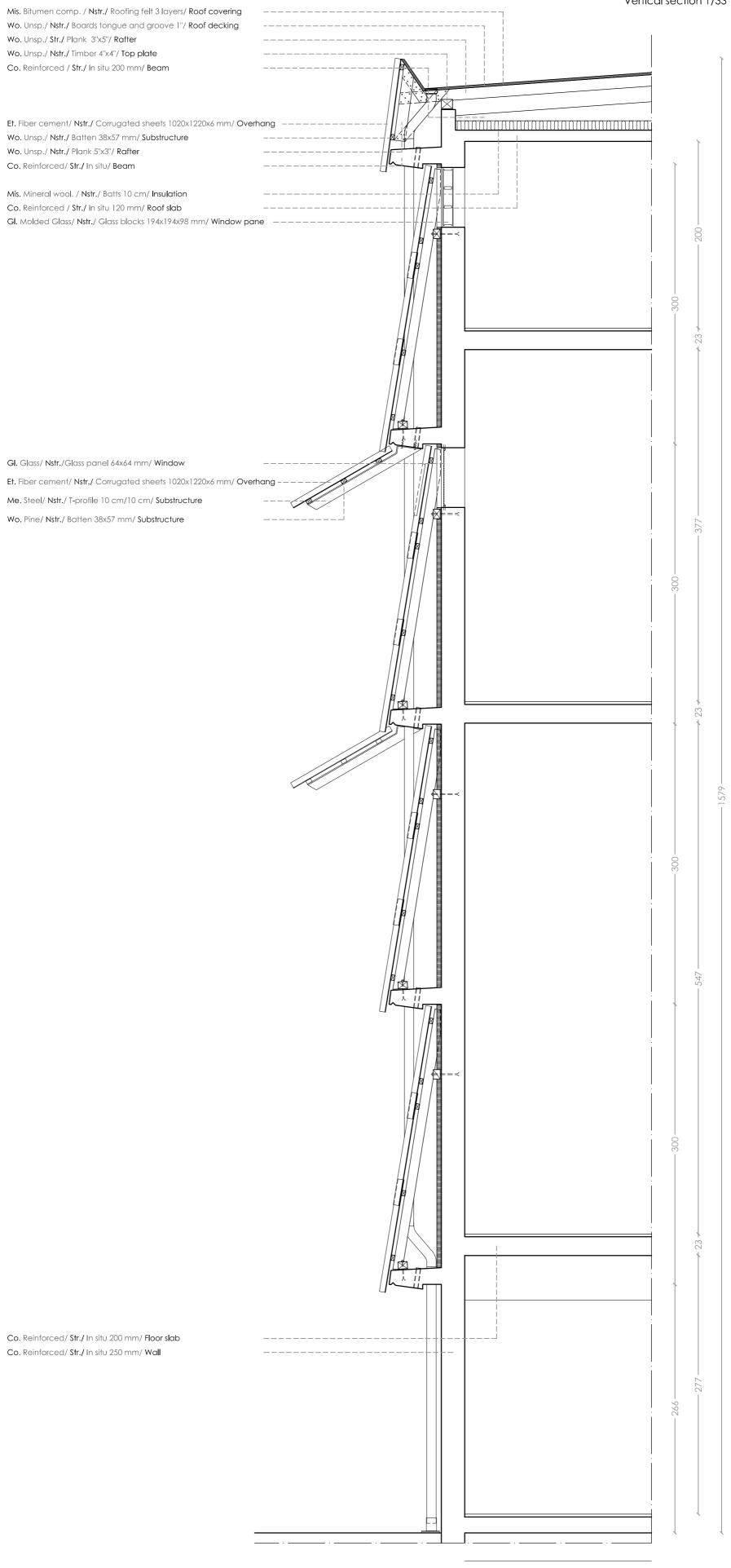


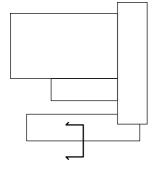






Bellahøj Transformer Station 1961-1968 Vertical section 1/33

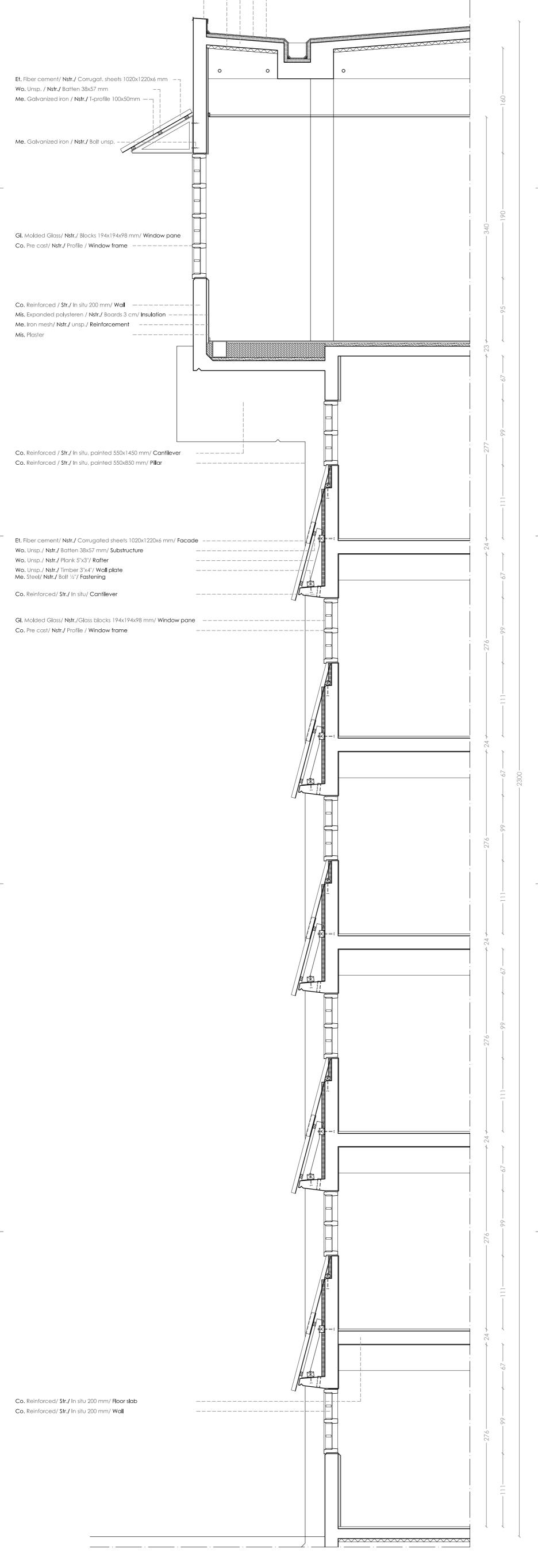


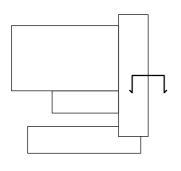


Bellahøj Transformer Station 1961-1968 Vertical section 1/33

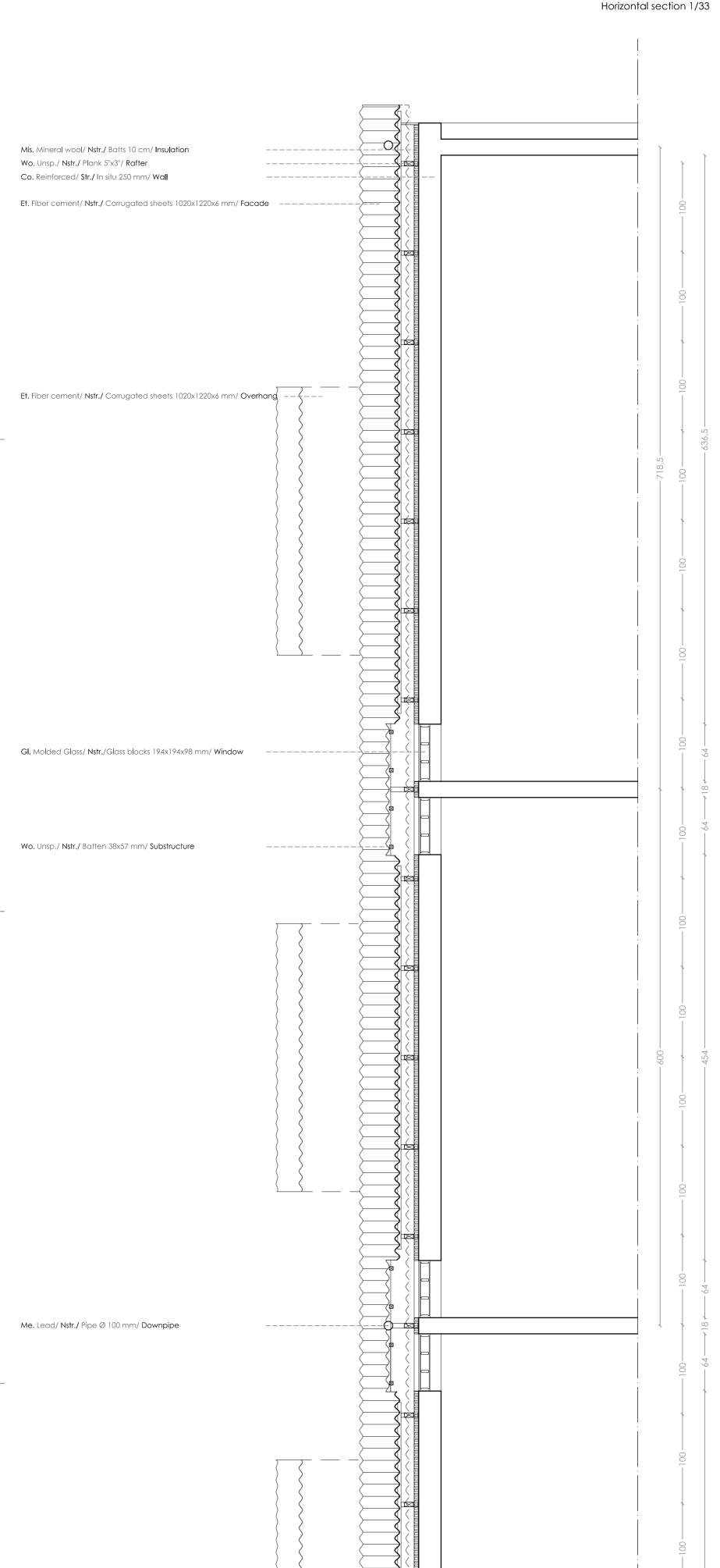
Mis. Bitumen comp. / Nstr./ Roofing felt 3 layers/ Roof covering
Mis. Glass comp. / Nstr./ Foam glass 5 cm/ Insulation
Co. Reinforced/ Str./ In situ 120 mm/ Roof slab
Mis. Cement-bonded wood wool / Nstr./ Panels 5 cm/ Cladding
Me. Zinc / Nstr./ Sheets unsp./ Flashing

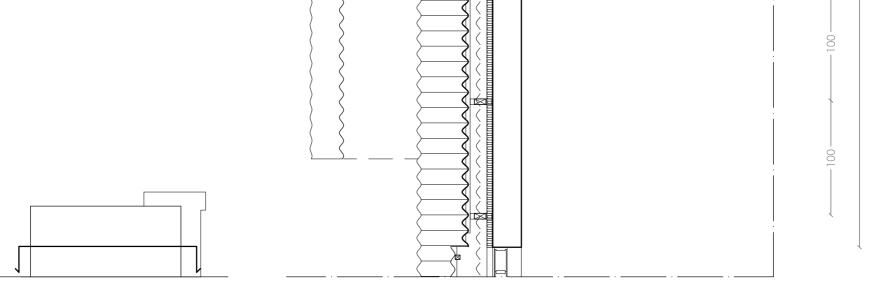
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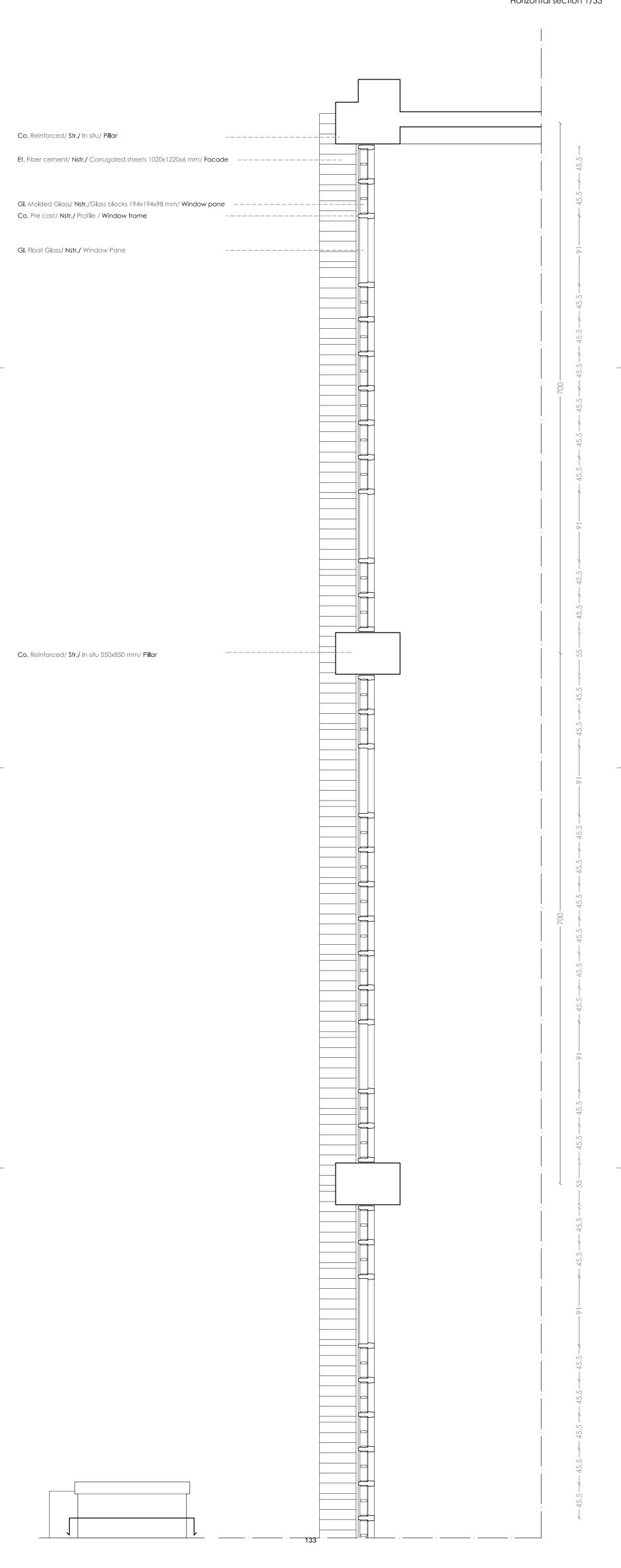


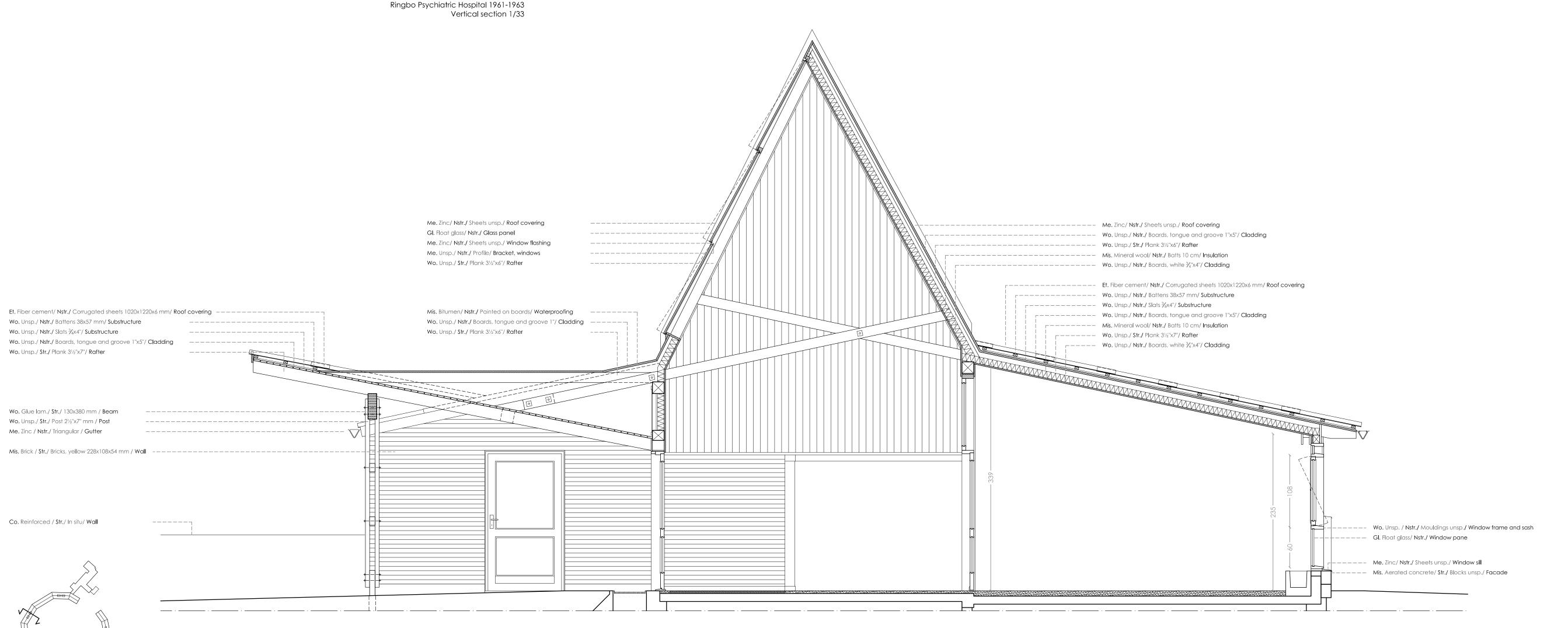
Bellahøj Transformer Station 1961-1968



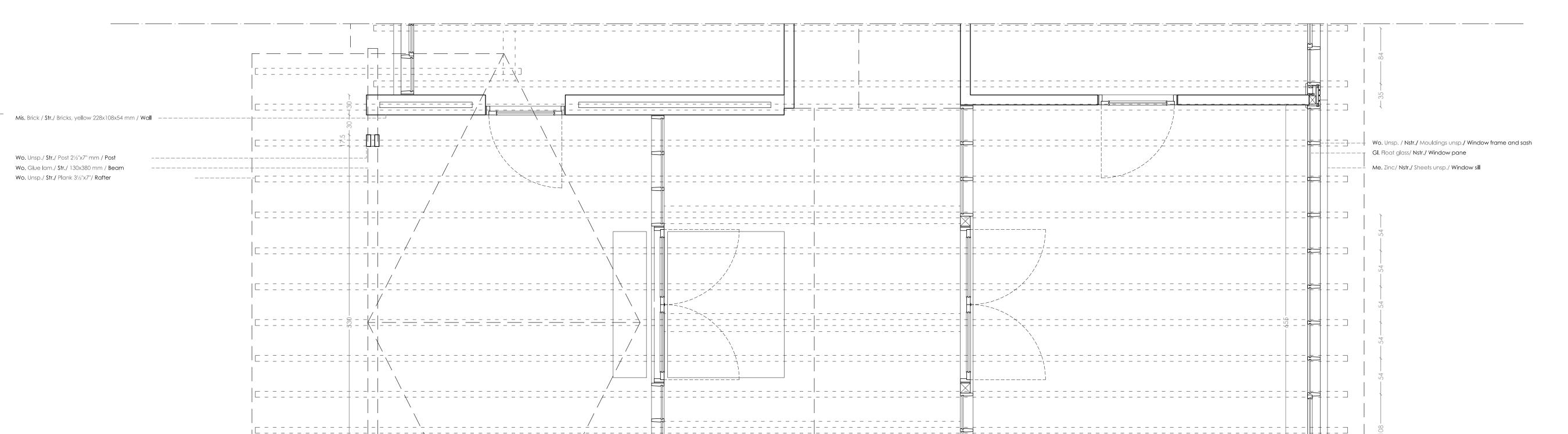


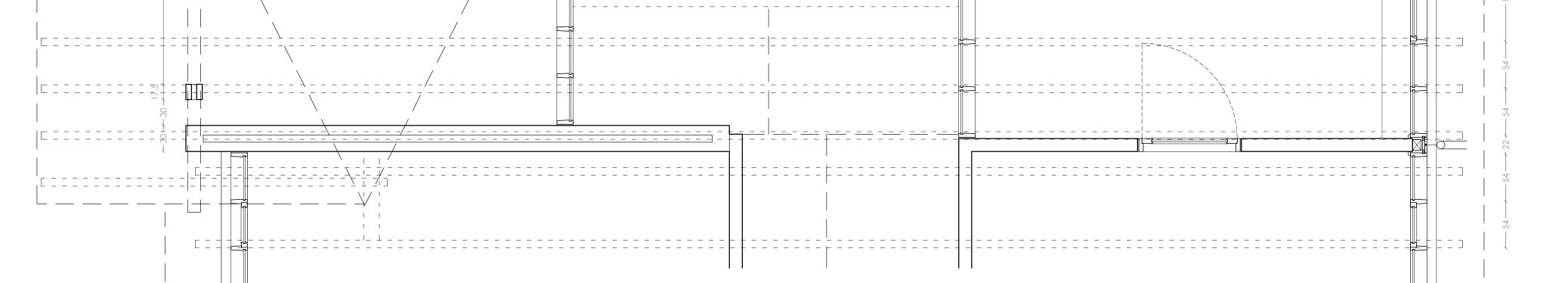
Bellahøj Transformer Station Horizontal section 1/33

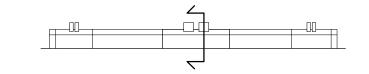


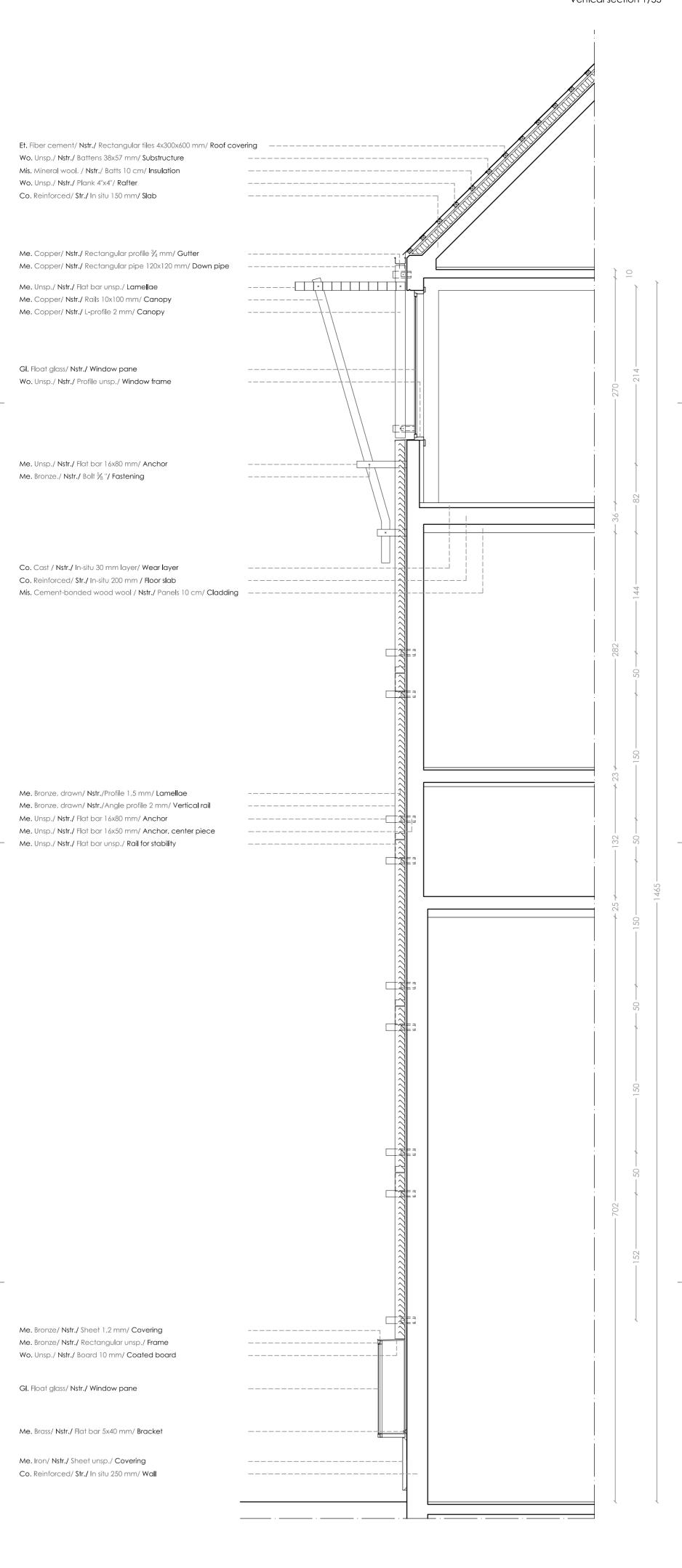


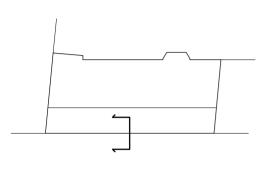




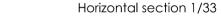


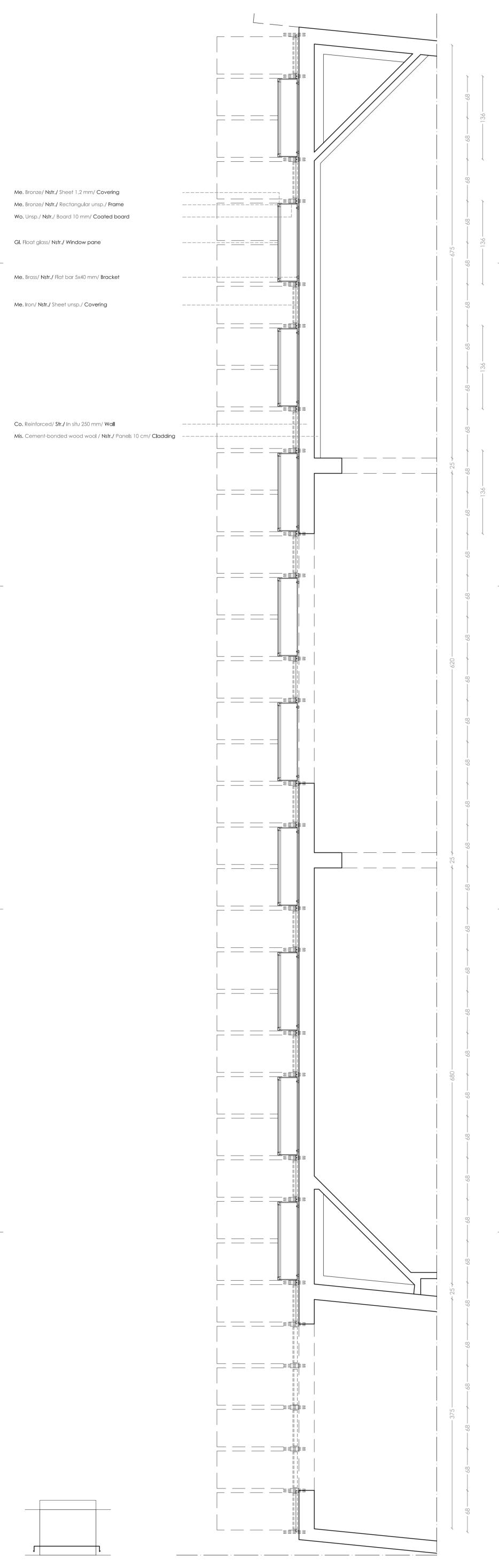






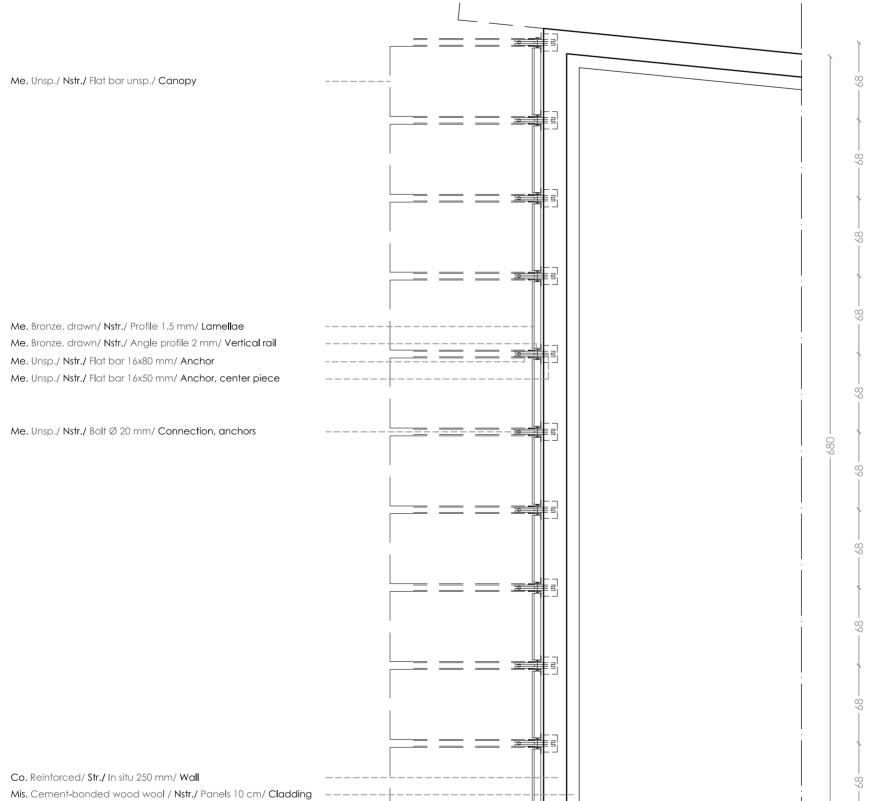
Bremerholm Transformer Station 1962-1963



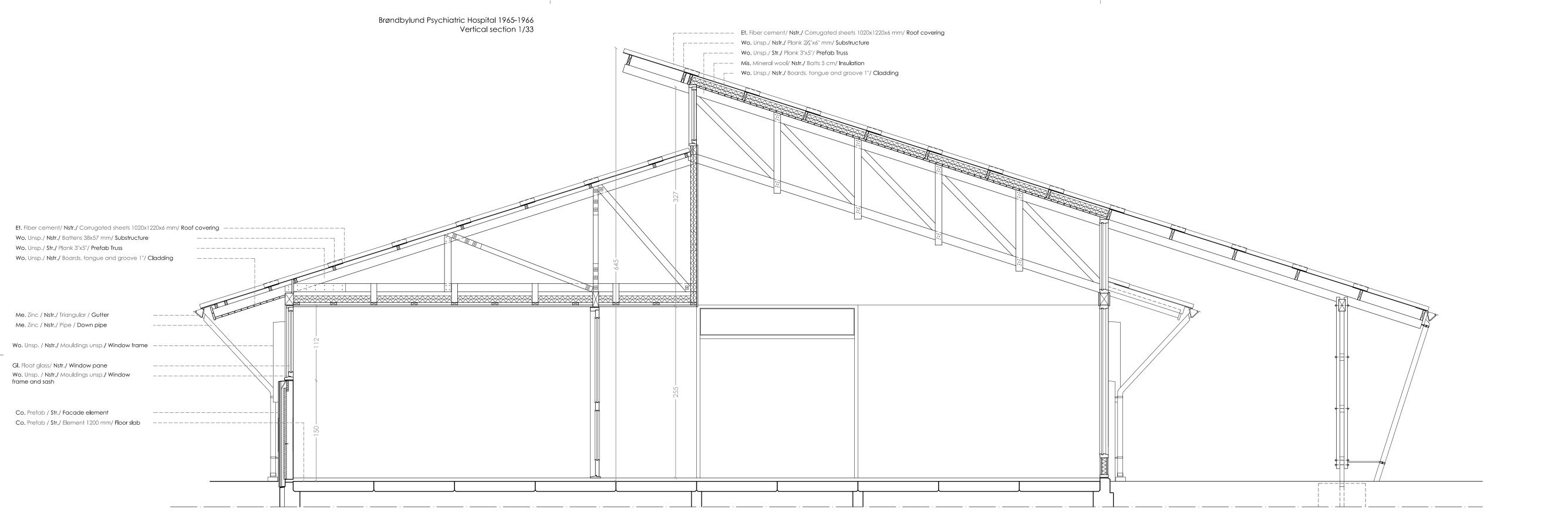


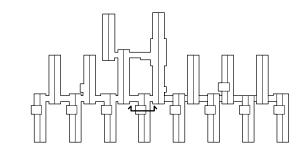
Bremerholm Transformer Station 1962-1963

Horizontal section 1/33

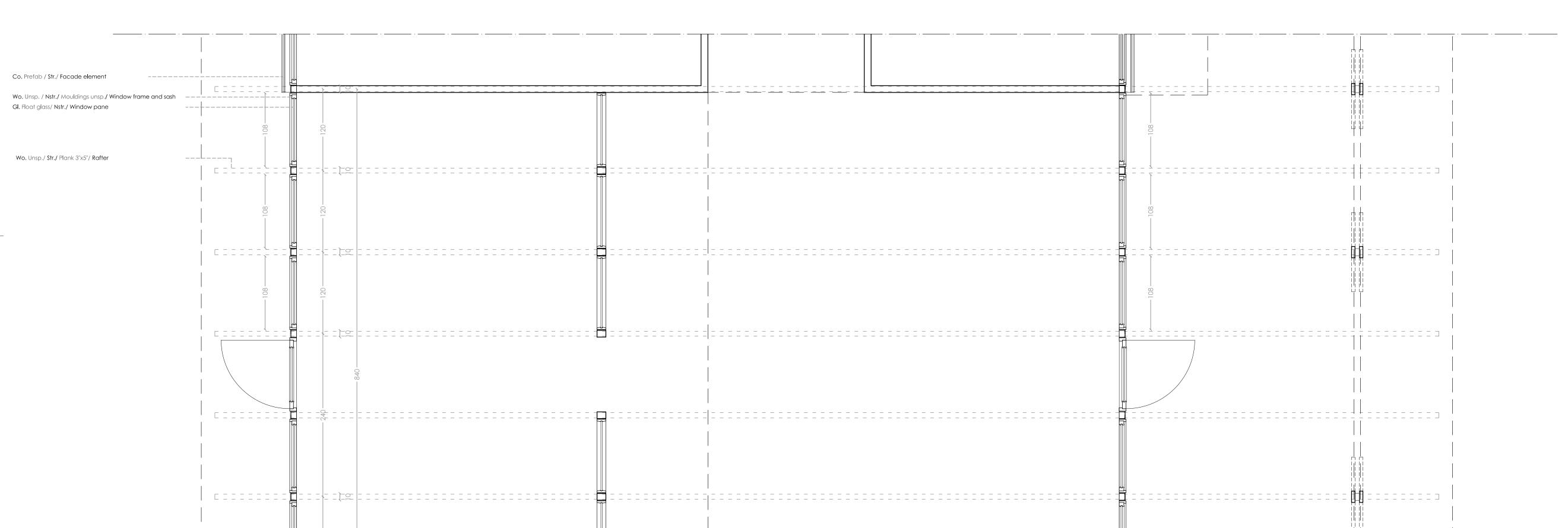


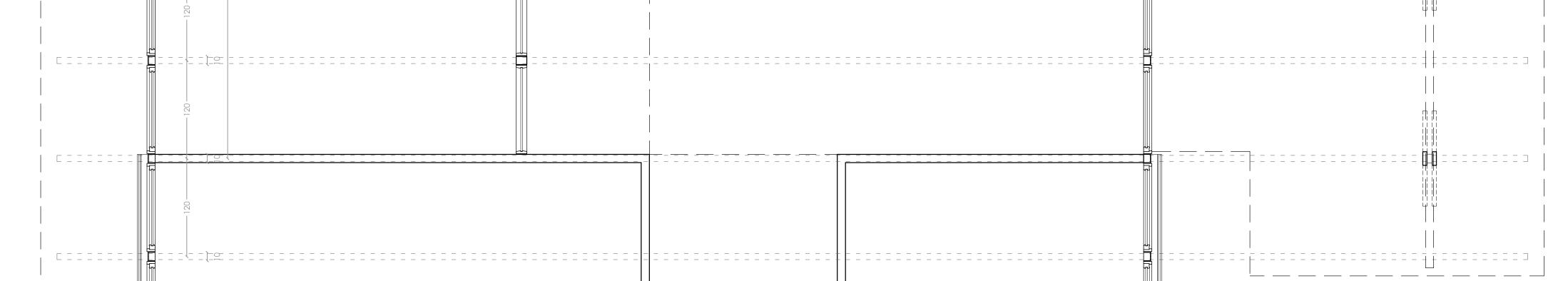
inforced/ Str./ In situ 250 mm/ Wall	
ement-bonded wood wool / Nstr./ Panels 10 cm/ Cladding	
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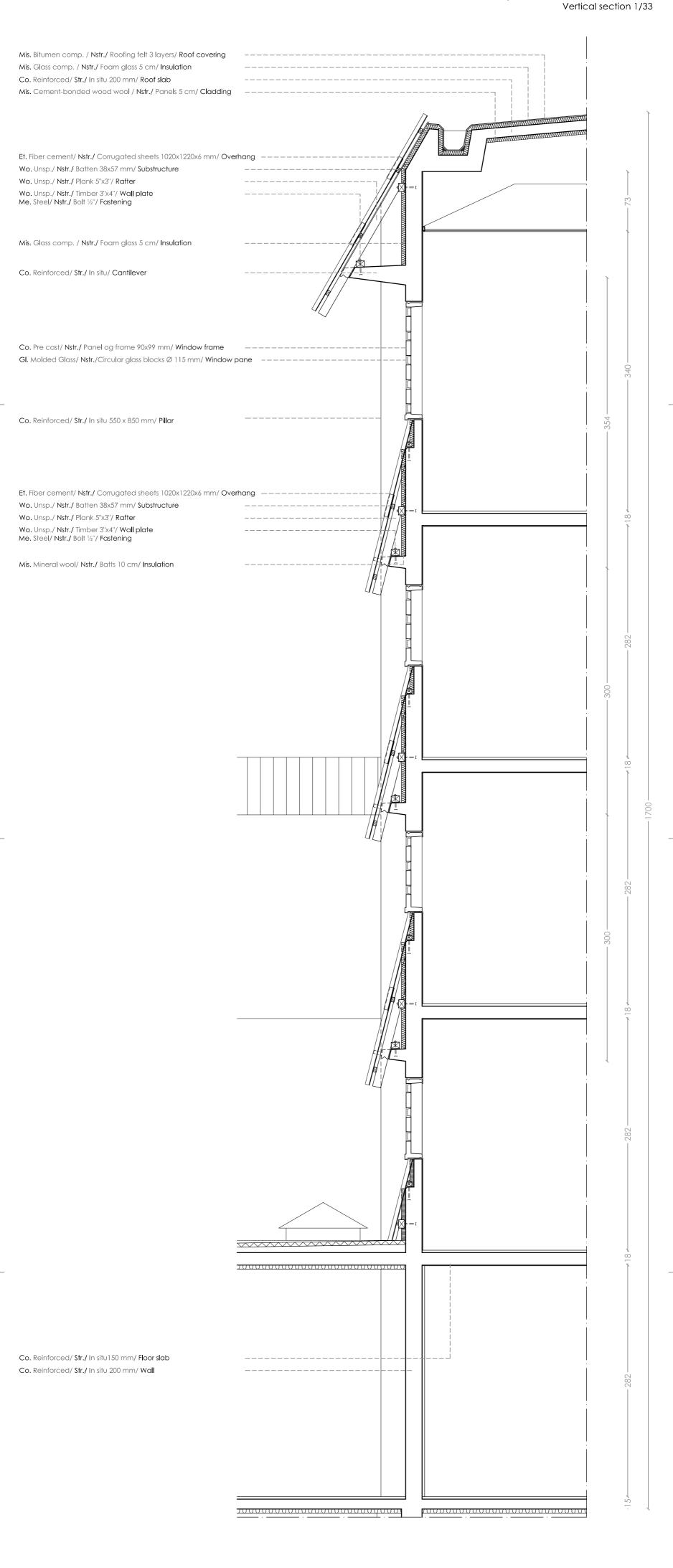


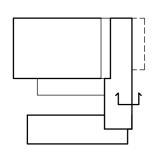
Brøndbylund Psychiatric Hospital 1965-1966 Horizontal section 1/33







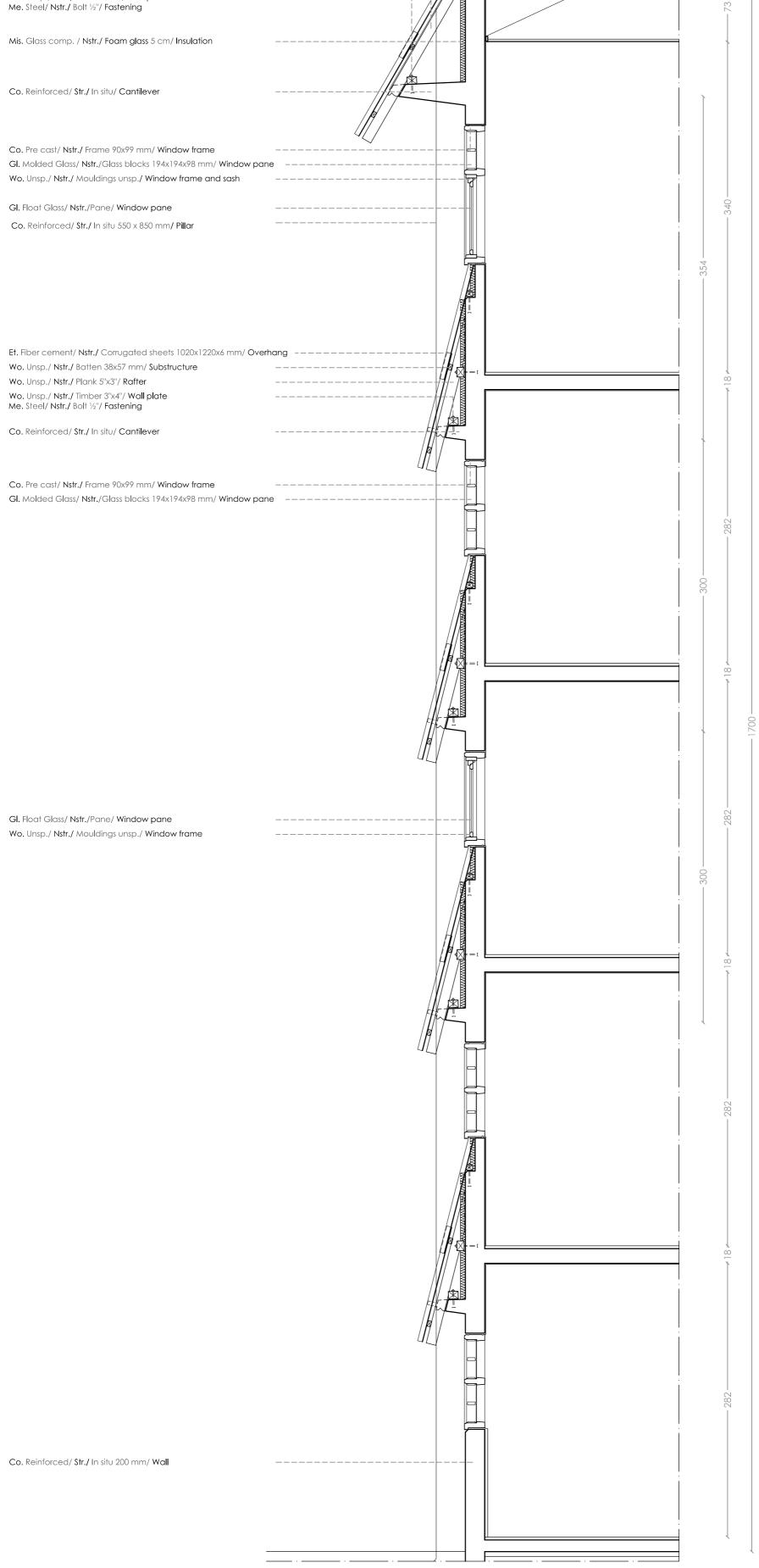


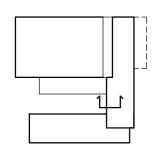


Vertical section 1/33 Mis. Bitumen comp. / Nstr./ Roofing felt 3 layers/ Roof covering _ _ Mis. Glass comp. / Nstr./ Foam glass 5 cm/ Insulation Co. Reinforced/ Str./ In situ 120 mm/ Roof slab Mis. Cement-bonded wood wool / Nstr./ Panels 5 cm/ Cladding WWWWW *** Et. Fiber cement/ Nstr./ Corrugated sheets 1020x1220x6 mm/ Overhang --Wo. Unsp./ Nstr./ Batten 38x57 mm/ Substructure

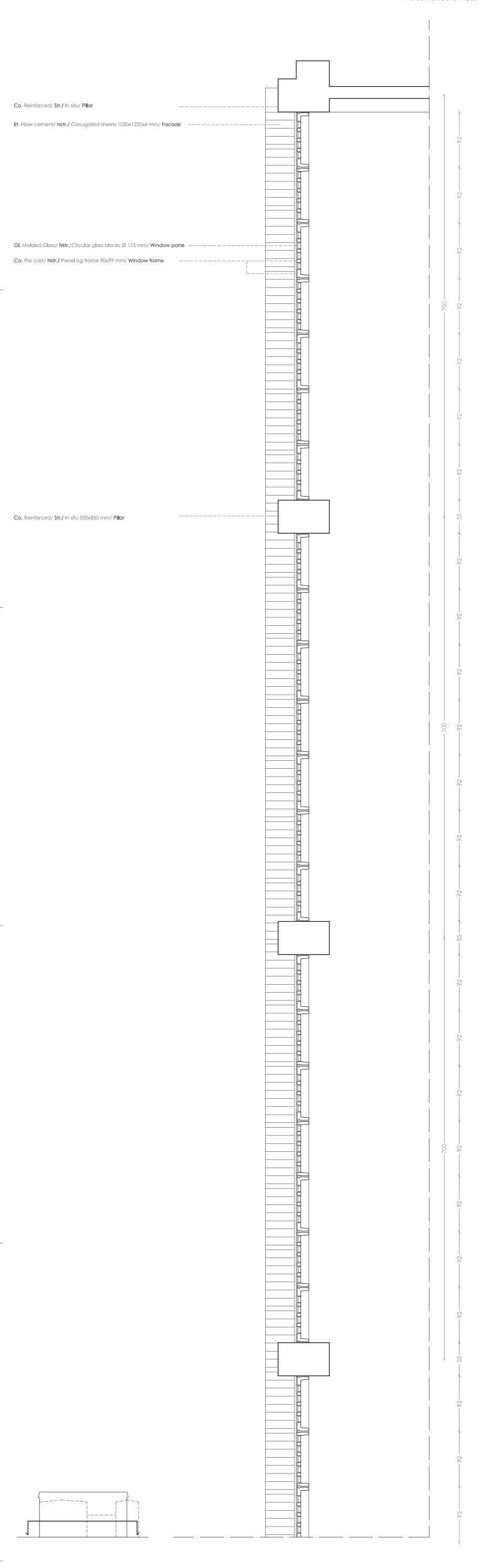
Amager Transformer Station 1966-1968

Wo. Unsp./ Nstr./ Plank 5"x3"/ Rafter Wo. Unsp./ Nstr./ Timber 3"x4"/ Wall plate Me. Steel/ Nstr./ Bolt $\frac{1}{2}$ "/ Fastening





Amager Transformer Station 1966-1968 Horizontal section 1/33



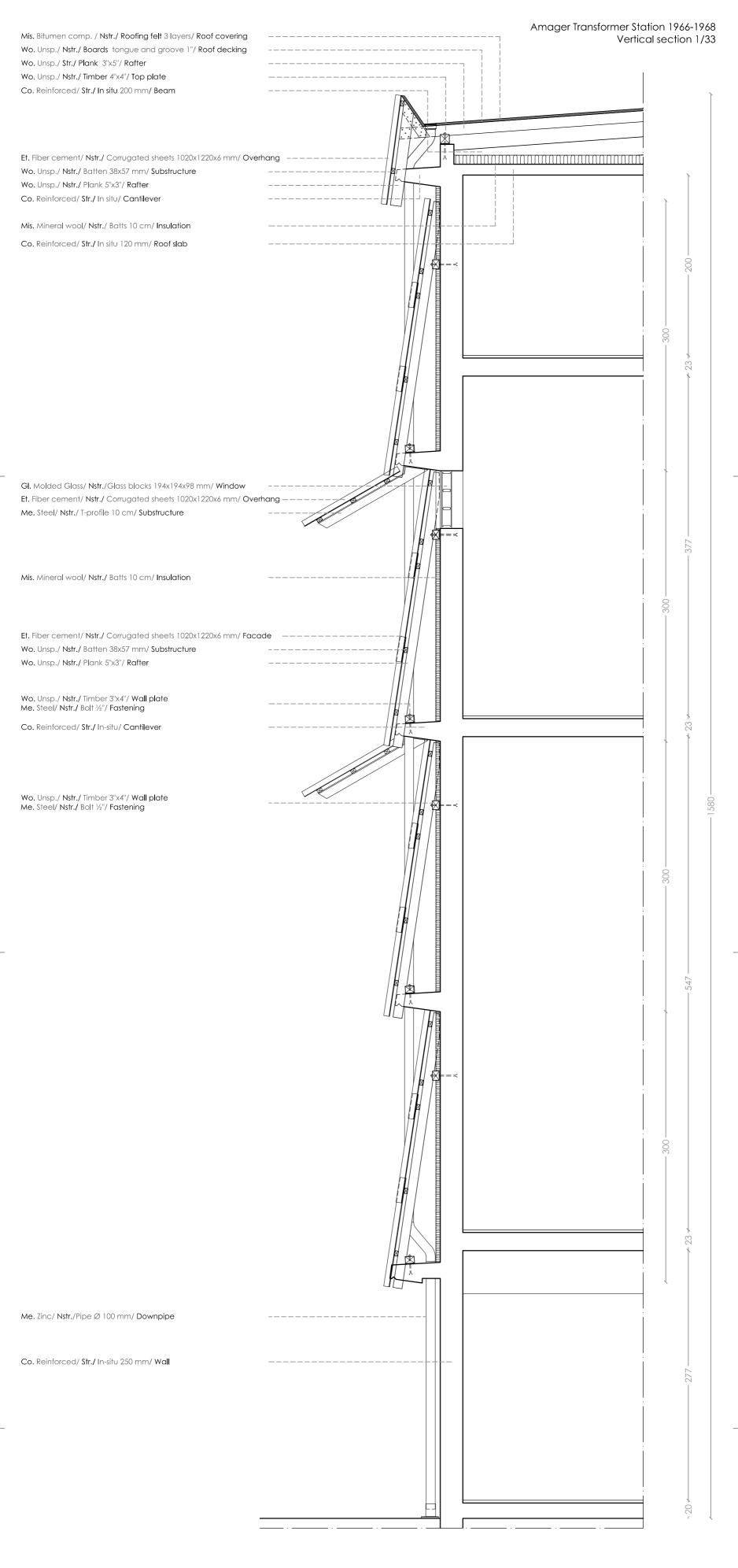
Amager Transformer Station 1966-1968

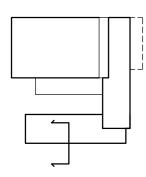
Horizontal section 1/33

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Co. Reinforced/ Str./ In situ/ Pillar		
Et. Fiber cement/ Nstr./ Corrugated sheets 1020x1220x6 mm/ Facade		45,5
GI. Molded Glass/ Nstr./Glass blocks 194x194x98 mm/ Window pane		45,5 -
Co. Pre cast/ Nstr./ Profile / Window frame		
Gl. Float Glass/ Nstr./Window Pane		- 6 - 1
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Mis. Bitumen comp. / Nstr./ Roofing felt 3 layers/ Roof covering Wo. Unsp./ Nstr./ Boards tongue and groove 1"/ Roof decking Wo. Unsp./ Str./ Plank 3"x5"/ Rafter

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Wo. Unsp./ Nstr./ Timber 4"x4"/ Top plate Co. Reinforced/ Str./ In situ 200 mm/ Beam

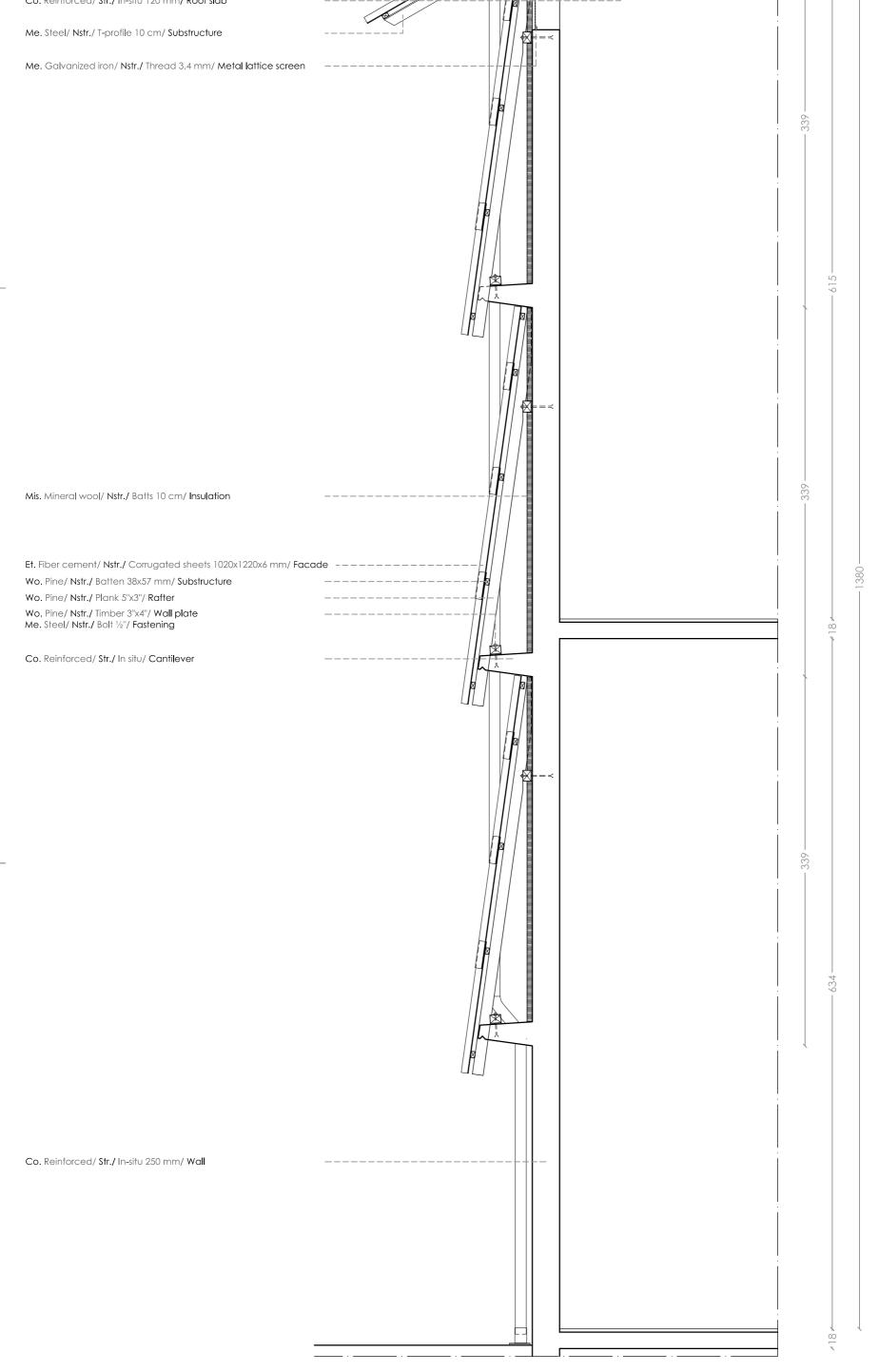
Et. Fiber cement/ Nstr./ Corrugated sheets 1020x1220x6 mm/ Overhang ---Wo. Unsp./ Nstr./ Batten 38x57 mm/ Substructure Wo. Unsp./ Nstr./ Plank 5"x3"/ Rafter

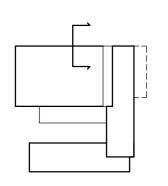
Mis. Mineral wool. / Nstr./ Batts 10 cm/ Insulation Co. Reinforced/ Str./ In-situ 120 mm/ Roof slab

Co. Reinforced/ Str./ In situ/ Cantilever

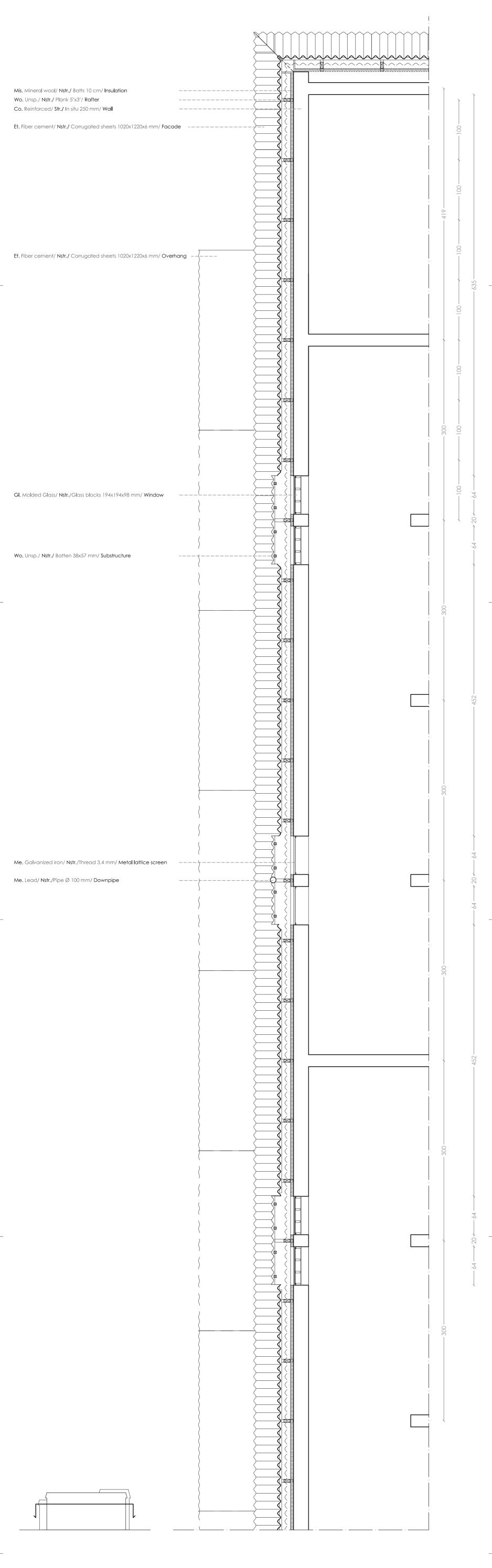
Amager Transformer Station 1966-1968 Vertical section 1/33

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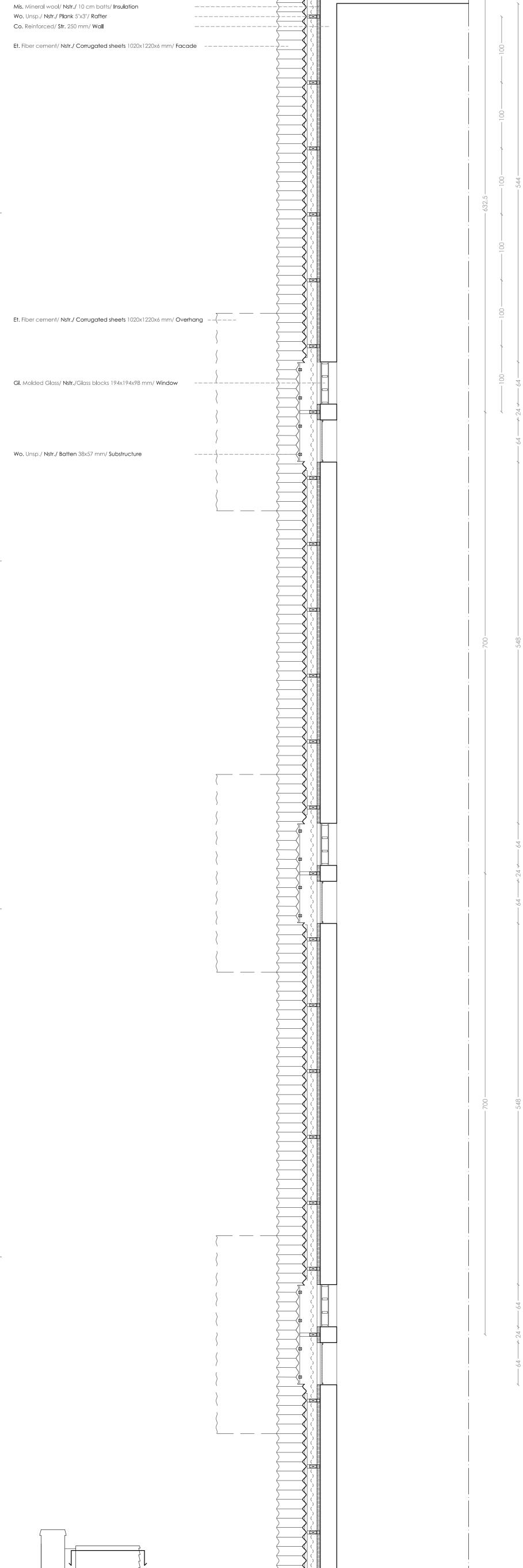


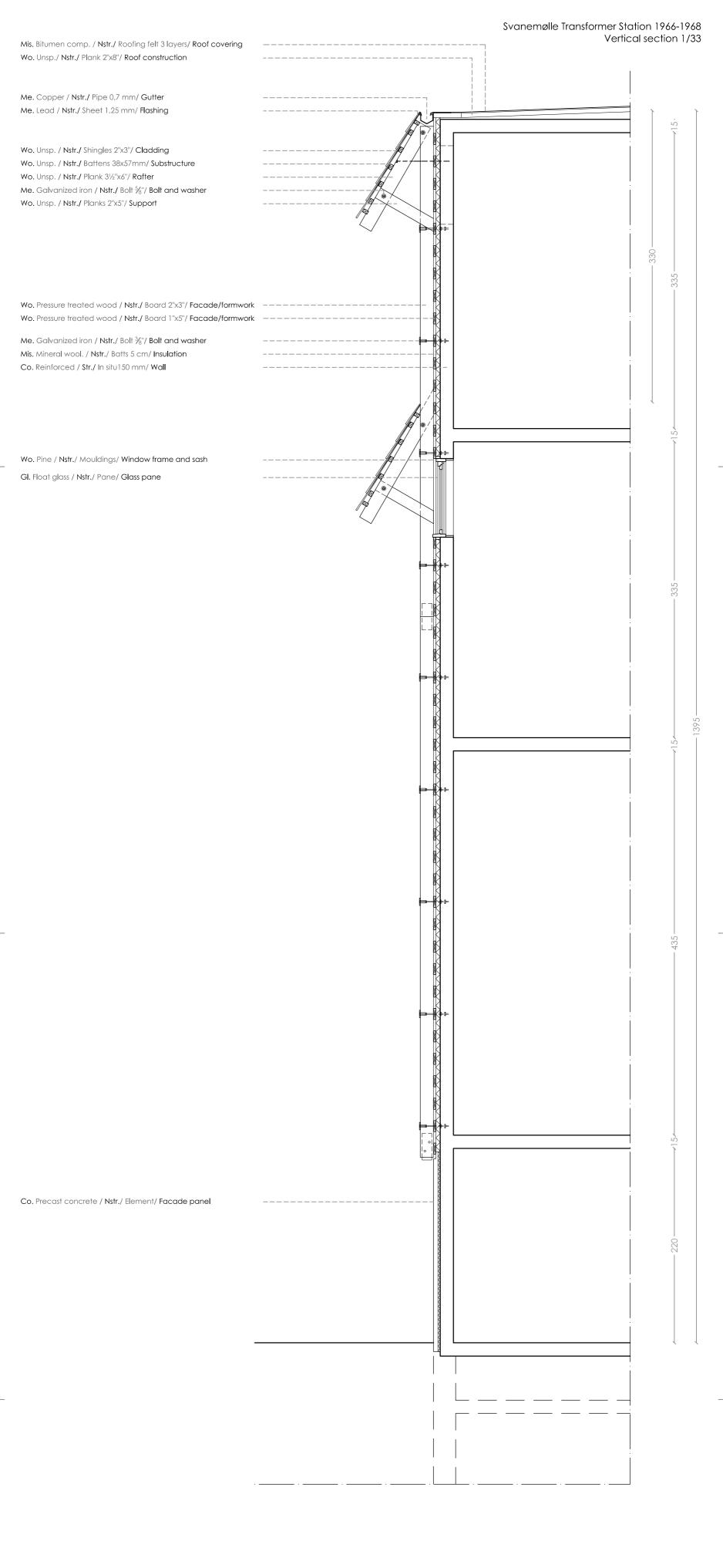
Amager Transformer Station 1966-1968 Horizontal section 1/33

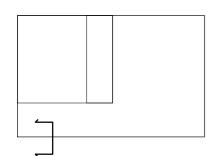


Amager Transformer Station 1966-1968 Horizontal section 1/33

Wo. Unsp./ Nstr./ Plank 5"x3"/ Rafter







Mis. Bitumen comp. / Nstr./ Roofing felt 3 layers/ Roof covering Wo. Spruce / Nstr./ Plank 2"x8"/ Roof construction

Me. Copper / Nstr./ Pipe 0,7 mm/ Gutter Me. Lead / Nstr./ Sheet 1,25 mm/ Flashing

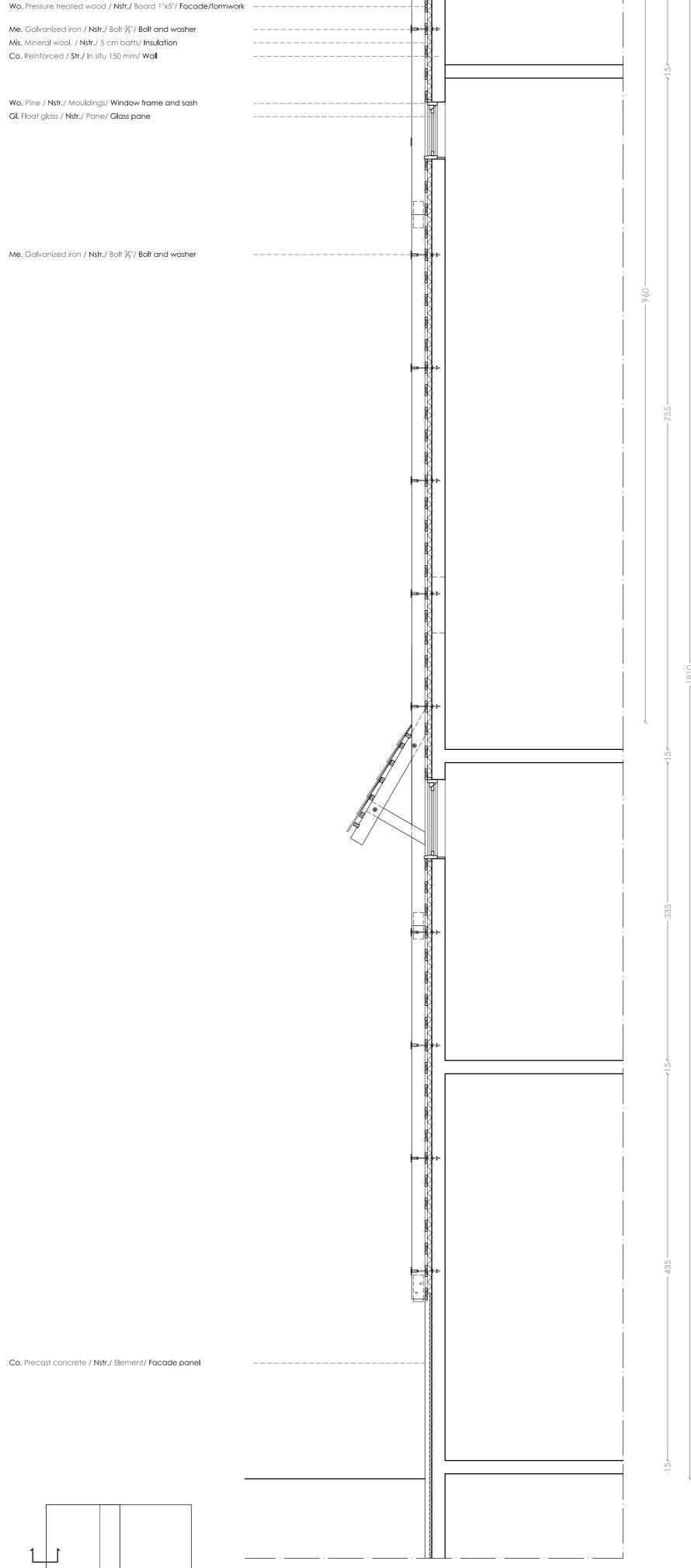
Wo. Unspecified / Nstr./ Shingles 2"x3"/ Roof covering Wo. Spruce / Nstr./ Battens 38x57mm/ Substructure Wo. Spruce / Nstr./ Plank 3½"x6"/ Rafter

Me. Galvanized iron / Nstr./ Bolt $\%^{\prime\prime}$ / Bolt and washer Wo. Spruce / Nstr./ Planks 2"x5"/ Support

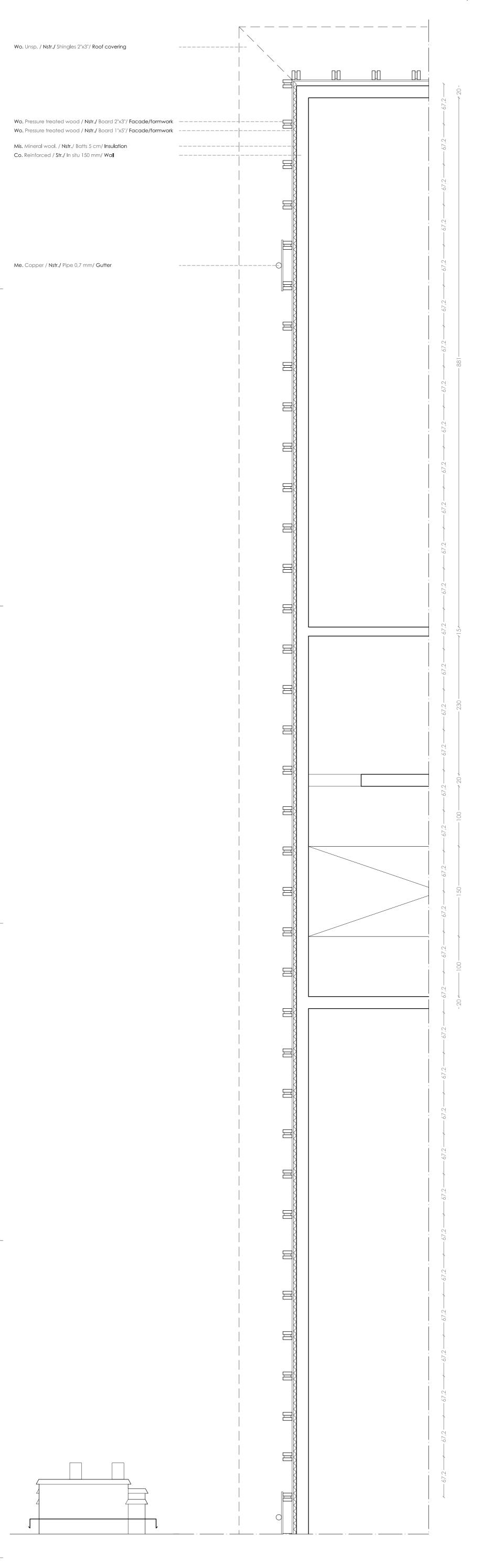
Wo. Pressure treated wood / Nstr./ Board 2"x3"/ Facade/formwork Wo. Pressure treated wood / Nstr./ Board 1"x5"/ Facade/formwork Svanemølle Transformer Station 1966-1968 Vertical section 1/33



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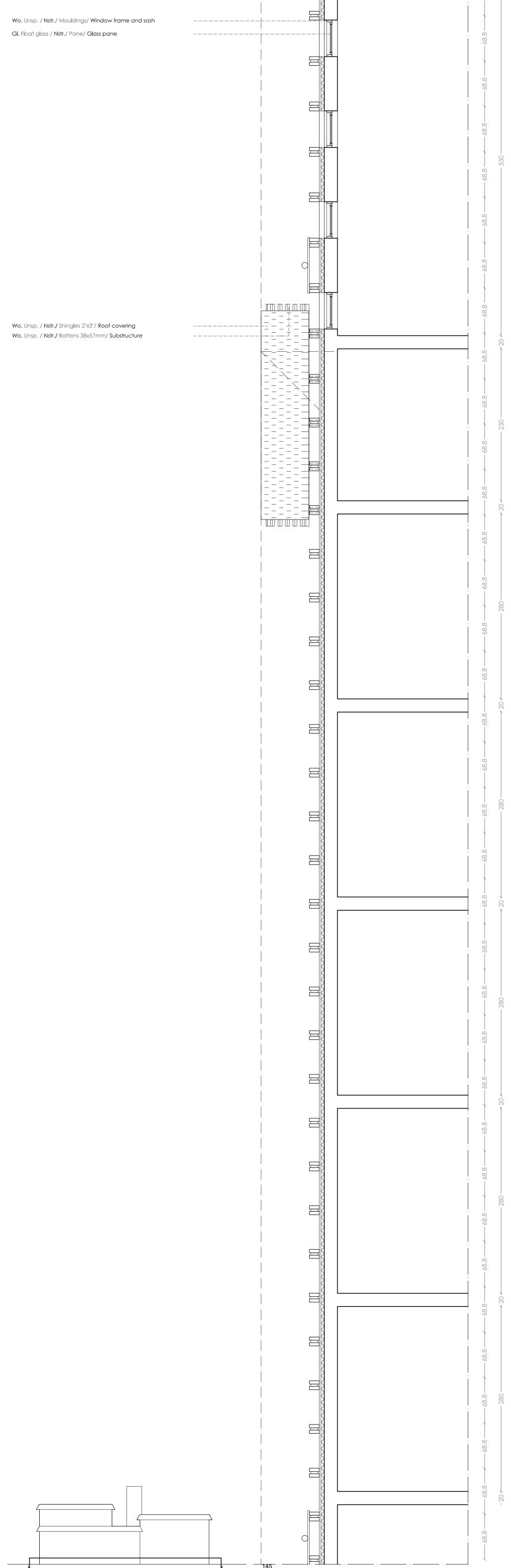


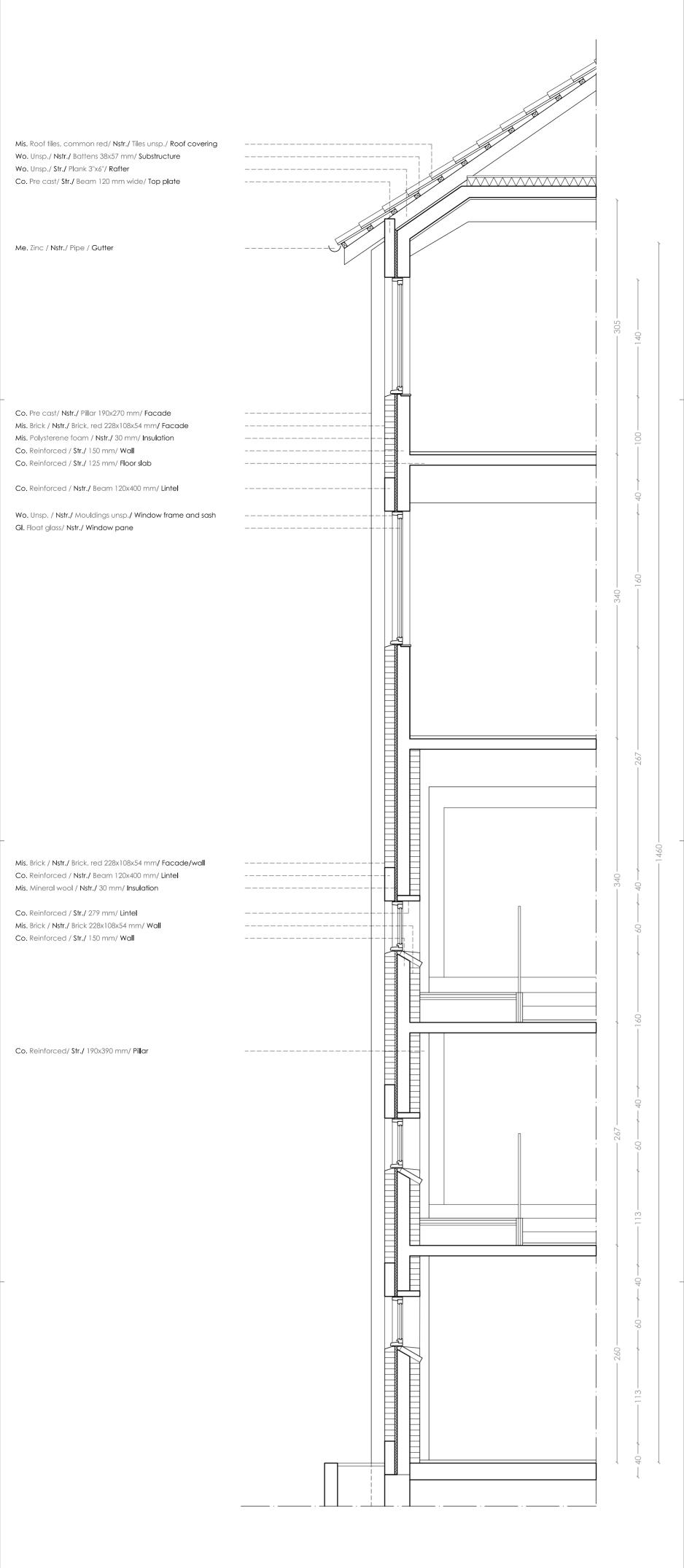
Svanemølle Transformer Station 1966-1968 Horizontal section 1/33

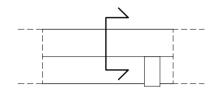


Svanemølle Transformer Station 1966-1968 Horizontal section 1/33

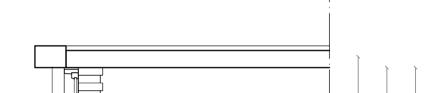
Wo. Unsp. / Nstr./ Shingles 2"x3"/ Roof covering

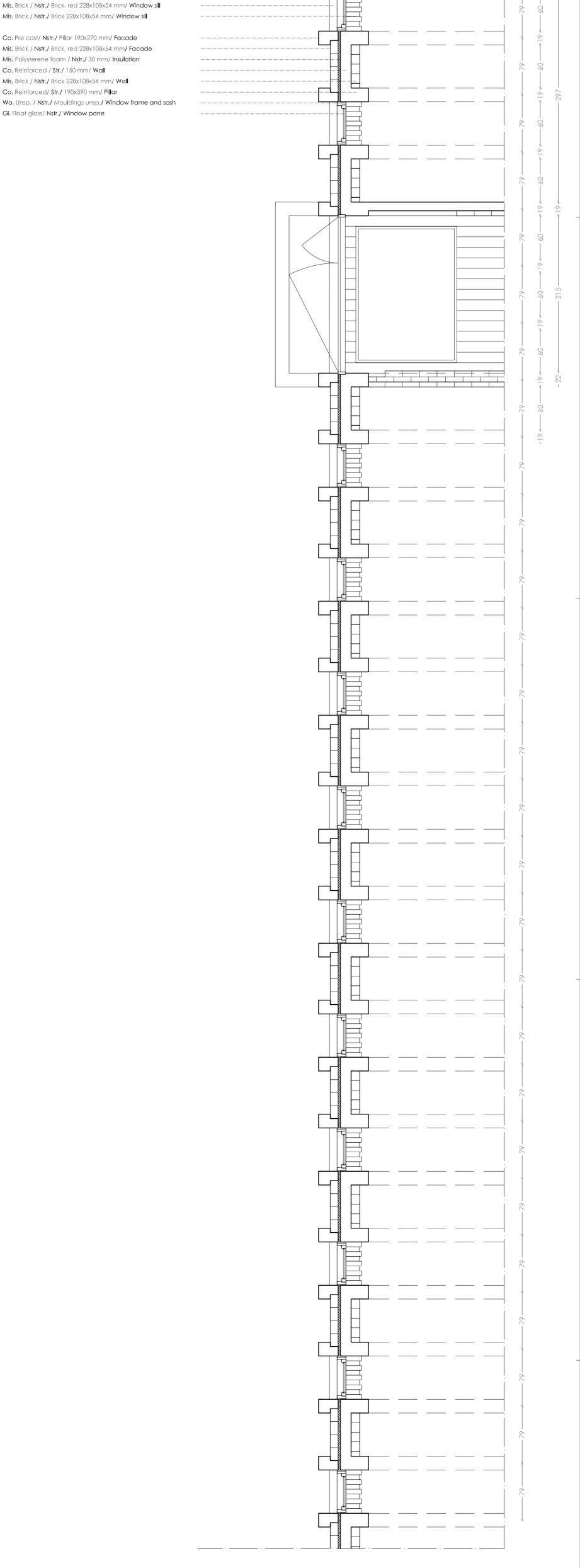


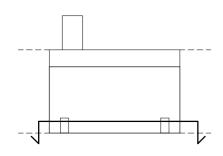


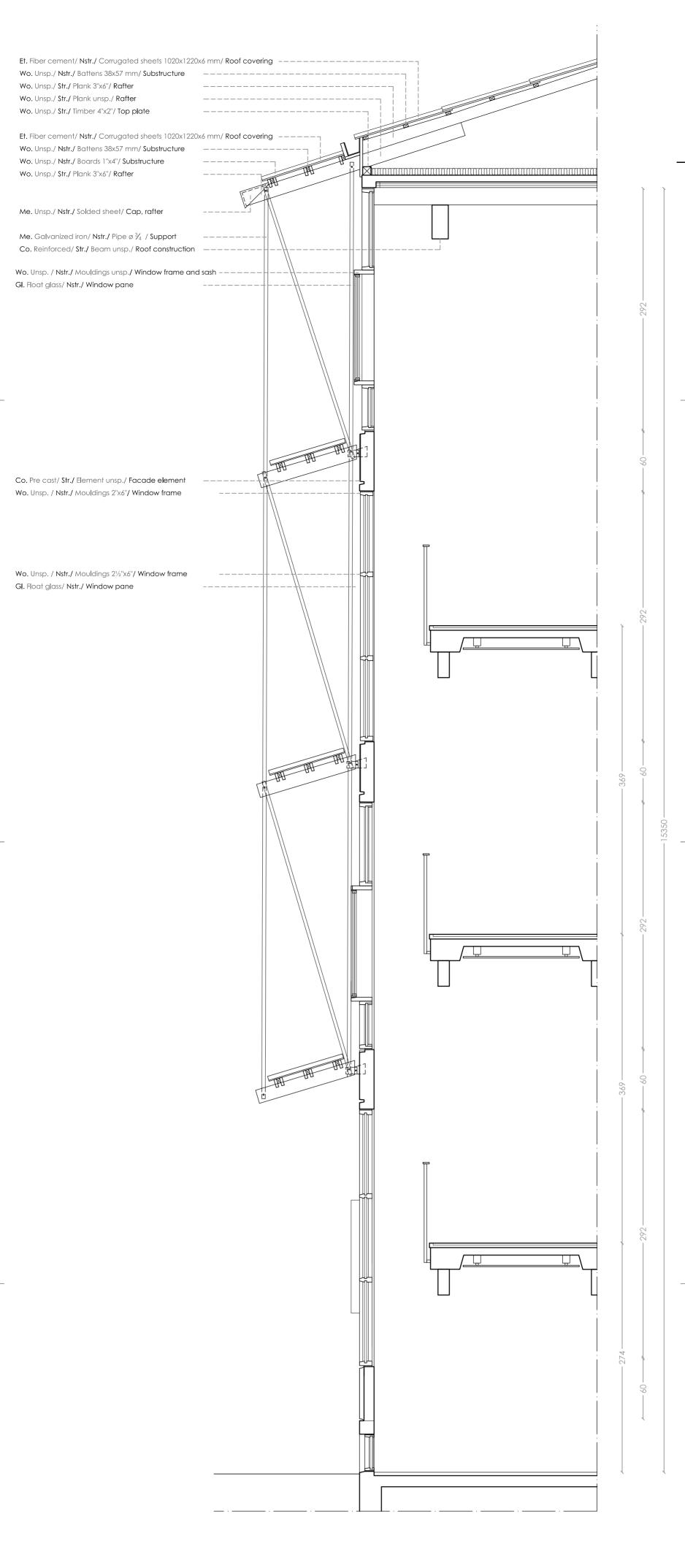


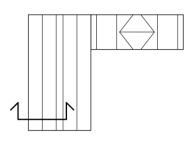
Tagensbo Church 1966-1969 Horizontal section 1/33



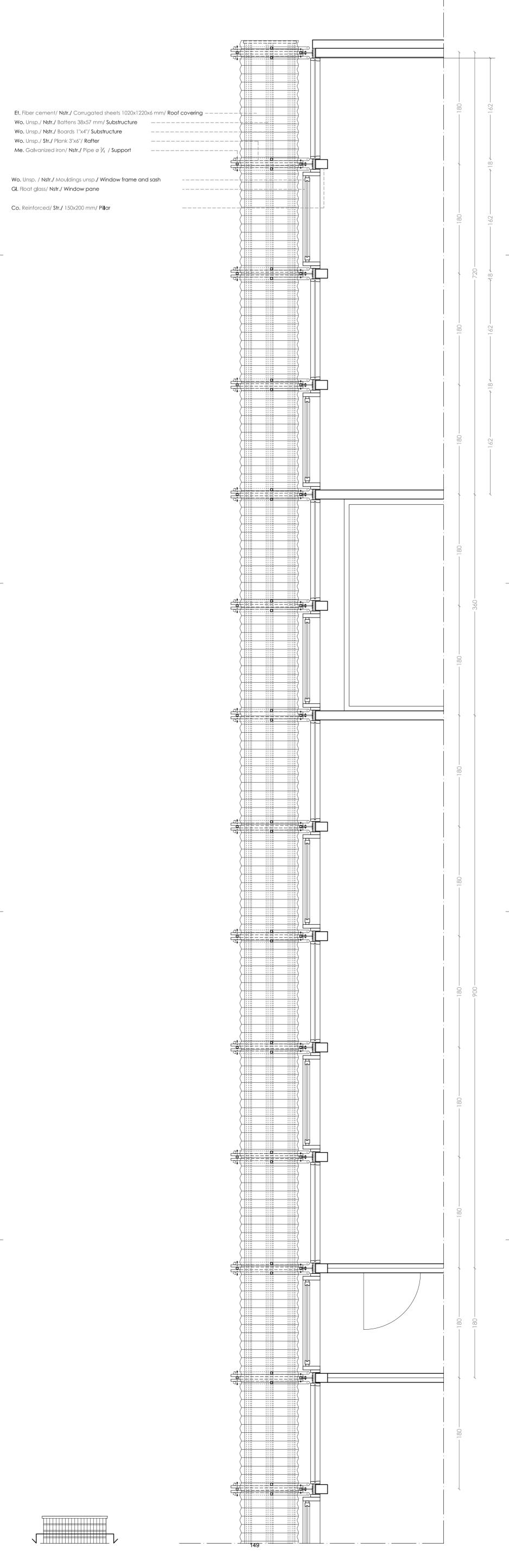








Gasværksvejens School 1969-1971 Horizontal section 1/33





Investigations: Crops

















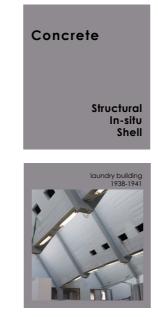


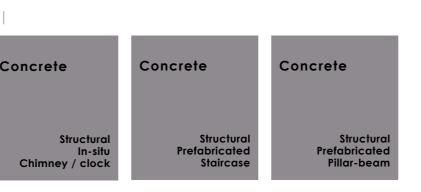












Concrete	Concrete	Concrete
Structural Prefabricated panel Slab-wall	Nonstructural Block Fill-in	Nonstructura Lightweight block Fill-ir











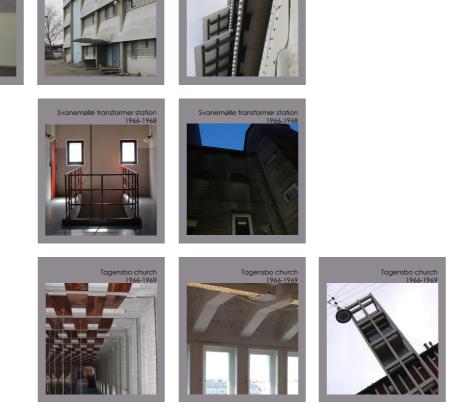






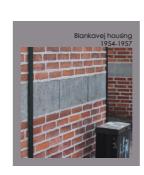




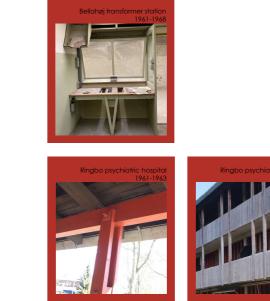






















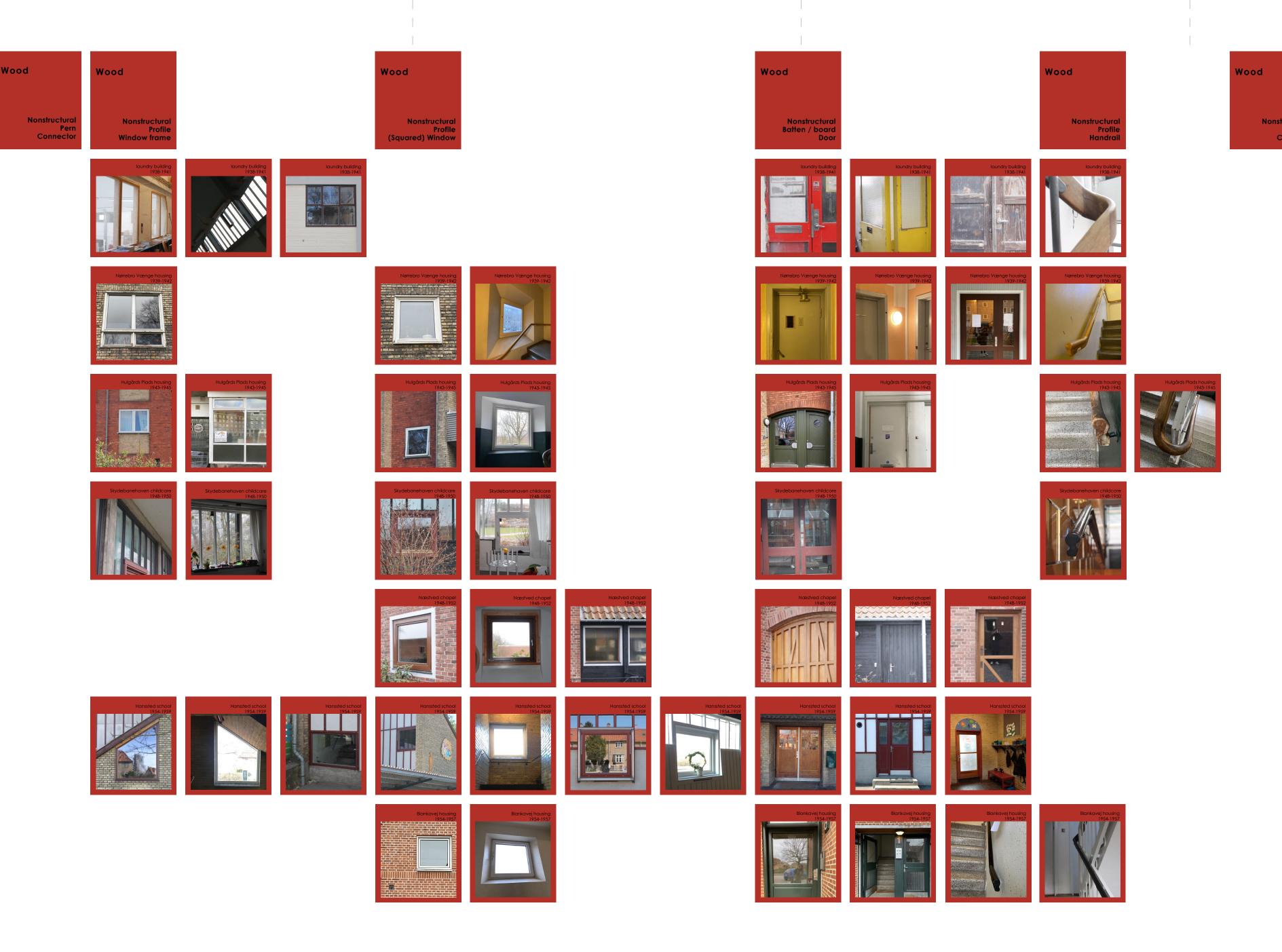






















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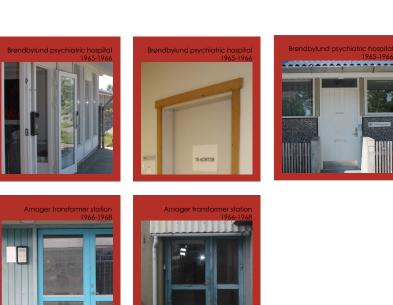
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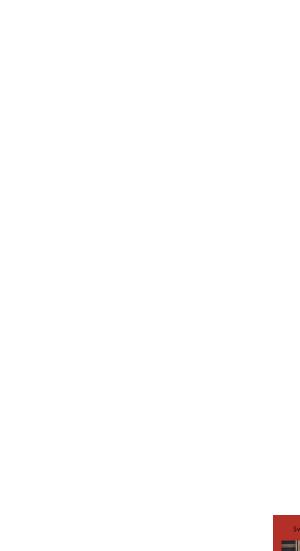
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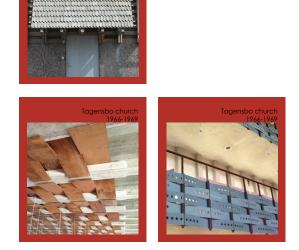


Identification





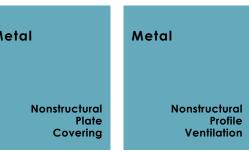


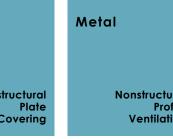


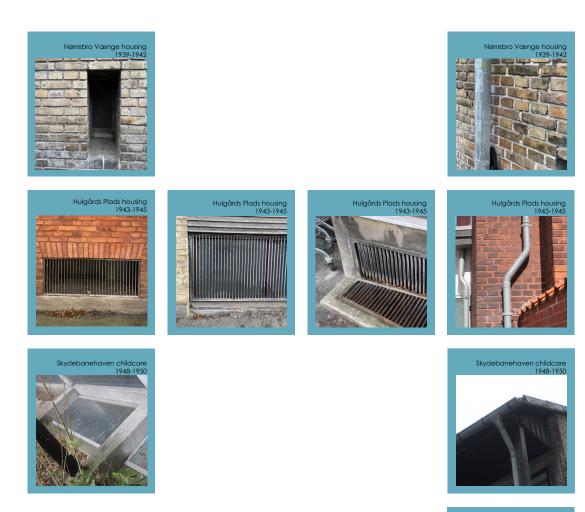




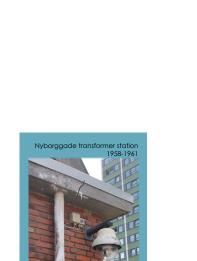














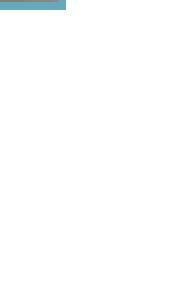


Blankavei housina Blankavei housina



















Svanemølle transformer station 1966-1968



















Skydebanehaven childcare 1948-1950















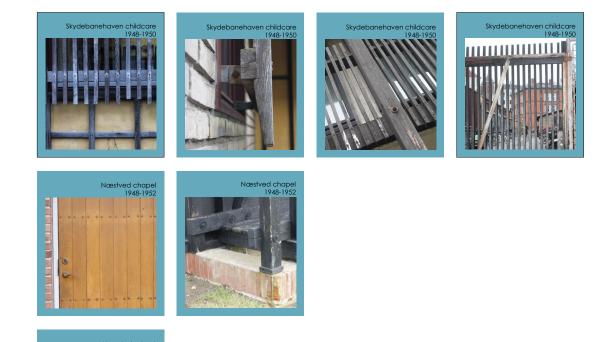




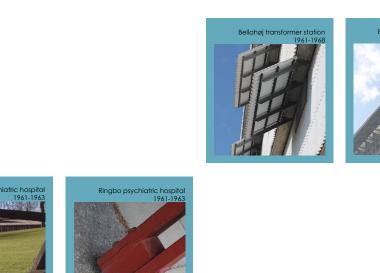












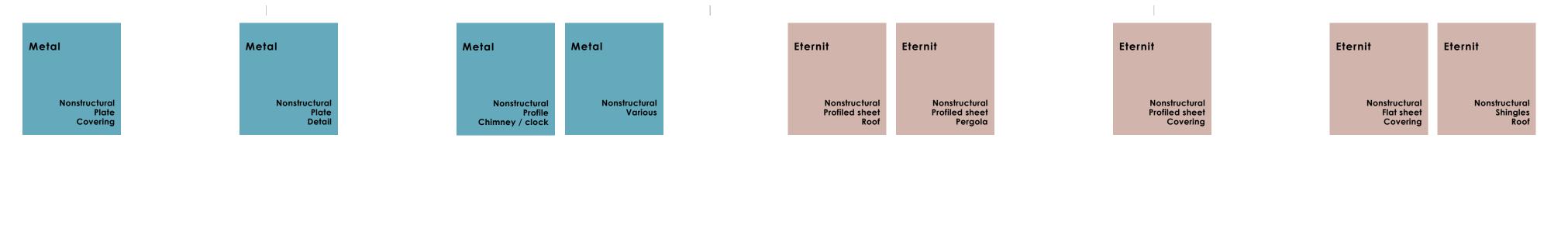
Brøndbylund psychiatric hospital 1965-1966



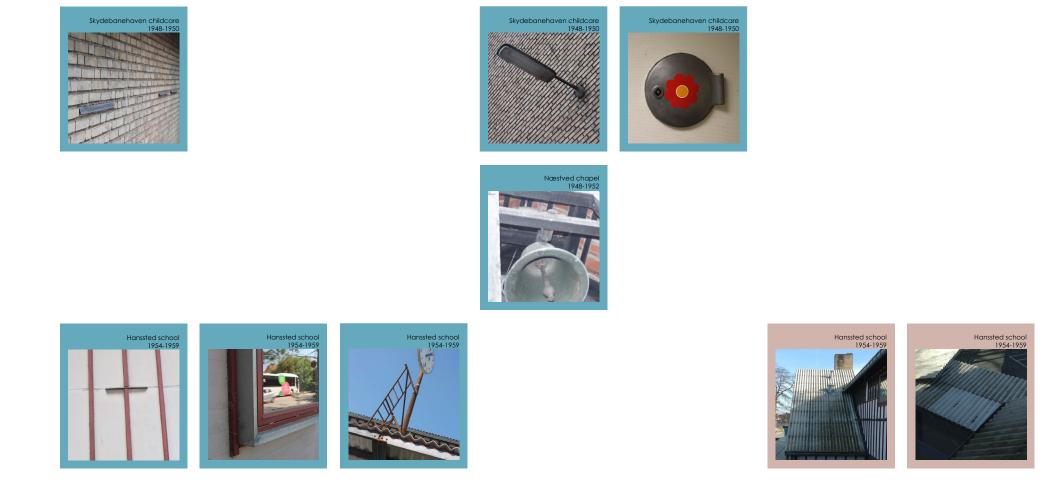


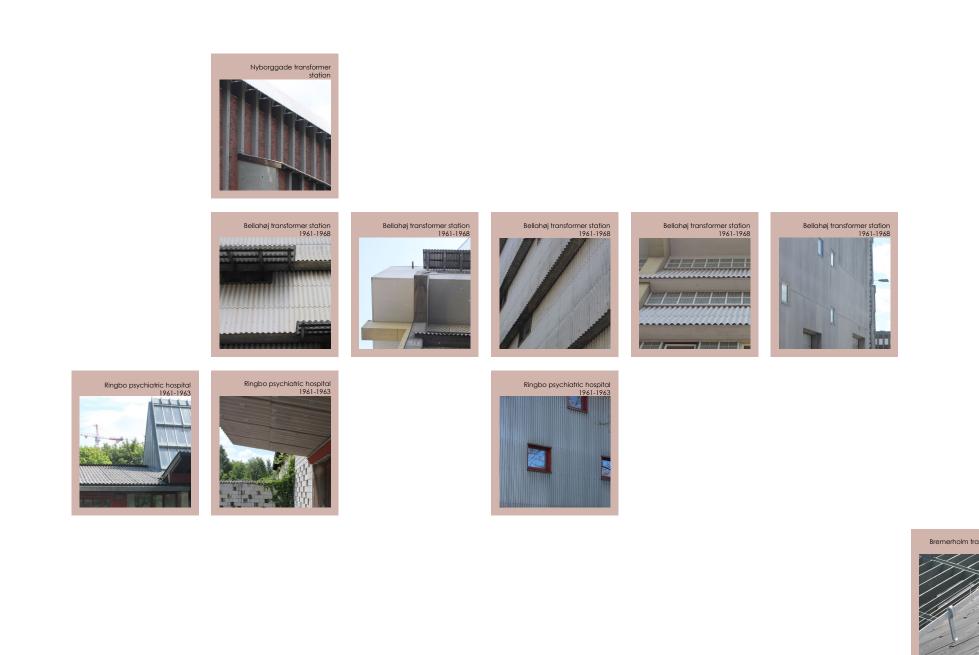


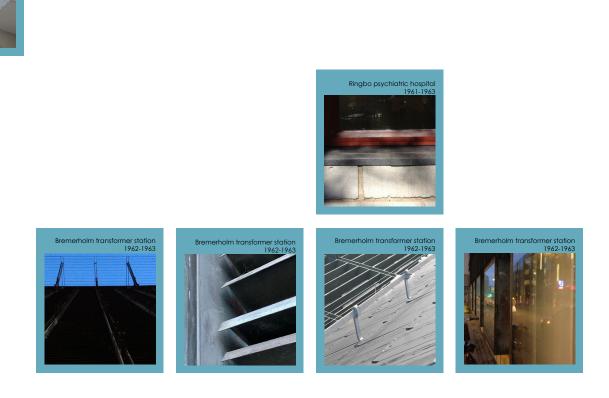


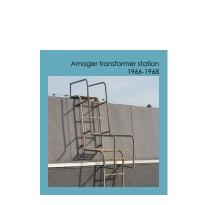


























Investigations: Faults





Bellahøj Transformer Station (1966 - 1968) Amager Transformer Station (1962 - 1963)

Hulgårds Plads housing (1943 - 1945) Skydebanehaven Childcare (1948 - 1950)



Skydebanehaven Childcare (1948 - 1950) Hanssted School (1954 - 1959)

Tagensbo Church (1966 - 1969)









Bremerholm Transformer Station (1962 - 1963) Svanemølle Transformer Station (1966 - 1968)

Hanssted School (1954 - 1959) Skydebanehaven Childcare (1948 - 1950)

Nørrebro Vænge housing (1939 - 1942) Hulgårds Plads housing (1943 - 1945)















Nørrebro Vænge Housing (1939 - 1942) Blankavej Housing (1954 - 1957)

Tagensbo Church (1966 - 1969) Nyborggade Transformer Station (1958 - 1960)

Amager Transformer Station (1962 - 1963) Bellahøj Transformer Station (1966 - 1968)



Ringbo Psychiatric Hospital(1961 - 1963) Brøndbylund Psychiatric Hospital (1965 - 1966)

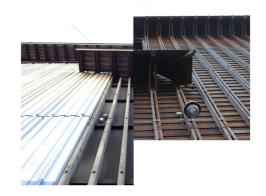


Nørrebro Vænge Housing (1939 - 1942) Blankavej Housing (1954 - 1957)





Brøndbylund Psychiatric Hospital (1965 - 1966) Ringbo Psychiatric hospital (1961 - 1963)









Skydebanehaven Childcare (1948 - 1950) Ringbo Psychiatric Hospital (1961 - 1963)

Svanemølle Transformer Station (1966 - 1968) Bremerholm Transformer Station (1962 - 1963) Nørrebro Vænge Housing (1939 - 1942) Hulgårds Plads Housing (1943 - 1945)













Skydebanehaven CHildcare (1948 - 1950) Hanssted School (1954 - 1959)

Hanssted School (1954 - 1959) Ringbo Psychiatric Hospital (1961 - 1963) Nørrebro Vænge Housing (1939 - 1942) Hulgårds Plads Housing (1943 - 1945)



Svanemølle Transformer Station (1966 - 1968) Gasværksvejens School (1969 - 1971)



Nasa Earth Observatory, Faults in Xinjiang, 2013. "Piqiang Fault, China detail." Wikimedia Commons. https://commons.wikimedia.org/wiki/ File:Piqiang_Fault,_China_detail.jpg

An interpretative and analytical approach

"What a transformation, what a movement, what a deformation, what an invention, what a discovery!"¹

Bruno Latour, 1999

Transformation

Even though built works has become the core of the investigation, however, the complexity and synthesis of a built work could not be understood just by direct observation on-site. In regards to this, there was a need of `transportation'2, which indicates the necessity of finding a medium/s to fragment and displace³ such original built work in order to revise it from off-site: A neutral territory where one can test and trace relations within the same work and across the different works. And naturally, `transportation' implies `transformation'. As stated by the French Philosopher Bruno Latour "A thing can remain more durable and be transported farther and more quickly if it continues to undergo transformations at each stage of this long cascade [...] knowledge does not reflect a real external world that it resembles via mimesis, but rather a real interior world, the coherence and continuity of which it helps to ensure"⁴. In relation to this, it seemed reasonable that a first transformation stage of such inductive methodology ought to be as objective as possible. Again as Latour mentions, "[...] obliged at all costs to maintain traceability of the data we produce with minimal deformation (while transforming them totally by ridding them of their local context)"5.

Bruno Latour's references above relate to an expedition he was part of as an observer. During the trip, a group of botanists collected equal size of earth samples from the amazon forest and orderly kept them in a box to be studied in the laboratory. In my case, walking around HCH's buildings was simultaneously associated with the act of collecting. What I collected though were not objects themselves, but representations of them through photos. Such photos would transform the physicality and entity of the building into two dimensional samples or fragments -of the building- to be analyzed off-site. Photography was intuitively chosen as: 1) the camera was seen as a fast tool for collection 2), the device itself provided with a focus -camera lens- to look through that naturally required certain framing 3) and it basically captured what was exposed, the visible, but would also insinuate what laid beyond it.

Whereas botanists travelling with Latour decided upon setting up very strict cartesian coordinates on the ground of the amazon forest, which would then become columns and rows in a box to be transported elsewhere (Fig. 82). I felt the urge to move by intuition and act a bit more randomly within the field of the built and tectonics. I walked and shot around the building following my own impressions, curiosity and motivation. Besides, there were certain regulations to follow as most of HCH's buildings are still in use. For example, some areas could only be visited at a certain time or under specific conditions. Thus, setting up a very strict plan to document the works beforehand would have proceeded against everyday circumstances. In continuity to this, the camera device seemed to provide with a fine correspondence between focus -the broad theme of tectonics- and unsettlement -still open for discussion off-site, since photography entails interpretation-. After visiting and capturing the buildings, the result was a large set of unorganized photos, at that stage still kept at the laptop's hard drive, that fragmented HCH's buildings into smaller tectonic portions and features.

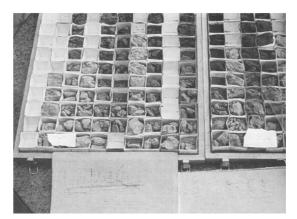


Fig. 82

"The more we recognize the uniformity of our work and the less we require our work to be entirely new the more refined it will become."⁶

Stephan Bates, 2014

Repetition

The first unstructured phase of the analysis described above, the data collection through photography, was followed by other more structured stages comprised of three investigations, *Cuts*, *Crops* and *Faults*. These investigations employ architecture based tools, as drawings and photos, to depict and communicate tacit knowledge inherent in the built works, which couldn't be understood through traditional text based methods. The question is, how were these investigations developed? According to the bottom-up nature of the project, investigations were decided in relation to 1) approaching and `transforming' the built as something physical, large, static and accessible, though often directly incomprehensible in architectural means, into something manipulative, small and comparable 2) and HCH's works specific features, situated within the theme of tectonics.

There are some early distinguishable features in HCH's works that drive the specificities of the investigations. On the one hand, the unique character of the facades, stands out from the immediate context. By experimenting with different materials than the buildings nearby and through including vernacular elements in an abstract and repetitive mode, facades' orderly expressions settle as backdrops to the existing scene. Whereas endless repetition follows the horizontal dimension of the facades, a tripartite division constitutes its vertical development. Such characteristics are applicable to the outer expression of HCH's buildings, whereas from inside, such distinctive character is not evident. The interior appears rather dissociated from the outer surface and presents a more common aspect similar to other buildings of the same period. Thus, one could derive that 1) buildings' facades are comprised of different layers 2), its outer layer consists of a vertical pattern in the horizontal development and a tripartite division in its vertical composition 3) and finally, that such features will repeat in almost all HCH's works.

On the other hand, as an alternative to showing a `very personal architectural calligraphy'⁷ -as certain gestures, lines/ shapes, related to

the drawing/ thinking hand of the project's author that are recognizable as certain built forms repeated throughout ones oeuvre- HCH's built works are distinguishable by displaying a limited variety of materials, formats and elements. These reappear in different situations within the same work as well as across works.

Considering these two features, patterns/ rhythms of the facades and repetition of certain materials/elements, the analyses of HCH's works arises through the process of initially two investigations, *Cuts* and *Crops*. Whereas *Cuts* -through drawing- depicts issues of patterns and rhythms, as well as layering and detailing, *Crops* -through photography- focuses on tracking material/ elements continuities within one work and across works. The third experiment, *Faults*, that results from the knowledge gained in the first two, juxtaposes expression and construction features of two comparable works and facilitates a tectonic discussion. The three experiments establish a cross reading investigation of the works through different focuses, in which the same approach is consistent and repeated throughout works regardless their program⁸, location and size.

It seems relevant to refer to the architect Dan Hoffman's installation *Recording Wall*⁹ as a clarifying example to the repetitive attributes of this PhD project: The subject -HCH's repetitive character of the facades and the use of equal materials/ elements- and the method -a consistent approach through Cuts, Crops and Faults-. *Recording Wall* (Fig. 83) shows the repetitive task of constructing a masonry wall by using the same piece of material (a concrete block) and by doing the same motoric movements. And such process is systematically recorded through photography. Each photo of the building process, in which the author places one concrete block at a time, is after composed as a collage. The art piece represents the real built wall, made of the repetitive task. In a similar way, the layout of *Cuts, Crops* and *Faults*, also embraces the repetitive attributes of subject and methodology.

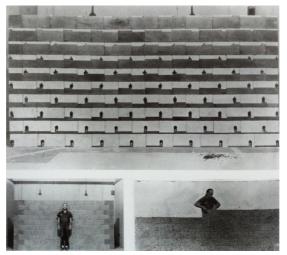


Fig. 83

"I like your suggestion that drawing is a ghost subject – exactly for the reasons you give and also because, before drawing evolved into a "questioning" of something visibly there, it was a way of addressing the absent, of making the absent appear."¹⁰

John Berger, 2004

On Cuts

Facades' even and layered character built of a limited range of materials and construction methods situate the analyses on the tectonics of the building's skin. This shouldn't mean to isolate the study of each work into such thin layer. Instead, to use it as a driving force to unfold deeper questions embedded in the logic and integrity of each work. This means that a specific facade situation should raise a question, which might find an answer or discussion in itself, somewhere else in the building or even in different building.

Looking through the large collection of photos intriguing relations among the outer, the in-between and the inner layer emerged. Often, there is a fragile layer which covers/ protects and gives expression to the building anchored to a more robust layer with structural properties which remains hidden or partly hidden. Considering this, it seemed natural to start by digging into the hidden parts of these facades and its relation or nonrelation with the more exposed parts. If we were to proceed directly with an obsolete built work we could have performed a series of real cuts to reveal the invisible materials and construction solutions. Whereas within the architecture milieu, the physical action of cutting is most often translated into the act of drawing sections.

In this case, drawing Cuts in both directions seemed relevant considering facades' different orders. While the horizontal dimension shows repetition through a strong vertical rhythm, the vertical one is comprised of three distinct parts: Base -in contact with the ground-, body -the middle partand top -the meeting with the roof-. The number of horizontal and vertical cuts is therefore reconsidered in each building. Horizontal ones are normally placed in the body part of the building, as seriality is most present in this area. Whereas vertical ones are decided according to the number different sequences.

However, there are few buildings that do not completely fit under the category of a 'layered facade'. It is through the process of trying to set up

and draw the sections of some of the works that one realizes the difficulty to determine its limits. In such cases, facades and roofs seem impossible to split. Those buildings are Ringbo and Brøndbylund Phsychiatric Hospitals, Næstved Chapel and to some extend also Hanssted School (though this one also shows features of a layered façade). Distinct to all the rest, the first three cases are one storey buildings. In all them, the contrast between a structural layer and a thinner covering is here reorganized as a heavy base in contact to the terrain and a weightless covering embracing the upper part of the façade. Therefore, in these situations, sections include the entire envelope of the building -façades and roof-.

From a certain distance, works express smoothness and regularity. This is accentuated by the very distinct character of the existing context. However, from a closer position, we appreciate very subtle though rough joining details. These two complementary tectonic characteristics, evenness and roughness, in connection to the distant and close points of view, indicate the type of data and the scale that should be considered in the drawings: On the one hand, *Cuts* are thought as detailed drawings that should expose minor particularities as materials' and elements' geometry and dimensions, especially relevant in the analyses of joints. On the other hand, drawings should include the entire height/ length of the façade, or a large fragment of it, to address concepts of order, modulation, rhythm and seriality.

Drawings have been developed considering the following information sources: 1) My own experiential point of view, in which I would walk around the building and collect tectonic features in a rather spontaneous way through the camera lenses 2) and existing construction drawings from *Byggesagsarkiv* in Copenhagen. Thus, the investigation is based on the combination of the following sources: 1) my own memory from being onsite, which can't be documented 2), what I can see in the photos once off-site, that often reveal more, or distinct facts, than what I could deduct on-site 3) and what I can analyze in the construction drawings. Even though existing technical drawings provide with plans, sections, facades and details of the buildings, however the act of redrawing and doubting, instead of seeing and reading, was thought as a critical point to understand the logic of the works. In addition, the experiments' comparative character made it necessary to find a drawing consensus among the different types of sections. Since existing technical drawings appeared different probably depending on the thinking/ drawing hand¹¹, date of construction and different contingencies of each project. Finally, a two-dimensional orthographic *Cut* drawing was digitally produced, however thought and made very similar to a hand drawing process, as limits and scale of the drawing were decided beforehand.

Usually construction drawings would confirm what had been observed onsite. However, a few times, a drawing did not correspond with the state of the built work today. We should point at two relevant situations in which investigating the work from on-site and within a rather close distance reveals important information not possible, or difficult, to deduct through the existing drawings . The first case unveils that a work has been extended or transformed by a different architect than HCH, as Amager Transformer Station. From a distance it was not possible to discover the added part of the building (Fig. 84). One should get very close, stand just a few centimeters away from the facade and look up towards the short overhangs. There you would realize that the building shows two different construction methods and expressions: Some overhangs are made of concrete, others of plasterboard (Fig. 85 and 86). Besides, concrete ones are part of the structure shell, just an extension of it, and wooden battens are attached to it. Whereas plasterboard sheets are added as the last piece, just in means of covering something. And wooden battens have no construction/ structural connection to it. Apart of this, the building shows an unsolved corner joint between two inclined Eternit plates (Fig. 85). The differences are not only the chosen material -concrete/ plasterboard-, but also the construction processes and expressions. Besides its distinct abilities to weathering, as something that construction drawings can't express.

The second case we should look at is Blankavej Housing. Section drawings show an inclined facade corresponding to each floor (Fig. 87). This is a facade tectonic tendency in HCH's buildings, used in different ways in Nyborggade, Bellahøj and Amager Transformer Stations and Hanssted and Gasværksvejens Schools. Blankavej Housing is the first and only housing block in HCH's oeuvre that uses concrete floors and beams as thresholds above openings, even though these are covered with a layer of bricks. At the section drawing, HCH places a thicker section of bricks just above the beam and gradually reduces the section in the upper part, which results with an inclined wall. If the work had been built as described, the outcome would have been 1) a different expression of the building's facade 2) and a very elaborated and manual construction process, since each brick row would demand a different dimension of stones. Instead, the built work shows a cladded beam covered with one row of bricks rotated 90 degrees (Fig. 88).

The reflections above bring the reader into some details which belong to the discussion part of the PhD project, chapter 6 and 7. However, it seems relevant to describe such facts in order to illustrate the character of the methodology. Intuitively, it seems appropriate to navigate among existing construction drawings, self-experience at the built work, the original building and later extensions/ transformations, without discarding one or another from advance. Such looseness helps to better approximate HCH's built works, and investigate the way tectonic characteristics repeat, change and iterate across works.

Finally, sections are placed into two groups, according to horizontal and vertical ones. Drawings are folded and carefully organized in chronological order. Thus, by unfolding some of the drawings simultaneously, one should be able to read more than one work at a time, see a certain progress/ transformation and perceive its repetitive character. In order to explain the distinct facade/ roof features of Hanssted School, Næstved Chapel and Ringbo and Brøndbylund Psychiatric Hospitals, its section drawings differently folded.





Fig. 85

Fig. 86

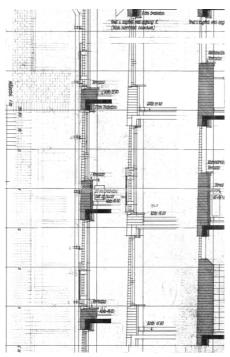


Fig. 87



Fig. 88

"It might be possible to imagine an experience of enlightenment strictly as a visual experience following this photographic procedure, one that enables our eyes to do the thinking about material things."¹²

Richard Sennett, 2008

On Crops

As already mentioned, photography has been the main medium to capture HCH's built works. Photos were taken without a preestablished focus, other than an interest in the broad theme of tectonics, what seemed to be characteristic in the works. The attempt was to divide the whole building into smaller fragments in order to understand it.

"Every library answers a twofold need, which is often also a twofold obsession: that of conserving certain objects -books- and that of organizing them in certain ways."¹³. In connection to the second part of Perec's quote, some of the photos were printed in a small paper in order to organize them. Since its digital format made it impossible to visualize and manipulate them to find relations, continuities and discontinuities, across works. Once printed, photos were put together according to different construction, structure and expressive criteria, by always seeing the 17 works as one *oeuvre*. Some development occurred through playing and self-discussing with these first set of photos. Though, at this early stage, it was not feasible to decide upon a specific number and type of categories.

In this regards, Koolhaas' 'Fundamentals' exhibited in the 14th Venice Architecture Biennale¹⁴ was used as a point of departure. 'Fundamentals' focuses on the fundamental constructive elements of our buildings. It is about buildings, instead of architects, and about history, instead of contemporaneity. Besides that, 'Fundamentals' is based on different categories of building elements that are put together regardless their context. And, as part of the Venice Architecture Biennale Exhibition, such elements have been displayed through images and objects -mock ups and samples-. These premises were considered relevant considering the experiential and practice based approach of this PhD project as well as the photo character of the experiment Crops. However, not all the categories of 'fundamentals' became meaningful for HCH's works. Some of them were discarded, and others were added new. Thus 'Fundamentals' were adjusted to the specifics of HCH's works and described as: Façade generator, window, door, base, top, brise- soleil, balcony, corner, skylight, joint/ detail, water drain, lamp, ventilation, chimney, clock, cladding and stairs (Fig. 90). Afterwards, according to each category, printed photos were joined together in small leporellos to be unfolded on a large surface (Fig. 91) or kept compact (Fig. 89).

However, the criteria still seemed rather heterogeneous to find some logic across HCH's works, since some categories referred to materials, some to elements, some to patterns and others to similar ways of ordering facades. Besides, while working with Crops, the impression was that the layered character of HCH's facades -that was being investigated through the experiment Cuts- was not fitting into an element based division. Somehow, it was not possible to detach an element from its specific context and decide where to exactly cut it off, in a similar way to how building elements were exposed at 'Fundamentals'. Therefore, intuitively, Crops suggests to go one step backwards and introduce categories based on materials, seen as the minor tangible constitutive part of any built work (Fig. 99, 100). And specially significant considering the tectonic characteristics of HCH's works, since materials keep reoccurring in different evolutive formats, e.g. from in situ concrete, to concrete blocks and to prefabricated concrete elements. And such different formats seemed relevant as they would require distinct tools/ techniques to put them together¹⁵.

Thus Crops ended up in 5 basic materials: wood, ceramic, concrete, Eternit (fiber cement panels) and metal. Each material was after subdivided in its different formats. Glass was discarded since it didn't play a role within the tectonic discussion¹⁶. Moreover, nonvisible materials as isolation or impermeable membranes were also excluded. This last decision was taken in connection to 1) the tectonic notion, as the art of making mere structural/ construction features and processes manifested 2) and the chosen instrument to investigate the works, photography, which basically only captures what is visible. Thus, subcategories to materials were defined by the following nomenclature: material type, structural/ nonstructural implications, material format and specific situation/ function at the building. A remark to be made is that in *Crops* the facade delimitation preestablished in *Cuts* didn't seem logic. First, when tracking materials within and across works it was clear that specific material formats were used in different situations other than facades. For example a wooden batten was used as a handrail, a latticework, an espalier and a joint profile between Eternit plates (Fig. 92, 93, 94 and 95).

Second, some architecture elements showed development depending on the logic of its material, e.g. staircases, roofs, doors, windows and railings. Meaning that the same architecture elements would require different construction methods and result in distinct expressions due to employing a new material/ technique. For example, this is the case of the main staircase at Tagensbo Church and Gasværksvejens School. At Tagensbo Church, the whole staircase is made of wood, as in all his previous works, which requires to be mounted on-site (Fig. 96). While in Gasværksvejens School, the same design is made of several metal frames mounted off-site, transported and joined on-site (Fig. 97). Prefabrication results in a few expressive differences, a whole different construction process and a tectonic shift.

Therefore, it all indicated that photos, apart of getting preserved and organized, as stated by Perec, would finally provide with some knowledge to further discuss and contextualize the works. But how did such five material categories - and subcategories- emerge? The way to proceed with such large quantity of photos worked in a double direction: One, by randomly finding photos which would reveal a certain material situation. For instance, a photo of Blankavej Housing showing a detail of a flat brick threshold (Fig. 98) would act as a 'trace'¹⁷ of what it represented, or as 'authentication'¹⁸ of one fragment of the built work, the brick threshold. Another, by looking for some specific material or building purpose. For example, when looking for the structural material, which exists in every building, one should revise different photos and doubt different possibilities. Sometimes, photos would reveal new unexpected conditions,

not recognized while being on-site¹⁹. Others, the question remained unresolved, as structural materials are often concealed. In this case, other materials/situations, as well as construction drawings, could help to unfold such question. For instance, by pointing at the same photo of Blankavej Housing, and trying to see through the brick thresholds one could guess the structural principles of the slab (Fig. 98). Such question "what kind of structure hides beyond the brick window threshold?" even though not explicated in the image per se, is insinuated through the image. Since a photo often tells a bit more than the mere image, just because of accumulated knowledge and cultural background of the `spectator'. This is even more true if the photo has been taken and is being read by the same, the `operator' as the `spectator', since there is a relation of subjectivity to consider. In this case, a material lenses should allow us to look beneath the image and search also for technical aspects²⁰.

Furthermore, photos are not fully communicative for what they exhibit on the image. It might actually be unclear what material photos are displaying, since naturally several materials interact together in the same photo. Somewhat the photo could have been cropped to show a closer image of the one significant material and isolate it from all the rest. However, it is not the purpose of the experiment to have a catalogue of building materials. What is important for the experiment is to see how the selected materials are put together with others in the built work, while understanding its function and relations to other works²¹. This allows us to understand and communicate that, even though HCH uses the same material/ format repetitively, its construction system and expression tectonics- changes because of a different context. To clarify what material is displayed in each photo a color code has been applied.

Another issue was that when searching for specific materials accurate photos were often missing²². However, it was accepted to use photos as they were instead of taking them again with proper -conventionalconditions. If the five materials' categorization had been taken into account before visiting the works, issues of framing, distancing, blurring,

object disturbances and composition could have been considered previously. However, the experiment was developed bottom-up. Every new step was decided considering the knowledge and challenges met in the previous one. And in this case, photos existed before deciding on the experiment Crops. Thus, voluntarily, ordinary photos were used as they were and best adjusted through the act of cropping. Accepting the imperfection of photos was also related to the will of keeping the particularity and contingency of a moment alive and revealing the inductive process in the final format of the experiment. Specifically, this refers to certain details, the punctum of the photos, which probably wasn't intentional, but most likely inevitably as couldn't be separated from the whole set up of a situation²³. This results in a certain aesthetics: The ordinary and non-composed character of the photos refers to the 'snapshot aesthetics'. Though this aspect is not innocent. Consciously²⁴, during the process of taking photos, there has been an interest in showing the "As found"²⁵. Here, such state recognizes the architecture as it was originally built -HCH as the architect-, but also the architecture today, in use and exposing decay, modified by people and time.

The five material categories were displayed as a large map placed on the ground (Fig. 99, 100). However, several circumstances motivated the design of an alternative format, which shouldn't depend on the spatial characteristics of a room, but instead be compact, transportable and easy to revise while working with the project. According to this, photos were put together in a series of compact booklets. Its very small dimension (95 x 80 mm) was decided in relation to the body scale, specifically the grabbing hand (Fig. 101). Different volumes correspond to each material and its structural or nonstructural implications (Fig. 102). Finally, the digital format of each material situation has been mounted following the set-up of the material photo map²⁶, that is included in the PhD book as one foldable map.

Bruno Latour's "Circulating Reference"²⁷ chapter in the book Pandora's Hope. Essays on the Reality of Science provides a theoretical framework to contextualize Crops. As already introduced in the "transformation and transportation" subchapter, the author together with some botanists and soil scientists adventure in the amazon rain forest looking into how empirical knowledge -material world of soil and plants- is turned into text -scientific knowledge-. Latour states that throughout the process of measuring and sampling we lose "locality, particularity, materiality, multiplicity, and continuity" but we gain "compatibility, standardization, text, calculation, circulation, and relative universality". While Latour's references are real pieces of soil from the forest and placed in a box according to certain coordinates. HCH's Crops, are fragments of the built works gathered through photos and mounted together as a map/ small booklets.

The term Crops is related to the act of framing and discarding non relevant information from the original photo. The aim is that each photo focuses on showing one material within a larger aggregate resulting into a fragment of the work. In comparison to Latour's sampling, in which the piece of soil is forethought selected, carefully extracted and precisely cut, here the act of cropping happens after a process of reflection. Somehow, the entire built work is collected through an initial intuitive process of shooting. Once off-site, the raw and unstructured material, digital photos, is printed, analyzed, classified, cropped and displayed on the floor/ bind together.



Fig. 89









Fig. 93



Fig. 94



Fig. 95







Fig. 98

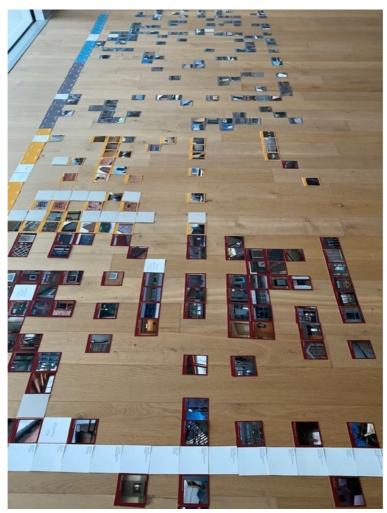


Fig. 99





Fig. 101



Fig. 102

"There is a surface. Now think -or rather feel, intuit- what is beyond it, what the reality must be like if it looks like this way."

Susan Sontag, 1977

On Faults

Faults aims at revealing some of the findings of *Cuts* and *Crops*. *Cuts*, a part of showing issues of rhythm and order, demonstrates a certain lack of correspondence between the inside and outside layers of the skin -as photos could be taken from outside and inside-: While the outside seems more attentive to material properties and issues of context and perception, the inside responds to the specific demands of the room. And the structure interacts in-between these two layers, either totally concealed or semi- exposed in one or the two sides. Whereas Crops depicts material continuities, and also discontinuities, through photography and its perceptive properties, one becomes aware that the use of equal materials might result in similar expressions, but also the opposite. As well as the use of different materials might result in similar expressions.

In order to further investigate such idea, two comparable photos, corresponding to two fragments of different built works, are put together as a collage. The act of juxtaposing²⁸ two photos aims at reaching beyond comparison by extra emphasizing the following situations: 1) what expression-wise seems similar might conceal distinct construction/ structure solutions, materials and programs, for example the facades of Nyborggade Transformer Station and Tagensbo Church; 2) what expression-wise looks distinct might cover similar solutions, for example, two different materials might conceal similar construction solutions; or two similar joining details constructed with different materials might be embedded in approximate facade compositions as it happens in Nyborggade and Bremerholm Transformer Stations; 3) different façade expressions might be comprised of equal architecture elements as windows, doors, railings and cavities, as in Nørrebro Vænge and Hulgårds Plads Housing Blocks 4) and two alike facades disrupted by a small detail -perns, fastenings, joints, thresholds, wooden battens and finishing textures/patinas-might disclose a major construction difference beneath, as we can see in Skydebanehaven Childcare and Hanssted School.

The development of Faults obviously requires the knowledge acquired in the two previous artefacts, *Cuts* and *Crops*. The process starts by detecting two works that have something in common. First, very similar fragments of works are selected, most likely facades, but also staircases, interior claddings, windows and joining details. Since in general, it is known that by finding close resemblances between the two parts the contrast becomes more apparent. Second, the two fragments/ photos are manipulated digitally in terms of frame, dimension, perspective and scale, if relevant. Although two photos are adjusted in order to visually match with each other as if we were looking at one photo, however the joint or division line, the *Fault* line, is reinforced by displacing the photos' different contours.

The name Faults expands from the original geological and tectonic meaning of a fault seen as "a planar fracture or discontinuity in a volume of rock across which there has been significant displacement as a result of rock-mass movement". Furthermore, "[...] a fault trace or fault line is a place where the fault can be seen or mapped on the surface and it is also the line commonly plotted on geologic maps to represent a fault"²⁹. This real and abstract line of a fault zone has motivated the making and the specific layout of these series of juxtapositions, in which alignments continuities- and fractures -discontinuities- between two works become explicit alongside the line. The difference here is that the fault situation is artificially constructed. Normally, before a geological fault originates we would see one complete entity, which cracks and generates a fault. After the fault happens we can still recognize some connections between the two parts, in terms of dimensions, colors and textures. The result might seem similar between two of HCH's works, though the process is different. Here connections are ideally constructed: The two buildings are physically disconnected, however, there are some connections that help us interpret HCH's works in a certain way. Besides, when seeing all the different faults together, one can observe relations also among them all .

"Why write if what you want to say can be built?"³⁰

Wilfried Wang, 2008

Seeing works through theory and practice

Some architects have hardly published any writings, one of them is Sigurd Lewerentz. His writings are limited to a few mottos given to competition entries, which reveal his profound thoughts on a certain matter. In connection to this, he called his own ironmongery firm "Idesta" which in Latin means "it is" or "it exists". The things produced were: a physical window, door frame or iron detailing, and the name of the form and the products show full correspondence³¹.

HCH is another architect that shows his knowledge in the physicality and detailing of his buildings instead of writing. He often visited the building site and discussed construction methods and details to control the materialization of the architecture project³². The architectural skills, probably among other reasons, may be associated with his education as a carpenter prior to his architectural education. This approach is taking form in all of his built works.

The analysis of his oeuvre through the three investigations confirms that HCH had an interest and expertise in practices that can be characterized as tectonic. Evidently, his approach did not emerge from having an awareness towards tectonic theories on the contrary, most likely it was based on the procedures of building and hands on. Such practice-based attitude of the architect is aligned with the bottom-up approach methodology of this PhD project. In which, tectonic features embedded in the work arise through examining them by use of the architect's basic tools, as drawings and photos. This approach deviate from framing the works into specific theories beforehand, but let the work speak through the architects' analytical tools. Thus, the believe is that built works become the anchor point between HCH's intentions and the author's own analyses and followingly interpretations.

However, the subject of built works should not be exempted to be discussed from relevant theoretical positions. As the professor of architectural history Adrian Forty states, "[...] part of the pleasure of architectural history comes on the one hand from examining the work and using that experience to test out theoretical propositions; and on the other hand, from bringing theories to interrogate the work. It's a two-way process, as a result of which both works, and theories are enriched [...] Thinking through objects and seeing through theory"³³. In this case, tectonic theory on the one hand should facilitate a deeper understanding of HCH's works. On the other hand, it should assist to better comprehend the abstract character of such theories.

The three investigations, Cuts, Crops, and Faults have various purposes: 1) depicting a series of facade sections, 2) tracing material continuities - and discontinuities-, 3) and juxtaposing intriguing tectonic relations. The character and steps of each investigation was formulated based on the initial premises that 1) HCH's enclosures show unique layered facades, especially in comparison to its contemporary culture, 2) HCH employs the same or similar materials and formats within one building and across buildings and 3) alike expressions might conceal different construction methods and vice-versa. Besides proving the purpose of their main object, investigations unfold other specific features of the works. Somehow, what was formulated and refined as a method in close connection to a specific subject -the tectonic characteristics of HCH's works- becomes a mere tool/s to navigate among works. This fact insinuates that such tools (investigations), could be applicable to other architectural works. Cuts, Crops and Faults provide a methodical way to investigate a series of built works that present certain tectonic features, specially integrated at the facades.

In this case, the development of the three investigations has shed light on some issues grouped under the following themes: 1) *Fragility and Robustness*, addressing the layered character of the facades and specially the use of concrete 2) and *Frameworks and Ready-mades*, indicating the thorough integration of coverings through a modulated open system and off-the-shelf elements, as well as its connection to context conditions. These two positions should not be seen in direct

correspondence with any of the three investigations. As it is through the investigations' complementary character that such themes have become apparent. Each theme, articulated as a chapter, will first be provided with a theoretical and practice-based background and followingly by relevant examples of HCH's works.

The discussion holds a tectonic position with focusing on: 1) Tradition, understood as "the stock of general knowledge (including general scientific knowledge) which specialists assume as the ground of present practice and future progress [...] "34 and 2) Ecology, which addresses issues of waste, life-time, economy and construction processes. In addition, it indicates the relevance of HCH's approach to tectonics from a present day perspective. Such scheme also allows for different readings, as for example focusing on reading the discussion of one of the buildings. In addition, it seemed ineffective to fully subdivide the discussion of HCH's works within each one of the different themes discussed under the two next chapters, since these themes are very much interrelated with each other. Thus approaching such themes separately for each one of HCH's works would end in constant reiteration. Once that said, there might be some repetition between the two chapters, six and seven. Even though the first one, "Fragility and Robustness" mostly addresses the structural parts, whereas the second one "Frameworks and ready- mades" relates to the coverings/ claddings/ building envelops, it was challenging to totally divide some of the discussions. Besides that, the reader meets the two chapters in different moments. Thus, it is considered appropriate to situate certain information again.

² In the chapter Circulating Reference Latour describes "In jumping from the soil to the drawer, the piece of earth benefits from a means of transportation that no longer transforms it. In the previous photograph we could see how the soil changed state; in Figure 2.13 we see how it changes location. Having made the passage from a clump of earth to a sign, the soil is now able to travel through space without further alterations and to remain intact through time.' Bruno Latour, Pandora's Hope. Essays on the Reality of Science Studies (Cambridge, Massachusetts: Harvard University Press, 1999): 51.

³ Through the example of the Stockholm Exhibition in 1930, Thordis Arrhenius explains that what remains today is basically ephemeral material that accompanied the event, whereas the buildings that gave support to the international exposition were dismantled shortly after -as natural in architectural exhibitions-. And very few traces of it are still present on-site. In this case what is accessible today is 'the displaced' as "catalogues, publications, postcards, plates and mugs, broaches, scarves, and other souvenirs", whereas what was 'in place', the built, is no longer there. Such example is the opposite representation of this project. What we have here is the built, but apart of construction drawings of the projects, we haven't been able to locate any other complementary material. Somewhat, here 'the displaced' ought to be created in means of understanding and studying what is 'in place'. Thordis Arrhenius, "Place and Displacement: Exhibiting Architecture" in the foreword of the book *Place and Displacement* (Lars Müller Publishers, 2014): 7-12.

⁴ Bruno Latour, Pandora's Hope. Essays on the Reality of Science Studies (Cambridge, Massachusetts: Harvard University Press, 1999): 58.

⁵ Ibidem, 47.

⁶ Stephen Bates refers to a say by Heinrich Tessenow. Lecture by Stephen Bates and Jonathan Sergison during The Dunlop visiting professorship in architecture at Harvard GSD in Spring 2014.

⁷ Rafael Moneo employs such expression when addressing Alvaro's Siza's architecture works, and as a counterpoint he mentions Herzog & de Meuron's `obsessive desire to align their architecture with certain materials'. Rafael Moneo, Theoretical Anxiety and Design Strategies in the work of eight contemporary architects (Cambridge Massachusetts: The MIT Press, 2004): 2.

⁸ Within the 18 works, there is a home for orphan children, a laundry building for a psychiatric institution, three housing blocks, two churches, two schools, one daycare, five transformer stations, two psychiatric hospitals and one gas pressure regulator. There is a significant difference between transformer stations and the rest of the works, as the first ones are built for almost non humane use. This could have set up a premise to divide the way to investigate the works. However, there seem to be a meaningful connection between one group and the other. There are different examples of tectonic features used in technical buildings that have after been applied in other type of social works. This is the reason why different programs don't set up a condition to split works and investigate them in a different way.

⁹ Exposed at Cranbrook Art Museum, Bloomfield Hills, Michigan, USA, 1992.

¹⁰ John Berger, "Distance and Drawing (a correspondence with James Elkins)," in Berger on Drawing (Occasional Press, 2005): 109.

¹ Bruno Latour, Pandora's Hope. Essays on the Reality of Science Studies (Cambridge, Massachusetts: Harvard University Press, 1999): 51.

¹² Richard Sennett, The Craftsman (Penguin Books, 2008): 95.

¹³ Georges Perec, "Brief Notes on the Art and Manner of Arranging One's Book," in *Species of Spaces and Other Pieces* (Penguin Classics, 2008): 37.

¹⁴ Rem Koolhaas, Dutch architect and founder of OMA (Office for Metropolitan Architecture) explained that the exhibition would be "about architecture, not architects [...] Fundamentals will focus on histories – on the inevitable elements of all architecture used by any architect, anywhere, anytime."

¹⁵ Richard Sennett explains metamorphosis as one of the three key issues in connection to 'material consciousness'. Discussing on 'type-form' he states that "evolution occurs when a new material condition requests the new use of a new tool". Richard Sennett, *The Craftsman* (Penguin Books, 2008):126.

¹⁶ Except when glass is inserted in prefabricate concrete panels. In such case it has been decided to consider this complete element under the category of concrete.

¹⁷ "The material relation between the image and what it represents is an immediate and non-constructed one. And is indeed like a trace". John Berger & Jean Mohr, J., Another way of telling: A Possible Theory of Photography (Bloomsbury Publishing, 1982): 93.

¹⁸ "The Photograph's essence is to ratify what it represents". Roland Barthes, Camera Lucida Reflections on Photography (Hill and Wang, 1981): 85.

¹⁹ "While photographs document, they also create something new. The camera's lens cuts a section out of a broader context. It allows elements to be visible and relationships legible, but with no notion of exposing something essential in what it depicts". Claus Peder Pedersen, "Tilfældets Tektonik," in Arkipelaget Pamflet no. 3, (Det Jyske Kunstakademi, Arkitektskolen Aarhus, Antipyrine, 2013): 30.

²⁰ "[...] to clean the surface of the image in order to accede to what is behind: to scrutinize means to turn the photograph over, to enter into the paper's depth, to reach its other side (what is hidden is for us Westerners more "true" than what is visible)'. Roland Barthes, *Camera Lucida Reflections on Photography* (Hill and Wang, 1981: 100.

²¹ "Photography reduces the extend of the space down to the image's flat surface, thus raising a question of how the photographed building occupies the surface. If the surroundings take up too much space, the building recedes into the background, and the risk is that something else will steal the show. On the other hand, if the context is absent, and the building fills the entire surface of the photo, then it is reduced to an object". In this case, we should substitute 'building' per 'material'. Claus Peder Pedersen, "Tilfældets Tektonik," in Arkipelaget Pamflet no. 3, (Det Jyske Kunstakademi, Arkitektskolen Aarhus, Antipyrine, 2013): 26.

²² "The conventions involved in defining good architectural photography appear to be somewhat restricted. The basis is almost always a technically perfect photo: correctly exposed, classically composed with clearly defined volumes and precise cropping. The perspective is corrected in order to compensate for tilting vertical lines [...] In the best (sometimes worst) case the photo involves a lyrical

¹¹ As explained by Kim Lyngvig Hansen, one of HCH's former employees at the office of the Copenhagen's municipality, HCH was one of the two leaders of the Copenhagen's architecture department, working under the city architects Poul Holsøe and F.C. Lund after. HCH would supervise different projects and engage with the sketching phase. However, it was a number of other architects responsible of producing the drawings as they appear today.

interpretation of light and the play of shadows on physically exposed surfaces. Claus Peder Pedersen, "Tilfældets Tektonik," in Arkipelaget Pamflet no. 3, (Det Jyske Kunstakademi, Arkitektskolen Aarhus, Antipyrine, 2013): 27.

²³ "Hence the detail which interests me is not, or at least is not strictly, intentional, and probably must not be so; it occurs in the field of the photographed thing like a supplement that is at once inevitable and delightful; it does not necessarily attest to the photographer's art; it says only that the photographer was there, or else, still more simply, that he could not photograph the partial object at the same time as the total object. The Photographer's "second sight" does not consist in "seeing" but in being there". Roland Barthes, *Camera Lucida. Reflections on Photography* (Hill and Wang, 1981): 47.

²⁴ "Even when photographers are most concerned with mirroring reality, they are still haunted by tacit imperatives of taste and conscience [...] In deciding how a picture should look, in preferring one exposure to the another, photographers are always imposing standards on their subjects". Susan Sontag, *On Photography* (Penguin Books, 1977): 6.

²⁵ Alison and Peter Smithson, "The 'As Found' and the 'Found" in a publication that accompanies the exhibition: "The Independent Group: Postwar Britain and the Aesthetics of Plenty", Institute of Contemporary Arts London, 1990.

²⁶ This map was set up in June 2022. A first mock-up was already mounted in May 2020. And it is expected to mount a final version of the map for the PhD defense.

²⁷ "It seems that reference is not simply the act of pointing or a way of keeping on the outside, some material guarantee for the truth of a statement; rather it is our way of keeping something constant through a series of transformations". Bruno Latour, Pandora's Hope. Essays on the Reality of Science Studies (Cambridge, Massachusetts: Harvard University Press, 1999): 8.

²⁸ "The juxtaposition of two contrasting objects, images or ideas is the fact that they are placed together, so that the differences between them are emphasized." *Collinsdictionary.com.*

²⁹ `Fault (geology)' Wikipedia, https://en.wikipedia.org/wiki/Fault_(geology), 2020.

³⁰ Wilfried wang, "Epilogue. Between Arrangement and Subtle Rebellion," in Nordic Architects Write. A documentary anthology. Edited by Michael Asgaard Andersen (Routledge, 2008): 401.

³¹ Ibidem.

³² Information revealed by Kim Lyngvig Hansen, who worked with the team of HCH during the 60's in the City Architect's office in Copenhagen. Interview from the author.

³³ Adrian Forty, "Future Imperfect". Adrian Forty's Inaugural Professorial Lecture, delivered at UCL in December 2000, in Forty Ways To Think About Architecture. Architectural history and theory today (Ed. John Wiley & Sons. Ltd, 2014), 20.

³⁴ Reyner Banham, "Stocktaking" in Architectural review (1960).



Fragility and Robustness: The tectonics of facades' layerings "Why white marble was selected for painting?"

Gottfried Semper, 1851

In the very first part of "The four Elements of Architecture" and linked to his discoveries of Greek polychromic, Gottfried Semper argues that the reasons why some Greek temples were built of white marble was because it was to be painted afterwards. His first observation is that white marble was only used for specific occasions², as grey marblelike limestone covered with stucco was mostly used. His answer is that marble gave "a great base, moderate hardness, fineness, and uniformity of texture... and was very durable". Plus, paint would "preserve marble longer" and provide with a "fragrance". He turns the more obvious question around. Instead of saying "why is white marble painted?" he says "why white marble is selected for painting?". One can read that there is a clear intention on painting and giving color (covering) and that the choice to be made is focusing on the adequacy of the structural material to be covered. Besides this, paint would protect and give marble a sense of smell³. Thus, there is a close interdependency between the choice of both materials (the marble / the paint) and their purpose (as well as the intention of the architect within a wider cultural context).

HCH's layerings

Often HCH's works' enclosures are comprised of structural elements totally or partly concealed with other layers on its outer side and on its inner side. Whereas, the structural part is massive, the covering layer/s are rather thin and often ordinary and weightless. Even though this way of building might relate to the high security demands of HCH's five transformer stations (1958-1966), however the first signs of this feature already exist in previous works as; Skydebanehaven Childcare (1948-50) and Hanssted School (1954-59). Such façade hierarchy is sometimes rearranged as a heavy base in close dialogue with the ground covered by a weightless and extended roof. Notably seen in Ringbo and Brøndbylund Psychiatric Hospitals. In any case, there is a unique (meaning clear and ambiguous) distinction between a fragile and a robust element associated with distinct materials, construction methods, detailing and therefore expression.

Modernity's white dress

Using different layers to construct an enclosure of a building is quite common in construction procedures of today. Insulation and protection requirements, structural needs, limited construction periods, economic reasons, and certain aesthetic ambitions among others, make it difficult to rely on monolithic elements. However, it was a rather singular solution 70 years ago. In the post-war period, the layering character of some buildings was most often reduced to plaster and paint. Within the mainstream orthodox modernism, Mark Wigley discusses its featured white painted walls as being 'not naked'. He asserts that even though it is a reaction to the decorative character of the XIX c. facades, it is nonetheless another way of 'dressing a building'. In this case, according to the 'modern man' inhabiting it4. Wigley probably uses 'white' as the cliché color of modernity, which in general is seen as the negation of color and elimination of added elements and details. In other situations, enclosures had been coated with different contrasting bright colors. This gave a distinct expression to the sleek white, however the argument of eliminating the 'old' decoration through a new type of 'modern'

decoration still seems valid. Though, this is only one of the multiple applications of such 'innocent' and 'powerful' thin layer. Especially within the period of modern architecture, but also before and after, colored paint has often been used in means of, camouflaging or emphasizing, similarities or contrasts, between figures, volumes, planes, contours, textures and details. By adding paint, the architect would effectively visually alter relations within the architecture object and/ or between this one and its background/ context⁵.

Another modernity, sincerity and playfulness

As exposed by Collin St. John Wilson at his book, The other tradition of modern architecture: The uncompleted project⁶, there is another modern architecture, which is not about smoothness and painted facades. Wilson writes in favor of an 'organic' and 'durable architecture', which should 'grow from within', in connection to the site and the needs of the ones inhabiting the architecture. HCH's building enclosures are more aligned with such material consciousness. Although his works also develop from within, often enclosures negotiate between insinuating the program beyond them and a predisposition to not literally explain the program. Construction and expression-wise this connects with the fact that often HCH's enclosures, as rather natural, embed the structure of the building and a covering with no loadbearing function. The contrast and thorough articulation between the robust structural parts and the light coverings is what makes his works unique, fascinating and even provocative. As for some, discovering that an elaborated wood, bronze and ceramic façade conceals a concrete wall might be met with doubt from today's perspective⁷.

In general, HCH's enclosures reveal a high awareness towards materials and expression which results from a fine balance between 'honesty' and 'fantasy'⁸. This has been described by Richard Sennett like the relation that grows from working within the material logic and creativity beyond a brick façade covered with stucco. His elaborated explanation does not simply relate 'honesty' to brick and 'fantasy' to stucco. He states that whereas brick stones' properties provided craftsmen with a certain logic to pile them up, such properties -as the three dimensions of each stone and texture-were once invented and given by men. Thus, in many ways a brick wall is comprised of honesty and fantasy. In a similar way, we should not see HCH's layered facades in such same order and logic by attaching 'honesty' to the loadbearing concrete part and 'fantasy' to the nonstructural wood, bronze and ceramic layer. HCH's way of designing is more complex than making a naked concrete wall and covering it with a creative and expressive added layer. As it is the interplay between the properties given by certain materials -loadbearing and nonloadbearingand HCH's interpretation and manipulation of such properties, besides the way to join materials together, what is especial about his enclosures.

Early modern references

HCH's original⁹ layering might find references to some theories and works which emerged during the XIX and beginning of the XX c., before the full establishment of any form of modernism. Distinct to the structural rationalist discussion¹⁰ another discourse presents us with the believe that the essence of architecture is the spatial enclosure. Among others, the architects Adolf Loos and Otto Wagner, are representatives of such discussions. Kenneth Frampton refers to them as "the next generation of *Semperians*" as the ones that would inherit and develop "the technical and tectonic consequences of Gottfried Semper's theoretical corpus"¹¹ in their work.

Origins and discussions on the notion of dressing

Gottfried Semper is one of the first architects who claims the predominance of the wall to the subordination of the structure in a set of detailed theories. He elaborates on how the hanging textiles are representing the wall. And he links the first appearances of ornament with the textile arts: The act of weaving or knotting materials as part of the production of mats. As well as he associates the mat with the first space making and dividing element, which later would develop into masonry walls and other materials, which would initially imitate the original material

appearance of embroideries¹². In relation to the structure, Gottfried Semper adds that " [...] the often-solid walls behind them (hanging textiles/blankets) were necessary for reasons that had nothing to do with the creation of space; they were needed for security, for supporting a load, for their permanence, and so on [...] Even where building solid walls became necessary, the latter were only the inner, invisible structure hidden behind the true and legitimate representatives of the wall, the colorful woven carpets"¹³. Aware of Karl Bötticher's (1806-1889) theory of Core-form and Art-form¹⁴, Gottfried Semper defines his own conceptual version that is Structural- technical and Structural- symbolic, which offers an alternative to Karl Bötticher's view. From Gottfried Semper's perspective, the origin of enclosure and its embedded ornament (Structural-symbolic) precedes the main structure (structural-technical). He inverts the traditional believe by arguing that "false accessories are the true essence of architecture"¹⁵. He claimed that pre-historic humans would first make a home, as defining an internal space separated from the outside. While an awareness for a structural support, protection and defense would come later¹⁶.

Truth or masking of materials and construction

According to Gottfried Semper, the form of mats responds to the logic of the material properties and its making, the weaving process. Besides, its pattern and objects illustrate the rituals and believes of the existing culture and society. According to this Gottfried Semper writes that; "[...] we would recognize a perfect accord not only in the objects depicted but also in the manner of treatment"¹⁷. Meaning that the correspondence is between the represented images and the rituals, but also between the expression of such images and the logic of working with a certain material. The technique of weaving finds its origins in the knot as craft and expression of tying together two ends of a thread. Gottfried Semper states, "[...] the knot is perhaps the oldest technical symbol and, as I have shown, the expression for the earliest cosmogonic ideas that arose among nations"¹⁸.

However, Gottfried Semper's position on the formal logic of ornamentation and craft as part of the enclosure is doubtful or perhaps changing over years. In the very last part of The Four Elements of Architecture (1851) he claims (regarding the Greeks) that "[...] the selection of decorative forms and colors is determined not by an architectural element foreign to the wall (As was the case with the Assyrians), but by the construction itself and the material available"¹⁹. However, in a later text: "Style in the Technical and Tectonic Arts or Practical Aesthetics" (1859) he asserts that "[...] it is not absolutely necessary that the material as such, becomes an additional factor in the artistic appearance". And after, he even describes the fact and need of dissimulating the dressing's own material as: "[...] I think that the dressing and the mask are as old as human civilization [...] The denial of reality, of the material, is necessary if form is to emerge as a meaningful symbol, as an autonomous creation of Man... The untainted feeling led primitive man to the denial of reality in all early artistic endeavors; the great, true masters of art in every field returned to it - only these men in times of high artistic development also masked the material of the mask"20. Considering this description, it seems as if his notion of 'dressing' (Beikleidung)²¹ initially was more so related to using and expressing the logic of materials which created it. Whereas later, it was more attached to the masking or dissimulating effect of the reality of its own materials.

Tectonics and Stereotomics

Some years after, Gottfried Semper extended his ideas on this topic by defining two categories: Stereotomy, as to what relates to the *technical-structural*, with no formal and functional character and represented by stone and brick construction. And *tectonics*, as to what relates to the *functional-formal*, made of materials that can work as frames, lattices and supports, as well as to the *technical-historical*, attached to the use of timber.

The architecture historian Kenneth Frampton (1930) would elaborate further and discuss on these two concepts. He is reacting to the Postmodern victory of the 1990'ies by addressing *tectonic* thinking to overcome *scenography*. Within this argumentation of *tectonics* and *stereotomics* K. Frampton states that: "[...] framework tends towards the aerial and dematerialization of mass, whereas the mass form is telluric embedding itself even deeper into the earth. Which may be said to symbolize the cosmological opposites to which they aspire: the sky and the earth"²². Which makes one think of *stereotomics* as a strong connection to topography. This discussion seems relevant in connection to a few of HCH's works, such as Ringbo and Brøndbylund Psychiatric Hospitals.

The engineer and the architect

From a practice-based perspective it is at the beginning of the XX. c that we see the first discussions of the 'free-façade' or division between the structural and nonstructural elements of the building, between structure and skin. We should understand this fact in direct connection to the appearance of new technologies, in means of access to new materials and building methods. Nonetheless, architects have addressed such new possibilities in different ways and often together with other relevant conditions as culture, tradition and economy. Thus, we could ask what is the impact of such new possibilities of building? Is there a correlation with construction processes an appearance? Or is expression the mere communication of an image? Discussions on this theme are elaborated by David Leatherbarrow and Mohsen Mostafavi in the book Surface Architecture, and especially in the chapter "The Appearance of Covering". The authors explain the development of the outer elements of the wall (shell, skin, cladding or covering) concerning issues of production and representation through different architects and works since the beginning of the XX c. till recently.

They begin with analyzing the works of the American architect Albert Kahn, as a first and extreme example of the double compromise in architecture. Or how new materials and technologies had to mediate "between the products of industrialization and the public realm – between engineering and architecture."²³ Albert Kahn as architect, together with his brother Julius Kahn as engineer, founded Albert Kahn Associates. They were responsible of many innovations in construction, but especially in concrete technology. Together they pioneered the use of reinforced concrete for industrial buildings. And although they are most known for a number of industrial facilities they were also in charge of social institutions as churches, synagogues, schools, libraries and residences. The two categories are notably different in program as well as in expression. The first category shows the logic of industrial production. In Albert Kahn's words these buildings should respond to present needs as change, flexibility, adaptability and extension through new materials and techniques. Whereas the second category shows conventional motifs of representation inherited from the classic tradition of architecture.

HCH's works could also be divided into similar categories: Transformer station facilities and all the other social works, as schools, hospitals, and housing blocks. And somehow, within the Danish context, he is also one of the first architects to build within the possibilities of reinforced in-situ concrete. However, in this case there is not a separation between production and expression in correspondence to each both cases. HCH seems to learn from the two categories to approach architecture as a unified task regardless its technical/ social program. Definitely, overseeing industrial buildings, programs with no human conditions, stressed what seems rather common in all his works: A certain autonomy/ freedom of the enclosure. Such an aspect probably encouraged HCH to conceive the enclosure as a mediating part between the nonhuman and the human, between a protected machinery interior and an approachable human exterior. While this separation is more radical in his industrial buildings, to a different extend it is still evident in all his other works.

On concrete

Using Gottfried Semper's words when questioning "Why white marble was selected for painting?" in reference to classic Greek architecture, one could ask "why concrete was selected for covering?" in relation to HCH's works. His first works are basically built of brick structural facades, whereas his later works are built of reinforced in-situ concrete and other formats as lightweight blocks and prefabricated elements. We don't know HCH's reasons for deciding upon concrete, since what we know so far is that he did not leave any written statement about it. What we know through his works is that HCH's first use of reinforced in-situ concrete is at the industrial facility Sundholm Laundry Building (1938-1941). And his first use of concrete in one of his social buildings occurs in Nørrebro Vænge Housing (1929-1942). A housing block built with wooden decks, reinforced in-situ concrete staircases and brick facades. This mixed solution of techniques and materials was rather common in the 1930'ies in Denmark. One assumption is that using a concrete staircase instead of a traditional wood one, would change requirements considering fire regulations. As for example the need of having one staircase (built of concrete), instead of two staircases (built of wood) per each apartment.

The above mentioned argumentation is just one example of how, given the fact of HCH's absence of information, the remaining buildings reveal some sort of evidence that provide some possible explanations. In the following lines, the reader should see the different categories not as having to choose one or the other. Instead, as approximations that might have influenced HCH's way of doing. And the progression of the different categories/ points follows a chronological order. Chronology is one of the few facts we know of each one of the projects. And it has become a key issue when developing the three experiments included in this thesis as it provides a valid tool to better understand the evolution of material choices (see *Crops*) and construction methods (see *Cuts*). Moreover, the focus will be on the structural elements of the buildings that are stressed through well-defined arguments. While matters on coverings will be approached in more detail in the following chapter, Frameworks and Ready-mades: The tectonics of facades' coverings.

1)HCH was part of a certain architectural culture: As stated by the Danish architect Tobias Faber, the office of the City Architect in Copenhagen, from where HCH developed almost all his works, was one of the first ones "to work honestly and without prejudice with reinforced in-situ concrete"²⁴. HCH was part of this tendency and probably his interest grew from working together with his first superior, Poul Holsøe, Copenhagen's City architect.

The structural principles of the buildings in Copenhagen's Meatpacking District (Kødbyen,1931-1934), designed by Poul Holsøe together with Curt Bie, and Tage Rue seem to be a reference for HCH's (and Poul Holsøe) Laundry Building in Sundholm (1938-1941). The two buildings are designed with a sawtooth roof shape made of reinforced in-situ concrete supported by load-bearing pillars placed in a grid pattern. However, the crude expression of HCH's industrial facility differs a lot from the Meatpacking District's smooth white painted facades. In Sundholm the pillar beam insitu concrete structure is exposed in the facades. The structure that exposes itself as a frame is 'filled out' with traditional yellow bricks and windows with dark red wood frames -that aesthetically refers to workshops and industrial modern buildings of that time.

Another example that may have formed part of the inspiration to HCH, can be found in the dentated reinforced-in situ concrete structure: Brønshøj Water Tower (1928-1930), designed by Ib Lunding and Poul Holsøe. The same type of profiled enclosure shell is used by HCH at different occasions, as the transformer stations of Nyborggade (1958-1960), Bellahøj TS (1961-1968) and Amager (1966-1968) and Tagensbo Church (1966-1969). While in Brønshøj Water Tower the concrete is totally left exposed, HCH always covers or partly covers the structural shell.

Besides the office of the Copenhagen City Architect, there were few other local references amongst the first generation of Danish architects to utilize concrete as a building material: Mogens Lassen developed the Systemhuset (Ordrup, 1937). The building was one of the first multi-storey houses in Denmark to be built with a system of load-bearing transverse partitions and floor separations in reinforced in situ- concrete. Poul Henningsen, an architect, writer, cultural critic, and designer designed/built his own house (Gentofte, 1937), together with Viggo Møller-Jensen with exposed hollow concrete blocks. The use and exposure of cheap and ordinary materials was a reaction to the neighboring houses that belonged to conservative middle and high- class Danish society. HCH, a few years later, wanted to use exposed blocks in the garage next to Bellahøj Transformer Station (1961-68) and succeeding in Ringbo Psychiatric Hospital (1961-63). Another architect is Viggo Møller-Jensen, who founded "Fællestegnestuen" (1996 - late 1980'ies) together with Tygge Arnfred and Jørn Ole Sørensen. Prefabricated concrete elements were applied in their first project for the housing district Albertslund (1963-1968), which encouraged tenants to rearrange and extent their homes. We find first use of HCH's prefabricated elements in Brøndbylund Psychiatric Hospital (1965-1966), Tagensbo Church (1966-1969) and Gasværksvejens School (1969-1971).

2) Reinforced in-situ concrete, different to the more traditional materials of brick and wood, offers more structural flexibility in terms of covering larger spans, and it is more appropriate when working with different structural directions. In terms of enclosures this applies to larger fenestrations.

We see the first sign of this in Skydebanehaven Childcare (1948-1950). The building comprises two volumes: One consisting of two-storeys with classrooms and service areas and the other, of just one storey, with a sleeping/ playing room. The first volume shows two very distinctively contrasting facades with features that are seen as transitional key points in HCH's oeuvre. The north façade, related to smaller service rooms as toilets, staircase, and storage spaces, is built as a traditional brick facade plastered, painted ochre, and covered with a railing element made of wooden battens. Whereas the south facade is designed with a loadbearing in-situ concrete frame. This design solution responds to the rather large spans between classrooms (made of a small and a big module of a total of 7,5 m), which probably provoked the rotation of the structural direction. Such decision is aligned with the need of transparency towards the garden and light orientation. Furthermore, the upper floor shows an overhanging balcony, which is anchored to the recessed concrete façade and to the foundation by slender wooden pillars. All these tectonic features are more successfully achieved through the design of a concrete frame than relying on a perforated load-bearing brick wall.

A few years later, and before the design of any of his transformer stations, HCH would face a similar situation in Hanssted School (1954-1959). This is the first time in which he uses an in-situ casted loadbearing façade. The two/ three storey building is designed with two long narrow wings. One, with large common classrooms and gymnastics room, situated along Vigerslevvej, a very busy road surrounding the area of Valby. The other, with regular classrooms, and rotated about 60 degrees from the first one, is facing a very quiet housing area. Vigerslevvej wing's enclosure, different to the structural frame of Skydebanehaven, is built as a very thin shell of concrete (16 mm) that adjusts to different situations of large openings. Very often a long opening situated above a parapet. The argument is again that large spans (11 to 14 m in- between rooms as gymnastics, and laboratory) would require the rotation of the structural direction to avoid in-between supports that would disturb the performance of certain activities.

It is important to notice that in both buildings there is a mixed use of a concrete structures and loadbearing traditional brick walls. Structural concrete is only employed where there is a need for better views, light conditions, and spatial qualities of the rooms (e.g., larger spans). Even though the two materials -brick/ concrete- demand different approaches construction- and structure-wise, the enclosures are rather similar expression-wise. Specially in the structural principles of the Hanssted School there is a strong disposition to make them almost equal. It is then very subtle nuances that reveal clear construction differences. Such similar expressions are basically provided by the covering elements, their materials, and the way they are put together.

3) Concrete can provide a resistant shell for the design of transformer stations. These are buildings with high security demands and almost no human program. Moreover, its performance can be optimized according to the forming geometry of the concrete, as for example a profiled surface and inclined walls.

HCH will first make use of a profiled shell in Nyborggade Transformer Station (1958-1960). The enclosure is built as a reinforced in-situ profiled concrete shell of variable depth: thicker at the base (32 cm) than the top (10 cm). Columns are of 23 x 50 cm and placed regularly every 103/ 109 cm depending on the total length of the façade. This results into a sequence of 23-103/ 109- 23- 103/ 109- ... cm

However, HCH had already tried to work with inclined enclosures before in his housing block Blankavej (1954-1957). Here, corresponding to the horizontal brick lines of the facades (that conceal a concrete beam/ slab). Quite exceptional for HCH, the construction drawings show a singular detail that has not been built as intended. Apparently, a detailed section drawing of the project brings these lines to an extreme by suggesting an inclined exterior brick façade in connection to each floor. Construction-wise, this would demand a different brick stone size in each row. Even though this solution was not built, since it might have resulted in a very complex- and expensive craft procedure on-site, however it reveals a certain awareness towards the material waste and performance of the architect.

After Nyborggade Transformer Station, HCH designed Bellahøj Transformer Station (1961-1968). The building is comprised of a service wing. It is the volume facing Hulgaardsvej that includes laboratories, workshops, offices, kitchen, and a canteen, changing rooms for staff, and a control area situated in the cantilevered top floor, as well as a full height room to keep and repair transformer stations. At the back, there are two lower volumes that are for technical equipment. The Hulgaardsvej volume is again designed as an in-situ concrete profiled shell. But in this case, with a less recurrent rhythm and larger pillars (645- 55- 645- 55- ... cm) than Nyborggade Transformer Station. The space in-between the pillars is filled with a concrete parapet and a glassed surface above to provide light and ventilation for the different use of the spaces. The parapet shows small horizontal overhangs positioned every 3 meters corresponding to the slab's height, where to fix inclined Eternit panels (or Cementous fiber panels) afterwards. The two other volumes are also designed as concrete shells, but much without fenestrations as the functions of the buildings are for machinery only. HCH uses again the small horizontal overhangs every 3,4 meters. In this case its position is not related with any floor height inside, as the space is divided into two high rooms.

Later, construction systems are used in Amager Transformer Station (1966-1968), which is almost a copy of Bellahøj Transformer Station. However, there is a minor, although remarkable, variation of the concrete shell of two of the volumes for keeping and repairing transformer stations. The short horizontal overhangs are in this case perforated by the wooden substructure supporting the Eternit panels, while in Bellahøj Transformer Station these battens also existed, but not all visible.

Bremerholm Transformer Station (1962-1963), the third technical building designed by HCH, is located at the city center of Copenhagen, a very dense area with apartment blocks and shops. This highly technical infrastructure was built according to the regulations of the historical center. The facade is aligned with Bremerholm Street (even though it is recessed from one of the adjacent buildings) and follows the volumetric geometry dictated by the regulations. This is particularly visible in the section drawings in which the two top floors are set back following a specific steep angle. These floors, situated above the transformer station, are comprised of office spaces.

The program of this building, that is very different to its surroundings, called for high safety requirements. HCH approaches this condition with a structural enclosure built as a reinforced in-situ concrete shell -its depth changes from 25 cm at the base to 15 cm at the top-. In the last second floor, such opaque shell is transformed into a sequence of slender pillars of 15 cm wide x 20 cm deep also built with concrete. These are positioned every 136 cm. This very close rhythm, a part of answering to their slender profile, relates to the width of the rooms in connection to them: The space between two pillars corresponds to the width of one office, 257 cm. In the same way, the rest of larger offices also are positioned according to the structural sequence of structural elements as pillars. Divisions between offices do not have any structural property, as they are built of plasterboard. Related to this, when it comes to small spaces there is always a minimum comfortable width to consider. Perhaps a width around 250 cm would represent a minimum requirement for someone to work in. In addition, HCH would most likely have avoided having walls against glass surfaces placed in-between pillars. Such basic reasoning, among others might have to do with the modulation of the covering, which is addressed in the next chapter.

Svanemølle Transformer Station (1966-1968) is the third electricity facility of a compound located next to Martin Nyrup's Gasometer, and the last of this type of industrial buildings designed by HCH. Back then, the gasometer was not listed as a protected building and as point of departure the new project should have occupied its built area if Nyrup's building would have been demolished. But HCH managed to squeeze the new transformer in between the old gasometer, the former transformer station, Nyborggade Transformer Station, which he designed 8 years before, and the existing emergency bunker hidden underground. In 1993, the war shelter program was closed, and the built area became part of the transformer station, together with three more floors above in continuity with the existing part of the Transformer Station. Apart of the change of topography, coincidently with an interior wall which was the former facade, and a difference in the building height, there are no other signs today that reveal the transition from the old to the new building.

The enclosure of the building is comparable to Bremerholm Transformer Station. An in-situ concrete shell that is 15 cm deep, is slightly thinner here. It might be related to the fact that in this case HCH uses the wooden formwork applied for casting concrete as a permanent element on the outside of the enclosure. Such covering protects the deterioration of reinforced concrete due to its exposure to environmental conditions as rain, frost and dust, as well as gives a very special tactility and expression to the building.

4) Among other reasons, the design of the five technical facilities with almost no human programs might have influenced the design of other social buildings. The use of concrete, which HCH became familiar to working with, was then also seen appropriate for the design of Tagensbo Church and the Gasværksvejens School.

At Tagensbo Church (1966-1969) the structure is built as a reinforced in-situ concrete shell with a very close sequence of slender pillars placed as the following, 19- 60- 19- 60-... cm, like Nyborggade Transformer Station. However, in this case the structure is only exposed in the interior side of the large triple height room. On the exterior, prefabricated concrete pillars replicate the rhythm and form of the in-situ casted load-bearing pillars. This is a first example of a covering element coinciding with the structure and mimicking its form. It is neither designed as an added veil with its own material- construction logic, as in Hanssted School, or the Transformer Stations of; Bremerholm, Bellahøj, Amager, and Svanemøllen, nor as a direct exposure of the real structure, as in Nyborggade, Amager, and Bellahøj Transformer Stations.

Gasværksvejens School (1969-1971) is HCH's last project. It is an extension of an existing school in the city district Vesterbro, downtown Copenhagen. It was supposed to become a prototype to build fast and cheap schools in different locations. Regarding this, the architect Kim Lyndvig Hansen²⁵, explained that since the building had to offer a repeatable and adjustable program that was very much in control of other agents, HCH had put a greater effort into designing the facades than the interiors. If this was the case, the situation was then comparable to having to design one more transformer station.

The building consists of a modulated structural grid of 180 x 180 cm. The structure is a combination of prefabricated slender concrete pillars and beams corresponding to the facades and loadbearing concrete panels, and interior decks. Facades are designed with a combination of prefabricated textured concrete panels and windows placed in-between the slender structure. However, this seemed not enough as an enclosure for HCH. In both cases, the two facades of the classroom wing and the facade of the gym/ theatre wing facing the playground, he superimposes an elaborated hanging structure. In this case it holds distance to the facade and is only connecting to it through specific fixing brackets.

5) In single-storey buildings, HCH reorganizes the robust structural layer and the fragile covering through a base or parapet and a roof. He applies such scheme in Ringbo and Brøndbylund Psychiatric Hospitals, Næstved Chapel and for the Gas Pressure Regulator placed next to Bellahøj Transformer Station.

As its name indicates, Ringbo Psychiatric Hospital (1961-1963) is designed within a ring or circular plan geometry. The ring is built of twelve similar modules comprised of two different programs and corresponding enclosures that alternate. One type is related to the rooms and service part of the module and the other one to the common areas including entrance areas, living room, and terrace. The first one, is built with a low base of in-situ reinforced in-situ concrete and with prefabricated blocks on top. This massive base makes the building easily adaptable to the changing topography outside. Above, there is a continuous window strip. The second type of enclosure is rather transparent and provides accesses and a few cross-views between the interior garden and the outside. From a certain distance it is the geometry of the roof that also marks the difference between both types of programs. The second situation, in which entrances are positioned, is recognizable through an exaggerated pitched roof, built of crisscrossed wood trusses. Different to previous works the structure is not coinciding with the facade but corresponding to the spatial division of rooms and built of loadbearing brick walls.

A clock is placed in the middle of the garden to help staff and patients' orientation. Its construction logic is comparable to the one of the main building: Big concrete stones scattered around, and in close relation to the terrain, support some wood battens with very exposed joints to hold the clock up.

In Brøndbylund Psychiatric Hospital (1965-1966) we see a building that is the same typology as Ringbo Psychiatric Hospital, both in terms of function, scale, peripherical location and certain expression. However, the layout of the plan is very different. Here, the comb scheme in comparison to the ring, makes the building much more controllable but also much less social. Each one of the thirteen private units can be isolated without interfering with the rest of the program. Concerning outdoor spaces, Brøndbylund Psychiatric Hospital is designed with more defined and secluded spaces that only are related to the same module and are not part of a broader common area, as seen in the design of the Ringbo Psychiatric Hospital.

In Brøndbylund Psychiatric Hospital, HCH applies a prefabricated concrete system for the first time, in line with the general construction development of the 60'ies in Denmark. The building complex holds a module of 120 x 120 cm organized as a grid plan, which dictates the dimensions of the slab elements, the position of loadbearing interior walls,

the modulation of façade elements and the dimensions of the rooms. Extreme modulation, as the result of using a prefabricated construction system, and the comb plan scheme, is what makes this building distinctively different from Ringbo Psychiatric Hospital. However, the structural *principle* is the same. The spatial arrangement inside is corresponding with the loadbearing walls, while enclosures are not structural. Again, in continuation of design features also found in Ringbo Psychiatric Hospital, the façades are defined by an opaque base, here made of prefabricated concrete panels with a rough finish, and a transparent top part that is defined by the width of the 120 cm modulation. Most parts of the building are covered with a sloped roof, built of wood trusses, and finished with corrugated Eternit plates. Beneath the light structured roof lays a flat slab made of prefabricated components. As in the Ringbo Psychiatric Hospital, common spaces are covered with a very elaborated roof geometry of wood trusses.

In Næstved Chapel, one of his few built private commissions, HCH designs a base primarily made of brick and a large roof built of a wood structure covered with ceramic tiles. Brick walls show a profiled shape corresponding to the structural and nonstructural parts of it. At the gables, the profiled geometry of high brick walls is exposed at the two sides of the wall, whereas at the side low walls such profiled design is only exposed at the interior part of the Chapel. Almost all of the brick pillars (59 x 83/ 71 cm) conceal a core of reinforced in-situ concrete -only revealed at the plan drawings of the project. Those are probably needed in means of potential lateral forces provoked by the wind -at the gables- and the roof wood trusses resting on them -at the side walls-.

Besides that, another way to interprete the building through the concepts of 'robustness' and 'fragility' is by looking at the expression of its two contrasting volumes: The chapel room, showing a continuous ceramic mass, and the shed and service rooms, basically exposing black painted wood. Such different tectonic choices are emphasized at one of the gables. Opposite to the main access to the chapel, HCH positions a bell structure. As an alternative to the design of a bell tower, he puts together an intricate wood structure which replicates the chapel gable in a smaller proportion.

The smallest of all the buildings is the Bellahøj Gas Pressure Regulator (1967-1968). The very basic and important function of the building is to prevent damages of a possible gas explosion in Bellahøj. It is built as a naked reinforced in-situ concrete shell of four tilted walls and a light roof made of corrugated Eternit panels supported by a wooden substructure. Its border position, at the edge of Bellahøj Transformer Station site area, mediates with an important variation of topography. A slender staircase is attached to one of the slightly inclined walls and would originally connect the two different terrain levels. The detail of the four corners shows once more HCH determination on solving intersections as exposed and open meetings. Somewhat like designing wood joinery. Similar situations have been seen in Nyborggade and Bellahøj Transformer Stations. As well as in one of the details of the tower clock in Brøndbylund Psychiatric Hospital.

On coverings

According to architect and professor Andrew Saint²⁶, when referring to concrete used in buildings for the first time (which he dates from the beginning of the XIX c): "[...] even when a building is, in structural terms, almost wholly of concrete, it will usually deny its nature with a coating of cement, roughcast or tile-hanging". And he adds: "[...] reticence of expression, so puzzling and irritating to the ethic of modernism can be described to three factors: caution about the weathering properties of concrete [...], caution about the aesthetic tractability of concrete [...], and a sense of inferiority, arising from the fact that concrete was usually adopted 'faute de mieux', for cheapness. Far from conceiving that concrete should determine style, builders and architects had a strong sense of the need for its architectural subordination"²⁷. By saying this, he relates to the initial applications of concrete.

HCH's use of covered concrete is only partly aligned with the explanation above. He is definitively aware about its weathering properties and need of protection. However, his choice on concrete doesn't seem to be for the lack of something better. We have seen in several cases that the appropriateness of concrete's technical qualities are related to structural reasons and program needs, besides its expressive qualities. HCH intentionally engages with different concrete formats -in-situ, prefabricated elements and hollow blocks- since for specific building functions concrete's properties are more suitable than other materials' properties, as wood and brick. Besides that, he is not seeking to hide concrete, on the contrary he continuously reveals its presence. And it is the interplay of the concrete structure and different types of light coverings, in means of technique and expression, that is most characteristic about his works.

Moreover, Andrew Saint mentions that "Concrete construction [...] reached early urban maturity as a way of combining elegance in traditional materials with a new freedom of internal plan – a freedom often greater than that afforded by steel- framing, also coming into general use at the time".28 In regard of this HCH is achieving flexibility through the use of concrete, though by avoiding the use of 'elegant traditional materials', in regards to the covering, which refer to a monumental use of stone and brick to fit well into the urban context of that time.²⁹ On the contrary, HCH's coverings celebrate the cheap, rough, ordinary, and temporary, as an alternative to the opulent. Most often he uses wood, Eternit (fiber Cementous plates), ceramics, and metal to cover or partly cover concrete. These materials are guite thin, light, and reacting to the environmental conditions, such as light, rain, fog, sun and dust. These are probably not durable materials, but at the same time easy and cheap to replace, and to disassemble. HCH takes advantage of such delicate properties and features to build with and to generate the expression of the dressing, which is designed accordingly to the massive structural layer beneath. This way of designing, with an attention towards the choice of materials, its performance trough time and the way to put them together,

from a construction as well as an expressive perspective, is known through the notion of 'tectonic thinking'³⁰.

Such coverings are not contradicting to the structure, neither do they replicate it. They conceal it, in Gottfried Semper's words; they mask it. However, HCH always uses material properties and construction joints as constituent elements of the dressing/enclosure, whereas Gottfried Semper's position was a bit confusing since it changes over time. First, Gottfried Semper mentions materials and the knot that later in his writings become the joint as the attributes to consider in *the making of the dressing*³¹. However, at some point he also writes that the *masking* effect, would not only relate to the structure, but the masking could also affect the dressing itself³².

Another important aspect of HCH's building coverings is that they also manage to fit into the built context. However, not by using a strict resemblance to it, as Andrew Saint indicates when referring to "the first use of concealed concrete covered by elegant materials". HCH seems to have a broader understanding of the notion of context, which goes beyond copying the mere appearance of the tangible surroundings. In the making of the dressing, HCH embraces additional contextual issues, such as program, human (and non-human) scale; time issues, such as transformation- extension matters; and weather conditions. Such dressing features and the logic of its materialization is addressed in the following chapter Frameworks and Ready-mades: A tectonic discussion on facades' coverings. ² "White Marble was chosen only later and then only when it lay nearby or for unusually magnificent buildings [...]" Gottfried Semper, "The Four elements of Architecture (1851)," in *The Four Elements of Architecture and Other Writings*. Trans Harry F. Mallgrave & Wolfgang Herrmann (Cambridge University Press, 1989): 98.

³ Ibidem.

⁴ Mark Wigley, White Walls, Designer Dresses: The Fashioning of Modern Architecture (MIT Press. Reprint edition, 2001).

⁵ Juan Serra, "Three Color Strategies in Architectural Composition," in Color Research & Application 38, no. 4 (2012).

⁶ Colin St. John Wilson, The Other Tradition of Modern Architecture: The Uncompleted Project (Academy Editions, 1995).

⁷ Within informal conversations some people has demonstrated surprise and disappointment once discovering that some of HCH's detailed and expressive facades were concealing a layer of reinforced in-situ concrete. I assume such reaction could be explained as 1) instinctively relating such wood, bronze or ceramic layer with a pure 'decorative' purpose, that by the broad architecture community is unacceptable today and 2) a certain mindset that promotes the use of material mass and the concept of truth as an answer to today's environmental challenges, and claims that all materials included in the building should also be integrated in its expression.

⁸ "A third kind of material consciousness invests inanimate things with human qualities [...] honest brick evokes a building surface in which the brick-work is exposed rather than covered over: no cosmetics [...] Yet the material dynamics of stucco are those of play and fantasy; its ethics are those of freedom -at least they were to craftmen [...] In the craftsman's hand, baked clay became an emblem of natural rectitude; this natural virtue was made rather than found [...] So, to in humanizing materials, it was necessary to pair honesty and fantasy, brick and stucco; they played off each other". Richard Sennett, *The Craftsman* (Penguin Books, 2009): 136-141.

⁹ "Originality traces its origins back to one Greek word, poesis, which Plato and others used to mean something where before there was nothing". Richard Sennett, *The Craftsman* (Penguin Books, 2009): 70.

¹⁰ In the XVIII c., as a response to the baroque excessive ornamentation and renaissance classical expression. Marc-Antoine Laugier introduced the idea of the *primitive hut* arguing for simplicity and structural clarity and aesthetics found in nature. His view was that the classic Greek orders should be reformulated. He saw the column, the entablature and the pediment as the basic elements of architecture and claimed that, except from their regular forming and distributing, nothing else should be added in order for a building to be perfect. He was the first theoretician who asserted that classic orders should first be functional as part of the construction, and then naturally become decoration. Later, Eugène Violet-Le-Duc, also adherent to the structural rationalist tendency, in place of the classic. In his

¹ Gottfried Semper, "The Four elements of Architecture (1851)," in The Four Elements of Architecture and Other Writings. Trans Harry F. Mallgrave & Wolfgang Herrmann (Cambridge University Press, 1989): 98.

Entretiens Sur l'architecure (1863-1872) he describes those true forms should be found in connection to program and construction techniques. Forms should emerge from an analogous relation to those conditions and thus avoid imitation. Possibly, some of the will of bringing truth forward, as an alternative to the superimposed embellishment of former periods, had an influence on other contemporary positions.

¹¹ Kenneth Frampton, "Studies in Tectonic Culture: The poetics of Construction in Nineteenth and Twentieth Century Architecture" (The MIT Press, 1996): 89.

¹² Gottfried Semper, "The Four elements of Architecture (1851)," in The Four Elements of Architecture and Other Writings. Trans Harry F. Mallgrave & Wolfgang Herrmann (Cambridge University Press, 1989): 103.

13 Ibidem: 104.

¹⁴ Karl Bötticher (1806-1889) in his Tektonik der Hellenen (1844-52) propagated and linked the concept of tectonics with archeological excavations and investigations and specifically to Greek architecture (as originally published by his master K. O. Müller (1797-1840) in the Manual of the Archeology of Art). K. Bötticher argued for relations between structure and ornamentation as an integrated system of architectural expression which he defined as Core-form and Art-form. In which Core-form is the abstract concept of the structural scheme, while Art-form acts as the physical representation of those forces, which emerge as ornament. This discussion between structure and form, structure and ornamentation, structure and enclosure.... initiated by different architects of the XIX c. embraces a broad topic, though from different approaches and nuances.

¹⁵ Mark Wigley, "Untitled: The housing of gender," in Sexuality and Space (Princeton Architectural Press, 1992): 370.

¹⁶ Gottfried Semper, "Style: The textile Art (1860)," in The Four Elements of Architecture and Other Writings. Trans Harry F. Mallgrave & Wolfgang Herrmann (Cambridge University Press, 1989: 255.

¹⁷ Gottfried Semper, "The Four elements of Architecture (1851)," in The Four Elements of Architecture and Other Writings. Trans Harry F. Mallgrave & Wolfgang Herrmann (Cambridge University Press, 1989): 105.

¹⁸ Gottfried Semper, "Style: The textile Art (1860)," in The Four Elements of Architecture and Other Writings. Trans Harry F. Mallgrave & Wolfgang Herrmann (Cambridge University Press, 1989): 217.

¹⁹ Gottfried Semper, "The Four elements of Architecture (1851)," in *The Four Elements of Architecture and Other Writings*. Trans Harry F. Mallgrave & Wolfgang Herrmann (Cambridge University Press, 1989): 128.

²⁰ Gottfried Semper, "STYLE: The textile Art (1860)," in *The Four Elements of Architecture and Other Writings*. Trans Harry F. Mallgrave & Wolfgang Herrmann (Cambridge University Press, 1989): 257.

²¹ The two authors of the English version of *The Four Elements of Architecture and* other Writings choose dressing in means of the German word Bekleidung. Kleiden literally means to dress. Even though they admit that its translation does not entirely fit, it seems more appropriate than cladding as it contains the meaning of the concept of masking. Moreover, Semper introduces it in connection to the relation between clothing and architecture, which he states appears later and in connection to the space making of the first settlements. Gottfried Semper, *The Four* Elements of Architecture and Other Writings. Trans Harry F. Mallgrave & Wolfgang Herrmann. (Cambridge University Press, 1989): 293.

²² Kenneth Frampton, "Rappel à l'Ordre: The case for the tectonic," in Architectural Design, vol. 60, no. 3-4/ 1990: 20-31.

²³ David Leatherbarrow and Mohsen Mostafavi, Surface Architecture (The MIT Press, 2002): 2.

²⁴ Tobias Faber, Danish Architecture (Danske Selskab, 1963): 168.

²⁵ Kim Lyngvig Hansen worked with the team of HCH during the '60 in the Copenhagen's municipal office and collaborated in the design of Gasværksvejens School.

²⁶ Andrew Saint, "Some thoughts about the architectural use of concrete," in AA Files, No. 21 (Spring 1991): 5

²⁷ Ibidem.

²⁸ Ibidem: 9.

29 Ibidem: 8.

³⁰ Architecture based on tectonic principles tells us the story of its making -it refers to its overall contextual setting and the embedded meaning- from the ideas forming the program, over particular construction details, to the weathering of the buildings in the course of time. In that sense it concerns the essence of construction and construing in architecture. Tectonic thinking is hesitant to random construction solutions; it thus forms a critical resistance to shifting trends determined either by the economic interests of the building industry, paradoxes in building regulations – or by spontaneous architectural trends. Anne Beim, "Introduction. An Ecology of Tectonics" in Towards an Ecology of Tectonics. The need of Rethinking Construction in Architecture (Edition Axel Menges, 2014): 21.

³¹ Gottfried Semper, "The Four elements of Architecture (1851)," in The Four Elements of Architecture and Other Writings. Trans Harry F. Mallgrave & Wolfgang Herrmann (Cambridge University Press, 1989): 128.

³² Gottfried Semper, "STYLE: The textile Art (1860)," in The Four Elements of Architecture and Other Writings. Trans Harry F. Mallgrave & Wolfgang Herrmann (Cambridge University Press, 1989): 257.

7

Frameworks and Ready-mades: The tectonics of facades' coverings "In principle, it will always have the character of a 'continual background' in our field of vision, a background that everything else is silhouetted against."¹

Christian Norberg- Schulz, 1966

In the article "order and variation" Christian Norberg-Schulz refers to the correlation between the environment and human settlements and uses principles of perception psychology to describe them. He sees the landscape as a diffuse natural background in which certain man-made figure/s are inserted. For us to see this visual order, to be able to comprehend it, the connection between background and figure should be clear. Otherwise, our experience will be 'vague' and 'meaningless'².

HCH's coverings

From a conceptual level, HCH's coverings show coherence to what is described by Christian Norberg-Schulz. As it has been elaborated in the previous chapter, usually HCH's enclosures are comprised of different layers. The outer layer, the covering, is often designed as a continuous background in which different industrialized components as windows, doors, drains and ventilation gadgets are integrated. Sometimes, parts of the structural layer are intertwined with the covering layer. In other building examples, the structural shell is totally concealed underneath the nonloadbearing layer. A certain 'order' is what provides logic to the background, while at the same time, it makes room for a 'variety' of already formed components to be attached. Besides, Christian Norberg-Schulz explains that there is a hierarchy between 'order' (landscape) and 'variation' (man-made structures): One (landscape) provides the conditions for the other (settlements).

HCH's coverings show a similar dependency between contextual background and components. However, distinct to Christian Norberg-Schulz claims for clarity between 'background' and 'figures', HCH's coverings display a rather diffuse image of both systems. It is possible to comprehend them, however the boundaries between the two are not always all clear. HCH's elaborated joining details merge and somehow camouflage backgrounds and components under a continuous veil. The assumption is that it is his expertise on putting materials together what transforms the typical clash between the distinct attributes of the two systems into a smooth and well-integrated transition.

Craftmanship and industrialization

Another distinction between HCH's backgrounds and components is that part of the first ones construction is crafted on-site, while the second ones are montage buildings totally industrially produced with elements off-site. This fact situates HCH's coverings in the transition of two periods and building methods: 1) Craftmanship, characterized by monolithic loadbearing enclosures, often comprised of a combination of wet and dry construction processes mostly built on site, e.g., a brick façade put together through wet processes and comprised of different dry assembled components as windows and doors. 2) Industrialization and massproduction, characterized by loadbearing and non-loadbearing enclosures fitted with dry off-site produced elements and components transported to the building site and mostly with joining based on dry construction processes.

HCH's enclosures show a combination of craftmanship and massproduction. Whereas the crafted backgrounds are built of different material formats, as Eternit plates, wooden battens and bronze profiles, manipulated and put together on-site, of-the-shelf prefabricated components as windows, doors, drains, gutters and ventilation gadgets are inserted within such crafted background. Whereas the first materials should be further manipulated, often cut, and joined, through skills of craftmanship to perform in a certain way, the second ones are finished components built in a factory/ workshop. Considering this, the kind of industrialization of HCH's craftmanship backgrounds shows some connections to the very beginning of architectural industrialization known through the 'balloon frame' concept. This emerged in the USA at the beginning of the XVIII c. as a revolutionary technique which grew out of using wooden battens and allowed to produce entire facades or even buildings in the factory and after being transported to a specific site.

Parts and wholes

One of the challenges of industrialization and mass-production is that the ideal integrity embedded in traditional monolithic facades is challenged by the fragmented assembly of prefabricated components. As the architect Charlotte Bundgaard has stated: "While ideally classic architecture defends an architecture based upon harmony and correlation from whole to detail and upon the architect as creator, 'genius'. With *montage* (a current architectural condition related to industrialization) as a key concept, industrialization instead relates to dynamics, change and flexibility [...] We are no longer merely dealing with

the work as a product but rather with the work as a process"³. Charlotte Bundgaard further develops the idea of *montage* by looking into the field of arts: "The collages of the Cubists described a universe of fragmentation. Juxtapositions of everyday objects in shattered still-lifes or created new constellations and new meanings [...] rejecting the idea of coherent artworks and replacing it with artworks representing a complex, heterogeneous world"⁴.

Another alternative perspective into the topic of fragmentation and challenged unity is described by the architect Kasper Sánchez Vibæk in his attempt to discuss architecture quality in regard of industrialization. He argues: "By having (at least) two different 'languages' to describe a whole made of parts, the differences and overlaps of these in the particular project can be used as a quality check"⁵.

Moreover, architecture theory has argued the condition of fragmentation in connection to the theory of social assemblages introduced by Manuel DeLanda, who elaborates on the notion of 'totality'⁶. He explains that 'parts' which constitute a 'whole' (starting with society) form a seamless totality. He calls such conception, in which parts cease to have a meaningful existence outside the whole, relations of interiority. In contrast, Manuel DeLanda suggests an understanding of wholes characterized by relations of exteriority, where parts retain certain autonomy in relation to the other parts and the whole. Therefore, a part could be detached from an assemblage and attached to another where it could perform differently while keeping its own defining properties.

HCH's crafted and industrial assembled coverings are made of two or three 'languages', using one of Kasper Sánchez Vibæk's definitions of 'quality', that perform and express unity, in opposition to what was exposed by Charlotte Bundgaard regarding industrialization. On the one hand, backgrounds are both the physical *structural skeleton* (of the covering) and the architectural concept that guides the position and provides hierarchy to each building component⁷. I will name them frameworks, materially - referring to the construction system with references to the origins of framing construction- and conceptually -with references to the notion of open infrastructures, used by contemporary architecture offices as Lacaton & Vassal⁸, OFFICE and MUOTO. A concept already introduced by Yona Friedman in 1950'ies9-. On the other hand, equal and similar components as windows, doors, pipes, gutters, and ventilation gadgets, are repeated within the same work, in its different enclosures, and across works¹⁰. For example, a similar squared window repeated in different situations performs and expresses differently depending on its specific position. Such elements are ordinary building components used in the everyday Danish context. They are detached from its known traditional/ industrial use and placed in HCH's new configurations of the coverings in a similar manner to a ready-made. As Charlotte Bundgaard indicated by referring to Ignasi Sola- Morales¹¹, HCH's coverings also demand the architect's role as a director who should put together all the parts. However, in this case this is not enough since frameworks still demand a high degree of design process off-site and craftmanship on-site. The well-fitting character of both, ready-mades, and frameworks, shows HCH's ability to anticipate and solve the integration of 'parts' and 'wholes' while outlining the specific properties of the framework.

Repetition, variation and flexibility

Industrialization and mass-production meant standardization and equality: More and cheaper equal products available for everyone. According to Charlotte Bundgaard this has changed in the last decades: "The architectural characteristics of the 1960'ies architecture repetition will be replaced by a radically different architecture, an architecture of individuality and flexibility"¹². Moreover, "Through the concept of *montage*, the building components can be changed and replaced, creating an open works in constant change"¹³. And she argues this by showing examples of Lacaton & Vassal's works.

HCH's coverings are an early example of repetition, flexibility, and transformation within early industrialization. However, distinct to contemporary industrialized and digitalized methods of design and fabrication, HCH does not achieve flexibility and identity through masscustomization¹⁴. Alternatively, he navigates among the interrelated concepts of rhythm, scale and variation. Frameworks are comprised of the repetition of equal sequences of materials/ elements and presented as endless planes. Besides this, HCH also employs singular elements/ volumes that contrast with the continuous character of the covering. This provides coverings with rhythm, periodicity, and a basis to play with an ordered alternation of ready-mades, as well as diversity and identity. Rhythm is decided upon a set of design features and facts as: Dimensions of materials/ elements, façade lengths, interior spatial divisions, structural features, ready-mades' given proportions, human perceptual properties, environmental conditions, and the built context. Thus, definitively rhythm is something that is here designed and not just generated by the given dimensions of some materials and components put together on site. Although there is a high awareness of materials' and components' properties, however these need to be consciously manipulated in a certain way to answer to a set of architectural principles. In this regard, HCH often decides to divide materials/ elements of enclosures into smaller fragments. In terms of human perception this is related with the concept of scale¹⁵, which is different to the objective dimension of something or industrialized production. HCH's reasons in the design of coverings frameworks and ready-mades- seem to respond to the following facts/ conditions:

1) Recognition of the context through an approximation to the human scale, in terms of tactility and visual perception. An important feature specially concerning HCH's industrial facilities with no human program. Anne Beim and Marie Frier Hvejsel have analysed two of HCH's buildings in regard of 'urban tectonic' position¹⁶. A new perspective that develops principles studied by Eduard F. Sekler. who through a didactic exercise

suggested that architecture and city structures (urbanism) should be considered in relation to the human body.

Expression-wise HCH's enclosures often stand out from the immediate context. However, by deliberately escaping from a usual replication of the peripheries, their distinct expression succeeds in tuning into the setting. By experimenting with different materials and configurations than the buildings near by enclosures' endless orderly expressions settle as backdrops to the existing scene. Rather than relying on mere formal gestures that replicate the existing, HCH maneuvers with a more fundamental interpretation of context, as a combination of built and environmental conditions, that often translates into abstract expressions.

2) A higher degree of flexibility to decide upon the placement of *ready-mades* within a *framework*. And thus, often resulting in a more accurate adjustment between covering, structural features, interior spatial characteristics, and context of the buildings. Coverings and inside spaces are designed according to different conditions. They often belong to different façade layers, are designed through distinct construction methods and appear different. However, there are some specific situations that reveal their rather imperceptible though meaningful correspondence.

3) Possibilities of adjustment, as extension and transformation, seen as a sustainable aspect. The strong conceptual character of the *frameworks* provide with an 'open infrastructure' as well as a 'set of rules' to easily be manipulated. Besides, HCH seems aware of the constantly changing character of an architecture work: Features in relation to weathering are considered in the design process and still legible today.

Whereas rhythm and periodicity are present along covering's horizontal development, 'order', understood as the classic tripartite composition of base, body and entablature defines its vertical arrangement. Following the architecture critic John Summerson's (1904-1992) understanding of the

classic Greek tradition we find two possible meanings of the word classic: 1) A building whose decorative elements come from the architectural vocabulary of the ancient world 2) and a building that is essentially classical concerning a demonstrable harmony of parts, achieved by proportion and thus equal or related ratios in a building, that is a rather abstract conception of the classical¹⁷. Nevertheless, each of the three parts is tectonically distinct to the other. And it seems natural to consider three very different situations in relation to this: 1) the enclosure meeting the ground 2), the in-between part 3) and the enclosure meeting the roof. Recognition of such situations are important not only in terms of building culture and construction, but also regarding issues of the built context, exposure to weathering matters and human perception.

Joints

Assemblages of wholes, and connections between 'parts' and 'wholes' are built through joints, to some extend also defined as details. But can we use the term detail and joint for the same purpose? The architect and theorist Marco Frascari claims that any architectural element defined as a detail is always a joint¹⁸. However, he develops his argument with an example of Palazzo Ruccellai in Florence designed by Leon Battista Alberti which makes one doubtful. He observes that in many cases the stone joints are not real (material) ones: Some fake grooves have been added to provide regularity to the façade. As the real dimension of the stones would not fulfill with the concept of beauty described by Leon Battista Alberti as "the 'concinnity' of all the details in the unity to which they belong"¹⁹, alluding the ideal integrity between 'parts' and 'wholes'.

My own interpretation is that such grooves are details, but they can't be understood as joints. A joint is a connection. In this case, if two different stones were physically put together it would have to be done through a 'material joint'²⁰. Therefore, such detailing (fake grooves) of the stones are units of signification that only embrace one of the two Marco Frascari's so called concepts, the 'construing' meaning of architecture. In the article "The Tell the Tail Detail" he elaborates on the double role of details, the physical act of building ('construction') as putting things/ materials together and creating meaning ('construing')²¹. And elaborates on Carlo Scarpa details to show another practice based example of this idea. Considering this, I wouldn't mean that joints should only refer to the material act of assembling, whereas details should refer to its representation. The division is often blur and fortunately intriguing. But the fine line that distinguishes the two concepts could be the joint requirement to be constructed as a real assembly, in means of putting materials together to provide support/ strength among them. Said in another way, 'material joints' are always details, whereas details do not always perform as joints, though they are represented as such.

The British architects Jeremy Till and Sarah Wigglesworth discuss the meaning of the expression 'God lies in the details' ascribed to Mies van der Rohe²². This aphorism again expresses the importance of the detail in architecture. According to Mies message this relates to: "[...] architectural honesty, truth, economy of means [...]". To introduce the mindset of the article, in a humorous way, Till and Wigglesworth start by pointing out to an alternative reading of Mies words as 'God tells lies in the details'²³. This is later argued as having "to do with an apparition of rationality that is tied into an aesthetic will to beauty. Mies masterminds this illusion with greater skill than anyone else"²⁴. Here again, as Alberti's claim for 'concinnity', in one way or another detailing has to do with beauty, more than mere construction logic. And naturally, such conception of beauty changes over time. Mies claim that "[...] architecture is the symbol of our time" and that "[...] technology and architecture should grow together"²⁵ is then aligned with an aesthetics of "[...] simplicity, less and less material, leaner and leaner structures"26. This is how technology should manifest, according to Mies. However, this often contradicts or conceals the logic of construction. Thus, the sensible reasoning concerning the interrelated concepts of 'construing' and 'construction', intentionally or not by the architect, do not always turn out successfully.

Till and Wigglesworth end with a final reflection that criticizes the limited range of materials that are considered appropriate within detailing. They mention that the only recognized materials are those included in the canon or those new materials coming from other technologies and innovations from other industries and that are adapted into building: "Boat-building, armaments, bio-technique, motor, industries - are raided for inspiration". Materials from the vernacular (mud, thatch), do-it-yourself shop (plastic, pine), mass-produced industry (cheap cladding materials), the domestic (fabric, paper, card) are considered outsiders. And the buildings which result from them are considered a degraded form of architecture²⁷. Finally, they introduce present environmental considerations as a new value system to interpret detailing. With this, they claim for 'other details'28, that should overcome aesthetic or rational limitations.

Another relevant approach to detailing is exposed by Charlotte Bundgaard in connection to the design principle of *montage* within industrialization and prefabrication. As explained before, with *montage* the traditional accordance between 'parts' and 'wholes' changes. And therefore, also changes the role of the details. In this case, through detailing, the architect as a director, should tell the story of the act of juxtaposing different prefabricated components. Charlotte Bundgaard suggests two different approaches to join prefabricated components, either as an 'exposed joint' (a physical hinge which clearly expresses its function) or as an 'absent joint' or 'dis-joint' (a juxtaposition that simply clashes the elements without any visible bonds)²⁹.

She then proceeds to analyze and discuss some works from the French architects Lacaton & Vassal. She describes that they use industrially produced products, as a greenhouse (Latapie House, 1993) or parking decks (School of Architecture in Nantes, 2009). These are employed by modifying them as little as possible to adjust them to a new situation, like a 'ready-made' or 'objet trouvé' in art: "Through a deliberate displacement Lacaton & Vassal turn a greenhouse into a dwelling, or a parking deck into a school"³⁰.

The architects claim that using industrially produced products provides them with well- functioning, cheap solutions, and new spatial potentials for the users. As well an aesthetics based on the most reasonable, the beauty of what is obvious. Then Charlotte Bundgaard asks what happens to the detailing of ready-mades? Such prefabricated products are provided with their own detailed solutions, which improve and change over-time, and architects don't normally get implicated in its design. However, what really requires the architect's knowledge and skills is the joints between ready-mades and the rest of the system. Lacaton & Vassal manage to integrate both systems without almost distinguishing between the iconographic character of the ready-made and their own designs. They adopt the raw and cheap character of the taken product to design the rest. And they approach detailing in the same way: "In the entire house (Latapie house) they (Lacaton & Vassal) meet the tone of detailing that belongs to the prefabricated greenhouse structure". They do not attempt to accentuate the juxtaposition between the ready-made and the non-ready-made. "They rather seem to tell the story of a relaxed approach, with room for both construction and meaning".

Therefore, in industrialized mass-produced architecture, "Details become the link between the stable parts and the flexible element"³¹. In Lacaton & Vassal's buildings the crucial joining occurs between product readymades (a greenhouse or a parking deck) and the rest of the design. Whereas in HCH's enclosures, the essential joining manifests between component ready-mades (windows, doors, ventilation gadgets, drains and gutters) and frameworks. And in a comparable manner to Lacaton & Vassal's disposition to blur the clash between the product ready-mades and their own part of the design, HCH diffuses the connection between component *ready-mades* and *frameworks*. In continuity to Lacaton & Vassal's comparison, here, besides meeting the ordinary and rough character of the prefabricated components, accurate and strong modulation of the enclosure (as described before) is what makes both systems express as an integrated whole. And the abstract concepts of rhythm and modulation are materialized through the physical connection between elements, the joints. Such joints are highly elaborated, even emphasized, and at the same time crude due to 1) the type of materials employed -cheap and ordinary- 2) and the directness between construction logic and the story they tell. Here there is a thorough correspondence between the 'construction' and the 'construing'. We see a very clear case of such integration with the repetitive use of a squared (or almost squared) window. HCH's elaborated joints and particular rhythm of each framework makes us see such ordinary windows equally repeated, while at the same time we perceive their identity as they become totally integrated to each new situation.

HCH's intricate detailing is rather based on skilled craftmanship than high technology. This, together with the use of vernacular and cheap industrialized materials situates HCH's works to the category of 'outsiders'³². An idea exposed by Till and Wigglesworth in 2001, while the fame of iconic buildings: Spectacular and easily recognizable objects/ images made of expensive materials and often built through high technology processes. But after 20 years of such statement, we hope that the impression of 'outsider' has started to change, maybe even reverse, due to a growing awareness towards sustainable issues.

Suggestive joints, the case of Otto Wagner's works

HCH's career as a public servant and his industrial commissions are worth comparing to Otto Wagner (1841-1918), who also worked for a public institution and was appointed architect of the *Stadtbahn*, the new railway system in the city of Vienna (1893). There, he oversaw designing several metro stations and bridges. "The infrastructure of this large scale project ended up decisively marking Wagner's later work, bringing together it closer to the field of engineering and new structural systems in iron and reinforced concrete"³³. These city works, more than 40 metro stations, were the only ones where Otto Wagner used metal structures. This, in

combination with walls, brought him to investigate on metal fixings between both elements as highly expressive and construction elements.

Otto Wagner started investigating with this system in Majolikahaus (Vienna, 1899), the metro station in Karlsplatz, in which there is a will of manifesting the rhythm of the skeleton and to differentiate it from the extremely thin marble plates used in between the slender pillars. Fastenings are orderly arranged along the marble plates. Later, in two of his most known works, Post Office Savings (Vienna, 1906) and St. Leopold am Steinhof church (Vienna, 1907) he investigates some of these initial ideas. In this case substituting the exposed metal framework structure for concealed brick and stone loadbearing walls. In the Post Office building, he covers the brick bearing structural walls with 6 to 9 cm thick granite slabs in the base part and 2 cm thick stone panels in the upper part. Iron bolds, in the first ones, and aluminum bolds, in the second ones, perforate the covering panels and anchor them to the brick wall beneath. This construction system enabled the marble plates to be applied much faster since the fixations would secure their positioning during the drying time of the mortar³⁴. Fixings become ornamental features which manifest construction purposes, even though they only served as construction devices temporarily: "It is as if Wagner wanted to leave the wood truss visible after building a brick structural arch"35.

Furthermore, the depth of the covering materials is left exposed and deliberately revealed at the corner. Intersections of the two planes are left open to expose the depth of the granite slabs and stone plates. And the perpendicular meeting of two thin stone plates reveal a slightly curved geometry thicker in the central part of the stones. This deeper section is coincident with the position of the fixing and prevents the stone to collapse. Wagner's choice of dressing, instead of building with mass as structure and expression as other contemporary works did, relates to using technological possibilities to reduce construction time and costs. The different details that express the performance of the covering show Wagner's tectonic thinking.

Here we see an early example of industrialized enclosures designed through the concept of dressing first introduced by Gottfried Semper³⁶. The production of the enclosure is represented as such, specially through its different joints. Wagner reveals the properties of both, covering and structure, even though the latter is not visible. Somehow, by revealing the lightness of the covering material, the massiveness of the one beneath is self-explanatory. Besides, as stated by Marco Frascari both the unified concepts of 'construction' and 'construing' are present and revealed through detailing/joining. In Gottfried Semper's words, the knot becomes production and expression regarding the act of weaving, within the making of the dressing. It is the art historian Kenneth Frampton who describes the etymological connotation of knot and joint from Gottfried Semper's theory: "The former being indicated as Knoten and the later by die Naht. In modern German, both words are connected to the concept die Verbindung, binding"37. Thus for Gottfried Semper the minimum significant tectonic element within the notion of dressing is the knot or the joint, like Marco Frascari's understanding of the detail or the joint.

A similar approach to the self-expression of the covering's production, often also by means of its joints, is seen in HCH's works. It basically happens trough three strategies: 1) exhibiting the material depth (in joints and corner meetings) 2), thorough choice and careful arrangement and exposure of fixings 3) and making temporary construction elements of the covering part of the building's permanent expression.

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'Raison d'être' of HCH's coverings

In the following paragraphs enclosures, especially coverings, will be discussed with a focus on what has been introduced in this chapter. As seen previously, works are organized chronologically, unless it makes sense to establish comparisons to another specific work. In summary, what we can extract from the introduction part is that HCH's coverings could be understood as Frameworks and Ready-mades. This refers to the concept of 'parts' and 'wholes', in which within industrialization parts could often be comparable to ready-mades (as one of the main concepts of montage in art). Although such feature would normally develop into a different conception of the ideal integrity -that assumes that all parts should be related to each other and to the whole, and the other way around-. However, in HCH's works we can still perceive such ideal correspondence between Frameworks (wholes) and Ready-mades (parts). Is this because of its character situated in-between industrialization and craftmanship? Moreover, such frameworks are characterized by concepts of rhythm, repetition and variation in some cases. And are often subdivided in very small fragments as HCH has deliberately scaled down material's dimensions. In most cases the result is a rather abstract expression of the facade in which entire coverings perform as backgrounds of a specific built context. Relations scape the mere copy of the built surroundings and comprehension of the context is based on rather fundamental conditions. In brief, the logic of HCH's coverings seems to respond to 1) the will of approximating the human scale and perception from a certain position 2), having more flexibility between interior and exterior conditions. Even though such coverings are rather independent from interior situations, their fragmentation allows to respond to different programs/ structures/ contexts in a flexible way 3) and presenting possibilities of adjustment, as restoration, transformation, and extension of the works.

HCH shows first signs of an awareness towards issues of context and the human body in Nørrebro Vænge Housing Block (1939-1942). The pergola elements provide the very long, flat, and slightly curved brick façade with

an added rhythm. Its position demarcates the access points and its very small size give extra comfort to the experience of entering or leaving. Its side screens are built of very slender wood lattices painted white and put together with small ordinary nails³⁸ that reminds of Gottfried Semper's carpets and notion of dressing³⁹. And the area comprised around the doors is covered in light grey vertical wood battens. The scale of such pergolas in comparison to the large block, the choice of materials and the delicate way they are put together makes the more accessible part of the façade an approachable space of transition.

In his next project, Hulgårds Plads Housing (1943-1945) HCH uses a similar combination of materials (brick) and techniques (loadbearing facades) to the previous housing block. And he adds a new material/ element: A balcony built of reinforced in-situ concrete. Such element is designed as an outdoor room, as its tilted ceiling and side brick walls provide it with enclosing features comparable to a cavity or niche. Furthermore, in its outer side, concrete shows a horizontal pattern corresponding to the formwork made of twisted wooden battens. Above the opaque part we see a steel bar where pots can be fixed. Again, HCH shows an intention to make such transitional spaces between the private and the public more accessible through proportions and tactility. However, Hulgårds Plads Housing expresses very different to the large and smooth façade of Nørrebro Vænge, Housing more in line with traditional brick housing blocks. Here we see a sequence of yellow brick and mortar walls defining balconies. These vertical elements contrast with the red brick and mortar background façade and provide it with a strong vertical rhythm.

In addition, facades are comprised of the following elements: Windows, some of them with a squared proportion, long deep perforations at the base part to provide ventilation to storage areas, main entrance doors, storage doors and small ventilation spots. All of them exhibit a type of ornament which is directly related with the logic way of putting bricks together to fulfill and expose structural requirements. Such elements are combined in different ways in the four facades addressing issues of context and program. Housing is arranged in two blocks placed almost perpendicular to each other and following the alignment of Hulgårds Plads and Frederikssundsvej. The two blocks embrace a big public backyard in between. The building is comprised of two and three room apartments distributed in three floors (Hulgårds Plads) and five floors (Frederikssundvej). Studios, storage area, access and a daycare are located at the ground floor. On the one hand, main access is thought from Hulgårds Plads and Frederikssundvej. On the other hand, sunorientation determines that south and west facades should incorporate balconies. These elements/ conditions: balconies (best sun orientation), accesses (from main roads), storage doors (from backyard), yellow walls (defining balconies) and squared windows (related with stairway and living rooms) generate four different types of facades which share the same elements though differently combined.

Furthermore, a daycare, located at the north-west corner, is designed with an added zig-zag plan form which softens the sharp intersection between the two housing blocks. It is built of wood and glass light panels, which gives it a very distinct expression from the rest. On the one hand, such small and distinct volume explains the development of a different activity. On the other hand, from a human perspective, it makes a gentler contact and transition while walking close to such corner situation.

Even though both previous examples; Nørrebro Vænge and Hulgårds Plads Housing blocks- are buildings designed with traditional loadbearing brick enclosures, however the two of them seem relevant to introduce HCH's later works with enclosures comprised of different layers. Both buildings show that issues of rhythm, repetition, scale, and variation, as well as an awareness towards context and the human body starts before the layered character of HCH's later works.

Skydebanehaven Childcare (1948-1950) shows HCH's first interest in coverings as made of different layers. The north façade is constructed as a wooden espalier designed as a slender element that covers the yellow

plastered brick wall and the sequence of equal squared windows within the same regular framework. Such espalier is added with no specific functional reason other than scaling down the façade. From a perceptive understanding, it blurs the contrast between massiveness and hollowness of a traditional loadbearing wall and adds a tactile element to the very long and flat plane. Its expression, materials and colors, reminds us of the brick and wood Danish traditional facades of the XVIII c., today still very common in the old part of Copenhagen. Though in this case wood acted as the main structural system, while brick would fill in the spaces inbetween wooden battens.

The opposite south façade is built as an exposed in-situ loadbearing concrete frame. The rhythm is here provided by similar wooden battens which divide the large glass surfaces of each one of the classrooms into smaller pieces. Besides, the enclosure incorporates large, squared windows, doors, and concrete pillars -corresponding to the interior spatial division of one big and one small unit per classroom- into the same modulation. The lower part of the ground floor is cladded with inclined wooden battens that resemble Hulgårds Plads' balconies horizontal concrete pattern. The sequence of squared windows are positioned between the glassed top and opaque low parts. Somewhat visually its precise intermediate position acts as a joining element. Such proportion of windows and its particular rare, displaced position will reappear in almost every building. And HCH will show a range of variations on how to put this prefabricated element together with the rest of the design. The same wooden battens used in the north façade are also applied as other types of coverings: 1) a railing for the balcony at the south facade 2), a window lattice to provide privacy to the interior 3) and a transitional pergola element linked to the two entrances.

Shortly after, HCH designs Hanssted School (1954-1959). Facades expose a similar modulation to Skydebanehaven Childcare's north facade. However, in this case wooden battens act as an active joining element between white Eternit panels (fiber Cementous plates), covering the concrete shell, and glass panels. Fastenings are orderly arranged on the slender battens. The very small metal dots provide with a changing pattern depending on the light projected on them. Squared windows are superimposed to the vertical rhythm of battens and slightly displaced, as in Skydebanehaven. Although its size fits in-between the Eternit modulation (coincident with three modules), however its metal and deep wood frame is not aligned with the façade plane, sometimes slightly tilted.

Eternit panels (fiber Cementous plates) could have been used in its original size (common dimensions are 1192 x 3050 mm), but it was probably decided to split its width of 1192 mm into three parts of 430 mm each. This choice optimizes material waste of each panel (20 mm of unused material in relation to cuts) as well as provides the enclosure with a more frequent rhythm and design flexibility than using a full size panel. The lower part of the facade is left with exposed concrete and finished with a pattern that shows the use of horizontal wood battens as formwork.

Even though the description above relates to the design of Hanssted School enclosures in general, there are a few relevant differences between the two wings that form the building. The one aligned with the busy road of Vigerslevvej is connected to the row houses as an extension of them. Although Hanssted School captures size, scale, composition, and the overall ordinary character of the family houses, however it does it by using very distinct materials as Eternit (fiber Cementous plates) and concrete. As mentioned before, this wing is built as a concrete shell (HCH's first example of this type of structure). And the reason seems to be that large span between rooms, gymnastics, and laboratories, required the rotation of the structural logic. Therefore, the facade is designed as a loadbearing element. If such interior spatial arrangement should be manifested on the façade, walls coincident with the program, would appear in apparently random different positions (from an outside perception). Such nonstructural character of the interior divisions is probably the reason why HCH decides to conceal them beneath one continuous covering that hides distinct situations under the same veil. While at the same time, modulation of the framework enables to alternate Eternit (fiber Cementous plates) and glass panels in a regular and frequent rhythm depending on the interior and exterior necessities. For example, an Eternit panel positioned in-between a long series of glass panels is applied in the case of having an interior wall intersecting with the enclosure, the position of a drain or a ventilation gadget.

The other wing is designed with a different structural system. In this case, structure is coincident with interior walls in-between classrooms and the enclosure is a nonloadbearing element. However, HCH employs the same modulation of the framework as in Vigerslevvej's wing. Here, brick walls intersecting with the façade (classrooms divisions) are exposed since they follow a regular rhythm and show the structural logic and program of this part of the building. They are even enlarged at its edge (façade meeting) to exactly fit with the 43 cm module of the Eternit and glass panels.

The intention of solving different situations with equal/ similar coverings, or building rather independent enclosures, is also seen in the design of accesses. Comparable to Hulgårds Plads, where the same elements are combined in different ways at each one of the 4 facades, here HCH uses a very similar access volume in the two wings: Along Vigerslevvej wing and along the interior wing facing the playground. Such accesses conceal a stairway. One should notice that even though volumes are exposed as the same/ similar, they conceal two very different types of staircases. At Vigerslevvej staircases are designed of one single flight, whereas at the interior wing those are comprised of four flights. Though, there is a minor detail that suggests such variation from an outside perspective: The position and geometry of the window.

HCH's first technical facility, Nyborggade Transformer Station (1958-1960), shows a constant sequence of structural concrete rips and bricks covering the in-between inclined parts of the shell. Bricks are of different reddish tones, according to the burning process, and contrasted with a few scattered yellow ones. Such choice and composition of bricks could be related to the potential of using some leftovers or excess of material. Brick cladding protects the thin layer of concrete and gives the industrial building a less crude character within the residential area of Nørrebro. The distance between concrete rips (103 or 109 cm), a part of being related with the structural properties of the shell and the length of each façade, seems relating to the form/s and number of stacking bricks. The corner situation is delicately solved by the exposed meeting of two columns, like how a wooden structure would be designed. And columns reveal the fastenings of the joining and closing process of the formwork panels: A series of round holes vertically distributed which turn into a permanent ornamental motive.

Instead, the vertical development of the building follows a clear tripartite composition, which reminds us of the Classic Greek tradition ordering. A low volume built of loadbearing brick walls and enclosures, surrounds the high central element described above. Perhaps, the displacement of the industrial metal green door -its natural position could be in the exact middle, but it has been moved one structural module to break the symmetry- shows HCH's acknowledgement of the classic 'rules' but also an intentional playful gesture.

Whereas the base parts are massive, the overhanging cornice appears as a floating element. It is solved with a series of steel profiles anchored to the concrete façade which support undulated Eternit (fiber Cementous plates) panels. The cornice protects a row of windows situated just below the roof slab. The original windows incorporated an elaborated opening mechanism, but it has been dismantled and replaced for fixed glass blocks. Light coming in reflects on the white painted concrete surface of the main high room and provides it with some diffuse light.

Specifically classical is the gesture of leaning the façade in producing a certain cornice relief and a shadow effect under the roof, as already seen in P. Behrens A.E.G. turbine hall (Berlin, 1909). A neo-classical building designed on the lines of a temple but with all the stylistic signs and symbols

left out or changed. Despite that, Nyborggade also shows a recognition of the close built context, Martin Nyrup's Gasometer. Such brick circular facility shows a similar classic structure of base, body and top. And a middle part comprised of equal intervals of columns and slightly recessed circular windows.

At HCH's next technical facility, Bellahøj Transformer Station (1961-1968), the two low volumes for repairing and keeping transformer stations show enclosures fully covered with undulated Eternit (fiber Cementous plates) plates. In this case, rhythm is present in both directions: The vertical development of the covering is divided into three and four fragments -the two buildings differ in height-. The length of each fragment, about three meters, connects with a recognizable average height of a housing block apartment. This division is achieved by slightly inclining each fragment. The orientation of the undulated Eternit (fiber Cementous plates) panels added to its inclination helps to conduct water to the ground in a more efficient way. Besides, such inclination -anchored to short concrete overhangs- becomes the fixing mechanism of a sequence of drains that appear as woven within the weightless panels. Such drains are precisely positioned in the middle of orderly arranged groups of squared window pairs that alternate on the facade. Thus, the drain is coincident with the rare position of the center window frame. In addition to it, each group of windows is covered by a brise-soleil which gives extra protection to the windows as well as adds texture to the enclosure. All these elements: horizontal fragments, inclined Eternit panels, drains, windows and brisesoleils provide the façade with different complementary horizontal and vertical rhythms. In addition to this, in the vertical direction we see again a clear tripartite composition: The base part is built with exposed concrete. Following HCH's remarks written in one of the construction drawings, it exhibits a "well executed naked concrete wall" that reveals a horizontal wooden pattern. As described above, the middle part is cladded with inclined Eternit panels of the same proportion. And the very top is built with one single and smaller Eternit panel that covers the façade-roof joint. The

composition and number of elements show no relation with the spatial properties of the two double height machinery rooms connected to it.

The service volume facing Hulgardsvej shows a different type of enclosure. Here, vertical rhythm is given by exposed concrete pillars as part of the structural concrete shell combined with covering parts, like Nyborggade transformer Station. Horizontal rhythm is generated by alternating stripes of glass blocks and windows followed by inclined undulated Eternit (fiber Cementous plates) plates forming the sill. Bands correspond to the height of each floor. The connection to the interior program is in this case clear.

Amager Transformer Station (1966-68) is in many ways comparable to Bellahøj. The main distinction is that the wooden substructure of the undulated Eternit (fiber Cementous plates) panels is here exposed. Construction-wise, such battens perforate the concrete overhangs. Or concrete is casted with a dentation where to position the wooden battens. The result is that 1) the construction process is more elaborated than in Bellahøj 2), both wood and concrete deteriorate faster 3) and exposure of battles increase the effect of lightness and adds an extra rhythm to the enclosure. Apart of these changes, the building remained very similar to Bellahøj Transformer Station till 1977, when the facility was extended by a different architect than HCH, C. N. Christiansen. At that time, the two low volumes covered with Eternit were prolonged. It was done by following a straightforward extrusion of the existing section. But distinct to Bellahøj, the gable was also covered as in the two other facades. This provoked a weak joint of inclined Eternit panels at the corners. Construction- wise the joint is not properly solved as the logic of joining undulated Eternit (fiber Cementous plates) panels is by overlapping them. Whereas in Bellahøj Transformer Station HCH decided to leave the edge of the covering exposed. The meeting with the gable façade is solved as a clear clash. The two different construction systems originally the gable was uncovered and showed a loadbearing concerete wall- and properties of materials (depth) are revealed.

In Amager, the joint between the old and the new is impossible to detect from a certain distance, since weathering has homogenized it. However, there are a few modifications to point at. In the new part of the building the concrete structural façade is designed totally flat, with no overhangs related to the support of Eternit panels' inclination. This nuance is visible while being on-site: From a standing position close to the facade, one notices that concrete has been replaced by plasterboard panels. A number of those panels try to fit in the intricate geometry defined by undulated Eternit plates, wooden battens, and concrete wall. The construction process is reversed. Here plasterboard is the last part to complete the facade, while concrete came first and had the structural purpose of providing support to the different elements in relation to it. In addition, decay impact on concrete is positively embedded in the material characteristics and expressed through its patina. However, the plasterboard loses its original features and appears ruptured and fragile.

This is an example that shows how very small tectonic differences may have a huge effect. At first, one could think that Amager's extension is just an evolution of HCH's way of thinking/ designing. Since the aesthetic outcome of the turning corner with inclined Eternit panels might be misleading. However, the two details mentioned above - the unsolved joint of two Eternit plates at the corner and the substitution of concrete overhangs for plasterboard plates - show that its significance is not properly achieved. Along Marco Frascaris' thinking, there might be an intention of telling a story, but this is not fully delivered: Even though the 'construction' part of the tale.

In Bremerholm Transformer Station (1962-63) the covering is designed as a refined bronze skin which entirely covers the structural concrete shell. A vibrating rhythm is provided by vertical and horizontal elements. A series of bronze brackets are anchored to the concrete shell every 68 cm to support prefabricated elements comprised of two vertical bronze profiles of two meters long and horizontal bronze lamellas welded in between.

Such modulation (68 cm) might be connected with 1) the total width of the site, or distance between neighbor buildings 2), the intention to relate it to the windows of the buildings nearby (two modules are approximately equivalent to one traditional window comprised of two doors) 3), producing elements -of a door size- easily transportable by humans, as they need to be moved and fixed on-site 4) and making it fit with the slender structure at the top floor, where concrete shell changes for a sequence of pillars, placed according to interior divisions.

Here, as in Bellahøj and Amager Transformer Stations, we see a three part division of the vertical development of the enclosure. The base is covered with steel plates painted in cream color, the central part is designed with door size lamella components -as described above- and the top part is designed as a horizontal glass span protected with a continuous brisesoleil that follows the enclosure modulation. As seen in Nyborggade Transformer Station, this provides the upper part with a sense of lightness.

In this case, the common squared window appears aligned at the bottom part of the enclosure corresponding to two modules of the framework. Again, such windows are placed in between bottom and middle part. They were most probably thought as displaying devices to place advertisements. To stress its exposure purpose, they project about 30 cm off the façade plane. The empty plot would originally show a back wall with painted advertisements, but the construction of the new Transformer Station blocked its view from standing perspective. In a different way, these windows would replicate and divide the available surface of the backfire scape wall.

Distinct to Nyborggade and Bellahøj Transformer Stations, and unique in HCH's works, the main access door designed accordingly to the dimensions of transformer stations is here totally camouflaged. Instead of using a ready-made door, here it is specifically designed for the project. It becomes an extension of the *framework*, and it shows hidden within its pattern. Another singular choice of the project is to use a noble and expensive material as bronze. This fact is probably connected to the special circumstances of the facility that is placed in the old city of Copenhagen.

While in Bremerhølm Transformer Station we see an investigation of the potentials of bronze, in Svanemølle Transformer Station (1966-1968) we see a similar approach through wood, instead. Both buildings share a similar aesthetic expression: A strong regular verticality, endless repetition, rough and elaborated joining details which manifest as some sort of ornamentation and a tripartite division of the façades as base, body, and cornice. However, within this analogous character, there is one main and relevant distinction as for properties of the construction and the structure. In Bremerholm Transformer Station, the covering is also the formwork of the concrete shell beneath. Thus, what shaped the amorphous mixture became its cladding and expression on the outside face. The inside formwork was removed, and concrete was in most parts painted. This example brings tectonics to the extreme by making one aware not only of the construction forces and logic behind the work but bringing forward the process of building as something to be part of the story and expression of the building. Furthermore, wood battens show different tonalities according to the replacement of single elements as well as larger parts that have been deteriorated due to its exposure to the environment.

The formwork was designed as a first layer of hard black isolation -slightly visible in-between wood battens-, a second layer of horizontal wood battens and a third layer of vertical wooden battens, placed every 66-69 cm depending on the length of the façade and the position of overtures. Such vertical modulation is almost the same as in Bremerholm Transformer Station. Vertical wood battens are joined together with traditional wooden perns. And every 35 cm in height there is a screw with the function of establishing pressure between the exterior and the interior side of the formwork. Corners are solved as we have often seen before, as a direct intersection of two wood profiles, that emphasize the two façade planes. Regularity and repetition embedded in the covering system allows

certain flexibility for other gadgets and elements to be integrated in the building: Almost squared windows and ventilation devices are comprised between two vertical wood battens. Drains are as usual superimposed to the façade and here attached to horizontal wooden profiles: HCH deliberately displaces them from the rhythm of vertical wooden profiles.

The base part of the facade is covered with prefabricated rough concrete modules produced of a mixture of small rocks. This provides the building with a resistant and durable solution in contact with the ground which easily adapts to the slopped topography. As seen before, some of the windows are particularly placed in-between wood and concrete parts. The cornice is projected outwards of the façade plane, like other Transformer Stations. Again, to stress the lightness of the cornice element windows are situated just below it. Not only the entire substructure is built of wood battens, but also the roof covering is made of wood tiles.

Tagensbo Church (1966-1969) is one of HCH's few private commissions and designed together with his partner Viggo Jørgensen. In one of the very few writings by HCH we find an explanation about the project's context. Considering the location of a church within the area of Tagensbo in Copenhagen, the building should be placed in the axis of Grundvigs Church and Grundvigs School and aligned with Oldermandsvej (the back street). And the building should fit into the character of the housing blocks of the area showing rather narrow plots in relation to the depth of housing apartments. In this regard, HCH refers to Christian's Church in Christianshavn (Nicolai Eigtved, 1754-1759). Unusual in Christian Churches, its plan layout is orientated across the shorter side, instead of the longer. Similar to a theater layout, the congregation is closer together and get a better view of the podium. Such a scheme is replicated in Tagensbo Church. Besides the church, the building is comprised of a daycare (top floor) and extra rooms for Sunday school, youth club and meetings (first floor). HCH reveals that the municipality wouldn't accept 'just a church'.

Like HCH's first transformer station, Nyborggade, the structure shows as a reinforced in-situ concrete shell with a very close sequence of slender pillars placed as the following, 19- 60- 19- 60-... cm, however, here exposed in the interior side instead of the exterior. On the exterior, prefabricated elements replicate the rhythm and form of the in-situ casted pillars. It is the joints between such elements that somehow reveal its nonloadbearing character. In-between pillars, the concrete shell is cladded with dark red bricks outside, and concrete bricks inside. Windows, of three different proportions in relation to the interior program (church, office, and daycare) are placed in between columns and following the position of the interior balconies of the church space and floors. Therefore, from a standing position outside, it is possible to read the section of the building by tracing the placement of windows.

The interior of the Church is covered with different materials, as concrete bricks, ceramic bricks, and plywood painted in sharp colors as pink and blue. This is unique compared to previous works, in which interiors are humbler by using traditional coverings as dark wood, brick, white tiles and ordinary plaster.

The bell tower is anchored to the front façade. It follows the same structure modulation, but it is built as an in-situ concrete frame. From the distance, the church façade disappears within the sequence of housing blocks through similar texture and color. Though the extra height of the tower bells helps to identify it.

The new part of Gasværksvejens School (1969-1971) is comprised of two volumes positioned in an L-shape. The extension together with the existing building delimitates the playground. The two wings are placed perpendicular at the intersection of the two streets lstedgade and Eskildsgade. The classroom part -Eskildsgade- is built as a four floors building volume and the gym and small theatre part -Istedgade-, is built as a two floor building volume. Between the old and the new buildings there is no physical contact other than through an existing red brick wall

aligned with the street which encloses the school area. HCH builds a continuation of the low existing wall which embraces two distinct situations. In one case, it becomes part of the covering of the enclosure: Acting as a base it avoids fragile materials above - wood and glass- to be too exposed to the street level. In the other case, the low brick wall distances from the façade to provide light and privacy to the basement, while at the same time, the school gains a long and narrow yard with a more private character to the playground in the middle of the compound.

The entire building is modulated in a grid of 1,80 x 1,80 meters. The structure is a combination of prefabricated slender pillars and beams on the facades and loadbearing prefabricated concrete panels and decks at the interior. In the classroom wing, the structure follows a north-west southeast direction, the short dimension of the room, as usual. In the other part, direction is rotated 90 degrees to also cover the shortest dimension of the room. Although this is quite clear from standing in the interior of the gym, however from outside the situation is confusing. HCH's intention to fit in the near context the street of – Istedgade - make him build two fake gables at the rooftop of the gym/ theatre wing which have no structural connection. Its only function is to fit with the profile and rhythm of the buildings along the street. Here we see a very clear example of how HCH, through a playful gesture, finds appropriate to establish a connection between the school and the existing context, even though this means to contradict the structural- program scheme.

Enclosures are designed with a combination of prefabricated textured concrete panels and windows placed in-between the slender concrete structure. Regarding this, Gasværksvejens School is built with a structure aligned with the enclosures that perform as a framework. While concrete panels and windows are inserted as off-the-shelf components. In this case, the covering is detached from the enclosure's surface. HCH superimposes and elaborated structure and hangs it from the two facades of the classroom wing and the playground façade of the gym/ theatre wing. Such coverings are built as a combination of round hollow steel profiles, undulated Eternit plates and dark red painted wooden battens. Brisesoleils shouldn't be argued in terms of sunlight obstruction, since these wouldn't be needed in connection to the climate. However, from being inside one of the classrooms, through the filter of this added element, one feels less exposed to the street, but still not prevented from having a view and enough indirect light. Thus, even though it is a thin and fragile element, it gives a certain perception of depth and comfort.

Wooden substructure of brise-soleils extends a bit out of the line of undulated Eternit panels. This type of substructure has already been used in Bellahøj Transformer Station, though concealed underneath concrete. And subsequently, in Amager and Svanemølle Transformer Stations, the substructures are exposed but of the same length as the covering panels. Here, HCH exaggerates their function by extending them further out than the panels. Aesthetic-wise, such detail gives the hanging covering an extra texture and a perception of more lightness. However, constructionwise, the edge of such battens becomes very much exposed to rain and frost. HCH seems aware of this fact since the top level -the more exposed one- is protected with small metal caps. And he might have learned from a previous experience designing the small Gas Pressure Regulator (1967-1968) next to Bellahøj Transformer Station. The roof is designed with the same type of wooden battens also covered with undulated Eternit panels. However, in this case the edges of the extended structure appear ruptured.

The next two works are of a different type. Ringbo Psychiatric Hospital (1961-1963) and Brøndbylund Psychiatric Hospital (1965-1966) are one storey buildings with large plan developments in close contact to the terrain. In both cases, coverings perform as light extended roofs together with the upper part of the enclosures.

In Ringbo Psychiatric Hospital repetition and modulation is distributed along a ring plan geometry. The division into twelve similar modules, a part of responding to program needs, generates a better integration with the changing topography (each module is displaced about four or five steps from the other) and allows to continuously circulate around the ring. Enclosures are comprised of an opaque sill in contact with the terrain and a transparent strip above. The sill, built of concrete blocks, varies in height. Its lower part adjusts to the variable topography, while the height of the top part adapts to the demands of the different spaces of patient's rooms, common spaces, toilets and meeting rooms. Like Hanssted School, vertical rhythm is given by the vertical wooden battens in between glass panels and squared windows, and some opaque parts. Spans between vertical wooden battens are of 55,5 cm, with variations of +2/-1 cm. In the same way as in Hanssted School windows and doors are part of such modulation: One squared window or door corresponds to the width of two modules. Here, the small displacement of the squared window gives space for one source of natural ventilation through a small accessible compartment. Besides this, the downwards move provides with a wider span of visibility from a bed laying position. Interior divisions are always coincident with such modulation. The smaller space, a staircase, takes 2 modules, and the larger space, main accesses, and common rooms, take 12 modules. And, as seen before, the meeting of an interior wall with the enclosure is solved with an opaque fragment built of vertically joined dark red wooden battens. However, here opaque parts don't follow the standard modulation as in Hanssted School. These differ among 15, 25 and 35 cm, while the standard module measures an average of 55,5 cm.

At access points, characterized by an exaggerated pitched roof built of criss-crossed exposed wooden trusses and an extended roof, loadbearing interior brick walls are exposed at the façade. Such 30 cm of yellow brick mass become another added component within the modulation. In these sections, south facing enclosures are designed as full height glass surfaces to provide light to the common room. These rooms are extended outdoors into a terraced area protected by a low roof. HCH uses a painted dark red beam and a double profile wood pillar to sustain such pergolas.

In Ringbo we see a close connection between enclosure modulation and interior loadbearing walls and therefore with the spatial organization of rooms and common spaces. However, such coincidence is not fully revealed from outside. Strong modulation gives flexibility for different programs, as well as camouflages those changes under the continuous rhythm of its covering.

Brøndbylund Psychiatric Hospital shows one only module of 120 cm that regulates the building development. This is applicable for the organization of the program, the structure (loadbearing interior division walls), exposed roof substructure and enclosure. At the enclosure, such grid lines are recognizable through a vertical wood batten of 15×15 cm every 120 cm. Within this regular sequence, we see some accessible windows for ventilation and some fixed glass elements. Different to all the other works, here both types are of the same size, 120 cm. Besides this, such wood profiles (15×15 cm) allow to join interior walls with enclosures. Below this transparent strip, the sill is built of prefabricated concrete components - same type as in Svanemølle Transformer Station- that follow the same 120 cm modulation.

As in Ringbo Psychiatric Hospital, common spaces are covered with a very intricate roof geometry supported by wood trusses. In this case pillars are designed as V and double V profile -first used in the design of desks placed at the bunker under Bellahøj Transformer Station-.

Clocks

Finally, HCH's ability to navigate between the principles of 'frameworks' and 'ready- mades' is also present at his smallest designs. HCH integrates a clock device in a number of his works. The clock is sometimes supported by a singular wood structure in the middle of a garden, as in Ringbo Psychiatric Hospital; comprised of a filigree metal assemblage attached to the facade, as in Bellahøj Transformer Station⁴⁰ and Gasværksvejens School; raised by a concrete structure, as in Brøndbylund Psychiatric hospital or elevated by a tubular metal structure, as in Hanssted School and one unidentified building. In this last case, it is precisely an old photo that includes the clock infrastructure what reveals that such work, or at least part of it, has most probably been designed by HCH⁴¹.

Even though the different examples mentioned above show a preformed clock, a 'ready-made' object, put up and embraced by different types of 'frame-works', the totally of the structure is always perceived as a thorough articulation of materials and formats. In some of the cases, HCH seems to use the techniques like the ones of a 'bricoleur'⁴², by using whatever materials are available and by joining existing things together in new unexpected ways. Probably the difference between what is 'taken' as a prefabricated object/ mechanism, and what is 'crafted' is more obvious than in the configurations of the facades' coverings. It might be such contrasting conditions -between 'frameworks' and 'ready-mades'-embedded in HCH's clocks' constructions what makes one open the eyes for more subtle design features of the facades previously analyzed.

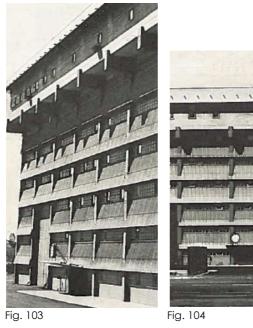




Fig. 104

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Fig. 105

² Christian Norberg-Schulz, "Order and variation," in Nordic Architects Write. A documentary anthology. Edited by Michael Asgaard Andersen (Routledge, 2008): 255-258.

³ Charlotte Bundgaard, "Framing Fragmentation – The architect as a master of montage," in *Changing Roles; New Roles, New Challenges* (TU Delft, Faculty of Architecture, Real Estate & Housing, 2009): 315.

4 Ibidem: 318.

⁵ Kasper Sánchez Vibæk, "Conditions for architectural quality in an industrialised context- Moving towards architecture sustainability," in *Three Ways of Assembling a House* (The Royal Danish Academy of Fine Arts School of Architecture Publishers, 2010): 22.

⁶ Manuel DeLanda, A New Philosophy of Society: Assemblage Theory and Social Complexity (Continuum; Annotated edition, 2006).

⁷ Charlotte Bungaard describes Rosalind Krauss levels comprised in art works of montage – the fragment (the single material element), the plane (the surface uniting the fragments), the interval (the gap between the fragments), and the seam (the joint assembling the fragments). And she translates these four levels into the realm of architecture as: the building component, the structural skeleton, the interval and the join. Charlotte Bundgaard, "Framing Fragmentation – The architect as a master of montage," in *Changing Roles; New Roles, New Challenges* (TU Delft, Faculty of Architecture, Real Estate & Housing, 2009): 318.

⁸ They describe a structural system which should embed ideas of extension, superimposition and flexibility. As well as invent new relations with the program. They mention "Construction systems based on structure and coverings, and with a fine relation between loadbearing capacity and construction costs, become interesting since they don't present us with preconceptions towards a specific program and can develop into anything that can be placed in it... There is a determination to disconnect program and structure." Anne Lacaton & Jean-Philippe Vassal, Actitud (Editorial Gustavo Gili, 2017: 73-87.

⁹ Yona Friedman theoretical projects of open infrastructures: Plans and structural grids should allow for the free will of the individuals. The framework was to be erected first, and the residences conceived and built by the inhabitants inserted into the voids of the structure.

¹⁰ The artefact Crops demonstrates that it is possible to trace material continuities within one work and across works. And that such materials sometimes are comprised within a building component.

¹¹ Charlotte Bundgaard, "Framing Fragmentation – The architect as a master of montage" in *Changing Roles*; New *Roles*, New *Challenges* (TU Delft, Faculty of Architecture, Real Estate & Housing, 2009): 320.

¹² Charlotte Bundgaard, "Framing Fragmentation – The architect as a master of montage" in *Changing Roles; New Roles, New Challenges* (TU Delft, Faculty of Architecture, Real Estate & Housing, 2009): 316.

¹ Christian Norberg-Schulz, "Order and variation," in Nordic Architects Write. A documentary anthology. Edited by Michael Asgaard Andersen (Routledge, 2008): 256.

¹³ Charlotte Bundgaard, "Framing Fragmentation – The architect as a master of montage" in *Changing Roles; New Roles, New Challenges* (TU Delft, Faculty of Architecture, Real Estate & Housing, 2009): 315.

¹⁴ Kasper Sánchez Vibæk, "Conditions for architectural quality in an industrialised context." (The Royal Danish Academy of Fine Arts School of Architecture Publishers, 2010): 26.

¹⁵ The notion of scale is a relation between some dimensions -height, width and volume-independent and real and a chosen number of units. Even though every object has invariable and precise measurements, however the scale of such object will depend on the election of a system of proportions. Federico Soriano, "sin_escala," in *Sin Tesis* [Editorial Gustavo Gili, SA, 2004]: 19.

¹⁶ Anne Beim and Marie Frier Hvejsel, "The ecology of urban tectonics – Studied in everyday building culture of Hans Christian Hansen: Beyond Their Limits," in *Structures and Architecture*: 206.

¹⁷ John Summerson, The classical language of architecture (The MIT press, 1963): 44.

¹⁸ Marco Frascari, "The Tell The Tale Detail," in *Theorizing a New Agenda for Architecture: Anthology of Architectural Theory, 1965-95* (Princeton Architectural Press, 1996): 500-514.

¹⁹ Franco Borsi, Leon Battista Alberti, The Complete Works (New York: Electa/ Rizzoli, 1989): 239.

²⁰ "Details can be 'material joints', as in the case of a capital, which is the connection between a column shaft and an architrave, or they can be 'formal joints', as in the case of a porch, which is the connection between an interior and an exterior space". Ibidem: 2.

²¹ Marco Frascari, "The Tell The Tale Detail," in *Theorizing a New Agenda for Architecture: Anthology of Architectural Theory, 1965-95* (Princeton Architectural Press, 1996): 500.

²² Jeremy Till & Sarah Wigglesworth, "The Future is Hairy," in Architecture the subject is matter (Routledge, 2001): 11-28.

23 Ibidem: 11.

²⁴ Ibidem: 15.

²⁵ Ludwig Mies van der Rohe, "Architecture and technology" in Arts and Architecture 10, no. 67 (1950): 30.

²⁶ Jeremy Till & Sarah Wigglesworth, "The Future is Hairy," in Architecture the subject is matter (Routledge, London): 14.

²⁷ Ibidem: 22.

²⁸ "Other details". It is the title of a subchapter. Ibidem: 21.

²⁹ Charlotte Bundgaard, "Make do with what you have. On detailing an architecture of ready-mades," in 10th International Detail Design in Architecture Conference: (2011): 45.

³⁰ Ibidem: 47.

³¹ Ibidem: 48.

³² Jeremy Till & Sarah Wigglesworth, "The Future is Hairy," in Architecture the subject is matter (Routledge, London): 14.

³³ Joao Quintela, "The disagreement between Otto Wagner and Gottfried Semper: A question of detail" in Estudo Prévio 17. Lisboa. CEACT/UAL – Centro de Estudos de Arquitetura, Cidade e Território da Universidade Autónoma de Lisboa (2020): 6.

³⁴ Ibidem: 16.

35 lbidem: 12.

³⁶ Wagner is aware of Semper's theoretical work: "It is Semper's undisputed merit to have referred us to this postulate, to be sure in a somewhat exotic way, in his book Der Stil. Like Darwin, however, he lacked the courage to complete his theories from above and below and had to make do with a symbolism of construction, instead of naming construction itself as the primitive cell of architecture" (Wagner, 1993: 106). Ibidem: 4.

³⁷ Kenneth Frampton, Studies in Tectonic Culture: The poetics of Construction in Nineteenth and Twentieth Century Architecture (The MIT Press, 1995): 86.

³⁸ The design of the wood lattices around the pergola has changed, but it still keeps the character of the original element designed by HCH (see photos in Crops and sections drawing in Cuts).

³⁹ See chapter 5. Fragility and Robustness: A tectonic discussion on facades' layerings.

⁴⁰ Photos of the different clock structures should be found at the experiment Crops. However, the clock of Bellahøj Transformer Station is not shown. This is because the one that appears today, a squared clock that coincidentally fits with the width of one of the concrete columns, is not HCH's design, as it was added later. Two photos by Keld Helmer-Petersen and Frank Bundgaard published in the article by Jørgen Sestoft in 1972 insinuate a different clock infrastructure to the one we can see today. Even though it is impossible to appreciate the details, the two different perspectives of the photos exhibit a round white clock supported by a hanging/ leaning structure positioned at the front façade.

⁴¹ The clock is illuminated from the top, similar to the clock at Hanssted school. Though in this case there are two lamps projecting light from below (see technical drawings in chapter 2, Hanssted School). The clock structure remains, but the lamps are not there today.

⁴² Claude Lévi-Strauss, "The Science of the Concrete," in The Savage Mind (University of Chicago Press, 1966): 11-15.



Summary discussion

The intention of this chapter is to summarize and discuss what has been explained in the previous chapters. Text is structured according to the four Research Questions that have been raised at the introduction chapter. Distinct to other PhD thesis, that would tackle the ending chapter as a discussion and/ or conclusion, in in this case a written summary seems also relevant. This is because of the fragmented character of this PhD thesis, that switches among different mediums, such as drawing, photo and text, as well as uses distinct layouts for each chapter. Therefore, it is considered important to provide with one continuous piece of text to clarify the content of each chapter besides the connection among their distinct formats.

The first stage of this PhD thesis focused on discovering what was HCH's oeuvre comprised of. As illustrated in chapter 2, A chronology under the column Dissemination HCH's works have been briefly published. By researching into local issues, Arkitekten and Arkitektur, it was possible to detect a few articles on his works. The character of such texts and photos is merely descriptive of the works in terms of program, construction, structure and materials. Besides that, in 1972, just three years after HCH had finished his last work, the Danish architect and critic Jørgen Sestoft published an extensive article on some of his works, "Arbejder af Hans Chr. Hansen", in eighteen pages of Arkitektur¹. And again Sestoft, in 1986, included several of HCH's works in a publication about the first hundred years of the City architect's office, "1886 – Stadsarkitekten I København – 1986"². The publication is divided into different periods, and HCH is given full support in the period of 1943-1973.

Apparently, after 25 years of silence, HCH's works started to become appealing for the architecture audience: From 2010 his works have been celebrated in an architecture blog by the architect Kristian Seier³; in 2013 an interview about a thesis project that proposes an extension and transformation of Hanssted School was published in an *Arkitekten* issue⁴; in 2016 Anne Beim and Marie Frier Hvejsel published an article that focuses on the notion of "urban tectonics" by analyzing two of HCH's technical facilities, Bellahøj and Bremerholm Transformer Stations⁵; and in 2020 the decision of finally demolishing Ringbo Psychiatric Hospital, one of HCH's works, aroused objection within some of the architecture collective.

Arkitekten and Arkitektur magazines have procured with an up to date list of HCH's works, referring to competitions, unbuilt and built works. Most of HCH's works are public works developed from within the office of the Copenhagen City Architect, first Poul Holsøe and after succeeded by F.C.Lund. However, on the side, HCH also had his small architecture office together with the architect Viggo S. Jørgensen, with whom he developed some competitions and proposals, of which two of them got to be built. Furthermore, HCH himself was also in charge of some architecture proposals and one built work. A list of all these works has been included in chapter 2, A chronology below the column Works. Obviously, the number of works is not limited and therefore new buildings and proposals could be ascribed to HCH in the future. From such list, only the built and accessible works have been incorporated in chapter 3, Hans Chr. Hansen's footprint.

Missing or incomplete information of unbuilt works and competitions, besides lack of data on HCH's life and working process, have supported an analytical empirical and interpretative approach focused on the built works that are presented in chapter 3. As already mentioned, information has mostly been found in two local Danish magasines, Arkitekten and Arkitektur. Besides that, some of the works were also spotted in a few Danish architecture books, and online sources. Furthermore, drawings of the buildings were found at the construction archive in Copenhagen, Byggesagsarkiv, that are now available online. Considering all this, chapter 3 has been mounted as an architecture guide, in which each work is presented and explained through basic data, drawings, a photo and related bibliography in one folded card, which can easily be reprinted in an A3 format paper, cut and folded by the reader. In this way, both content and format, encourage the reader to interact and interpret the buildings in her own way, in a similar way to how I approximated them, through self-experience.

The lists of works below aim at summarizing what has already been presented at chapter 2, A *chronology*. It has been found that, as an employee of the Copenhagen's city architect's office, HCH was in charge of the following works:

- Built project, Emdrupgaard Orphanate, 1937 (with P. Holsøe). This building is not accessible.
- Built project, Laundry building for Sundholm, 1938 (with P. Holsøe).
- Buitl project, Nørrebro Vænge Housing, 1942 (with P. Holsøe).
- Built project, Hulgårds Plads Housing, 1943 (with P. Holsøe and F.C. Lund).
- Built project, Skydebanehaven Childcare, 1948 (with P. Holsøe and F.C. Lund).
- Built project, Hanssted School, 1954 (with F.C. Lund and Agner Christoffersen).
- Built project, Gadekærvej- Blankavej Housing and Daycare in Valby, 1954 (with F.C. Lund).
- Built project, Nyborggade Transformer Station, 1958 (with F.C. Lund).
- Built project, Bellahøj Transformer Station, 1961 (with F.C. Lund).
- Built project, Bellahøj Garage, 1961 (with F.C. Lund).
- Built project, Ringbo Psychiatric Hospital, 1961 (with F.C. Lund, Walter Christensen, Knud Iversen, Eivinf Lorenzen and Georg Boye as landscape architect).
- Built project, Bremerholm Transformer Station, 1962 (with F.C. Lund, Walter Christensen, Knud Iversen and Eivind Lorenzen).
- Built project, Brøndbylund Psychiatric Hospital, 1965 (with F.C. Lund, Viggo S. Jørgensen, and Morten Klint as landscape architect).
- Built project, Amager Transformer station, 1966 (with F.C. Lund)
- Built project, Svanemølle Transformer Station, 1966 (with F.C. Lund)

- Built project, Gas Pressure Regulator located next to Bellahøj Transformer Station, 1967 (with F.C. Lund).
- Built project, Gasverksvejens School, 1969 (with F.C. Lund).

Besides that, together with Viggo S. Jørgensen, HCH developed the following competitions and works, comprised of built and unbuilt works:

- Competition project, Aarhus University planning (3rd prize), 1934.
- Built project, Tribune for Idrætsparken Football Field (1st prize), 1934. Demolished in 1990.
- Furniture designs and cutlery pieces, 1936-1942.
- Competition project, school in Herning (2nd Prize), 1938.
- Competition project, church in Copenhagen, 1939.
- Competition project, church in Munkebjerg neighborhood in Odense (1st prize), 1942
- Competition project, Mosegaard School in Gentofte (2nd prize), 1942
- Competition project, memorial for the astronomer and physicist
 Ole Rømer in the park next to Aarhus City Hall (2nd prize), 1944
 (with Henry Luckow-Nielsen)
- Buit project, Næstved Chapel, 1949
- Competition project, Langelinie Pavilion, 1950

In addition, HCH developed the following works on his own, consisting of built and unbuilt works:

- Unbuilt project, single family house "Honorary residence for a skilled man" (Academi Lille Guldsmedajle), 1937.
- Analysis drawing, stadium facility visited during a study trip in Roterdam. Feijenoord Stadium (designed by Brinkmann and Van der Vingt), 1940.
- Unbuilt project, Orphanate at Bakkegaardens, Bagsværd, 1946.
- Unbuilt project, Church in Odense, 1954.
- Built project, Tagensbo Church, 1966.

What refers to finding existing data on HCH's works has been approached through "archival research", including local magazines and the construction archive in Copenhagen. Therefore, what is presented in chapter 2 and 3 is basically a presentation of gathered information about his oeuvre. On the side, initially I tried to contact some of HCH's family and contemporary architects, though I did not succeed in finding relevant information. Besides that, having into account the time frame of a PhD thesis, besides the possibility to visit HCH's built works in Copenhagen, as well as my interest in a examining such built works from my own experience indicated the way of an alternative approach to develop the analysis and interpretation of HCH's works.

In parallel to investigating what was HCH's oeuvre comprised of, there was an interest in knowing in which architectural milieu did HCH's works emerge. In this regards, HCH's works apparently uniqueness motivated some research on his contemporary context before diving into the analytical part of the investigation. As presented in Chapter 2, A chronology, under the column Contextualization, his works show connections to some other works developed from within the city architect's office in Copenhagen, basically developed by his first boss Poul Holsøe together with different staff architects. Other relations, especially regarding an early experimental use of concrete and the choice of ordinary materials, also appear between HCH and a small group of contemporary Danish architects as Viggo Møller Jensen, who later would found Fællestegnestuen with Tygge Arnfred and Jørn Ole Sørensen; Poul Henningsen; Mogens Lassen and more recently also some works developed by the architecture office Vandkunsten. In addition, HCH's Transformer Stations, particularly the design of its enclosures, connect with local anonymous vernacular buildings, e.g. buildings for drying ceramics, and buildings designed by P.V. Jensen and Kaare Klint. Whereas HCH's first works show relations with Danish brick architecture, as some of Kay Fisker's buildings. Probably these similarity is not coincidental, as the "functional tradition" in which Kay Fisker's works are positioned should be understood as a continuation of the local vernacular building culture -as some of HCH's works could have found inspiration- in

combination with a moderate attitude towards the principles of the international Modern Movement.

Besides these analogies, HCH's works also exhibit similarities with a few international examples. The difference is that whereas through conducting an exploration of local journals, as *Arkitekten* and *Arkitektur*, I got an overall impression of the Danish architectural panorama contemporary to HCH, I can't assert the same for identifying associations coming from abroad. As these are relations that I came across rather coincidentally during the investigation, though lack of a structured and indepth exploration. In regards to this, I could have decided to not pinpoint at these sporadic works. However, the concept and open layout of chapter 2 provided with the conditions to include such complementary information, that reveal some global comparisons and might give a hint for further research.

The choice of examining HCH's context through the before mentioned local magazines was decided while trying to find and locate HCH's works through those such same sources. The two Danish magazines offered a comprehensive explanation of the local architecture scenario. The fact that there was no information regarding what kind of context could HCH's works have emerged from or be related to, made it obvious that an intuitive and bottom-up approach was appropriate to identify potential works that could be comparable to HCH's works. And this entails relations that were or were not intended by the architects. Therefore, the decision was to search for relations from building to building, that could be compared within issues of materials, construction, structure and expression.

Once existing information on HCH's works and related context had been collected, the next phase of the investigation focused in the analysis of the works. The problem was how to approach such analyses, and particularly how to embed HCH's built works into a tectonic discussion, what intuitively appeared characteristic of his works. Whereas chapter 2

and 3 aim at presenting the works and its context by reviewing existing information, the objective of chapter 4, Investigations was to analyze the works by utilizing HCH's built works, and the construction drawings, as main information sources. Such approach required the combination of phenomenological and empirical modes of investigation. However, mere observation of the works through self-experience would not convey any insights. There was the need to distill the physicality and integrity of the works into something more manipulative and fragmented, that would also enable comparison across works. Considering such circumstances, HCH's built works have been approached through other mediums than text, such as drawings, photographies and photocollages. From this perspective the methods used in this PhD thesis should be seen as another contribution to an established tradition in the analysis of architecture history. As it has been discussed in chapter 1, Methodological Framework within the XX c. some architects, as Wittkower, Rowe, Eisenman and Hejduk showed an interest in investigating architecture history through drawings. However, their interest was towards issues of composition and proportion. Whereas matters of construction, materials and ornament were deliberately discarded. Their argumentation was that renaissance architecture, such as Palladio Villas, should also be valued for its timeless qualities, basically referring to proportion and composition. Besides that, they claimed that by eliminating matters of style and expression from the discussion, that obviously also refer to material issues, comparison with other architecture works from different periods would also be possible. And they addressed such subject through single line drawings.

Alternatively, this PhD thesis focuses on tectonic issues, that as argued in the introduction chapter under *tectonic matters* deal with the interaction among structure, construction, materials and expression. While it disregards issues of spatial composition and proportion. As explained, such tectonic focus is related with what initially was found distinctive in HCH's works. The selected medium to depict HCH's works, among others, is also single line drawings. However, the character of such drawings is different to the one used by the former architects. Single lines are here connected to the need of detailing materials' and components' formal characteristics and how those are joined together. Whereas the lines of Wittkower, Rowe, Eisenman and Hejduk were merely conceptual, as those referred to the geometry that lay beyond the reality of a built work. Here lines belong to section drawings, and therefore refer to something that physically exist in the building, even though this is not always visible. Another fact is that whereas Wittkower and Rowe used drawing as an analytical tool, Eisenman to some degree but specially Hejduk turned such initial analytical drawing into an interpretative and speculative medium to generate new projects, in connection to their own practice and also as student exercises. However, in this case drawings are mere analytical devices.

The approaches of two other XX c. architects, Evans and Matta-Clark, show some more proximity to the objectives and ways of this PhD thesis. Whereas Evans demonstrates an interest for the concrete, its materiality and issues of phenomenology, in regards to a drawing technique that was used for projecting interiors of baroque architecture, Matta-Clark sheds light on abandoned and unknown buildings that ought to be demolished through direct interaction. It should be noted that Matta-Clark actions of cutting buildings and extracting building fragments emphasizes the discussion about drawing versus built work that was initiated by Evans. He wrote about the significance of drawing in relation to the so recognized architecture built work. Evans claimed that different to sculptors and painters architects dealt with an intermediate medium, the drawing. Therefore the architect's subject of concern was the drawing, and not the built work. Though he made it clear that such drawing should not be valued for its own properties, and how it looked, but for the type of relation it established with the built work. Such believe is challenged by Matta-Clark artistic actions into particular works. Instead of generating a projective drawing, he would act rather directly on-site and produce documentation, basically through photography, in correspondence to the process and final state. The meaning of such documentation was to give continuation to an artistic action and outcome since the building

would soon be demolished. This documentation, that first appeared in subordination to the real action and physicality of the work, would later become the art piece.

Evans and Matta-Clark have raised discussions on the relation between the built and the drawing that are relevant for this PhD thesis. The different mediums utilized to analyze the works, section drawings, a material photo map and photocollages intent to clarify something that already exists in the built works. In this regards, they are not *projective* documents, but have the character of documenting and interpreting something for further analysis. And it is precisely its capacity to establish relations with the built work what should be recognized. However, besides generating knowledge about the works, they also demonstrate to have their own potentials: One, they might reveal issues about the works which were not initially intended. Two, as analytical mediums they could also be applied to other built works.

In addition, Matta-Clark closeness to abandoned built works is comparable to how HCH's works have been approached in this PhD thesis. Though in this case no real action took place, instead there was the need to perform another type of actions without destroying the integrity of the built work. In relation to this, here Matta-Clark 's real cuts are translated into section drawings, that emerge from observation of the work on-site and from the construction drawings. Besides drawing, other mediums were also required, such as photography. However here photos act in representation of material fragments of the built work, whereas Matta-Clark photos often reveal the totality or a big fragment of his actions through photomontage. What differs in Matta-Clark's actions is that he aims at cutting or extracting as part of an artistic practice. Therefore his main goal is to execute the action. However, in order to succeed with such actions he needs to investigate on the type of construction and materials that he will be dealing with to secure a specific way of collapsing. Whereas the objective here is to get some knowledge about tectonic related issues in HCH's works, and section drawings become the medium instead of the purpose.

Moreover, the field of architecture photography has also provided with another medium to look into architecture history. This photographic genre focuses on capturing images of built works with the attempt to document/ interpret and communicate some attributes of the work that might, or might not, be aligned with the architect's will. Regardless this, the image itself always contains some inherent qualities independent to the built work. In this regards, photographies and working process of two XX c. photographers, Stoller and Helmer-Petersen, have been briefly presented and discussed within the framework of this PhD thesis. Helmer-Petersen's photographies that show fragments of the ordinary seem particularly relevant in relation to the character of the photos comprised in one of the three investigations, Crops.

Whereas the subject, methods and techniques of this PhD thesis should be seen in continuity to an established tradition in architecture history, as well as in architecture photography, research processes also show similarities with "art/ design research" methodologies, as it has been briefly introduced in the second part of chapter 1, *Methodological framework*. Such reference was not initially intended, since the employed methods here have been decided intuitively. Therefore, if such "art/ design research" context had been ignored, the choice and unfolding of the three investigations would have not been modified. However, the discussion concerning its development would have been limited. Since getting acquainted with those art/ design methodologies through courses and conferences, and realizing its equivalences, as well as distinctiveness to my own approach has provided support and a relevant field for discussion, that is larger than the architecture milieu.

As explained, the set-up of the three experiments⁶, here addressed as investigations, could be framed within a *program*⁷. Within "research *through* art/ design" methodologies, a *program* acts as an umbrella for

the analytical process and has a more open character than an hypothesis. Considering this, here the program has been described as the following: 1) Built works as main information source, 2) "Transformation" of the built works (on-site) into manipulative and comparable mediums (offsite) 3) and "Repetition" as subject and method of investigation.

And within the premises of such program, the three investigations emerged in connection to the following themes: 1) HCH's enclosures are comprised of different layers, and often a light expressive covering conceals or partly conceals a structural concrete shell (Cuts); HCH's works employ the repetition of five materials, and corresponding formats, within the same work and across works (Crops), which means that a certain continuity, and discontinuity, of materials/ formats can be tracked across works; 3) and similar façade expressions might conceal different construction/ structural systems, and the other way around, distinct expressions might be solved with comparable construction/structural systems (Faults). Somehow, the three themes in close relation to each one of the investigations could be now articulated as three hypothesis or research questions below research question 3 "How to embed HCH's built works into a tectonic discussion?". Although this might seem obvious a posteriori, however it was not possible to foresee before engaging with the analytical process. This is why, within "research through design" hypothesis are often replaced by a program, that should be unfolded through a set of experiments, that can take distinct forms, such as investigations, that should help to further elaborate the program, as well as set up and develop the research questions. The difference here is that the program has remained stable since the beginning. In this way it has helped to frame and give direction to the investigations. Whereas in common, programs keep changing and adapting according to the development of investigations⁸. Another difference is that the program has been here unfolded as one of the first tasks of this PhD thesis, whereas in other cases it is something that has been given to the researcher in advance. And in some cases one same program is provided to different researchers that should develop the investigation from a common point of departure.

The title given to each investigation refers to the result of a conceptual action that has provoked them -cutting, cropping, cracking-. Besides that, it has been argued that such way of working from the specifics of materials is known as "material thinking"⁹. This means that knowledge emerges from interacting with those materials, in this case a set of investigations. And such notion of "material thinking" has been contextualized within Heidegger's idea of "handling"¹⁰. He claims that it is through the use of tools that we gain knowledge on something, as opposite to contemplative knowledge. Somehow, such idea of performing an action through a tool and therefore developing a technique -this is how you get to know such tool and its potentials- explains the overall character of the three names.

Even though, as described above, the three investigations grow from the specifics of HCH's works, they are probably easy to translate when dealing with another set of architecture works. It might not be possible to exactly replicate them, though they provide with a methodological basis to start with. As defined by "The Community for Artistic and Architectural Research (Ca2Re)", experiments offer with a technique/s to explicate and interpret something¹¹. In this case, investigations could be seen as methods, and specifically techniques, that employ known architecture tools, as photos and drawings, to depict architecture works: Cuts, replicates a very common technique of performing conceptual cuts of a facade to deliver a combination of detailed and comprehensive information on construction, material formats and dimensions, and how things have been put together. Whereas Crops and Faults suggest a different way to investigate a building. Even though the tool, photography, is common within architecture, however the way to use it here is different. Crops contributes with a technique to find out material continuities (and discontinuities). Such knowledge can be extracted from the visual and self-explanatory character of the investigation Crops where photos are placed according to two different axis (y= HCH's works and x= five materials and related formats organized in relation to structural and non-structural implications). However, beyond such visual information, the reader is encouraged to speculate on other insights. In a similar way, *Faults* procures with a technique to juxtapose two comparable works or fragments of works and get to know about materials, rhythms and compositions to incite a discussion. Also in this case, anyone can perceive this information by looking at the series of photocollages. However, such images have been mounted on the basis of some knowledge that might not be straight forward visible. Since, it is the result of having been interacting with the material for a long time, plus the knowledge gained through the two previous investigations, *cuts* and *crops*, that generates such series of photocollages, and offer a summarizing perspective of the analysis phase.

Therefore, investigations, specially Crops and Faults, perform in two levels: One, what is communicated through their self-explanatory character. And two, what lays beyond its visual outcome. The former, is already explained through the visual character of each investigation. Thus, it is not verbally replicated in the PhD thesis. Instead, investigations as such are included in this PhD thesis, with minor format adjustments. In this regards, it could have been decided to place the three investigations as an annex to the written parts of the PhD thesis, by emphasizing the different character of the two elements. Though, a twofold format has precisely been avoided. Alternatively, the attempt has been to treat each part, text and images, within the same framework. As a way to advocate for other exploratory and explanatory mediums that are common and rather unique within the architecture discipline. And in this case, it appeared obvious to consider the framework of a book, or an alternative book format. As explained in the introduction chapter, Beyond a traditional monography, and analogous to methods and subject, format should also be situated and challenge a traditional monography.

Even though a writing that overrides the self-expressiveness of the investigations is not provided, chapter 5, *An interpretative and analytical approach*, aims at describing the development of each investigation in regards to methods, techniques and tools. In addition, this chapter intents

at discussing such investigations within other approaches intrinsic in architecture and artistic practices, as well as science studies within the field of philosophy. However, it is not written as a diary. Alternatively, it is a kind of recipe that aims at showing transparency of the process and providing guidelines in case those investigations should be adapted to another set of works. This chapter is structured with two first sub-chapters, such as "Transformation" and "Repetition" that unfold the *program* or framing of the specific investigations. Following this, the three investigations as *Cuts*, *Crops* and *Faults* are depicted, and finally there is a brief introduction to the following two chapters.

HCH's works location and accessibility, made it easy to visit the works several times. However, in order to analyze them, one should be able to fragment such entity into smaller parts, take some distance from a first impression on-site, as well as be able to see relations across works and compare them. Therefore, it was obvious that the physicality of the works ought to be transformed into something manipulative. Such necessity has been contextualized within Latour's notion of "transportation". And naturally "transportation" implies "transformation"¹². And following Latour's claim, even though detaching something from its own context already provokes a considerable transformation, however there should be as minimal deformation of data as possible¹³. And such mindset, of not modifying data unless it was appropriate and well-argued, has been consistent throughout the analysis and interpretation of this PhD thesis.

In this regards, by taking photos of a built work, the first transformation that one experiences is related to seeing the entire work through a small lenses. Suddenly, the entire complexity of a building is turned off, since only a small part is in focus. This fact makes it easier to select and collect materials on-site. The second transformation is that once off-site, such collected fragments can be printed out and therefore achieve another materiality and scale that is easier to interact with. Third, photos succeed in revealing tectonic matters that were not possible to distinguish while being on-site. And fourth, obviously photos show what is exposed, though also insinuate something that exists beyond the visible, that emerges through persistent observation. All this process of being at the building, collecting fragments through photos, and transporting them off-site shows relevant connections to how Latour describes a group of botanists collecting earth samples at the amazon forest. This is precisely the example he uses to discuss the notions of "transportation" and "transformation". Though there is an important difference: Whereas in this case the way of moving around the building was decided by intuition and driven by curiosity and motivation, Latour's botanists employed a more systematic way based on setting up two axes on the ground and extracting samples according to the spatial definition of X and Y.

While the notions of "transportation" and "transformation" framed the first and more unstructured phase of the analysis, the concept of "repetition" framed the following steps and define the first two investigations as *Cuts* and *Crops*: Most of HCH's works are built with an enclosure that consists of different layers. And the inside layer shows a very distinct expression to the outside one. Besides that, a limited amount of material types and formats are used within one work and across works. Accordingly, *Cuts* and *Crops* emerge from these two characteristics. Whereas *Faults* attempts at summarizing the findings of *Cuts* and *Crops*. Besides defining a framework for the investigations, such repetitive features also inspired a way to proceed with the analyzes of the different works: A repetitive methodological approach that is consistent across works regardless its program, location and size.

Regarding the layered character of the enclosures a series of section drawings seemed appropriate to discover the relation between the exposed and the concealed, besides non-structural and structural parts. Such section drawings should be positioned in the horizontal development of the enclosure, to show issues of rhythm, and also in the vertical development, usually divided into base, body and top. However, a few buildings, show a different type of enclosures. In this case the structural part and the thin covering are reorganized as a heavy base and a light extended roof. And in these one story buildings the relation between the enclosure and the roof is not possible to be divided, as one shows in continuity to the other. Therefore, in Ringbo and Brøndbylund Psychiatric Hospitals and in Næastved Chapel sections include both enclosure and roof. Hanssted School is also approached in such arrangement since it shows features of both types: The building is comprised of two stories, enclosure is constituted through layers, and roof becomes a continuation of the enclosure, particularly from the interior.

Section drawings have been developed as detailed drawings according to describing properties of materials and elements and specially the making of joints. Besides that they should contain the full length/ height, or a significant fragment of the enclosure, in order to address issues of modulation, rhythm and seriality. Drawings have been constructed according to the following information sources: My memory from being at the building, what collected photos revealed once off-site and examination of construction drawings. Even though construction drawings would often provide with plans, sections, elevations and details of the works, the act of redrawing seemed crucial as a way to induce doubt. In addition, the attitude of redrawing is more active than the one of reading, since one is required to continuously ask questions and compare information among different sources. Besides that, the intention was to establish a comparison among works in order to track certain developments in HCH's oeuvre. In regards to this, if we recognize that construction drawings had been drawn by different hands, in different times and circumstances, redrawing was considered appropriate.

In general, construction drawings reaffirmed what had been observed onsite. However, a few times inconsistencies between drawings and built works were found. The two cases described in chapter 5 dive into some building details which are more about the subject than the method of investigation. However, it seemed relevant to expose such intricate process in order to argue that during the analytical process all sources (constructions drawings and the built reality) and different building stages (the original project and later transformations) have been taken into account to better approximate the logic beyond HCH's works. Finally, long section drawings have been folded in the PhD thesis as a sequence of drawings chronologically organized. Those are bind into two groups regarding horizontal and vertical sections, that should emphasize the relevance of reading continuities and discontinuities across works as a development process in HCH's oeuvre.

After some tests, it was decided to print the line based section drawings on a brownish paper that comes in a 60 cm roll format and has a weight of about 60 GSM. First, the intention was to use a manifold paper roll of 60 cm width. Its transparency would have insinuated the drawing below and revealed certain continuities across works' enclosures, as argued above. Another argumentation is that in the old times, this type of architecture technical drawings were often drawn by hand on this type of paper. Its lightweight character made it possible to trace drawings from sheet to sheet. This process of copying enabled to develop the project and make changes without having to redraw everything from the beginning. However, in this case the use of manifold paper was not an option since the paper kept breaking during the printing process. Therefore, brown paper roll, that is usually employed as a cheap ordinary paper for wrapping, was considered instead. Besides that, the dimension of such section drawings, long and narrow, fitted well with the 60 cm width of the roll, and this would make the entire process of printing and cutting more efficient. Hopefully, the reading of black line drawings on a light brown background should not disturb the reading. Therefore, the choice of a brown paper shows an attempt to indicate some references to the old manifold and also responds to some practicalities.

Crops, the next investigation that started in parallel to Cuts, aimed at organizing the large amount of photos and intended to find some logic within and across works. In difference to Cuts, that was using a well-known architecture tool and technique for a specific purpose, in this case the objective and process were very uncertain. Intuitively, some of the photos were printed in a small card format and put together in long leporellos according to some categories, that got inspiration from Koolhass' Fundamentals exhibited at the 14th Venice Biennale¹⁴. However, the different building elements suggested by Koolhaas would not all fit into HCH's works' fragments exhibited through the collected photographies. Therefore, those categories had to be adjusted to HCH's works' characteristics and finally defined as the following: Façade generator, window, door, base, top, brise soleil, balcony, corner, skylight, joint/ detail, water drain, lamp, ventilation, chimney, clock, cladding and stairs.

Though, still such categories seemed not coherent, as they referred to materials, elements, rhythms and ways to ordering enclosures. According to this, an effort was made to organize such photos into the minimum physical units comprised in a built work, such as materials. This seemed especially relevant in HCH's works since it was already possible to foresee certain material continuities and discontinuities across works. Besides that some materials showed an evolution based on its different formats, such as reinforce in-situ concrete becoming concrete blocks and after prefabricated concrete elements. In addition, similar types of construction were addressed through different materials and adjusted according to distinct material properties and techniques embedded in those materials¹⁵. Thus, an understanding through material types and formats, besides its structural implications or not, seemed essential in order to find some logic. According to this Crops ended up in five basic materials: Wood, Ceramic, Concrete, Eternit (fiber cement panels) and Metal. Glass was discarded since it would not provide any relevant insights¹⁶. Besides that, invisible materials were also discarded according to the tectonic focus of this investigation, seen as how certain materials, construction and structure interact and become exposed; and considering that photos, as the medium used in Crops, only capture what is visible. Thus, subcategories to materials were defined by the following nomenclature: material type, structural/ nonstructural implications, material format and situation/function at the building. In addition, different to Cuts, the façade

delimitation did not make sense here, since material iterations were also found in other building elements.

Finding materials though photos and positioning them into those five categories and sub-categories was not a systematic procedure. First, it was difficult to navigate through the large amount of photos, and second it could not be proved that all existing materials of the built reality would have been collected. The way to proceed was either finding a material that was represented in one photo, or imagining what structural or construction element was missing and therefore looking for it among photos, that sometimes required to take new photos. Besides dialoguing with the photos, the whole process also took advantage of the information revealed in the construction drawings. In any case, the researcher is forced to read beyond the mere images, as often a photo tells a bit more than what is exhibited at the images and acts as a "trace" of what it represents¹⁷.

Besides that, photos often exposed more than one material. Since obviously a building fragment is composed of different materials that interact together. In this regards, one of the tasks consisted in cropping the photo in order to point at that one specific material. However, such cropping should not isolate the material, since the intention was to show the one material in interaction with the rest. This is argued in terms of how HCH would use such rather short list of materials within several works. Even though he repeats materials inside the same building and across building, he uses them within different configurations, and also gives them different functional and construction purposes. In this regards, exposing one material within different compositions was crucial¹⁸.

Because of the bottom-up process of Crops, the accurate photo of one material format was often missing¹⁹. This is because most photos were taken before the decision about a five material classification was made. However, it was consciously decided to keep the imperfection of photos in order to maintain the inductive character of the approach in the visual

outcome of the investigation. Besides that, while taking photos there was an interest in showing the building as it was, "as found"²⁰, with issues of decay, in use and modified through time. Therefore, intentionally²¹ the photos show a certain aesthetics that refers to the 'snapshot aesthetics'.

As already introduced, Bruno Latour's "Circulating Reference"22 chapter in the book Pandora's Hope. Essays on the Reality of Science provides a theoretical framework to contextualize Crops. He argues that through the "transportation" and "transformation" process of an investigation, and through measuring and sampling, we lose "locality, particularity, materiality, multiplicity, and continuity" but we gain "compatibility, standardization, text, calculation, circulation, and relative universality". That is exactly one of the focus of such investigation, to have a comprehensive vision across works, as the logic of an architect's oeuvre reaches wider than the limits of one building. The difference is that Latour's botanists extracted earth samples that were forethought selected and precisely cut on-site, whereas Crops acted a bit more randomly on-site and did most of the structured reasoning and reflection once off-site, as for the act of cropping, or discarding relevant information of each photo. Besides that, here the format and layout of such investigation has changed throughout its development, from booklets to maps, subject to different conditions. Finally, what is attached at the PhD thesis is a folded version of a digital material map.

Distinct to the two previous investigations, *Faults* has a summarizing and representative character. The insights gained through *Cuts* and *Faults* are combined into a series of photocollages that juxtapose two fragments of two of HCH's works. Photos contain enclosure parts as well as other parts of the buildings. Chosen fragments are comparable to each other in means of expression, construction, structure and materials. As described and exemplified in chapter 5 situations are diverse, either by addressing some kind of continuity between the two fragments, that shows a straight forward result among matters of expression, construction, structure and

materials; or by displaying a contradiction, or more intricate connections between the above mentioned matters.

Faults started with the outcome of Crops and Faults. After this, and according to what has been explained above, two comparable fragments of works were decided. And two matching photos were selected and juxtaposed. If needed, those were digitally manipulated in means of frame, dimension, perspective and scale. However, the joint and division line between the two parts was always emphasized by displacing the photos' contours. Such gesture should clarify the nature of the image, a photocollage, as well as it should reveal continuities and discontinuities between the two sides. Besides that, it relates to the term *Faults* that takes inspiration from the formation and result of geological faults. However, in this case the fault line has been artificially generated, whereas a geological fault reveals continuities and discontinuities between two parts that were initially physically together. The investigation *Faults* has been mounted as a leporello in order to encourage the reader also to find relations across the different juxtapositions.

The three investigations demonstrate that HCH had an expertise in practices that can be defined within tectonic matters. However his approach does not probably emerge from a knowledge on tectonic theories, but from an interest in building and the process of its materialization²³, that most likely relates to his educational background as a carpenter before his architectural studies. In this regards, HCH's practice-based field of knowledge is aligned with the bottom-up methodological approach of this PhD thesis. As it has been argued, it is through the analysis of a set of built works, that uses architecture based tools as drawing and photography, that certain tectonic features emerge. According to this, the believe is that works become the focus point where the architect's intentions and the researchers analysis meet. Although we don't know about HCH's intentions through a statement, or a sketchbook that embraces his ideas on architecture, such claim should not be seen as mere speculation. Throughout the analytical process it has been the

researcher's intention to let the works' features speak by themselves. Whereas the interpretative role has been based on evidence that is argued through what exists in the works and construction drawings. In addition, the chosen focus should not suggest that works should be uniquely understood through such tectonic lenses, as other potential interpretations might be embedded in the works' logic.

The intention and character of each investigation was set up according to a framing or *program* defined in connection to HCH's works. However, besides proving its objective, such investigations also shed light on other features of the works situated within the notion of tectonics. In this way, each investigation functions as a tool, that not only is applicable to HCH's works, but should also be appropriate to investigate other works that reveal some tectonic interest, specially comprised in the enclosures.

When applied to HCH's works, what is possible to deduct beyond the visual character the investigations is unfolded in chapters 6, Fragility and Robustness: The tectonics of facades' layerings, and chapter 7, Frameworks and Ready-mades: The tectonics of facades coverings. Such insights are put together and discussed with 1) some knowledge presented in chapter 2, A Chronology, under the column Contextualization; 2) chapter 3, Hans Chr. Hansen's footprints, concerning information deduced from construction drawings; and 3) some relevant theories and practices related to the notion of tectonics. Theories on tectonics are used here to discuss HCH's features, but also to better comprehend the abstract character of such theories.

Chapter 6 aims at interpreting, discussing and contextualizing the layered character of HCH's enclosures, with a focus on the structural reinforced insitu concrete part. At first sight, we could think that such layered feature - a reinforced in-situ concrete core covered with a layer of lighter materialswas directly connected with the design of a series of Transformer Stations. However, we already see the first signs of such way of building and the use of concrete in two earlier social works, Skydebanehaven Daycare and Hanssted School. In addition, the attempt to cover materials is not something common from the postwar architecture, on the contrary. At that time, coverings, if any, would be reduced to a layer of plaster/ paint. And this in general would not be considered a covering. However, Wigley claims that such thin -white- coating should also be seen as a dressing; though a type that negates ornamentation and is designed in relation to the "modern man"²⁴.

However, there is another type of modernity, which is not comprised of facades painted white, and other colors, that we should refer to when considering HCH's enclosures. According to Wilson, this is an "organic" and "durable" architecture that should "grow from within", in relation to site conditions and people inhabiting it²⁵. Even though HCH's enclosures also emerge from its internal needs, however their constitution and expression only partly reveals the program beneath them. Most of HCH's enclosures unique and intriguing. And from today's perspective, the fact of concealing something with an elaborated covering might even rise some controversy. Since criticism would claim that whatever material is used should be visible and part of the building's expression.

Moreover, HCH's enclosures seem to mediate between the notions of "fantasy" and "honesty", as described by Sennett²⁶. Though we should not attempt to interpret "honesty" -understood as what is technically neededin correlation with the structural concrete element, and "fantasy" - understood as what is technically superfluous- in connection to the covering. HCH's way of designing is more complex and understands both elements, structure and covering, from an holistic perspective. It is such interplay, between structural and non-structural elements, that engage with the ideas of "honesty" and "fantasy" indistinguishable, and makes his works unique.

In regards to the idea of covering, HCH's layered enclosures should be discussed within architecture theories and works that emerged during XIX

c. and the beginning of the XX c. In particular Semper's theories, that consider the spatial enclosure as the true essence of architecture and the structural elements are subordination to it^{27} , and its influence in the works of Loos's and Otto Wagner, as stated by Frampton²⁸. Semper, as one of the major representatives of that time, claims that hanging textiles provided with the first examples of walls. Those early textile elements to divide and create spaces, and configure a home, would develop into other materials, initially constituted through imitation of those embroideries, though constructed through different techniques²⁹. Furthermore, Semper relates the logic of ornamental motives with the materials themselves and the process of weaving to produce mats, seeing the knot as its minor constituent³⁰. Such knot would later develop into a joint. Besides this, mats' motives would also represent cultural rituals and believes of that time³¹. However Semper's position is a bit doubtful or evolving through time. Initially he claimed that decorative forms and colors of mats would depended on its materials and production process³². Whereas later he would write that it should not be totally necessary that material logic is explicit within the expression. He even comments on the need of denying the reality of such materials, and therefore alludes to the dissimulating effect or masking of materials, not only of the structural element beneath, but in relation to the mat itself³³. Such idea of masking, referring to insinuating and camouflaging, though not totally covering, is defined by Semper as Bekleidung³⁴ and translated to English as dressing, which differs from mere cladding. Besides that, dressing alludes to clothes and therefore establishes a link with its origins, the hanging mats.

Semper would further elaborate on his ideas on structure and dressing, through the notions of stereotomics and tectonics. Stereotomics referring to the technical-structural and built of stone and brick, and tectonics relating to the functional-formal and made of frames, lattices and supports. Kenneth Frampton would later develop these two concepts by relating tectonics to dematerialization and ethereal and stereotomics to mass and ground³⁵.

Besides such tectonic framework, we should also position HCH's works within discussions regarding the concept of the "free-façade". At the beginning of the XX c. the appearance of new technologies made possible the separation of structure and skin in buildings. It should be pointed that most of HCH's works are not showing an enclosure free of structure, on the contrary, this is one of his works' characteristics. However, the overall discussion on the "free-façade" is still relevant. Facing that new situation, architects would have to manoeuvre among new material and construction possibilities, as in-situ concrete, together with cultural, economical and traditional values. The question then is in what way such new technologies would have affected the expression of a building. In this regards, HCH uses the strategy of coverings as dressings, which not only pursue expression, but also deal with construction matters as it is exposed in chapter 7.

Among other subjects, Leatherbarrow and Mostafavi, have unfolded the condition of new technologies versus culture and tradition through different arguments and examples³⁶. Though it is precisely the architecture works of the American architect Albert kahn what procures with a meaningful case here. Together with his brother, as engineer, they pioneered the use of reinforced in-situ concrete for industrial facilities. Besides that, they were also in charge of other types of buildings as, schools, churches and residences. These two categories radically differ in program as well as in expression. Whereas the first ones would take advantage and honestly express the use of new materials and construction systems on the façade, the last ones would conceal the use of new technologies by showing an enclosure built of conventional motives. Regarding this, HCH was also one of the first Danish architects to use reinforced in-situ concrete, though the believe is that he always considered the interrelation of production and expression. And like the Kahn brothers, he was also in charge of industrial facilities and social types of buildings. Though alternatively, HCH would avoid seeing them as a duality. On the contrary, through the design of industrial facilities, buildings for non-humane use, HCH practiced with a rather autonomous enclosure,

that would act as a mediating element between human and nonhumane conditions- an approachable exterior and a protected interior. And to another degree, such feature is always present at his social works.

Following a brief contextualization on tectonic theory and on the origins of the "free-façade" the purpose of chapter 6 is to interpret HCH's works with a focus on the use of concrete as a structural element. Furthermore, and following Semper's claim, the purpose is to unfold why would HCH select concrete in order to be covered. Argumentations are organized into five categories and within them buildings are discussed in chronological order.

The first category assumes that HCH was part of a certain culture that, as mentioned by Faber, and referring to the city architect's office, "worked honestly and without prejudice with reinforced in-situ concrete"³⁷. Built examples and comparisons to HCH's works are provided in order to show a potential influence. And those are in more detailed described in chapter 2.

The second category considers that reinforced in-situ concrete offered HCH more structural flexibility -compared to wood and brick- especially when dealing with different structural directions, and this would translate to larger fenestrations. Two buildings are argued here: Skydebanehaven Daycare and Hanssted School. In both cases there is a mix of traditional loadbearing brick enclosures/ partitions and loadbearing concrete enclosures. And the choice between concrete or brick seems to relate to structure and program requirements. However, enclosures, built of different materials, are rather similar in expression. It is only a few subtle nuances that reveal construction and material differences concealed beneath a similar covering.

The third category reckons that reinforced in-situ concrete would provide a resistant shell for designing technical facilities as transformer stations. Besides this, HCH would optimize performance according to geometry, through profiled surfaces and inclined walls. HCH's five transformer stations -Nyborggade, Bellahøj, Amager, Bremerholm and Svanemølleare argued here.

The forth category assumes that the design of technical facilities influenced the design of HCH's social works, as Tagensbo Church and Gasværksvejens School. Tagensbo Church shows a profiled structure, however only exposed in the interior side of the enclosure. Exceptionally in this case, HCH replicates the type of structure with non-loadbearing prefabricated concrete ribs shown on the outside part of the enclosure. Thus, here covering does not act as a dressing, with its own material and construction logic, but replicates the character of the structural profiled shell beyond it. Gasværksvejens School is built with the combination of prefabricated structural elements, coincident with partition walls, and a rhythm of slender concrete pillars aligned with the enclosure. The school was an attempt to use a repeatable type of building in order to build fast and cheap schools in Denmark. HCH puts his signature by designing very elaborated facades that makes it difficult to distinguish the systematized nature of such project. In this regards, one could claim that HCH's attitude is similar to approaching the design of transformer stations, that show strong program requirements, yet autonomous elaborated facades.

The fifth and last category includes single story buildings. The believe is that in those cases HCH reorganizes the robust structural element and light covering comprised in the building's enclosures, and typical of his other works, as a heavy base and a light roof. Such scheme is employed in Ringbo and Brøndbylund Psychiatric Hospitals, Næstved Church and the Gas Pressure Regulator next to Bellahøj. The first two Psychiatric Hospitals show a similar structural principle, though Brøndbylund employs prefabricated concrete elements and therefore has a more rigid character. In both cases HCH liberates the enclosures from any structural purpose, instead structure is coincident with interior brick walls, which is unique of these type of buildings. The enclosure of Næstved Church is built of profiled brick walls, visible in the interior side. Most brick pillars conceal an in-situ concrete core -only noted through drawings and a singular solution of this building- that respond to lateral forces provoked by the wind, as well as the forces generated by the trusses resting on them. The Gas Pressure Regulator is a very small construction designed with four insitu concrete exposed tilted walls, and a light covering.

The last part of chapter 6 discusses some potential reasons in relation to the covering a concrete wall. This is achieved through comparison between HCH's way of working and the first uses of reinforced in-situ concrete, before the modern era. Besides that, these last paragraphs should provide with a transition to chapter 7, which deals with HCH's coverings' features.

According to Saint³⁸, the first use of concrete, that dates from the beginning of XIX c. and the need to cover it, in disagreement with the ideals of modernism, responded to protection against weather conditions, concrete aesthetic tractability and the lack of something better³⁹. It is assumed that HCH also covers concrete to protect the thin structural layer, though he does not choose it because there is nothing better. On the contrary, he decides on concrete since it is probably the best material to be covered, besides offering better structural possibilities according to program demands. Moreover, HCH does not totally conceal concrete, since he continually insinuates its presence. It is such interaction, between covering and structure, what is characteristic of HCH's works. In this regards, HCH's coverings show coherence with what Semper described through the notions of dressing and masking.

Saint also states that concrete would offer flexibility of plan, while still allowing the use of elegant covering materials for the enclosure, such as stone, that would perform in continuity to nearby traditional buildings⁴⁰. Instead of a stone type of covering, HCH used cheap and ordinary materials as wood, Eternit and ceramic. Exceptionally, he uses an expensive metal, such as bronze, in one of the transformer stations in relation to its context. Wood, Eternit and ceramic are rather cheap materials that react to environmental conditions. Although not as durable as stone, however cheap, easy and fast to replace and disassemble. Such properties are taken into account in the construction process as well as considered within the expression of the building. Besides that, HCH's coverings also fit into the context, though not through replication or extension of the existing, as explained by Saint, but through a larger awareness of the idea of context that goes beyond mere copying. This way of designing, that entails material, construction and environmental awareness, is known through "tectonic thinking"⁴¹.

Chapter 7, Frameworks and Ready-mades: The tectonics of facades coverings, aims at interpreting, discussing and contextualizing HCH's coverings. Here argumentations derive from the findings in chapter 4, *Investigations*, together with the construction drawings presented in chapter 3, Hans Chr. Hansen footprint.

First, it is argued that HCH's coverings are comprised of a continuous background in which different industrialized components are integrated. Background provides some kind or order to a variety of components to be included. Conceptually this is put in the context of Norberg-Schulz idea of landscape through the notions of "order" (landscape- background) and "variation" (settlements- figures)⁴². However HCH's coverings display a rather homogenized expression of both systems, in difference to Norberg-Schulz claim for clarity between background and figures⁴³. The believe is that HCH expertise on putting things together, through elaborated joints, succeeds in merging backgrounds and components into a well-integrated covering.

Another distinction between the two systems is that backgrounds are constructed on-site, whereas components are elements produced offsite. This positions HCH's coverings in the transition of craftmanship and industrialization. The type of craftmanship embedded in the construction of backgrounds -materials that should be manipulated, cut, folded or joined together on-site- is seen in connection to the idea of the "balloonframe", that dates from the beginning of the XVIII c.

Though one typical problem of industrialization is its fragmented character given by the assembly of prefabricated components. In general, this challenges the so called harmony among parts and whole common from classic architecture. In this regards, Bundgaard explains that such fragmented condition is natural⁴⁴ and she relates it to the notion of *montage*⁴⁵ in art. Another view into fragmentation, provided by Sánchez Vibæk, is that we should at least consider two languages in order to ensure a good relation between whole and parts⁴⁶. Besides that, and from a theoretical perspective, fragmentation is tackled from the theory of *social assemblage* suggested by DeLanda. He suggests an alternative understanding of the relation between parts and wholes through the concept of *relations of exteriority*, in which parts embrace certain autonomy in relation to other parts and the whole⁴⁷.

HCH's coverings also include prefabricated components, though both parts (components) and a whole (background) are well-integrated, in difference to Bundgaard's claim, and made of more than two languages, according to Sánchez Vibæk. Besides that, components (parts) maintain certain properties within the background (whole), making it proper to be used within different backgrounds, as explained by DeLanda. Ordinary building components, easy to find in the Danish context as doors, windows, pipes, gutters and ventilation gadgets, are detached from their known context and rearranged within HCH's backgrounds, similar to *ready-mades*. Whereas backgrounds are recognized as *frameworks*, materially in relation to the origins of *framing* construction and conceptually in correspondence to the notion of *open infrastructures*, introduced by Yona Friedman⁴⁸.

Another characteristic of HCH's coverings is that they embed repetition, variation and flexibility. As explained by Bundgaard, industrialization and mass-production was in its origins connected with repetition,

standardization and equality. However this has changed and today industrialization also offers individuality and flexibility⁴⁹. In this regards, HCH's coverings are far from mass-customization. His works deal with flexibility and identity, though through repetition, rhythm, scale and variation. Rhythm is created according to a set of design conditions, but not directly provided by materials' and components' original dimensions. HCH manipulates materials' dimensions, even though not always explicitly, in order to pursue a certain result. And often he does so by dividing materials/ components into smaller fragments to deal with a smaller scale. According to this, we assume that the designs of coverings, and specially the need to scale them down, take into account the following conditions: 1) Recognition of the context through a) a focus on the human scale -concerning tactility and visual perception- as introduced by Beim and Frier Hvejsel through the notion of "urban tectonic"⁵⁰; b) the surrounding built and c) environmental conditions; 2) achievement of more flexibility to decide upon the position of readymades within frameworks. Which leads to possibilities of better adjustment among different building situations, conditions and components; and 3) potentiality to extend/ transform/ maintain buildings (e.g. due to weathering, and program requirements), resulting in coverings' modifications through time, which become easier to execute and better integrated when dealing with small parts.

Whereas what is mentioned above corresponds to the horizontal development of HCH's coverings, "order" seen as the classic division among base, body and entablature comprises the vertical development of coverings. Though, in this case it is considered a rather abstract idea of the classic, that relays on a harmonious relation among parts, other than the use of decorative elements of the ancient world, as described by Summerson⁵¹. Besides that, such tripartite arrangement of parts has also been argued through other perspectives as construction requirements, context and human perception.

As mentioned before, HCH's coverings expose integrated ready-mades and frameworks. The assumption is that, besides other factors, this is specially possible through well-developed joints, or details. It has been argued through Marco Frascari's double notion of "construing" and "construction"⁵² that a detail is not always a joint, since it can also perform as a fake joint. Though a joint is always a detail. And therefore we can state that in most cases HCH's coverings provide with joints that perform as details. In addition, we should further discuss the honesty and truth of joints through Mies' view on detailing, as suggested by Till and Wigglesworth. They claim that in Mies case the construction of a detail is subordinated, even contradicted, to the achievement of a certain aesthetic of simplicity and representation of technology, such as less material and leaner structures⁵³. In opposition to Mies' type of details, Till and Wigglesworth ask for "other details"⁵⁴ not constrained within aesthetic values. They argue that the range of accepted materials in detailing is limited to recognized materials or materials coming from other technologies. However, vernacular, do-it-yourself and mass-produced materials are excluded and therefore considered "outsiders" 55.

Relevant for HCH's works detailing are the works of the French architects Lacaton & Vassal. Bundgaard explains that they use industrially produced products and slightly modify them in order to adjust them to new requirements, such as programs, similar to a "ready-made" or "objet trouvé"⁵⁶. These products are provided with their own type of detailing. However there is another type of detail to consider, that is between readymades and the rest of the system, and demands the architects' skills. In this regards, Lacaton & Vassal extend the raw and industrial character of the taken product to the rest of the design, and they adopt the same attitude with the detailing. The result shows a unified system that tries not to display the differences between both parts⁵⁷. In a comparable manner, HCH's detailing is key in order to integrate ready-mades -windows, doors, ventilation gadgets, drains and gutters- and frameworks. HCH, besides adjusting detailing to the ordinary and rough character of ready-mades, similar to Lacaton & Vassal, employs modulation and rhythm to merge both elements, ready-mades and frameworks, within one whole covering. HCH's joints are 1) crude 2) and extremely elaborated in relation to 1) chosen materials -often cheap and ordinary- and 2) because of proving full correspondence between "construction" and "construing", as defined by Frascari. In addition, HCH's intricate detailing is based on skilled craftmanship, instead of high technology. This, according to Till and Wigglesworth, would situate HCH's details to the category of "outsiders"⁵⁸. However, in the last years such idea seems to start reversing.

Another significant detailing example is provided by the works of Wagner, as described by Quintela⁵⁹. Like HCH, he also worked in a public institution and was involved with the design of the new railway system in Vienna. By designing metro stations and bridges he got to investigate on metal fixings to join metal frameworks and walls. Such joints would somehow influence the design of other later works. Specially relevant is the Post Office building: 1) Wagner shows an awareness on time and construction processes, and therefore also economy: Aluminum bolds, are left as permanent ornament on the façade, even though they were primarily thought as temporarily to accelerate the building process -drying time of mortar⁶⁰; 2) he reveals the character of the enclosure by showing the depth of the covering materials exposed – particularly at corner situations; 3) he is aware of material performance and waste and how this can become an ornamental feature of the façade -granite stones show a curved profile and increase depth at the fixing area to avoid collapseand 4) he takes into account economy and rationality - alternatively to surrounding buildings built of massive stone walls, Wagner's enclosure consist of brick loadbearing walls covered with a thin layer of granite stone. All these characteristics, demonstrate that the Post Office building adopts Semper's theories on the notion of dressing, masking and the knot, or joint, as the minimum unit of signification.

Most of HCH's works are definitively aligned with the different features of the Post Office building explained above. Even though it is not possible to know if HCH was aware of Semper's theories, however it has already been argued that Wagner translated into practice some of Semper's theories. Therefore, we could say that by depicting one of Wagner's works and proving its connection to Semper's theories and its similarities to HCH's works, we somehow demonstrate that Semper's theories are also relevant to look into HCH's works, regardless if this was HCH's intention or not.

HCH's works particularities are finally interpreted by using some of the theories and practices explained above. Compared to chapter 6, in this case works have not been classified into categories. This is because distinct topics repeat and iterate across works and it is not possible to find a pattern that groups works into different types of coverings. Besides that, in this case building decisions can be argued through several interrelated themes, as context, construction, expression, perception, etc. Thus , it makes it difficult to isolate some of those features into different categories. Therefore, it was decided to approach works basically by following its chronological order of development, unless Ringbo and Brøndbylund Psychiatric Hospitals, that show a distinct type of layerings to the rest.

Even though HCH's first brick social works are not comprised of a layered façade, however those already show an awareness towards the human scale and context issues, specially environmental conditions, that will later further develop as part of the coverings. First, this is manifested through the pergola elements defining the access points in Nørrebro Vænge housing Blocks. And a few years later, in Hulgårds Plads, he approaches such condition through different design strategies: The design of balconies that are similar to niches; the singular volume of a daycare making a smooth transition between the two blocks placed in a sharp angle; and a small variety of building components, such as balconies, doors and windows, that combined in different ways according to contextual issues provide with four variations of brick enclosures. Both buildings show long facades, though HCH demonstrates skills to break down such endless planes into smaller fragments, either through rhythm or by adding volumes that connect to the human scale.

Skydebanhevan Childcare reveals HCH's first signs of a layered façade. The north façade, even though constructed as a traditional plastered brick façade displays a wooden espalier that partly covers it. Probably, this is one of the few details in HCH's works, that does not act as a real material joint, as claimed by Frascari. Whereas the south façade, according to program needs and context conditions, changes for an insitu concrete framework. In both enclosures there are several elements that add tactility and consider the visual perception of the facades. This is basically achieved through the repetition of one material format, wooden battens displayed in different ways and performing as different architecture elements.

HCH's next work, Hanssted School, translates the character of the wooden espalier from Skydebanehaven Daycare into an active element that joints together Eternit panels. Here HCH intentionally divides such prefabricated Eternit panels into smaller parts to achieve more flexibility within the design process, besides addressing perceptive matters. However, he splits them efficiently, showing an awareness towards material waste. Moreover, the two wings of the school show very similar enclosures, though some subtle differences reveal a totally different construction method. Whereas one wing is built as a loadbearing in-situ concrete shell, the other one is built as a non-loadbearing wall, and the structure is coincident with the partitions between class-rooms. Indeed, this is not a random decision, but a response to program requirements. A similar design strategy is also visible in the design of accesses. Even though they appear as almost the same in the two long wings, they contain two different types of staircases. Besides that, in regards to context, Hanssted School appears as an extension of the surrounding row houses, in terms of scale and composition. However, such continuity is achieved through very different materials and construction techniques.

Nyborggade Transformer station is the first technical facility designed by HCH. It is designed as a profiled in-situ concrete structural shell covered with brick. Besides protecting the thin layer of concrete, such brick layer proves HCH interest to approximate the residential character of the close context. In addition, the choice of a variation of brick tonalities might be related to using some excess of material. Another ornamental feature that shows a construction intention is the round holes delicately positioned along the vertical concrete ribs, that refer to the fastening of the formwork panels. As explained, whereas the horizontal development of the facades show repetition and rhythm, provided by sequences of brick and concrete, the vertical development shows a tripartite composition. Here HCH clearly demonstrates an awareness of ancient classic architecture through a playful attitude towards it. The front façade displays a totally symmetrical disposition of volumes, however the one module displacement of the main metal door disturbs such arrangement. Another classical gesture, is revealed through the inclination of the enclosures and the top shadow projected by the overhanging cornice.

Bellahøj Transformer Station, also shows a three parts division of the enclosures. Though, as mentioned before, this could be a traditional way of composing facades, as well as an awareness of three different situations to take into account considering issues of construction, perception and context. Furthermore, it is clear here that HCH takes advantage of the double layered type of facades. In this case, built of a concrete shell covered or partly covered with inclined Eternit plates that conduct water to the ground, and aim at introducing a more common human scale to such giant technical facility. Whereas the design of a concrete shell responds to the program behind it, the number of horizontal divisions of the Eternit covering, besides changing the perception of what could have been a flat façade, alludes to an average distance between floors in housing blocks. This, as in the previous buildings, demonstrates HCH's way of dealing with context. Though, he is not interested in replicating it, instead, he has a more abstract and comprehensive way to include it in his designs. It is also a response towards a changing context, since instead of mimicking its shapes, colors, materials, that will probably not last, he refers to rather timeless and formless matters. Besides that, the horizontal development of the covering shows ordinary construction components, as drains, placed in accurate positions to become ornamentation.

Based on two specific details, Amager Transformer Station could be seen as an iteration or evolution of Bellahøj Transformer Station. First, wooden battens, as support of Eternit plates, are here visible at the edge of each plate. Even though expression-wise this gives extra lightness and vibration to the covering, however it provokes construction problems, in means of execution and decay. Second, corners are here solved as a direct intersection of two inclined Eternit panels. Whereas expression-wise this could look as an evolution of Bellahøj, however construction-wise it does not perform properly, since such joint can not be solved by the construction logic of overlapping two undulated panels. The two facts could be deduced by looking at the building from a certain distance, though from a very close position one could detect a major structural / construction change that revealed an extension of the building. Also coincident with construction drawings and old photos. This proves that two details with a similar expression, can actually conceal important construction and structural differences. In both cases, an according to Frascari, the two-fold meaning of details is not fully elaborated in this technical facility, since only the "construing" part of the tale is conveyed.

Bremerholm Transformer Station is built with a bronze covering. The seldom decision of using a noble and expensive material is most probably related to its central location in the old city of Copenhagen. The horizontal development of the enclosure, that shows a combination of vertical and horizontal elements, could be argued in terms of the built context, the human body and part of the program beyond it. And its vertical development shows a clear three part division. The transition between bottom and middle parts shows a sequence of equal squared windows that project about 30 cm off the enclosure plane. Such windows, with variations of size, depth and position, appear in almost every of HCH's works. However, it is in this technical facility where they become emphasized. They were probably meant to be exhibiting devices for

advertising, that should replicate the surface of the large back wall visible from the street also used for advertising, before Bremerholm was built. Another unique feature of this work is the character of the main door. Here, instead of using a ready-made component, HCH decides to camouflage the door within the framework characteristics, and therefore becomes totally imperceptible when closed. Again, this might be argued through the building's central location in the city, since such huge door would reveal the technical character of the building.

Svanemølle transformer station shows a similar expression to Bremerhom, though built through wood, instead of bronze. However, construction and structure-wise there is an important distinction between the two. Here the covering was also employed as the formwork of the structural in-situ concrete shell beneath. Besides that, the design of such covering allows for easy replacement/ maintenance of wood battens, that can be executed in separate sections. This is shown today through the different tonalities of wood that are well-integrated in the building's expression. Whereas in Bremerholm bronze brackets to fix the covering to the facade become ornamental features, here something similar happens with metal screws, that used to establish pressure between the two sides of the formwork. We see a framework designed with extreme repetition and regularity that allows for a range of different ready-made components drains, windows and ventilation gadgets- to be integrated. As common in other works, from bottom to top the building is arranged in three distinct parts. In this case the bottom segment, built of prefabricated rough concrete panels, is designed according to a changing topography, that is corresponding to the volume of a preexisting bunker. And as seen before, a few windows are placed just in between concrete and wood parts, expression-wise in means of a joining element.

The location of Tagensbo Church, that is also a daycare and youth club, placed in between two narrow housing blocks dictated the orientation of the church. In regards to this, an in this case exceptionally referring to HCH's own writing, he finds inspiration in Christian's Church located in Christianshavn. HCH would adopt its layout, similar to a theater oriented across its shorter side in plan, and adjust it to the narrow plot. Unusually, in this case HCH designs a covering that merely replicates the structural profiled shell beneath it, instead of showing the covering's own logic. The horizontal development shows a steady rhythm of prefabricate concrete "pillars", that are prefabricated components for covering, and dark red brick bricks. And it is precisely the joints between those prefabricated components or "pillars" what reveals its non-structural character. Besides that, such joints are not emphasized as in other situations. Atypically, HCH does not take advantage of its "construction" function to develop its "construing" purpose. The vertical development of the building enclosures varies according to the position of windows, which are placed in relation to the program. Such story, which reveals the section of the building, can be perceived from a standing position outside the church. Another distinguishing feature of this building is that, compared to other works built of rather humble and traditional interiors, here the inside space is also covered with different materials and unique colors.

Gasværksvejens School was built as the extension of an existing school. Even though the school's apparently autonomy within the new compound, there are some hidden gestures that reveal HCH cautious consideration of the close context: 1) HCH builds the continuation of a low brick wall by defining to different situations that are well-integrated in the new school and 2) he decides to design two fake gables on top of one of the two new volumes in order to replicate the housing orientation of the main street, without subordinating the structural direction inside the building. Furthermore, the school was supposed to be a test for designing other schools using a simple layout and prefabricated structural systems. However, such idea is in this case concealed beneath a very elaborated covering comprised of two layers. One is directly adhered to the building, as in other works, whereas the other is detached to it. Such second layer is designed as a brise-soleil. Even though, it should not be argued in connection to sunlight, however it gives a certain perception of depth and protection while being inside the classrooms.

The last two buildings, Ringbo and Brøndbylund Psychiatric Hospitals, are designed by following a different arrangement. As described before, in this case structure is not part of the enclosure, but aligned with the interior partitions instead. Besides that, the enclosure layered character is here distributed as a robust base in close contact to the terrain and a light covering comprised of low and large extended roofs, that show in continuity to the upper part of the enclosures. Such top part of the enclosure display a strong modulation, defined by an alternation of glass, wood panels and squared windows. Once more, the position of such squared windows, located in between the robust low part and the light top part, is unique of HCH's works. Such displacement here also relates to a functional requirement of the program. Whereas in other works, the inbetween position of the window only referred to expressive matters. A short movement provides with better visibility to the patient laying in bed, while a small top compartment brings ventilation to the room. Distinct to other works, here the enclosure modulation shows correspondence to the interior division. This is achieved by defining a minimum dimension, which is reflected at the enclosure between the distance of two wooden battens. According to this, the distance between two interior walls is always a multiple of such minimum dimension. However, from standing outside the building it is difficult to perceive this correspondence, that is revealed through a plan drawing. Instead, as seen in other works, HCH attempts at camouflaging such interdependence precisely through a strong modulation. Accesses, correspondent with common areas, are the only situation where the building deliberately manifests some discontinuity and a change of program. These areas are covered with large extended roofs with intricate geometries supported by wood trusses. Besides all these common features, what makes the two buildings quite different is the prefabricated character of Brøndbylund, that generates a more rigid modulation than Ringbo's. Something that is also reflected in the plan layout of each building: Brøndbylund is shaped as a comb, with a strong subdivision of spaces, whereas Ringbo, as its name indicates, is shaped as a ring that enables continuous circulation.

The last part of chapter 7, introduces a discussion about an element that is very present in several of HCH's works, such as clocks, though have not been previously referred. Just after unfolding the whole discussion on parts and wholes it became obvious that those singular elements were also conceived and built as a "frameworks and ready-mades". HCH's clocks overemphasize the relation between such two categories: A "readymade", as an existing object/ mechanism, and what gives it support, as a "framework", that is a small crafted structure to connect the object with some part of the building or the terrain. ² Jørgen Sestoft, "Stadsarkitekten i København 1886-1986," in Arkitektur no. 6/7 (1986): 302-322.

³ Kristian Seier, "Hans Chr. Hansen. Architect," Flickr 2010 https://www.flickr.com/photos/seier/sets/72157626209273636/with/5503278206/).

⁴ Martin Keiding, "Hvad Hvordan og Hvorfor. Interview med Even Brænne Olstad ved Martin Keiding," in *Arkitekten, no. 8* (2013): 39-55.

⁵ Anne Beim and Marie Frier Hvejsel, "The ecology of urban tectonics – Studied in everyday building culture of Hans Christian Hansen," in *Structures and Architecture:* Beyond their limits (Taylor & Frances, 2016).

⁶ Eva Brandt, Johan Redström, Mette Agger Eriksen and Thomas Binder, *XLAB* Documenta (The Danish Design School Press, 2011): 25, 35.

⁷ Anne Louise Bang and Mette Agger Eriksen, "Experiments all the way in programmatic design", in Artifact: Journal of Design Practice, v. 6, no. 1 & 2 (2019): 3.

⁸ Eva Brandt, Johan Redström, Mette Agger Eriksen and Thomas Binder, *XLAB Documenta* (The Danish Design School Press, 2011): 25.

⁹ Paul Carter, Material Thinking (Melbourne University Press, 2004).

¹⁰ Barbara Bolt, "Materializing pedagogies," in Working papers in Art & Design, v.4 (2006).

¹¹ Edite Rosa and Joaquim Almeida, "Conclusions and reflections from the Book 2 and for the CA2RE/CARE+ program," in 2 Evaluation of Design-Driven Research (2022): 532-535.

¹² In the chapter *Circulating Reference* Latour describes "In jumping from the soil to the drawer, the piece of earth benefits from a means of transportation that no longer transforms it. In the previous photograph we could see how the soil changed state; in Figure 2.13 we see how it changes location. Having made the passage from a clump of earth to a sign, the soil is now able to travel through space without further alterations and to remain intact through time.' Bruno Latour, *Pandora*'s *Hope. Essays on the Reality of Science Studies* (Cambridge, Massachusetts: Harvard University Press, 1999): 51, 58.

13 Ibidem, 47.

¹⁴ Rem Koolhaas, Dutch architect and founder of OMA (Office for Metropolitan Architecture) explained that the exhibition would be "about architecture, not architects [...] Fundamentals will focus on histories – on the inevitable elements of all architecture used by any architect, anywhere, anytime."

¹⁵ Richard Sennett explains metamorphosis as one of the three key issues in connection to 'material consciousness'. Discussing on 'type-form' he states that "evolution occurs when a new material condition requests the new use of a new tool". Richard Sennett, *The Craftsman* (Penguin Books, 2008):126.

¹ Jørgen Sestoft, "Arbejder af Hans Chr. Hansen," in Arkitektur no. 4 (1972): 156-173.

¹⁶ Except when glass is inserted in prefabricate concrete panels. In such case it has been decided to consider this complete element under the category of concrete.

¹⁷ "The material relation between the image and what it represents is an immediate and non-constructed one. And is indeed like a trace". John Berger & Jean Mohr, J., Another way of telling: A Possible Theory of Photography (Bloomsbury Publishing, 1982): 93.

¹⁸ "Photography reduces the extend of the space down to the image's flat surface, thus raising a question of how the photographed building occupies the surface. If the surroundings take up too much space, the building recedes into the background, and the risk is that something else will steal the show. On the other hand, if the context is absent, and the building fills the entire surface of the photo, then it is reduced to an object". In this case, we should substitute 'building' per 'material'. Claus Peder Pedersen, "*Tilfældets Tektonik*," in Arkipelaget Pamflet no. 3, (Det Jyske Kunstakademi, Arkitektskolen Aarhus, Antipyrine, 2013): 26.

¹⁹ "The conventions involved in defining good architectural photography appear to be somewhat restricted. The basis is almost always a technically perfect photo: correctly exposed, classically composed with clearly defined volumes and precise cropping. The perspective is corrected in order to compensate for tilting vertical lines [...] In the best (sometimes worst) case the photo involves a lyrical interpretation of light and the play of shadows on physically exposed surfaces. Claus Peder Pedersen, "Tilfœldets Tektonik." in Arkipelaget Pamflet no. 3, (Det Jyske Kunstakademi, Arkitektskolen Aarhus, Antipyrine, 2013): 27.

²⁰ Alison and Peter Smithson, "The 'As Found' and the 'Found" in a publication that accompanies the exhibition: "The Independent Group: Postwar Britain and the Aesthetics of Plenty" (Institute of Contemporary Arts London, 1990).

²¹ "Even when photographers are most concerned with mirroring reality, they are still haunted by tacit imperatives of taste and conscience [...] In deciding how a picture should look, in preferring one exposure to the another, photographers are always imposing standards on their subjects". Susan Sontag, *On Photography* (Penguin Books, 1977): 6.

²² "It seems that reference is not simply the act of pointing or a way of keeping on the outside, some material guarantee for the truth of a statement; rather it is our way of keeping something constant through a series of transformations". Bruno Latour, Pandora's Hope. Essays on the Reality of Science Studies (Cambridge, Massachusetts: Harvard University Press, 1999): 8.

²³ Information revealed by Kim Lyngvig Hansen, who worked with the team of HCH during the 60's in the City Architect's office in Copenhagen. Interview from the author.

²⁴ Mark Wigley, White Walls, Designer Dresses: The Fashioning of Modern Architecture (MIT Press. Reprint edition, 2001).

²⁵ Colin St. John Wilson, The Other Tradition of Modern Architecture: The Uncompleted Project (Academy Editions, 1995).

²⁶ "A third kind of material consciousness invests inanimate things with human qualities [...] honest brick evokes a building surface in which the brick-work is exposed rather than covered over: no cosmetics [...] Yet the material dynamics of stucco are those of play and fantasy; its ethics are those of freedom -at least they were to craftmen [...] In the craftsman's hand, baked clay became an emblem of natural rectitude; this natural virtue was made rather than found [...] So, to in humanizing materials, it was necessary to pair honesty and fantasy, brick and

stucco; they played off each other". Richard Sennett, The Craftsman (Penguin Books, 2009): 136-141.

²⁷ Gottfried Semper, "The Four elements of Architecture (1851)," in The Four Elements of Architecture and Other Writings. Trans Harry F. Mallgrave & Wolfgang Herrmann (Cambridge University Press, 1989): 104.

²⁸ Kenneth Frampton, "Studies in Tectonic Culture: The poetics of Construction in Nineteenth and Twentieth Century Architecture" (The MIT Press, 1996): 89.

²⁹ Gottfried Semper, "The Four elements of Architecture (1851)," in The Four Elements of Architecture and Other Writings. Trans Harry F. Mallgrave & Wolfgang Herrmann (Cambridge University Press, 1989): 103.

³⁰ Gottfried Semper, "The Four elements of Architecture (1851)," in The Four Elements of Architecture and Other Writings. Trans Harry F. Mallgrave & Wolfgang Herrmann (Cambridge University Press, 1989): 105.

³¹ Gottfried Semper, "Style: The textile Art (1860)," in The Four Elements of Architecture and Other Writings. Trans Harry F. Mallgrave & Wolfgang Herrmann (Cambridge University Press, 1989): 217.

³² Gottfried Semper, "The Four elements of Architecture (1851)," in *The Four Elements of Architecture and Other Writings*. Trans Harry F. Mallgrave & Wolfgang Herrmann (Cambridge University Press, 1989): 128.

³³ Gottfried Semper, "STYLE: The textile Art (1860)," in The Four Elements of Architecture and Other Writings. Trans Harry F. Mallgrave & Wolfgang Herrmann (Cambridge University Press, 1989): 257.

³⁴ The two authors of the English version of The Four Elements of Architecture and other Writings choose dressing in means of the German word Bekleidung. Kleiden literally means to dress. Even though they admit that its translation does not entirely fit, it seems more appropriate than cladding as it contains the meaning of the concept of masking. Moreover, Semper introduces it in connection to the relation between clothing and architecture, which he states appears later and in connection to the space making of the first settlements. Gottfried Semper, The Four Elements of Architecture and Other Writings. Trans Harry F. Mallgrave & Wolfgang Herrmann. (Cambridge University Press, 1989): 293.

³⁵ Kenneth Frampton, "Rappel à l'Ordre: The case for the tectonic," in Architectural Design, vol. 60, no. 3-4/ 1990: 20-31.

³⁶ David Leatherbarrow and Mohsen Mostafavi, Surface Architecture (The MIT Press, 2002): 2.

³⁷ Tobias Faber, Danish Architecture (Danske Selskab, 1963): 168.

³⁸ Andrew Saint, "Some thoughts about the architectural use of concrete," in AA Files, No. 21 (Spring 1991): 5

39 Ibidem.

40 Ibidem: 8-9.

⁴¹ Architecture based on tectonic principles tells us the story of its making -it refers to its overall contextual setting and the embedded meaning- from the ideas forming the program, over particular construction details, to the weathering of the buildings in the course of time. In that sense it concerns the essence of construction and construing in architecture. Tectonic thinking is hesitant to random construction solutions; it thus forms a critical resistance to shifting trends determined either by the economic interests of the building industry, paradoxes in building regulations – or by spontaneous architectural trends. Anne Beim, "Introduction. An Ecology of Tectonics" in Towards an Ecology of Tectonics. The need of Rethinking Construction in Architecture (Edition Axel Menges, 2014): 21.

⁴² Christian Norberg-Schulz, "Order and variation," in Nordic Architects Write. A documentary anthology. Edited by Michael Asgaard Andersen (Routledge, 2008): 256.

⁴³ Christian Norberg-Schulz, "Order and variation," in Nordic Architects Write. A documentary anthology. Edited by Michael Asgaard Andersen (Routledge, 2008): 255-258.

⁴⁴ Charlotte Bundgaard, "Framing Fragmentation – The architect as a master of montage," in *Changing Roles; New Roles, New Challenges* (TU Delft, Faculty of Architecture, Real Estate & Housing, 2009): 315.

45 Ibidem: 318.

⁴⁶ Kasper Sánchez Vibæk, "Conditions for architectural quality in an industrialised context- Moving towards architecture sustainability," in *Three Ways of Assembling a House* (The Royal Danish Academy of Fine Arts School of Architecture Publishers, 2010): 22.

⁴⁷ Manuel DeLanda, A New Philosophy of Society: Assemblage Theory and Social Complexity (Continuum; Annotated edition, 2006).

⁴⁸ Yona Friedman theoretical projects of open infrastructures: Plans and structural grids should allow for the free will of the individuals. The framework was to be erected first, and the residences conceived and built by the inhabitants inserted into the voids of the structure.

⁴⁹ Charlotte Bundgaard, "Framing Fragmentation – The architect as a master of montage" in *Changing Roles; New Roles, New Challenges* (TU Delft, Faculty of Architecture, Real Estate & Housing, 2009): 315-316.

⁵⁰ Anne Beim and Marie Frier Hvejsel, "The ecology of urban tectonics – Studied in everyday building culture of Hans Christian Hansen: Beyond Their Limits," in Structures and Architecture: 206.

⁵¹ John Summerson, The classical language of architecture (The MIT press, 1963): 44.

⁵² Marco Frascari, "The Tell The Tale Detail," in Theorizing a New Agenda for Architecture: Anthology of Architectural Theory, 1965-95 (Princeton Architectural Press, 1996): 500.

⁵³ Jeremy Till & Sarah Wigglesworth, "The Future is Hairy," in Architecture the subject is matter (Routledge, 2001): 11-15.

⁵⁴ "Other details". It is the title of a subchapter. Ibidem: 21.

55 Ibidem: 22.

⁵⁶ Charlotte Bundgaard, "Make do with what you have. On detailing an architecture of ready-mades," in 10th International Detail Design in Architecture Conference: (2011): 47.

57 Ibidem: 48.

⁵⁸ Jeremy Till & Sarah Wigglesworth, "The Future is Hairy," in Architecture the subject is matter (Routledge, London): 14.

⁵⁹ Joao Quintela, "The disagreement between Otto Wagner and Gottfried Semper: A question of detail" in *Estudo Prévio 17. Lisboa. CEACT/UAL – Centro de Estudos de* Arquitetura, Cidade e Território da Universidade Autónoma de Lisboa (2020).

⁶⁰ Ibidem: 12, 16.



Conclusion

Because of my Spanish background and interest on *critical regionalism* I could distinguish that Hans Christian Hansen's (HCH, 1901-1978) works showed connections with some works developed by a group of Catalan architects, *Grup R*, situated within such movement. These initial circumstances aroused fascination for the works of a Danish architect that had remained unknown for most of the architecture community. According to this, a contextualization between HCH, *Grup R* and other similar European architects would seem obvious and relevant in order to situate HCH's works within the works of other European architects. However, it appeared essential to first get knowledgeable about what was HCH's oeuvre comprised of and what was particularly characteristic about it. Still, a thorough contextualization on HCH's works will hopefully motivate some future research.

Two Danish magazines, such as *Arkitekten* and *Arkitektur*, have been key to discover and locate most of HCH's works. Periodically, these local issues published the works developed by the office of the city architect in Copenhagen. And HCH, who was an employee at the architecture department between 1928 and 1972, appears in several of the projects developed within this period. Additionally, a few articles have also been written on some of HCH's single works. And two extensive articles that contain several of HCH's works were written by the Danish critic Jørgen Sestoft (1934-1996), one in 1972¹ and the other in 1986². In regards to this, the believe is that this PhD thesis has located HCH's public works, basically through examination of these local magazines that demonstrate an accurate record of what occurred at the city architect's office. However, little has been found about HCH's private works, developed together with his partner Viggo S. Jørgensen or by himself.

At the beginning of the investigation, there was an attempt to search for HCH's family and friends, though this could not be achieved. Whereas those sources would have introduced a distinct methodological approach and also subject of investigation focused on the architect, not succeeding in finding information on HCH's life and way of working turned

my interest towards his built works through a bottom-up and intuitive approach. Yet, the line of investigation based on HCH as an architect, that is common from traditional types of monographies, is still open. And a successful investigation on HCH could give a complementary perspective to what this PhD thesis provides with, that is an investigation on his seventeen built works with a focus on tectonic matters.

Looking through the issues of the two Danish magazines from the late 20's till the late 70's also provided with a thorough understanding of the local architecture scenario. In this way, HCH's works have been related with other works by finding comparable images and texts that would give a straight forward description regarding materials, construction, structure and expressive matters. The result is that HCH's works appear rather unique in Denmark, though comparable to a small group of architects. Such Danish contextualization, that is here condensed into a folded diagram, could also be considered for further research. This would give to know another Danish way of thinking and doing architecture that is not yet well-known by the international architecture milieu.

After gathering and presenting HCH's works and close context, that are approached through "archival research" methodology, the investigation focused on the analysis of his works. This is based on empirical evidence and my own interpretation and has an intuitive and bottom-up character. In addition, it employs techniques and tools common from the architecture discipline, as drawings and photos. In this way, both subject and method are situated within an established tradition in architecture that uses other mediums than text to analyze architecture history. Whereas in most cases art and architectural historians, and also practitioners, as Wittkower, Rowe, Eisenman and Hejduk have used drawings to analyze works of architecture with a focus on immaterial matters, such as proportion and geometry, on the contrary this investigation focuses on the material, through drawing but also photography. This approach and mediums show a closer relation with Evans's and Matta-Clark's approaches, that have an interest on phenomenology and the tangible. And particularly Matta-Clark's real actions on buildings, bring the built and construction matters at stake. Besides that, he expands on other mediums, as photography and video, though in means of documentation, that differs from the analytical an interpretative character of the tools employed here.

Moreover, the field of architecture photography has also contributed in the analysis of architecture history. Photographers have not only documented, but also interpreted and speculated on some architect's works. Through the camera lenses photographers have created images, with their inherent properties and ideas, that replace the experience of being at a building. In this regards, the work and working process of two photographers, Stoller and Helmer-Petersen, have been briefly introduced and discussed within the premises of this PhD thesis. In particular, Helmer-Petersen fragmented images on the mundane are seen in correlation to the character of the photos comprised in one of the investigations, Crops.

In addition to contributing to the analysis of architecture history, methodological processes used in this PhD thesis can be contextualized within "art/design research" ways of pursuing an investigation. Instead of establishing a hypothesis, the analyzes started by defining a framework, what in "art/ design research" is known as a program³. In this case, three conditions define the program, and those should be understood in a sequence, from general to particular: 1) Dealing with the built, as method and subject; 2) transforming the built into something operational through architecture-based techniques and tools; and 3) employing a repetitive analytical approach across works, also inspired by the repetitive attributes of HCH's works.

Within such program three experiments⁴, here addressed as investigations, have been set up according to HCH's works tectonic characteristics seen as an overarching notion regarding materials, construction, structure and expression and its interaction. Even though the

three investigations are displayed through its visual character, through drawing and photography, those should not be seen as representations of some findings, but the end of a process to think HCH's works through. Since it has been through a long interaction with the materials at hand, such as drawings and photos, that insights about the tectonic logic of HCH's works have emerged, according to Heideggers' idea on "handling"⁵. In this way, the intrinsic visual format of those investigations differ from the visual outcome of the two chapters about HCH's built works and context, that employ other mediums than text with a mere explanatory intention.

Each investigation has been given a title: Cuts, Crops and Faults, that responds to the conceptual action that produces them. Cuts address the layered character of the works' enclosures, issues of rhythm and repetition, as well as detailing through large section drawings. Crops aims at finding materials continuities and discontinuities across works through photography. And Faults exposes some of the findings of Cuts and Crops through a series of photocollages that juxtapose two comparable building fragments. Such investigations are displayed as part of the PhD thesis each through its own visual medium, together with the text-based parts. Intentionally, a written replica has been avoided. Though a text in means of providing transparency and contextualization of the different methodological steps has been attached in chapter 5. Furthermore, even though investigations emerged from the particularities of HCH's works, however these should be considered analytical and interpretative, and even generative, tools with the potential to be applied and adjusted to other built works, within research but also didactic environments.

The result of the empirical analytical and interpretative process shows that knowledge gained through each investigation corresponds to what was initially intended to find. In addition, investigations also unveil other unexpected themes within the notion of tectonics that have been discussed under two main topics: The first one elaborates on the different layers of the enclosures, that often contain a robust structural core followed by a fragile covering, whereas the second one addresses features of such coverings comprised of a background or framework and prefabricated components or ready-mades. This last part intents at discussing HCH's seventeen built works, situated under the two themes mentioned above, and contextualizing them within practices and theories on tectonics.

It has been argued that around the late 40's HCH's traditional brick enclosures changed for concrete facades totally or partially covered with other materials as brick, wood, Eternit and metal. An initial sign of this change is seen in Skydebanehaven Childcare (1948-50) and consolidated after in Hanssted School (1954-59). Following these two works, a series of Transformer Stations (1948-1966), buildings for almost non-human use and high security demands are crucial for further developing what according to Semper started as variations on the idea of *structure* and *dressing*. The thin outer layer partially or totally conceals, yet insinuates or following Semper's idea *masks*, the structure beneath it. Even though such use of reinforced in-situ concrete has been argued as an architecture tendency within the office of the City Architect in Copenhagen⁶, however the integration between concrete and covering appears rather unique in HCH's works.

It is important to note that concrete is only used where it is necessary in means of structure and program. And even though the expression of the buildings provided through the design of coverings might appear similar in its different enclosures (e.g. Hanssted School), and that different buildings might show alike expressions (e.g. Bellahøj and Amager Transformer Stations), detailed sections show that the construction and structural logic of the core part, could be different. However, through accurate examination of the woks it is possible to find very subtle differences that manifest crucial construction/ structure differences, and are well-integrated in the expression of the works. In addition, depth and profile of reinforced in-situ concrete shells are optimized in terms of statics. So that a very thin layer of concrete, sometimes profiled, is able to technically perform only because such structural core is adequately covered and protected with other materials that prevent damages caused by weathering and time. Especially iron bars would fast become corrugated and the structural quality of the loadbearing element would be affected. Even though a thin covering, usually built of cheap and ordinary materials, might protect the concrete core only for a rather limited period, however it is also easy and/ or cheap to replace (e.g. Svanemøllen, Bellahøj and Amager Transformer Stations). According to this, we can state that in this case the different lifespans of the two enclosure layers, structure and covering, is not a disadvantage, on the contrary, it is actually a construction, structural and expressive intention of HCH's works. Such unique solution takes into account the alteration and finally breakdown of building materials, as well as provides conditions for replacement.

The choice of concrete in order to be covered has been theoretically contextualized within Semper's interpretation of Greek temples' polychrome and the use of white marble⁷, that was also chosen to be covered. And HCH's logic of coverings has been discussed through Semper's idea of the masking of structural parts, that should be subordinated to the covering⁸. Though whereas HCH's coverings always respond and display their own material logic, Semper's idea is a bit more confusing since he also claims that the masking could refer to the masking of the covering's materials and construction logic⁹. Besides that, HCH's works have also been briefly discussed with ideas on the "free-façade", and the impact of new technological possibilities together with tradition. Particularly, they have been compared to the works of the American architect Albert Khan, as presented by Leatherbarrow and Mostafavi10. Furthermore, the need of covering concrete has been situated with the first uses of concrete as described by Saint. At the end of the XIX c. the choice of concrete referred exclusively to its technical features, and covering it was considered a requirement regarding weathering

properties of concrete and its aesthetic tractability¹¹. Whereas HCH's works display a much more intricate and dependent interaction between a structural core and a covering in regards to technical performance and expression.

Most of HCH's works are designed with reinforced in-situ concrete loadbearing enclosures. In this way, the program beyond it is rather liberated from any structural element. However, in some of the works, such as Ringbo and Brøndbylund Psychiatric Hospitals, the structural principle is different. In both cases, the one storey development of the programs shows very strong correlations with the structural parts, such as brick loadbearing partition walls. Besides that, these walls show a strict correspondence with the enclosure modulation. However this is not made explicit expression-wise, precisely because the strong modulation conceals certain particularities of the program. But such dependency, but also flexibility, becomes obvious through a plan drawing. In these two cases, HCH rethinks the layered character of the works' enclosures as a heavy base in contact with the changing topography of the terrain and a light type of enclosure above. In addition, large overhanging roofs, or coverings, with variable sections manifest in continuity to the lightness of the top part of the enclosure.

The repetitive character of the enclosures' coverings is comprised of a twofold logic: A handcrafted background, or framework, (built on-site) and a series of prefabricated components, or ready-mades, as doors, windows, ventilation gadgets and drains (built off-site). However, the two types are not opposed or contrasting expression-wise, as suggested by Norberg-Schulz¹² in regards to his interpretation on landscape. They are actually in a dialogue as one depends on the other and their limits appear diffuse and well-integrated. The modulation of the background, among others, takes into consideration the properties and dimensions of the prefabricated components. Besides that, the full expression of coverings shows its own logic based on the properties of its constituent materials and issues of rhythm and order. There is no attempt at imitating the character

of the loadbearing element behind it, on the contrary, its expression reveals its natural covering purposes and as mentioned *masks* the structural layer. This is proven in all of HCH's works, unless in Tagensbo Church. His second last project, that is a private commission, displays a covering that replicates the material and sequence of structural profiles of the reinforced in-situ concrete shell beneath it.

Therefore, HCH's coverings express unity, even though they can be argued in-between craftmanship (frameworks) and industrialization (ready-mades). This contradicts Bundgaard's explanation on today's industrialization and mass-production¹³. Since she claims fragmentation is naturally embedded in such processes and she compares it to the collages' fragmentation of the Cubists. Besides that, HCH's two-fold logic is seen in relation to the at least two languages needed to describe a whole made of parts, as suggested by Sánchez Vibæk¹⁴. And finally, the way HCH employs the same or similar components within different backgrounds is aligned with De Landa's understanding of wholes and parts, where wholes are comprised of *relations of exteriority*¹⁵. He claims parts always maintain certain autonomy, and that is why they can perform in different types of wholes and still be recognized as such. HCH's squared windows repeated in several enclosures become a clear pedagogical explanation of such idea.

The repetitive and modulated character of HCH's coverings is based on the dimensions of different materials choices, sometimes intentionally modified. Besides that, rhythm and modulation, and a few times the appearance of singular volumes, also respond to the specifics of the program and context conditions. HCH's strategy to deal with such sequences is to scale down the character of the coverings. This means that even though some material formats originally exist in large dimensions (e.g. the white Eternit panels of Hanssted School) HCH decides to makes them smaller. Besides that, such division responds to a minimum waste of material of the original panel or material piece. This way of designing coverings 1) provides flexibility to organize the program beyond it and respond to minor changes that might occur from time to time; 2) offers a set of design principles to take into account in means of transformation, extension and maintenance of the facades 3) and addresses issues of human perception, such as sight and tactility, and the context nearby, that HCH's long enclosure planes particularly benefit from, and that is emphasized in his technical buildings made for non-human programs.

Whereas the horizontal development of coverings contains rhythm and repetition of materials and elements, its vertical development is comprised of three parts, such as base, body and top. This tripartite composition is not unique of HCH's works and seems coherent with Summerson's abstract interpretation of classic Greek architecture¹⁶. Besides that, the three parts also address three distinct construction situations as well as issues of context.

Articulation of frameworks, and connections between parts -readymades and wholes -frameworks- are built of joints, in common also defined as details. However, through Frascari's explanation on the notions of "construction" and "construing"¹⁷ it has been argued that whereas details are not always material joints, since they might aim at only representing or faking a joint, joints should always be built as a real physical material assembly¹⁸. HCH's works are characterized by the use of joints that embed both of Frascari's notions, through the real act of joining (construction) and also by creating meaning (construing), that is usually emphasized. However, this is denied in a few cases: Wooden battens of the north façade of Skydebanehaven Daycare only pursue the meaning of construing; joints between prefabricated concrete ribs at the covering of Tagensbo Church only contain the construction meaning; the corners between two Eternit plates at Amager Transformer Station do not succeed with any of the two concepts; and wooden battens perforate Eternit plates only by achieving the construing meaning. Tough, it should be noted that Amager Transformer Station joint and detail are part of an extension not developed by HCH.

Besides that, HCH's works joints are also discussed with Till and Wigglesworth interpretation of Mies' details. The example of Mies is well chosen to illustrate the detail subordination to beauty that is aligned with a certain idea of technology¹⁹. As a response to this, they claim for "other details"²⁰, that should be recognized according to another set of contemporary values. According to Till and Wigglesworth, HCH's joints, built of ordinary and cheap materials, and being far from using detailing in means of technological representations, are seen within this other type of details.

Furthermore, HCH's detailing is argued in correspondence to Lacaton & Vassal's detailing as discussed by Bundgaard²¹. The way they adjust industrially produced products and integrate them within a newly designed system that adopts their raw and cheap character, and therefore avoids clashing, is seen in relation to HCH's frameworks and ready-mades' unity.

And finally, Wagner's works are discussed in means of providing with a clear example of a practitioner architect that was influenced by Semper's theoretical ideas on tectonics. In this regards, Wagner's joints and other details and strategies, tell the story of a covering that performs as such, by *masking* the loadbearing layer beneath it, in a comparable manner to HCH's way of designing. Therefore, such example demonstrates that Semper's ideas on the joint, *dressing* and *masking*²² are valid to interpret HCH's works, regardless of HCH's intention.

A final observation is about the idea of context, that has been addressed several times when discussing HCH's coverings. It has been said that buildings are aware of the context in a different way than formally replicating the surrounding buildings. Alternatively, HCH's works show very receptive to an idea of context that goes beyond the physical built. This entails human perception, as the way buildings are physically approximated and observed, and environmental conditions, as weathering and how this will affect the building through time. Besides that, when relations are made with the nearby buildings, those are based on rather abstract matters, such as dimensions and composition. Context was not intended to be tackled as part of this investigation, though it has been demonstrated through specific situations that some of HCH's tectonic matters can be argued through contextual circumstances. This is only briefly discussed in this PhD thesis, but hopefully will be given attention in some future investigations.

To summarize, this PhD thesis provides knowledge about HCH's oeuvre. In this regards, a list of built, unbuilt works and competitions have been included. Together with that, information about the built works comprised of construction drawings, basic data, a photo and related bibliography has been made available in the form of an architecture guide to encourage the reader to discover the works through self-experience. Besides that, HCH's works have been briefly discussed with other significant Danish architecture works with a focus on tectonic themes, that were regarded as characteristic of HCH's works. Even though there is a minor group of local architects that show comparable ways of building to HCH, some of his works' features still appear rather unique.

Whereas the first part of the PhD project focused in gathering existing information through "archival research", the second part dealt with the analysis, interpretation and contextualization of HCH's built works. The fact of not being able to find information about HCH's life, working process and design intentions has favored a bottom-up and intuitive approach that puts attention on the built and accessible built works, both as subject and method of investigation. Such way of doing has been situated within the framework of an established tradition in architecture analysis. In addition, the investigation process has also been contextualized within modes of "art/design research".

In particular, HCH's tectonic features have been analyzed through the definition of a *program*, that acts as a framework for the development of three investigations -*Cuts*, *Crops* and *Faults*- that are thought through and

unfolded through architecture based tools, such as drawing and photography. According to the program, the set of investigations have been decided in relation to HCH's works tectonic characteristics, as well as certain methodological conditions and intentions. Considering this, the medium of a built work, together with information revealed through existing construction drawings, has been transformed into manipulative materials to be investigated off-site. Whereas Cuts refers to analyzing the work's enclosures, often comprised of a structural core and a covering, and its interrelation through drawing; Crops focuses in collecting material continuities and discontinuities within and across works through photography. Finally, some of the findings of Cuts and Crops are synthesized through a series of photocollages that juxtapose two building fragments in means of showing continuities, discontinuities, but also intended discrepancies and correspondences. The results of the three investigations are included in the PhD thesis through its inherent visual mediums.

Besides that, the development of the three investigations manifested other tectonic related issues that have been discussed and contextualized within tectonic theories and practices. These particularities have been grouped under two broad themes considered as essential tectonic properties identified within and across HCH's works: *Fragility and robustness*, in connection to the two layers comprised in the works' enclosures, sometimes rearranged as top and base; and *frameworks and ready-mades* in relation to the twofold composition of the covering or light outer layer. In this regards, theory assists in appropriately arguing works' tectonic features, together with situating them into a larger tectonic context. Besides that, specific situations distinguished in HCH's works facilitate an understanding of theories' abstract and ambiguous character. ⁴ Eva Brandt, Johan Redström, Mette Agger Eriksen and Thomas Binder, *XLAB* Documenta (The Danish Design School Press, 2011): 25, 35.

⁵ Barbara Bolt, "Materializing pedagogies," in Working papers in Art & Design, v.4 (2006).

⁶ Tobias Faber, Danish Architecture (Danske Selskab, 1963): 168.

⁷ Gottfried Semper, "The Four elements of Architecture (1851)," in The Four Elements of Architecture and Other Writings. Trans Harry F. Mallgrave & Wolfgang Herrmann (Cambridge University Press, 1989): 98.

⁸ Gottfried Semper, "The Four elements of Architecture (1851)," in The Four Elements of Architecture and Other Writings. Trans Harry F. Mallgrave & Wolfgang Herrmann (Cambridge University Press, 1989): 104.

⁹ Gottfried Semper, "STYLE: The textile Art (1860)," in *The Four Elements of Architecture and Other Writings.* Trans Harry F. Mallgrave & Wolfgang Herrmann (Cambridge University Press, 1989): 257.

¹⁰ David Leatherbarrow and Mohsen Mostafavi, *Surface Architecture* (The MIT Press, 2002): 2.

¹¹ Andrew Saint, "Some thoughts about the architectural use of concrete," in AA Files, No. 21 (Spring 1991): 5.

¹² Christian Norberg-Schulz, "Order and variation," in *Nordic Architects Write. A documentary anthology.* Edited by Michael Asgaard Andersen (Routledge, 2008): 255-258.

¹³ Charlotte Bundgaard, "Framing Fragmentation – The architect as a master of montage," in *Changing Roles; New Roles, New Challenges* (TU Delft, Faculty of Architecture, Real Estate & Housing, 2009): 315.

¹⁴ Kasper Sánchez Vibæk, "Conditions for architectural quality in an industrialised context- Moving towards architecture sustainability," in *Three Ways of Assembling a House* (The Royal Danish Academy of Fine Arts School of Architecture Publishers, 2010): 22.

¹⁵ Manuel DeLanda, A New Philosophy of Society: Assemblage Theory and Social Complexity (Continuum; Annotated edition, 2006).

¹⁶ John Summerson, The classical language of architecture (The MIT press, 1963): 44.

¹ Jørgen Sestoft, "Arbejder af Hans Chr. Hansen," in Arkitektur no. 4 (1972): 156-173.

² Jørgen Sestoft, "Stadsarkitekten i København 1886-1986," in Arkitektur no. 6/7 (1986): 302-322.

³ Anne Louise Bang and Mette Agger Eriksen, "Experiments all the way in programmatic design", in Artifact: Journal of Design Practice, v. 6, no. 1 & 2 (2019): 3.

¹⁹Jeremy Till & Sarah Wigglesworth, "The Future is Hairy," in Architecture the subject is matter (Routledge, 2001): 11-28.

²⁰ Ibidem: 21-22.

²¹ Charlotte Bundgaard, "Make do with what you have. On detailing an architecture of ready-mades," in 10th International Detail Design in Architecture Conference: (2011): 47-48.

²² Joao Quintela, "The disagreement between Otto Wagner and Gottfried Semper: A question of detail" in Estudo Prévio 17. Lisboa. CEACT/UAL – Centro de Estudos de Arquitetura, Cidade e Território da Universidade Autónoma de Lisboa (2020): 6-16.

¹⁷ Marco Frascari, "The Tell The Tale Detail," in *Theorizing a New Agenda for Architecture: Anthology of Architectural Theory, 1965-95* (Princeton Architectural Press, 1996): 500.

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