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Summary: The appearance of the pre-war campus of the current TU Delft in the Wippolder is rather unplanned although it does form a unity. The led to the research question: How did the Polytechnische School and Technische Hogeschool buildings in the Wippolder develop into a coherent campus on an urban and architectural level between 1893 and 1938. The research mainly done in pre-1958 archive of the TU Delft in The Hague put into context with some supporting literature. The pre-war campus developed in multiple stages. During the first stages there was no systematic plan to build a coherent campus in the Wippolder. Because of practical reasons more and more building where developed in the Wippolder. As the number of building grew the desire to turn the seemingly scattered buildings into a more coherent campus also grew. This cohesion was created by placing the buildings around three open spaces. Around these spaces the buildings achieved architectural cohesion in style and scale.

Keywords: Wippolder, Campus, Technische Hogeschool, Polytechnische School, TU-Delft, pre-war, vooroorlogs, development, ontwikkeling, urban, architectural, stedenbouwkundig, architectonisch, Vrijman, Lokhorst

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THE UNPLANNED CAMPUS

THE DEVELOPMENT OF A POLYTECHNISCHE SCHOOL
AND TECHNISCHE HOOGESCHOOL CAMPUS 1893-1938



ARCHITECTURE MASTER 2 THESIS GUUS BENING

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2015

Architecture TU Delft Master 2 Thesis **Guus Bening**

Abstract

The appearance of the pre-war campus of the current TU Delft in the Wippolder is rather unplanned although it does form a unity. This led to the research question: How did the Polytechnische School and Technische Hogeschool buildings in the Wippolder develop into a coherent campus on an urban and architectural level between 1893 and 1938. The research mainly done in pre-1958 archive of the TU Delft in The Hague put into context with some supporting literature.

The pre-war campus developed in multiple stages. During the first stages there was no systematic plan to build a coherent campus in the Wippolder. Because of practical reasons more and more buildings were developed in the Wippolder. As the number of buildings grew the desire to turn the seemingly scattered buildings into a more coherent campus also grew. This cohesion was created by placing the buildings around three open spaces. Around these spaces the buildings achieved architectural cohesion in style and scale.

Het uiterlijk van de vooroorlogse campus van de tegenwoordige TU Delft in de Wippolder lijkt ongepland terwijl er toch sprake is van samenhang. Dit leidde tot de volgende onderzoeksvraag: Hoe zijn de gebouwen van de Polytechnische School en de Technische Hogeschool ontwikkeld tot een samenhangende campus op stedenbouwkundige en architectonisch niveau tussen 1893 en 1938. Het onderzoek vindt hoofdzakelijk plaats in het archief van de TU Delft van voor 1958. De gegevens worden in hun context geplaatst met ondersteunende literatuur.

De vooroorlogse campus is ontwikkeld in meerdere stadia. Gedurende de eerste stadia was er geen systematisch plan om een samenhangende campus te ontwikkelen in de Wippolder. Om praktische redenen werden er steeds meer gebouwen ontwikkeld in de Wippolder. Met de groei van het aantal gebouwen groeide ook de wens om een meer samenhangende campus te maken. De samenhang werd gecreëerd door de gebouwen rondom open ruimtes te plaatsen. Hieromheen bereikten de gebouwen een architectonische samenhang in stijl en schaal.

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I.

Introduction

When in 1893 the then Polytechnische School build it's first building outside of the old city of Delft in the Wippolder, they seemed to have little idea that it would be the first of many of schools buildings in this area. The technical school was founded in 1842 as the Royal Academy and had become the Polytechnische School in 1864 and the Technische Hogeschool in 1905. Even to this day the now Delft University of Technology is expanding further into the Wippolder (img. I.1) following the pioneering foundation of this first building. The development of the Delft technical school into the Wippolder can be separated into two main areas: one developed before the Second World War and one there after. These periods seem to have a somewhat different approach. After the Second World War the South area clearly developed according to a previously made master plan. All the building where build around a planned central axis, the Mekelweg, now the Mekelpark. This is in contrast to the pre-war North area (img. I.2), where the growth had been more organic. This more organic development of the first Campus area will be the focus of my research.

Ever since the start of my architecture studies in Delft in 2011 I have have driven past these old and sometimes derelict buildings.

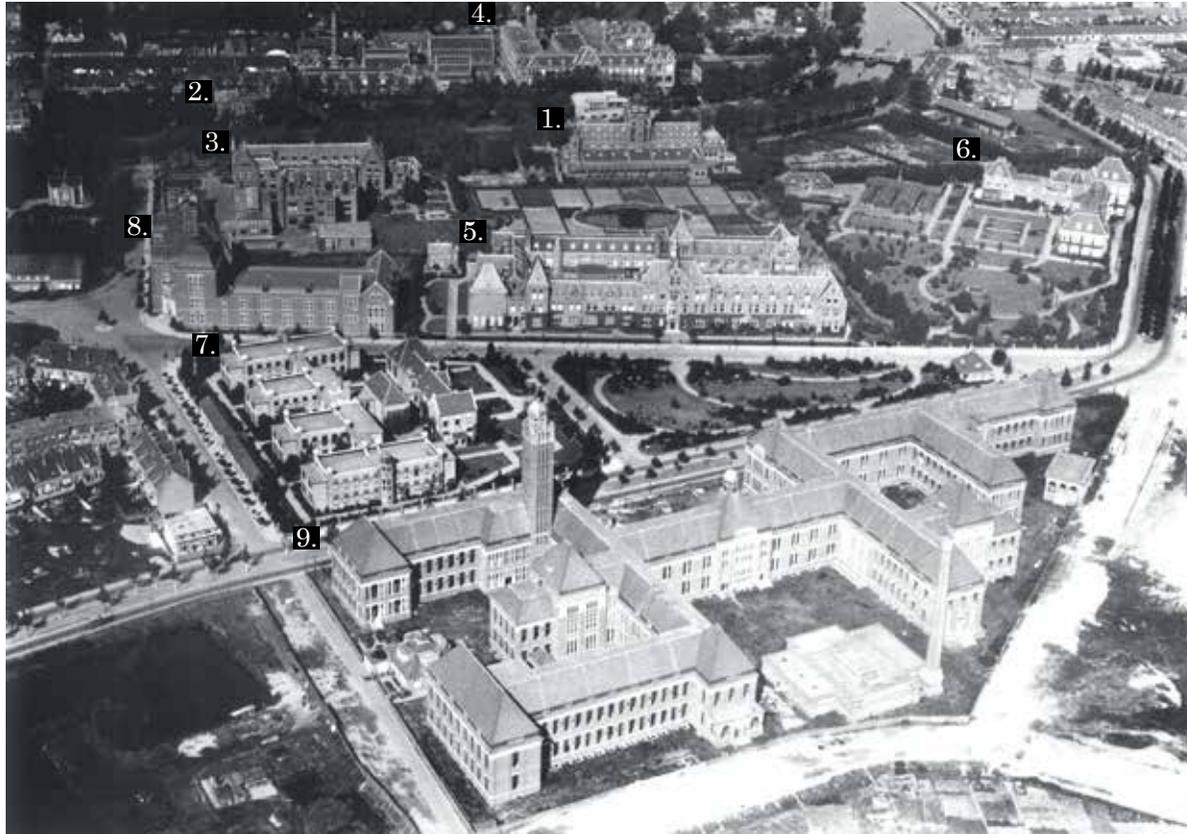
They seemed to have been forgotten in favour of the more modern and "master planned" campus further south. These buildings and there arrangement fascinated me, although little of their former glory was still visible. Many of these buildings where abandoned and stood empty in 2011; most notably the three buildings along my route to the Architecture Faculty when entering the Wippolder across the Bastiaansbrug. This prompted me to want to find out how this "old" campus had developed and why it was designed this way.

The current literature about this development was rather limited and could only provide a more broad perspective on it. Most of it seemed to refer back to one book "Bedreigde gebouwen: Delft" by E.J. Hoogenbeek and B.D. Verbrugge, that devoted a section to the development of the buildings of the Delft technical school. Although this book gave a good broad perspective of the overall development it lacks in depth analysis of why the Wippolder buildings where founded and designed the way they are, and also who and what contributed to this. Another problem I had with most of the available sources was the great emphasis they put on a 1921 plan for the campus by the famous architect H.P. Berlage made among others. Although this plan was spectacular, it had little to no influence on the development of the old campus as the urban plan for the old pre-war campus was not changed much after 1917. This plan no doubt was a great influence and inspiration to the post war master planned south campus. However as a factor in the planning of the pre-war north campus it's influence is negligible.

In order to formulate a research question, it is necessary to define the scope of the research. I will limit my research to the Wippolder campus area that was developed before the 1948 master plan for the south campus (Annema, 1973, p.86) was put into place. This physical boundary provides a time frame calculated from the moment the first building was constructed in the Wippolder in 1893 until the last construction of the last building of the pre-war



I.1 The newest building in the Wippolder, the TNW building



1. Geodesy,	1893	6. Microscopic Anatomy,	1917
2. Microbiology,	1897	7. Analytical Chemistry,	1923
3. Physics and Electrical Engineering,	1903	8. Physics,	1917-1930
4. Mechanical and Maritime Engineering,	1911	9. "Red" Chemistry,	1917-1948
5. Mining Engineering,	1912		

I.2 The "old" north campus in 1925

North Campus in 1938. The research will be focused on the urban and architectural arrangement and cohesion of these buildings as a group. It will be exploring the reasoning behind their founding and location. The main focus therefore will be solely on newly founded buildings in their original context and not on later modifications or extensions.

This lead met to the following research question: How did the Polytechnische School and Technische Hogeschool buildings in the Wippolder develop into a coherent campus on an urban and architectural level between 1893 and 1938.

In the research I will be mainly using archival sources and also some supporting literature. The used archival sources will mainly be the pre-1958 archive of the Technische Hogeschool Delft housed in the Dutch national archives in The Hague. I will be using these archives to find the reasoning behind the development of the North campus for correspondence and records. I will also be using building plans from these archives to look at the architectural development of the campus and how this has helped the formation of a cohesive campus.

The chapters are arranged in chronological order separating imported time periods in the development of the Campus. After this introduction the second chapter will provide some background information on the development of university architecture and planning in order to put the development in Delft after 1893 into context. The focus will be on the early university architecture and planning in Europe and America. This includes the historic situation in the Netherlands predominantly focusing on Leiden and of course on the development in Delft until 1893.

The third chapter will have its focus on the first developments of the Polytechnische School in the Wippolder and the conflicts this created. The fourth chapter will be about the campus development after the Polytechnische School became the Technische Hogeschool. The fifth chapter is about the developments that lead to the first real campus appearance. It will focus on how the campus went from a collection of loose buildings to a more coherent unity. In the sixth chapter the peak of campus development is described resulting in being the end of the development of this campus. Finally there will be a conclusion stating the definitive answer to the research question.

II.

Prologue: University architecture until the end of the 19th century

Before describing the historical development of the campus in Delft it is important to know how the technical school in Delft developed before the construction of the first campus buildings outside of the old town of Delft. In order to do this it is also important to have some information on the development of university architecture in the Netherlands, Europe and America to put the development in Delft in a broader perspective.

Early history of European and American university design

The first European universities were developed during the 12th century Renaissance, when the sciences lost since Roman times were rediscovered. The universities of Bologna, Paris and Oxford were the most important universities of that age and defining for the later universities (Jonathan Coulson, 2010, p. 1). These early universities had no distinctive architectural style of their own. The buildings they used were scattered through the city fabric as they rented already existing buildings constructed for different purposes in these cities. They were also not closely bound to their host cities, because most students and professors came from outside of these cities. This meant that a move to another city could be done without much hesitation (Jonathan Coulson, 2010, p. 2). The free movement of these early universities between potentially rivalling cities was also the reason for the erection of the first purpose built university buildings. A city could bind its valuable population of scholars by providing them with their own building. This first happened with the University of Bologna in 1322, when the city built a chapel exclusively for use by the university scholars (Jonathan Coulson, 2010, p. 2).

This process of binding a population of scholars to a university by means of a building can also be seen in the Netherlands many years later for much the same reasons. During the 80 Year's War the Netherlands became divided between a southern catholic and a northern protestant part (img. II.1). The main university the



II.1 *Leo Belgicus 1617 - Leuven and Leiden*

Netherlands had thus far been in Leuven. Leuven was in the Southern Catholic part of the Netherlands. This meant there was a need for a university in the Northern Protestant part of the Netherlands in order to provide higher education and to attract scholars from the Southern part of the country. This university was founded in Leiden in 1575 (Universitaire Pers Leiden, 1975, p. 11).

The collegiate university

In England a typical Gothic style developed for these new university buildings. Reason for this was that during the 16th century a different system of student housing developed in England. In contrast to the continental European system, where the university only provided the student with education, the English universities started to develop a system where the university's also provided housing and other



II.2 Tom Quadrangle Oxford - Collegiate gothic architecture



II.3 Nassau Hall Princeton 1756 - The North American Campus University

facilities to the students, the collegiate system. This meant that the English universities needed more buildings than their continental counterparts to provide all these facilities to their students. This led to the development of a typical architecture which is most clearly visible at the two most important universities of England, Oxford and Cambridge. These English collegiate universities consisted of one or more square courts around which the different university buildings were arranged. This was done for practical reasons and to keep strangers out and students in (Jonathan Coulson, 2010, p. 7).

The architectural style of these buildings changed over time. At first they were, as the fashion was at that time, designed in a Gothic style (img. II.2). This Gothic style remained popular even after the style had gone out of favour for other buildings. In the second half of the 16th century this changed because of the influence of an important British architect of the time, Christopher Wren. He introduces a new classical inspired architectural style that took over the architecture of Oxford and Cambridge (Jonathan Coulson, 2010, p. 7).

The great innovation in the architecture of universities came when English settlers founded the first universities in America in the 17th century. The universities here were organized in the same way as the English universities: they used the collegiate system, which provided more than just education to the students. But an important difference was the architecture (Turner, 1984, p. 17). The settlers could start with a clean slate when it came to the architectural design of these universities and so used this opportunity to design a new type of university. The new American collegiate universities which were not designed around a square court, but instead consisted of separate buildings in an open landscape (img. II.3) (Jonathan Coulson, 2010, p. 8).

The Netherlands and Delft

In the Netherlands however there was no such unity of style. The style of universities was very much a local affair driven by local demands and at a much lower budget than in England. In Leiden the university was allocated a former monastery building in 1581, originally built in 1515, in a late Gothic architectural style. This building was remodelled in 1616 to make it more suitable to be used as a university building by dividing the old chapel into two stories, by changing the windows and installing a new floor. The building is called the "Academiegebouw". In 1632 a deck with an access tower was built on the roof of the building to be used for astronomy and in 1670 the building was modernised even further when a renaissance style tower was built on top of the building (img II.4). Further expansion was made around the existing Academiegebouw starting with a botanical garden and a new Dutch Renaissance style



II.4,5 *Academiegebouw 1762 and Botanical Gardens 1615 - Leiden University building in 1594 (img. II.5) (Universitaire Pers Leiden, 1975, pp. 20-23).*

The Delft Royal Academy, which would later develop into the Polytechnische School, was founded in 1842. It developed in much the same way as Leiden and was also housed in existing buildings in the old city at first. The Royal Academy itself was housed in two existing building on the Oude Delft canal in 1845. In 1864 the Royal Academy became the Polytechnische School. In 1865 the first new building was build free-standing behind the two existing buildings. It was designed in a Neoclassical style by Delft City Architect C.J. de Bruyn Kops. In 1875 an almost exact replica was build right next to it. This was designed by E. Gugel. In this way two freestanding Polytechnische Schools villa's on the edge of Delft were created. Over time more existing building where acquired on the Oude Delft and extensions where build onto them (Hoogenbeek & Verbrugge, 1982, pp. 151-153) thus creating a strip of buildings along the Oude Delft. These building where refinished and partly rebuild in a Neoclassical style according to a design made by professor in Civil Architecture G.J. Morre (img. II.6).



II.7,8,9,10 *Expansion - Leiden, Utrecht Groningen and Delft*

The end of the 19th century marked an important era for the construction of new university buildings. Many of these new buildings where build for the three Dutch Government Universities in Leiden, Utrecht and Groningen (img. II.7,8,9) and for the Polytechnische School in Delft (img. II.10). Most were used for laboratories and usually build on the edge of the old city. They provided the facilities, that the older buildings in the historic city centre could not due to their age or the crowded location in the old city. After this moment



II.11 Delft 1940 - Mostly clustered buildings

of developmental unity these four institutions started to develop individually again. This can be seen by comparing the situation in Delft and in Leiden (img. II.11,12) at the beginning of the Second World War. While the buildings in Delft were mostly clustered in one area, the buildings in Leiden were spread all over the city. It is important to note that the cluster of buildings in the top left corner in



II.12 Leiden 1940 - Even spread of building through town

Leiden is actually one university hospital built at once (Universitaire Pers Leiden, 1975, p. 87), whilst the main cluster of buildings in Delft consists of different departments built over a period of 45 years. In the next chapters the development of the clustered campus of building in Delft will be explained.

III.

The first steps into the Wippolder: The Polytechnische School

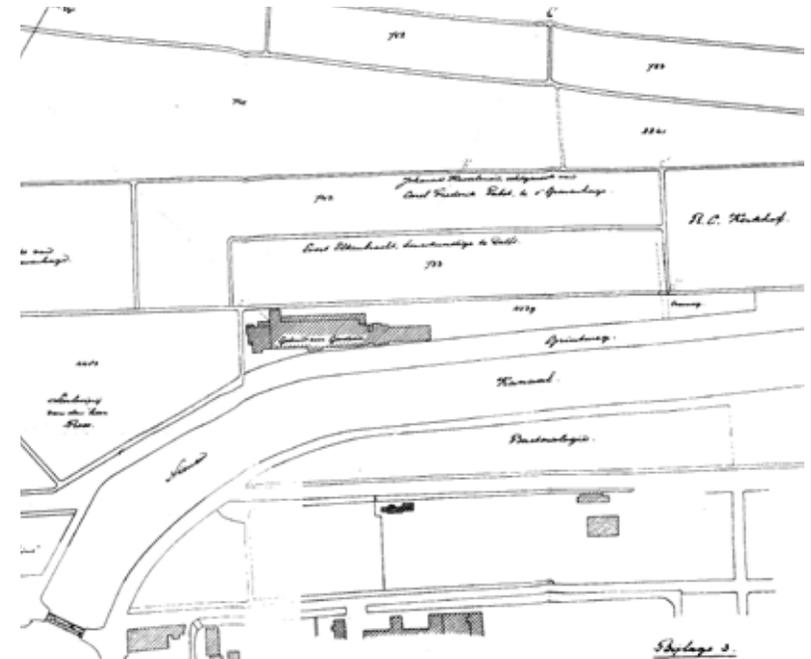
By 1897 the Polytechnische School in Delft had completed two new buildings just outside the city of Delft in the Wippolder. These buildings were the first buildings of the Polytechnic School that were built outside of the historic city centre of Delft, which was defined by the outline of the former medieval walls. The Polytechnische School was about to start a building campaign providing the facilities for a rapidly growing technical school, soon to be at a university level.

Building outside the old city

The first of these buildings was the Geodesy building (img. III.1), which was completed in 1893. The building was not designed to be used by the Polytechnische School in the first place, but by the Triangulation Department of the Dutch government, which was in dire need of space. The building space could then later be changed into other uses by the Polytechnische School after the Triangulation department had moved out, which was expected to be after only a few years. This however was not the case as the Triangulation department only moved out as late as 1930. This was after 34 years when their work for the government was finished. The building is placed on a lot (img. III.2) outside of the old city limits of Delft in the then undeveloped Wippolder area. This was done because of the specific demands the Triangulation Department had as they needed the building to be in an open space with a wide field of view so their experiments were disturbed as little as possible. Little did they know that over the coming years more building would be developed around their own buildings compromising the research done in the Geodesy building (Westendorp, Hallo, & Sluyterman, 1930, p.36). The second building in this series was the Micro-biological laboratory (img. III.3), which was built in 1895. This relatively small building completed two years later, was like the Geodesy building and built right next to the new Rijn-Schie Canal on a narrow strip of land of the city of Delft (img. III.4). The Micro-biological laboratory was mainly built to provide knowledge for the flourishing yeast industry in Delft



III.1 The Geodesy building - Front facade on the Schie-Canal



III.2 Location of the Geodesy building - In the Wippolder



III.3 The Microbiology building



III.4 Delft 1900 - New strip of land after the construction of the Schie-Canal

(Westendorp, Hallo, & Sluyterman, 1930, pp. 108-109).

These first two buildings build for the Polytechnische School seemed to have had somewhat different reasons for their founding than later build the Technische Hogeschool buildings. These later buildings where founded mainly to provide students with space for education and to do research in a wide variety of professional fields. The first two new buildings outside the city though where primarily founded to provide a local or national service for which there was a direct need, rather than being founded to meet the demands of students and researchers. In the case of the Geodesy building the direct need was to provide the national government with accurate and precise geographical data of the country. In the case of the Microbiology building it was to provide research for local industry (Westendorp, Hallo, & Sluyterman, 1930, p. 108).

Rapid growth: The first large campus building

By 1897 the amount of students enrolling in the Polytechnische School was growing rapidly (img. III.5) from 205 students in 1890 to 500 in 1897. However the existing facilities the university could not meet this new demand. By then the university consisted of a complex of buildings in the old city centre consisting of aging buildings that were no longer suitable for modern technical education.

The two above mentioned new buildings for Geodesy and Microbiology where already becoming too small. The Geodesy building was still predominantly equipped for it's purpose, but it's single lecture room was small and often overcrowded. The building

1890/91	alle ingeschreven die de loop aan de Polytechnische school volgen	205
1891/92	idem	224
1892/93	idem	250
1893/94	idem	296
1894/95	idem	320
1895/96	idem	424
1896/97	idem	450
1897/98	alle ingeschreven tot 25 Sept die de loop aan de P.T. school met volgen	500

III.5 Rapid growth in the number of students

¹Letter about overcrowding in the Microbiology laboratory, from M.W. Beijerinck to the director of the Polytechnische School, January 26th 1899, National Archive (The Hague), Archive TH-Delft until 1956 (acc.nr. 3.12.09.01), inv.nr. 113

²Letter about solving the overcrowding in various departments, from the director of the Polytechnische School to the Dutch Interior Minister, September 25th 1897, National Archive (The Hague), Archive TH-Delft until 1956 (acc.nr. 3.12.09.01), inv.nr. 113

³Manifesto explaining the dire physical and financial situation of the Polytechnische School, from all the Students of the Polytechnische School to the Dutch House of Representatives, 1899, National Archive (The Hague), Archive TH-Delft until 1956 (acc.nr. 3.12.09.01), inv.nr. 113

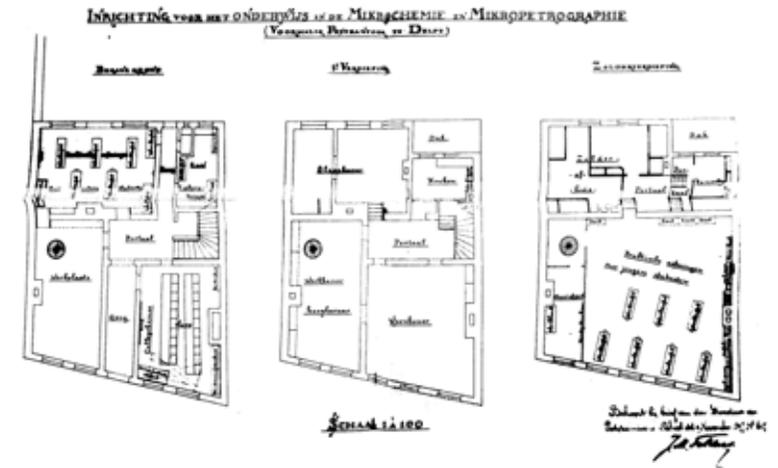
for microbiology was getting too small in general. This is described clearly in a letter¹ written in 1899 by the microbiology department to the director of the Polytechnische School. In this letter it is explained that they are disappointed with the building - by then only four years old - because already every classroom in the building was too small. They had to turn down students wanting to follow courses as there would have been too little space.

A large growth in student numbers was also noticeable in the departments of the Polytechnische School, which were still housed in aging buildings between the Westvest and the Oude Delft in the old city. This was especially true for the amount of students at the department of Mining Engineering and Chemistry and the amount of students at the department of Physic. This is made clear by a letter² written to the Dutch Interior Minister by the director of the Polytechnische School. There was even a manifesto signed by all of the students at the Polytechnische School directly addressing the Dutch House of Representatives and explaining their situation. They wrote in 1899 that "The building and facilities for education at that institution (The Polytechnische School), with few exceptions, are so absolutely insufficient, that they don't even meet the most basic demands"³.

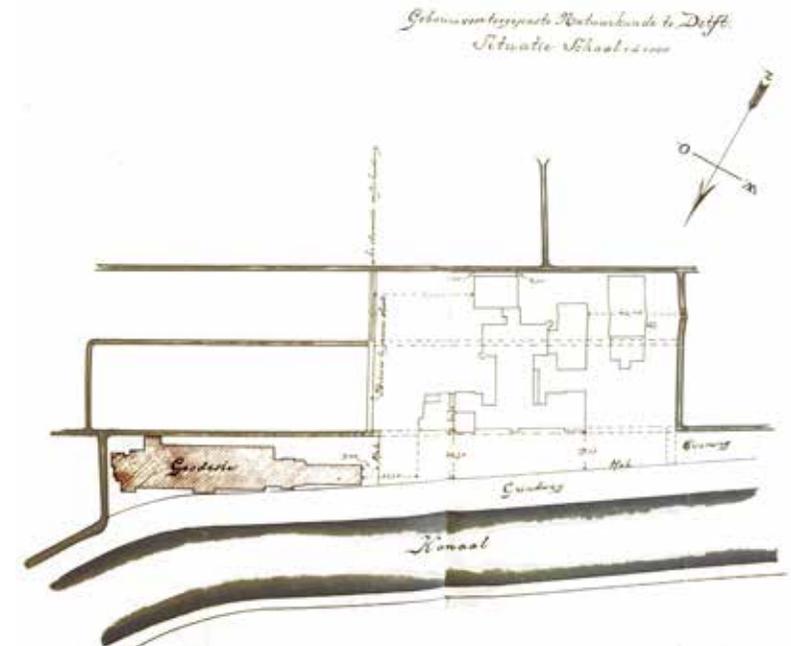
The university itself had very little funds to relieve these problems; it was clearly stated in the above mentioned manifesto from the Polytechnische School students. It explains that there is far too little space for all the students and that, compared to the three National

JAAR.	Universiteit te LEIDEN.		Universiteit te UTRECHT.		Universiteit te GROSSEPOLE.		Totaal der drie Rijk-Universiteiten.				Polytechnische School te DELFT.				Bedrag per studerende.		AANMERKINGEN.
	Bedrag der uitgaven.	Aantal studerende.	Bedrag der uitgaven.	Aantal studerende.	Bedrag der uitgaven.	Aantal studerende.	College- en examengelden.	Bedrag der uitgaven.	Ten male der schatkist.	Aantal studerende.	Bedrag der uitgaven.	Collegegelden.	Ten male der schatkist.	Aantal studerende.	Univ.-insteuten.	Polyt. School.	
1888	f 653,694	946	f 371,950	624	f 271,735	431	f 100,000	f 1,297,379	f 1,107,379	2001	f 146,433	f 49,400	f 97,033	247	f 553	f 393	
1889	654,275	980	363,500	660	303,456	464	195,000	1,318,231	1,123,231	2104	147,266	47,400	99,866	237	534	421	
1890	685,004	991	408,100	687	339,742	473	206,000	1,423,846	1,317,846	2151	154,425	48,800	105,625	244	566	433	
1891	724,230	942	455,515	721	319,575	501	212,000	1,499,320	1,287,320	2164	156,950	49,000	107,950	245	595	441	
1892	786,320	965	499,285	749	303,242	503	217,000	1,538,847	1,321,847	2217	159,650	51,400	108,250	257	596	421	
1893	753,065	993	441,795	800	304,392	504	224,000	1,499,252	1,275,252	2297	288,191	62,800	225,391	314	555	717	
1894	737,971	999	427,128	801	309,414	499	224,000	1,525,513	1,301,513	2280	203,025	70,200	132,825	351	571	378	
1895	743,821	958	450,194	844	356,570	496	228,000	1,550,788	1,322,788	2328	268,254	77,200	191,054	386	569	498	
1896	814,941	940	475,571	849	412,669	474	224,000	1,702,811	1,478,811	2265	229,853	88,600	141,253	443	653	319	
1897	810,537	974	474,881	831	374,600	489	226,000	1,600,018	1,434,018	2294	206,964	107,600	99,364	338	625	184	
1898	906,937	967	486,336	841	394,056	493	207,000	1,787,328	1,580,328	2391	248,235	111,200	137,035	555	687	246	

III.6 Difference in funding



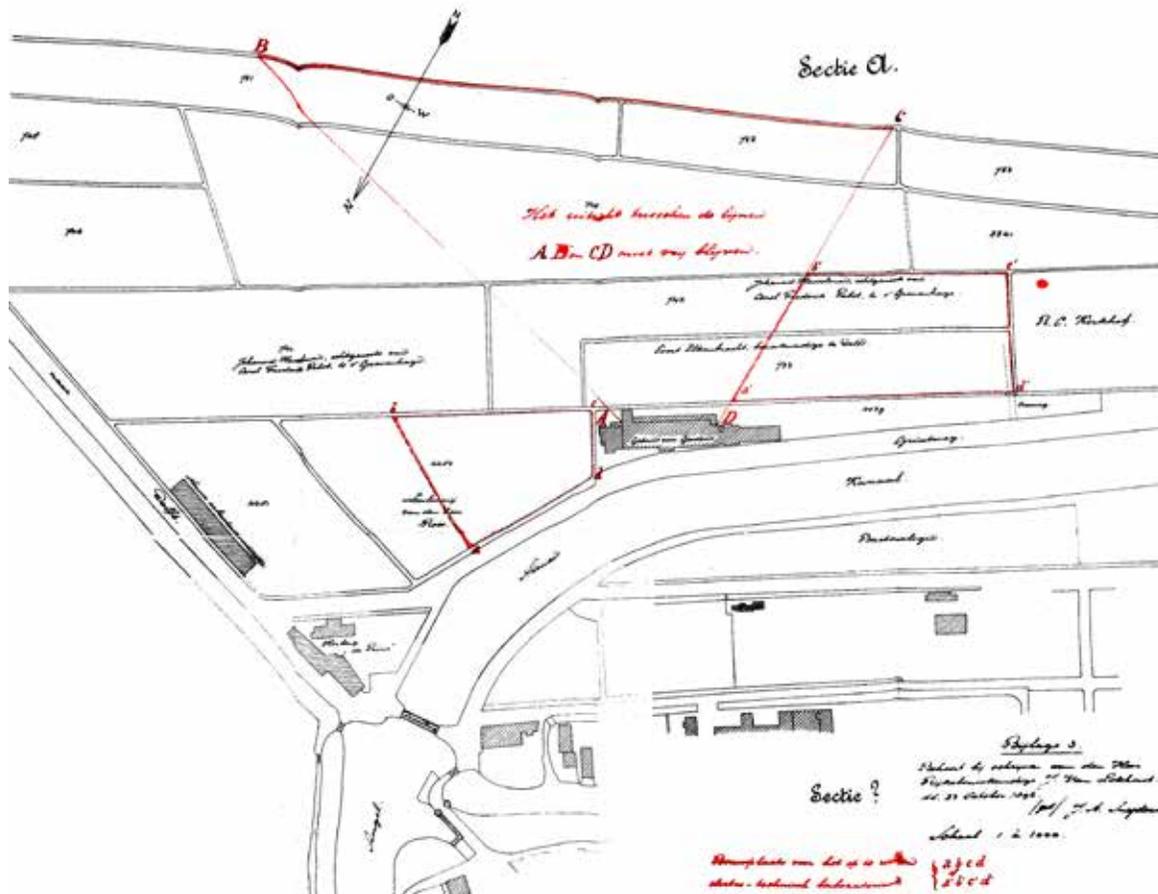
III.7 Space for chemistry in the former Delft post office



III.8 Location of the new Physics and Electrical Engineering building

Universities in the Netherlands, the Polytechnische School received less than half the funds per student. These National Universities in Leiden, Utrecht and Groningen received financial support from the Dutch government. In 1898 the three Dutch universities received on average 686 guilders per student each year, whilst the Polytechnische School only got 246 guilders per student per year (img. III.6). This was a very limited budget for the university, who had already tried to limit the overcrowding by renting old buildings in the city of Delft⁴. A much larger amount of funds was needed in order to properly solve its problem. In 1897 the university rented space in an old barracks

⁴Various letters concerning the renting of existing building in Delft by the Polytechnische School, 1897, National Archive (The Hague), Archive TH-Delft until 1956 (acc.nr. 3.12.09.01), inv.nr. 113



III.9 Open space needed for Geodesy research

building in Delft, the Agatha-Kazerne and also space in the former post office for the Chemistry department (img. III.7). Needless to say these old rented building still did not meet the demand of modern education and research.

On the first of March 1897 the Dutch Interior minister, in a response to the writing of the director of the Polytechnische School, approved the purchase of a plot of land. This plot (img. III.8) was next to the Geodesy building on the Kanaalweg across from the microbiological laboratory on the other side of the Schie-Canal and outside the medieval city limits of Delft⁵. In 1899 a design was made for this plot for a new building for Physics and Electrical Engineering by the Government Architect for Educational Buildings: J. van Lokhorst. This building is completed in 1903 (Hoogenbeek & Verbrugge, 1982, p. 153) and is the first large scale building completed to meet the broader demands of the Polytechnische School students and researchers. It can be seen as a predecessor for the later large Technische Hogeschool buildings.

The location of the building in the Wippolder had two main reasons. Firstly the building needed a large plot as it had a large footprint which was needed to provide ample natural light to the laboratories. Further due to the complex nature of the laboratories and experiment halls the building could not be housed in existing buildings. This issue made it difficult to realise the building in the crowded city centre of Delft. There was not a large enough plot of land available for the erection of a large new building. The second reason was that, together with this building a new electrical power plant had to be build. Reason for this was that Delft did not have a city-wide reliable electrical grid yet. It made sense to place this building as close as possible to the Microbiological Laboratory and the Geodesy building so this power plant could also provide power to them⁶.

However there were some problems with this very location in the Wippolder. The new building would be erected close to the existing building for Geodesy. The Geodesy building was placed in the Wippolder in 1893 because large open spaces were needed for their experiments. This meant that the new building for Physics an

Electrical Engineering had to be placed in such a way that I would not disturb the Geodesy research. The limits are illustrated on a map (img. III.9). It shows that the new building could only be built next to the Geodesy building to its left, or next to it and somewhat behind the Geodesy building on the right. This was also due to the fact that there was only one road near the Geodesy building, indicated as a gravel track in the image. This gravel track was later paved and became the Kanaalweg. The larger location on the right was eventually chosen for the new Physics and Electrical Engineering building.

Academic foundations: Dutch Collegiate Gothic architecture

The Geodesy and the Physics and Electrical Engineering building were designed by government architect J. van Lokhorst. He was greatly influenced by architects P.H.J. Cuypers and C.H. Peters, who worked in the same period. Lokhorst's architectural style was inspired by the Gothic architecture and early Dutch Renaissance style brick architecture. He developed a typical architectural style for archive and higher education buildings in the end of the 19th century. For these buildings he used a very function approach in the design. The goal of van Lokhorst was to try to meet the demands and wishes of the users of the building as close as possible. For this reason he always did thorough research to create a design brief that was as complete as possible. This included letting the future users sketch their ideal floor plans. He even took trips abroad with them to look at comparable buildings. This thoroughly considered design brief then became the leading motive for the design of the new building. This is often clearly visible in the exterior architecture of the buildings. As the different rooms and departments in the building demanded a different specification; their appearance on the outside also was different. This meant that the buildings were usually highly practical (Rosenberg, 1987, pp. 11-12). The arrangement of different shapes also helped the Gothic and early Renaissance architecture as the combination of different masses could be well expressed in these rather idyllic styles. As van Lokhorst designed many buildings for new archives, government Universities and the Polytechnische

School during this period his architecture can be seen all over the Netherlands (Saxa Loquuntur, 1903).

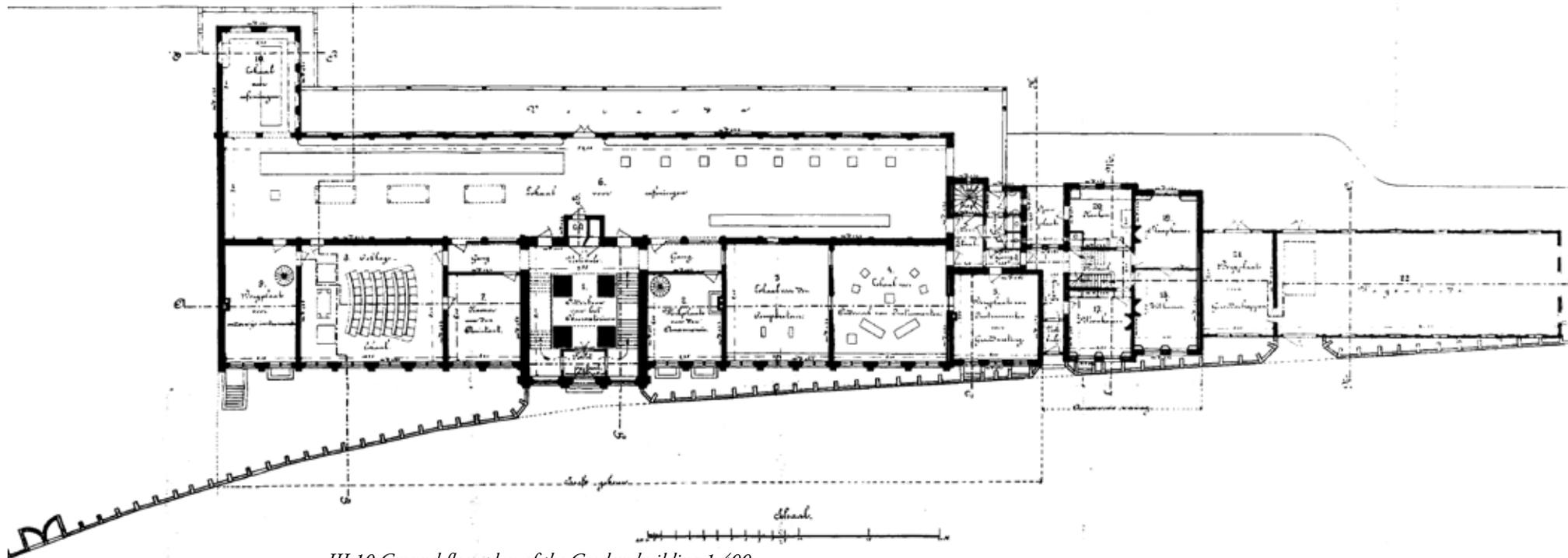
Lokhorst's architectural style used for university buildings also seems to be at least partly inspired by earlier Dutch university buildings, especially the Academiegebouw in Leiden. In the Academiegebouw the combination of Gothic with early Renaissance architecture that is also used in van Lokhorst's designs, is present. An important aspect of the Academiegebouw in Leiden is the fact that since the time it was built as a convent in the 15th century numerous additions have been made to the original building (Universitaire Pers Leiden, 1975, pp. 16-23). This creates a combination of different architectural styles and shapes.

These similarities in architectural style with the old Academiegebouw in Leiden are most clearly visible in the Geodesy building (img. III.10,11,12). Both the Geodesy building and the Academiegebouw have façades articulated with buttresses and tall vertical window strips. Even the observatory of the Geodesy building consisting of a flat roof with a cupola on top, strongly resembles the 1815 observatory of the Academiegebouw (img. III.13), which is now demolished. This process of referring back to historic university design creates a sort of Dutch variety of the collegiate Gothic style, popular in England and North America. It seems to fit the Polytechnische School as it was at that time aspiring to be at the same academic level as the older Dutch universities, especially the nearby Leiden University. Creating a building that resembles the architecture of the oldest Dutch university might help to literally give the Polytechnische School an academic foundation.

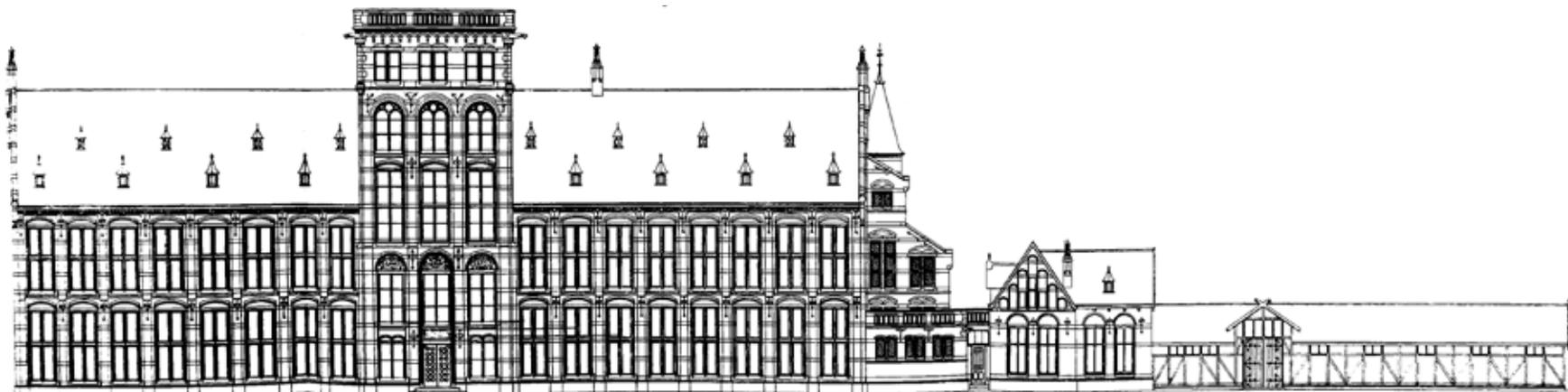
Despite its architecture referring to the past the Geodesy building was a very modern building for its time. The observation platform on its tower rested on columns inside the building, which had a separate foundation from the rest of the building. It only had a minimal connection to the walls thus allowing for a low level of vibration on top of the platform. The inside of the building contained a 52 meter long room for indoor experiments and an accompanying veranda for outdoor experiments (Hoogenbeek & Verbrugge, 1982, pp. 153-157).

⁵Letter concerning the permission to purchase land in the Wippolder, Dutch Interior Minister to the Board of Curators, March 1th 1897, National Archive (The Hague), Archive TH-Delft until 1956 (acc.nr. 3.12.09.01), inv.nr. 122

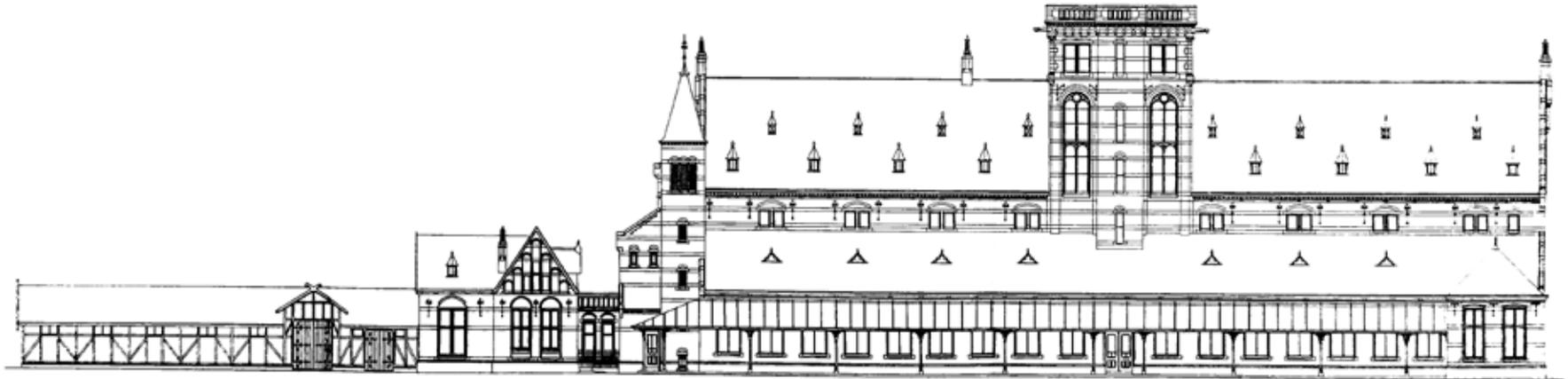
⁶Letter, Government Architect for Education J.A.W. Vrijman to the Board of Curators, May 29th 1909, National Archive (The Hague), Archive TH-Delft until 1956 (acc.nr. 3.12.09.01), inv.nr. 501



III.10 Ground floor plan of the Geodesy building 1:400



III.11 Main façade of the Geodesy building 1:400



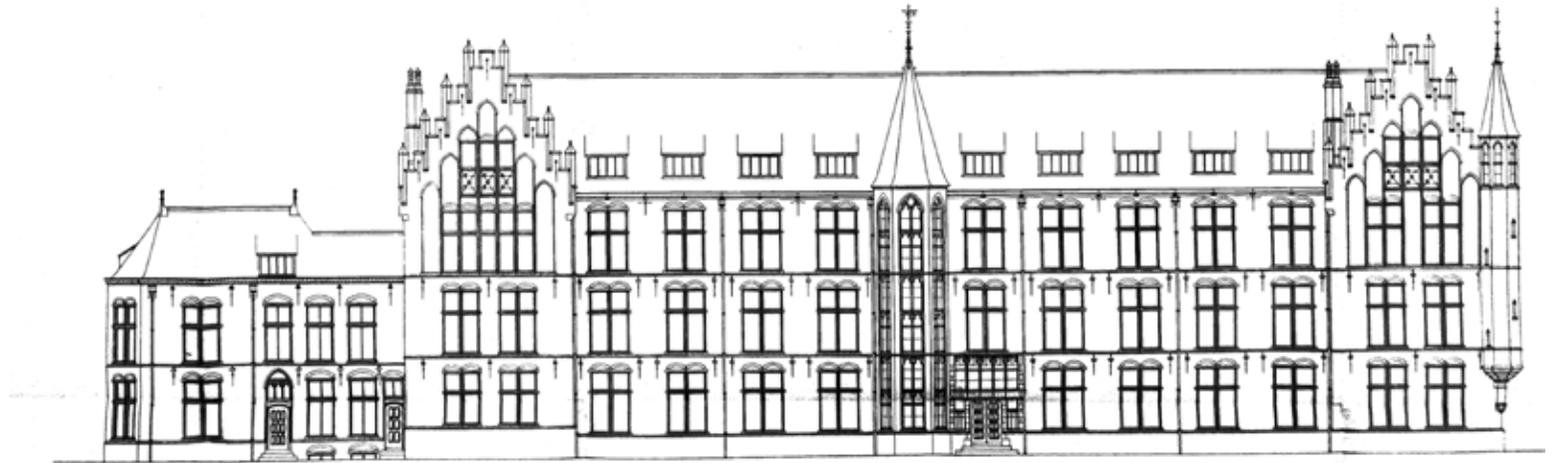
III.12 Rear façade of the Geodesy building 1:400

Instead of the combination of different styles used by the Geodesy building and the Academiegebouw in Leiden, the building for Physics and Electrical Engineering (img. III.14,15,16,17) is more purely Neo-Gothic in style. The brickwork is also much flatter and does not contain as many buttresses as the Geodesy building. The decoration of the building mainly consists of typical Gothic elements like turrets and stepped gables with pinnacles and complex roof shapes. Although this complex composition of building shapes is less of a consequence of architectural style than it is of the functional - designing from the inside out - approach van Lokhorst used in the design. All the different functions within the building are also clearly visible on the exterior of the building, indicating this design method was to create an interior space most suitable for its function. Only the main façade on the Kanaalweg seems to have been designed as a more formal façade.

The design of the Microbiology building is rather different than the two other buildings by van Lokhorst. In fact, it is different from most of the university buildings he designed. Although the brickwork has early Neo-Renaissance elements, the building overall does not look like a Neo-Renaissance style building. It does not even really look like an educational building; at least not as much as the other two buildings. It lacks the formal gables the other two buildings did have,



III.13 Rear facade of the Geodesy building 1:400

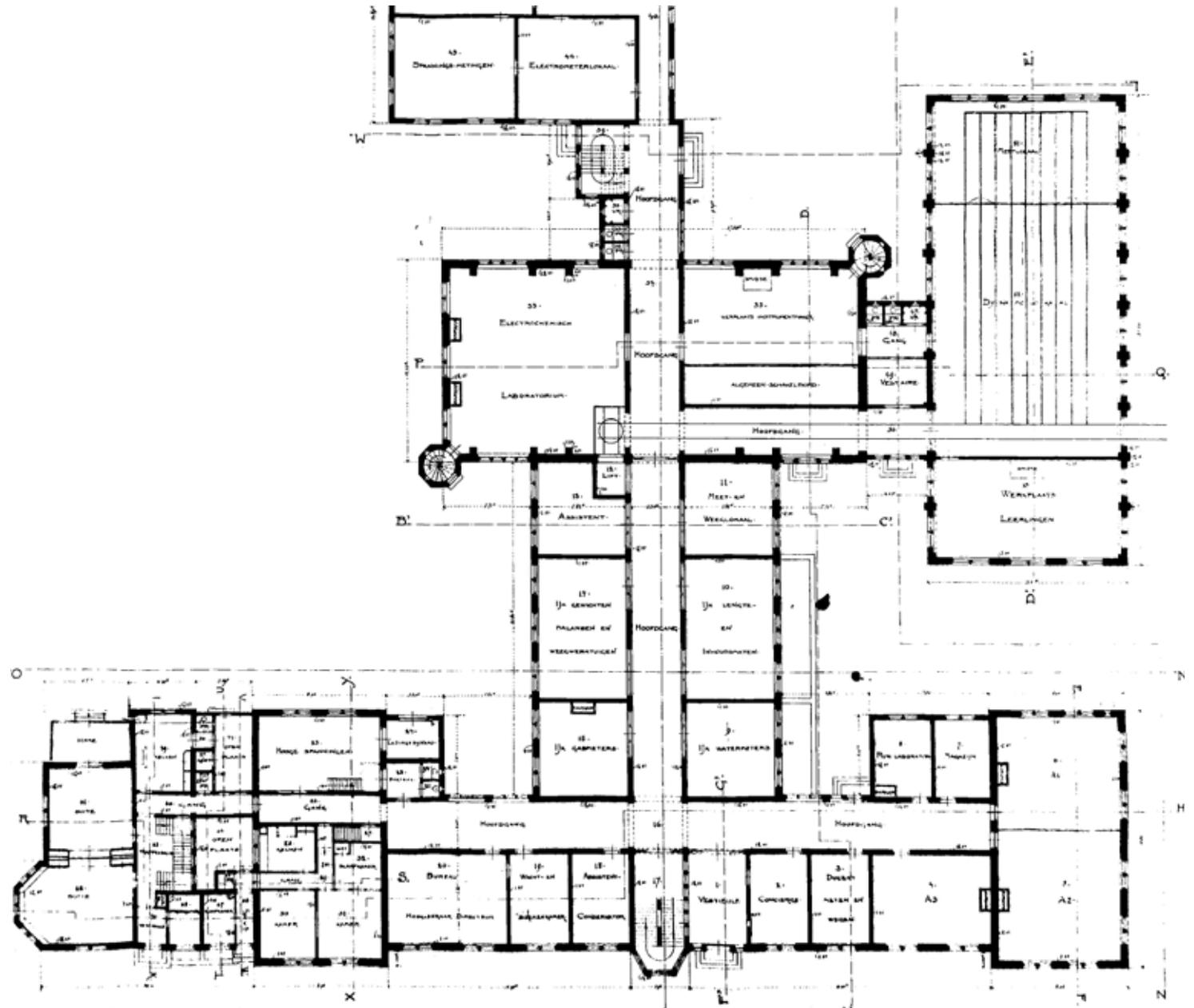


III.14 Main façade of the Physics and Electrical Engineering building 1:400



III.15 Left façade of the Physics and Electrical Engineering building 1:400

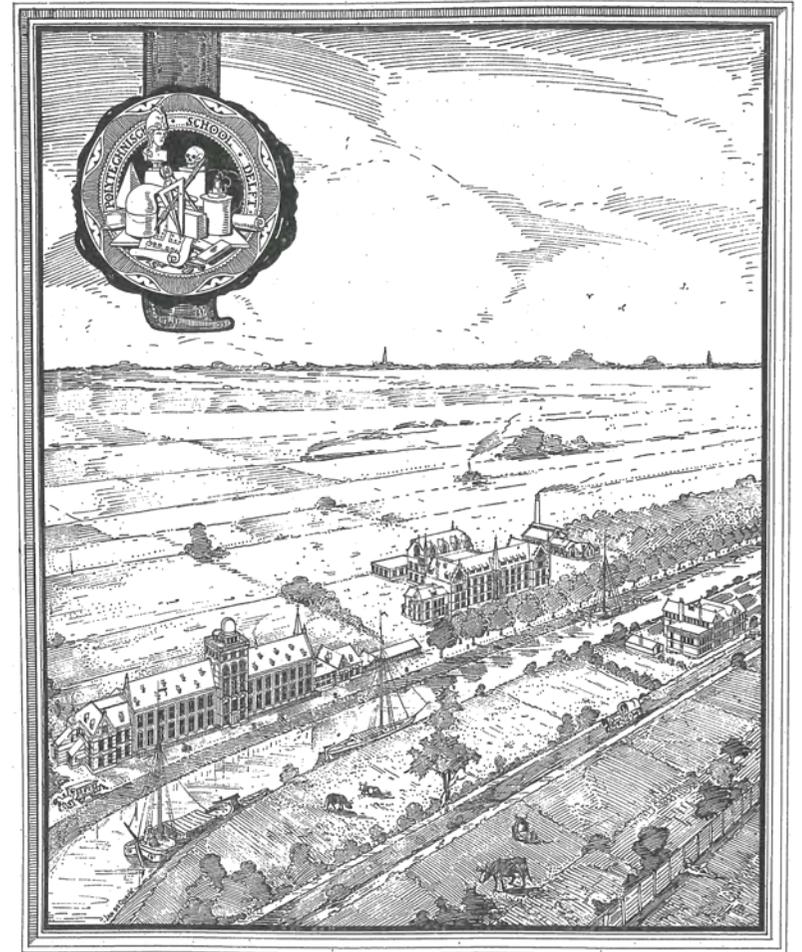
and instead of this the building has lots of overhanging woodwork making it look more like a large villa then a building for Microbiology. It also lacks the expression of the interior functions on the outside of the building which is so typical for van Lokhorst' other buildings. When these three building on the Kanaalweg where completed they formed the group of buildings (img. III.18) around which at a later time the campus would be formed. Little yet was to be seen of the layout of the future campus in the Wippolder as there were no roads in the area yet except for the Kanaalweg alongside the Schie-Canal. The buildings did however already form a coherent group of Polytechnische School buildings; especially the two buildings in the Wippolder. This was because of the similarities in architectural style and the fact that both buildings where orientated towards the Schie-Canal with their main façades. It was also greatly helped by the fact that they were the only two building of such a large scale on that side of the Schie-Canal.



III.16 Ground floor plan Physics and Electrical Engineering building 1:400



III.17 Physics and Electrical Engineering building



III.18 The three Polytechnische School building in the Wippolder

IV.

Fragmented further expansion: The Technische Hogeschool

In 1905 there was a large change in the technical education in Delft. On May 20th a new law was approved by the Dutch House of Representatives. It changed the regulations concerning university education in the Netherlands (Baudet, 1992, pp. 238-240). The Polytechnische School (Polytechnic School) now became a Technische Hogeschool (School for Higher Technical Education) which was at the same academic level as universities were. This change in the status of the school had been wanted by the school since the end of the 19th century.

Overcoming difficulties to become the Technische Hogeschool

The Polytechnische School considered itself - as the highest institute for technical education in the Netherlands - at the same academic level as the three national universities in the Netherlands, in Leiden, Utrecht and Groningen (Baudet, 1992, pp. 222-233). There were some major problems the school faced being a Polytechnische School rather than a university. A Polytechnische School for example could not issue doctorates, so students wanting to study for a doctorate still had to go to other technical schools in Europe. Also other titles with regards to specialisms, such as for example a title as an electrical engineer could not be given by the Polytechnische School. They still had to be obtained elsewhere in Europe (Baudet, 1992, p. 227). This of course meant that the Polytechnische School Delft faced a firm competition from the other technical schools in Europe, that were already at the same official academic level as universities.

Before the new law it had not been possible to change the status of the Polytechnische School to a Technische Hogeschool because a number of problems with the old law on higher education prevented a technical school from becoming a university. The old law for example stipulated that all Government Universities in the Netherlands had to offer the same five faculties, Medicine, Mathematics and Physics, the Arts and Philosophy, Law and

Theology. This created some problems, one being that most of the departments of the Polytechnische School did not fit within one of these five categories. This could potentially be overcome within the existing law by adding a sixth category for technical studies, but this then created yet another problem. Within the old law all the universities then had to offer this new department for technical studies, instead of only the potential new university in Delft (Baudet, 1992, pp. 226-227).

The new law changed the status of the Polytechnische School in Delft into a Technische Hogeschool. The level of Technische Hogeschool was at the same academic and official level as the universities, only the name was different. This overcame the previous problems by creating a separate category for the Delft School.

This change to the level of Technische Hogeschool also included some other changes besides the one mentioned above. The old Polytechnische School only had a single director in charge, whilst the new Technische Hogeschool had a board of curators, who were charge of the financial aspects, and a senate, in charge of education (Baudet, 1992, p. 229). The school was also split up into five separate departments, namely, General Sciences, Road and Water Engineering, Architecture, Mechanical, Marine and Electrical Engineering and Chemistry and Mining Engineering (Baudet, 1992, p. 222). But one of the most important changes for the developing Technische Hogeschool was the fact that by being at the same academic level as the Government University's it now also got the same financial support.

Buildings needed for a Technische Hogeschool

For the new Technische Hogeschool to get off to a good start the board of curators had to find out what was needed in order to become a high quality Technische Hogeschool that could compete on a European level. In 1906 a record was written by the board of

⁹Letter concerning the plot Nieuwelaan 40 which is offered for sale, from the Government Architect for Education J.A.W. Vrijman to the Board of Curators of the Technische Hogeschool, April 17th 1909, National Archive (The Hague), Archive TH-Delft until 1956 (acc.nr. 3.12.09.01), inv.nr. 501

Senate urges the Board of Curators to buy the land behind the building for Geodesy and the building for Physics and Electrical Engineering to be used for future expansion of the Technische Hogeschool. Furthermore it would be preferable by the Senate, if the land currently occupied by temporary buildings of the Technische Hogeschool on the Verwersdijk were to be sold instead of being kept for future use. The money from this sale could then be used to buy the land in the Wippolder behind the Buildings for Geodesy and the Building for Physics and Electrical Engineering. In this way the buildings of the Technische Hogeschool would be close together instead of being spread through the city, which was much preferred by the different departments. This land was later to be an important part of the Pre-war campus.

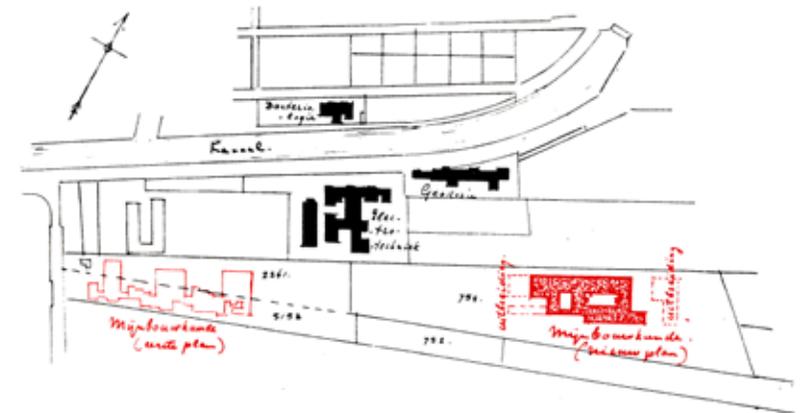
The 1908 Delft city expansion plan

The planned new building for Mechanical and Marine engineering (img. IV.1) was going to be built on a plot (img. IV.2) across from the existing building for Microbiology between the Ezelsveldlaan and the Nieuwelaan in the area between the medieval city and the 1894 Schie-Canal on land already owned by the Technische Hogeschool. This plot was near the just completed building for Physics and Electrical Engineering. It seemed to be big enough for all the necessary buildings as an offer to buy the adjoining plot was declined by the board of curators because they do not need the space⁹.

The building for Mining Engineering Created more problems than the building for Mechanical and Marine Engineering; in particular the location of this building. The new Mining Engineering building needed to be built free-standing in order to provide enough daylight to the lecture halls and laboratories as by the beginning of the 20th century, electrical lighting was not yet a suitable alternative for daylight. This was much discussed in the November 16th 1906 inquiry, when the board of curators deemed the current building on the Oude Delft unfit for modern laboratories, drafting rooms and lecture halls as there was not enough daylight in these old buildings. Although electric lighting was not yet a suitable



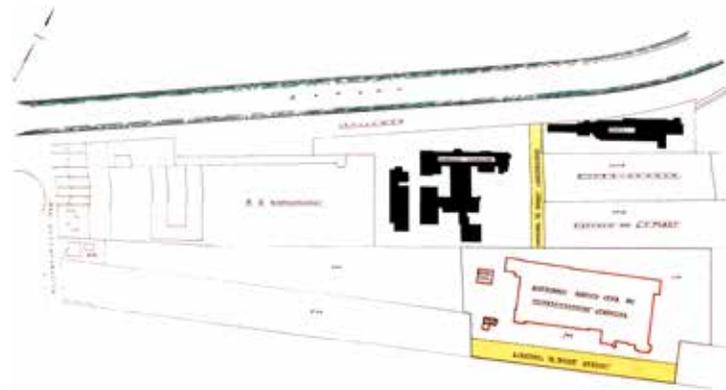
IV.3 Wippolder 1900 - Kanaalweg and Rotterdamseweg



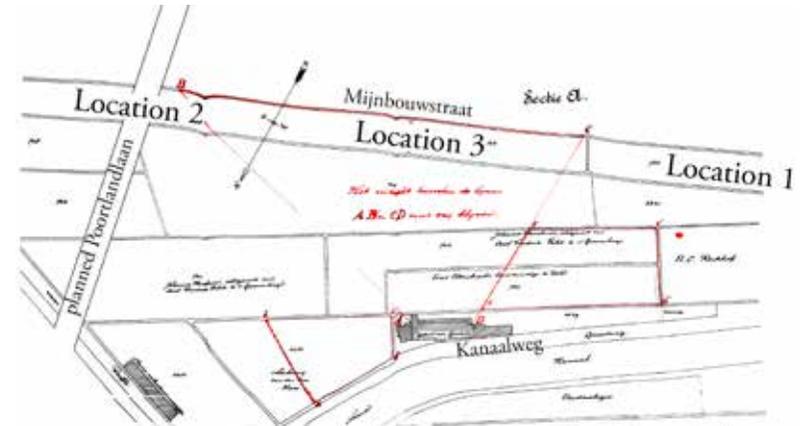
IV.4 Original and second location of the building of Mining Engineering

alternative to daylight, the building did need its own electricity, as the electrical grid of Delft was not reliable at that time. Therefore the Technische Hogeschool had its own two power plants, of which the largest of these had just been completed next to the new building for Physics and Electrical Engineering in the Wippolder. The other one was in the building complex on the Oude Delft. There were no suitable spaces available near the existing Oude Delft buildings of the Technische Hogeschool and its power plant,

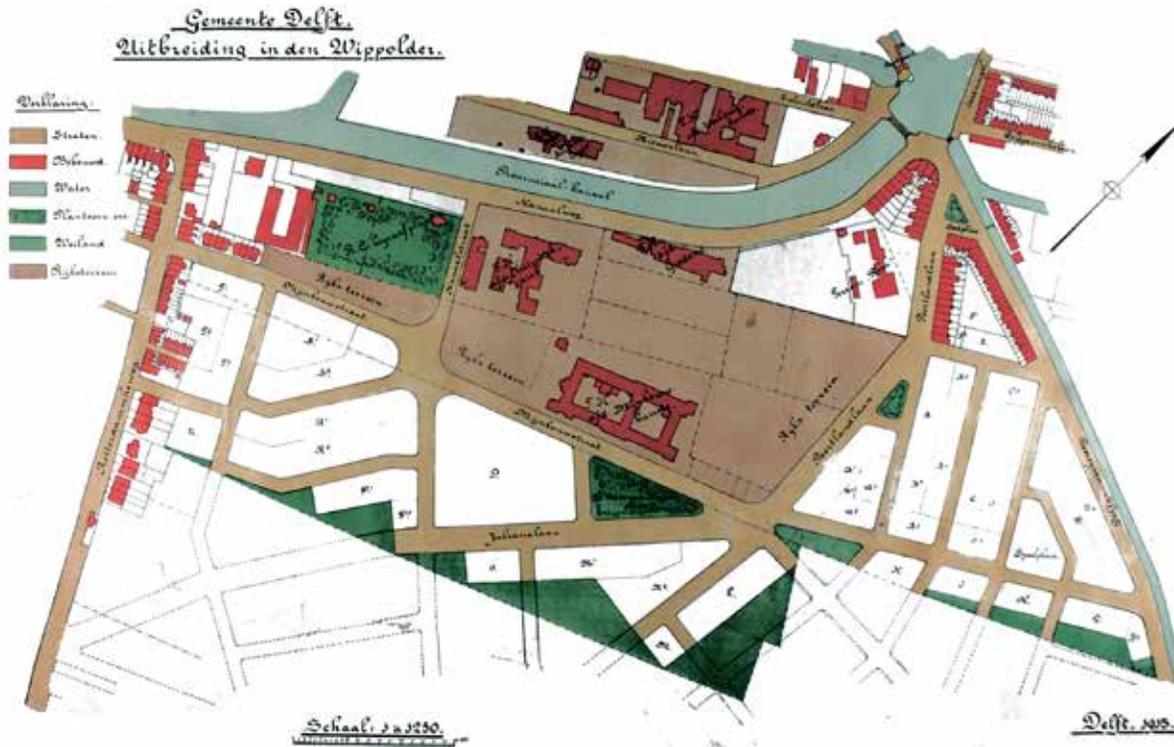
¹⁰Bestek en voorwaarden voor nieuwbouw met correspondentie, 1908-1917, National Archive (The Hague), Archive TH-Delft until 1956 (acc.nr. 3.12.09.01), inv.nr. 556



IV.5 Accessing the Mining Engineering Building



IV.7 The Mining Engineering building in conflict with the Geodesy research that could meet the requirements for space and natural lighting. This meant the best location for the new building would be near the Physics and Electrical engineering building and its power plant. The location for the Mining Engineering building needed to be on the south-west side of the Schie-Canal in the Wippolder because the available land on the north-east side of the canal nearest to the old city was planned to be used for the new Mechanical and Marine Engineering building.



IV.6 1915 version of the 1908 Delft city expansion plan

There were a couple of locations considered for the new building¹⁰. An important factor in the discussion on where to place this new building was the access to the new building. In the beginning of the 20th century there were only two roads in the Wippolder (img. IV.3), the Kanaalweg and the Rotterdamseweg, which formed the road connection between Delft and Rotterdam. The buildings for Geodesy and for Physics and Electrical engineering were situated on the Kanaalweg. The new Mining Engineering building was originally planned with one side on the Rotterdamseweg (img. IV.4), and in this way the building could be accessed from this existing street. This location was later dropped in favour of a location behind the existing building for Geodesy and the building for Physics and Electrical Engineering. This was the land that the Technische Hogeschool Senate had suggested the board of Curators

to buy in the 22th of February 1907 letter mentioned above. The land behind the two existing Technische Hogeschool buildings had some disadvantages. Firstly there was, unlike the location on the Rotterdamseweg, no existing street that would reach the new building. This could be solved in two ways (img. IV.5). Either by creating a new road parallel to the Kanaalweg or by building a simple access road from the Kanaalweg in between the building for Geodesy and the building for Physics and Electrical Engineering. That the decision between these two options had great consequences for the new Mining engineering building is made clear in a letter from the Board of Curators to the Mayor and Executive Board of the City of Delft on the 23 of April 1908 asking if the city was planning on building a new road parallel to the Kanaalweg. The Board of Curators asked this, because they needed to decide whether to place the building with its main facade oriented towards the Kanaalweg or towards a potential new street. Secondly the location behind the existing buildings for Geodesy and Physics and Electrical engineering could have influence on the research done in the Geodesy building, for which open space was required (img. IV.7). The original location on the Rotterdamseweg had limited negative influence on the Geodesy research as the building is placed outside of the required open land. The other option would at least partially be in the zone required by Geodesy. In the second location, behind the two existing buildings, the new building is placed as far as possible to the northeast so that footprint of the building is only slightly in the restricted zone. In 1908 there was a big change for the future of the Wippolder campus and in particular for the planned building for Mining and Chemical Engineering. Because of the Dutch Housing act of 1901 (Mácel, 1994, p. 8) every city in the Netherlands had to design an urban plan for the future expansion of the city. The council for public works of Delft, consisting of some officials and the City Architect, considered this a compromise of their freedom to work in their own manner. They even called it an assault on their personal freedom and had put making this obligatory plan off for some years¹¹. By 1908 they could no longer hold the making the

¹¹Minute of the Board of Public Works of the city of Delft, January 22th 1908, Delft City Archive (Delft), Minutes of the Board of Public Works 1895-1924, (acc.nr. 0.9.01), inv.nr. 31

¹²Letter, Government Architect for Education J.A.W. Vrijman to the Board of Curators of the Technische Hogeschool, November 22th 1907, National Archive (The Hague), Archive TH-Delft until 1956 (acc.nr. 3.12.09.01), inv.nr. 501

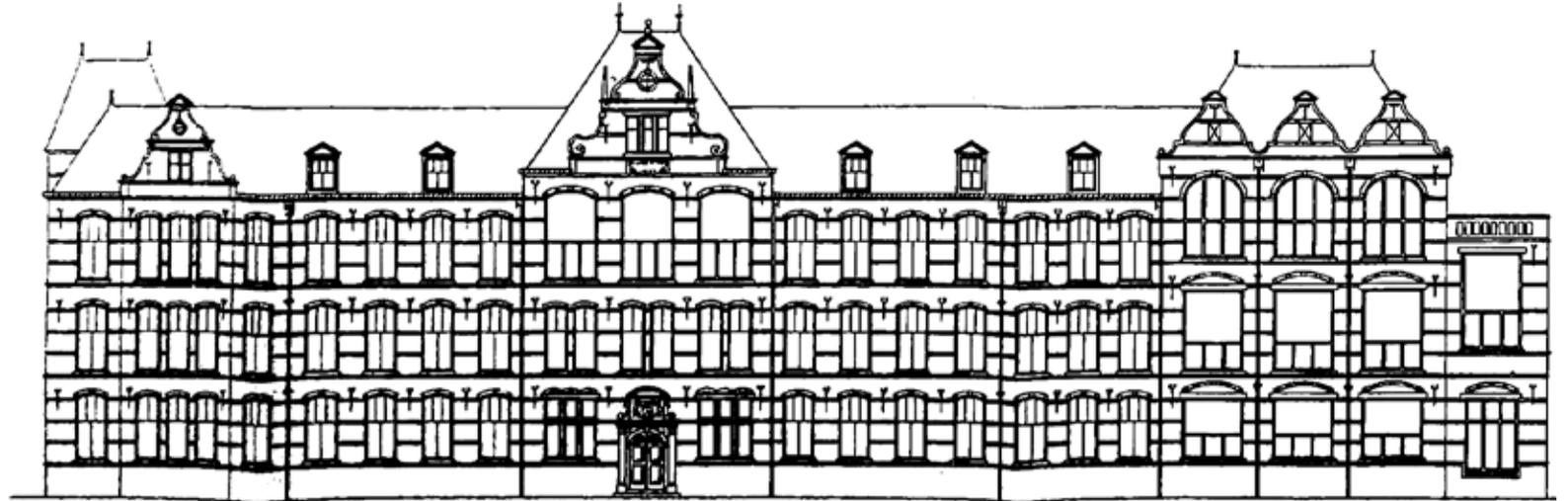
obligatory expansion plan (img. IV.6) and it was drafted by city architect M.A.C. Hartman.

This city expansion plan included the land behind the buildings for Geodesy, Electrical Engineering and Physics. The city of Delft seemed to have listened to the wishes of the Technische Hogeschool as a road was projected parallel to the Kanaalweg behind the existing buildings for Geodesy and Physics and Electrical Engineering providing access to the planned new building for Mining Engineering.

This meant however that the location of the new building was once again changed as one of the planned roads, the Poortlandlaan, conflicted with the location of the new Mining Engineering Building. The building was moved somewhat to the south east to a location behind the Geodesy building and the Physics and Electrical Engineering building. This new location must have compromised the Geodesy research as it was right in the middle of the reserved area, although a plot of land remained empty in between the new building and the Geodesy building.

The Government Architect for Education J.A.W. Vrijman and the Board of Curators of the Technische Hogeschool seemed to have had little faith in the city actually pulling through with this expansion plan. This was made clear by the way they acquired the land for the Mining Engineering building from the city of Delft. They intended to not only buy the land needed for the new building but also the land that in the plan by Hartman was reserved for the street in front of the planned building for Mining engineering¹². The Technische Hogeschool would then build this public street on their land after which the city could use and maintain it. They did this in order to make sure that the city could not change its plan for the area and move the street to another location. They wanted to make sure that the new Mining Engineering building would actually face a street instead of fields, or even worse, the backs of other buildings.

In 1911 the new Mechanical and Maritime Engineering building was completed and in 1912 the Mining Engineering building



IV.8 Main façade Mechanical and Maritime Engineering building 1:400



IV.9 Rear façade Mechanical and Maritime Engineering building 1:400

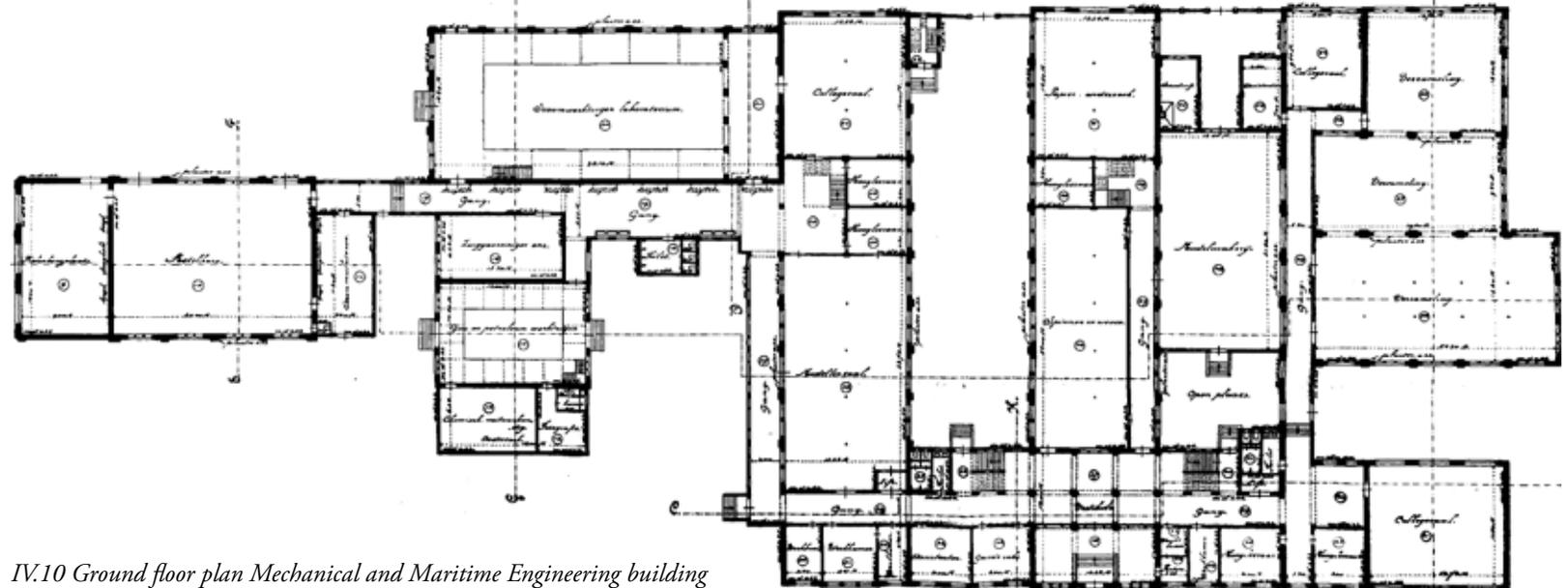
(Hoogenbeek & Verbrugge, 1982, p. 159). By then the building for Mining and Chemical engineering had exceeded the budget considerably which is made clear by the fact that there was not enough money to fully furnish the new building as planned. Only the most essential equipment and furniture was bought. This created severe tension between the government architect Vrijman, who was in charge of the budget, and the department of Mining and

Chemical Engineering. At one point the government architect even said that the department was unmanageable because they refused to accept necessary cutbacks on the funding of lab equipment¹³.

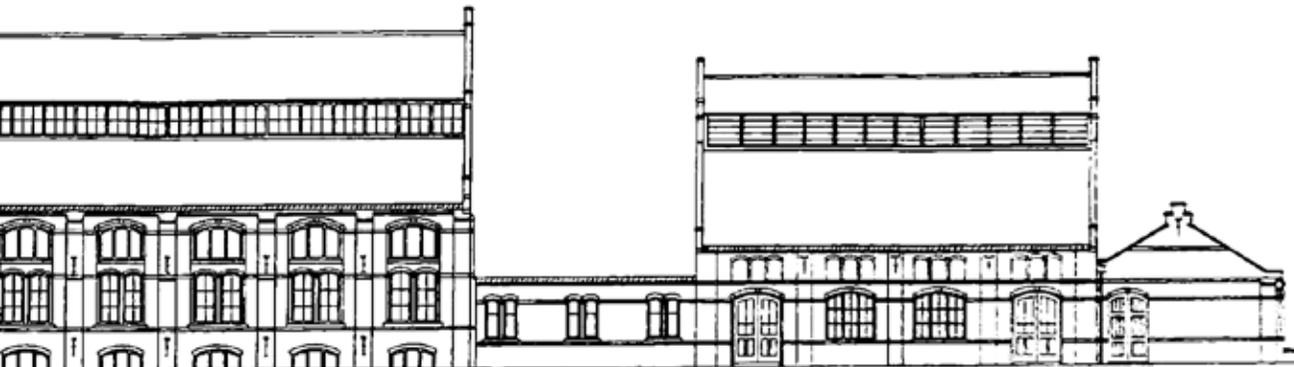
¹³Summary of correspondence between the government architect for education J.A.W. Vrijman and the faculty of Mining and Chemical Engineering, September 12th 1912, National Archive (The Hague), Archive TH-Delft until 1956 (acc.nr. 3.12.09.01), inv.nr. 556

A more formal campus architecture

Both the Mechanical and Marine Engineering Building (img. IV.8,9,10) and the Mining Engineering building (img. IV.11,12,13)

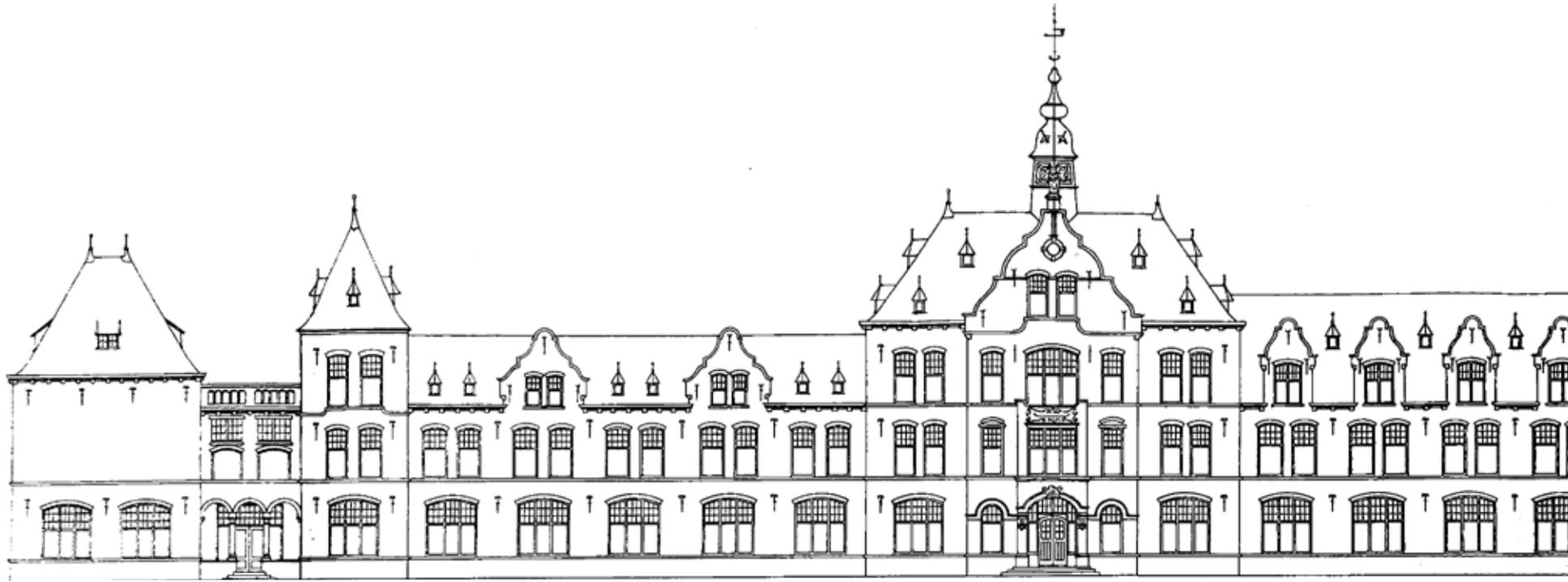


IV.10 Ground floor plan Mechanical and Maritime Engineering building



were designed by Government Architect for Education J.A.W. Vrijman. He replaced van Lokhorst after his death in 1906. Although it is not completely sure if Vrijman himself made the design for these two building or one of his employees did so. But even if it is not sure whether or not Vrijman actually made the design himself I will still accredit the design to him as he held the final responsibility for the office.

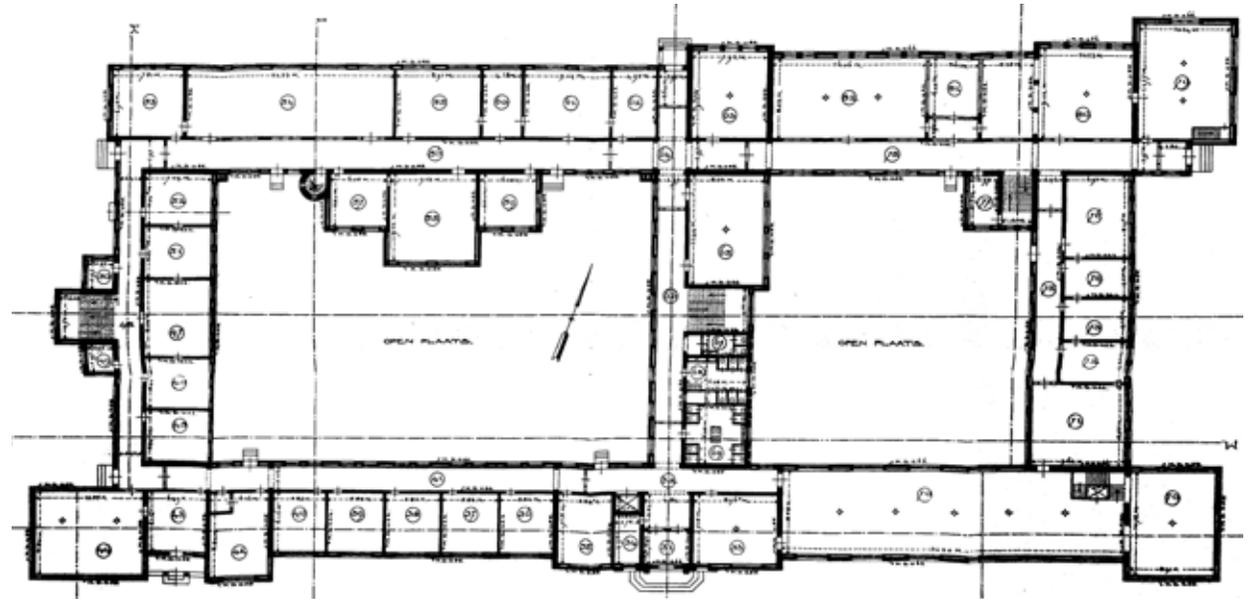
Compared to van Lokhorst, Vrijman used a more pure Neo-Renaissance architectural style for the buildings and he did not use any Neo-Gothic elements. The used Neo-Renaissance style is clearly visible in the decorations of his buildings. The stepped



IV.11 Main façade Mining Engineering building



IV.12 Rear façade Mining Engineering building



IV.13 Ground floor plan Mining Engineering building



IV.14 Neo-Baroque decorations on the Mining Engineering building entrance

gables of the two buildings have curvy volutes and the entrance of the Mechanical and Marine Engineering building is adorned with sculptures reminiscent of the late 16th and early 17th century Dutch Renaissance style. The roofs of both buildings are adorned with small dormers, especially the roof of the Mining Engineering building. The Mechanical and Marine Engineering building has a turret with an onion shaped roof on top of a squire tower. This tower recalls the type of tower used on the Geodesy building by van Lokhorst. Like the platform tower on the Geodesy building it seems to refer back to the old Leiden University Academiegebouw. There are also Baroque elements used in the mining engineering building around the entrance and in the shape of the tower (img. IV.14).

There are more differences in the design method of van Lokhorst and Vrijman. An important difference is that the Mechanical and Marine Engineering building and the Mining and Chemical Engineering building have a much more formal appearance than



IV.15 The first design for the Mining Engineering building by J. van Lokhorst

¹⁴Plan for a new Mining Engineering building, 1905-1905, National Archive (The Hague), Archive TH-Delft until 1956 (acc.nr. 3.12.09.01), inv.nr. 120

the buildings by van Lokhorst. This formalism is expressed mainly in the building shape and the façades. In both these buildings the façades are more or less in the same plane and have minimal setbacks and height differences in the main masses of the buildings. This creates a continuous building block. This block form is achieved with an E-shaped plan in the case of the Mechanical and Marine Engineering building and a plan around two quadrangles in the case of the Mining Engineering building. This of course does not mean that the functional, design brief driven approach of van Lokhorst disappears with Vrijman. Much like van Lokhorst, he designed the building around the needed space and their requirements. But the architectural expression of all these different interior spaces in the exterior massing seems less important to Vrijman than it was to van Lokhorst.

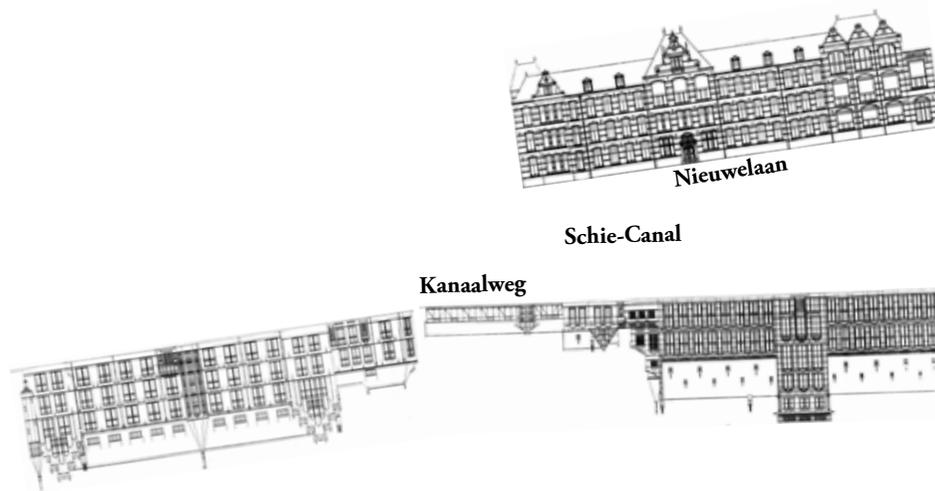
To further illustrate this difference between the design approaches of these two architects the archives turned up an interesting way to compare them¹⁴. Before his death in 1906 van Lokhorst had also made two designs for the Mining Engineering building. These would later be completely redrawn by Vrijman. Because these three plans are for the same building and therefore have a comparable design brief they can be compared to one another. The first design by van Lokhorst (img. IV.17) is E-Shaped and both



IIV16 The second design for the Mining Engineering building by J. van Lokhorst

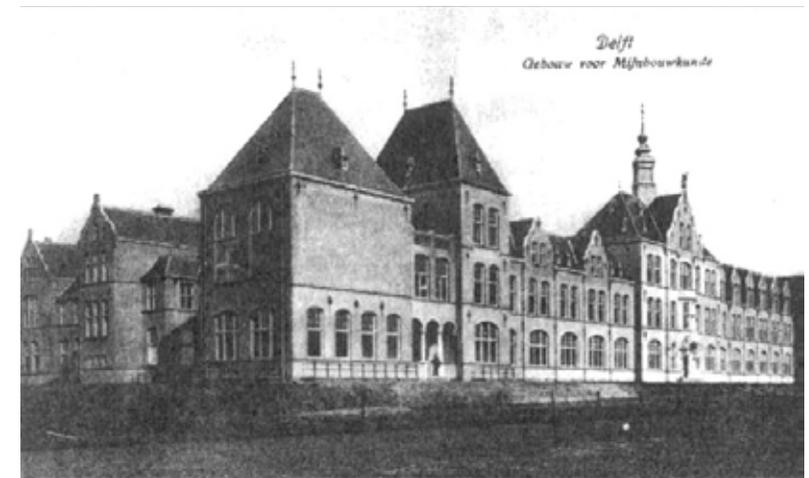
the second design of van Lokhorst (img. IV.16) and the design by Vrijman are arranged around two quadrangles. The first design by van Lokhorst has irregular façades with increasing setbacks. The building further has a highly irregular shape and consists of only one story. The main objective of the design seems an optimal arrangement of the required spaces. The architecture is merely a consequence of this arrangement. Even though both the second design by van Lokhorst and the design by Vrijman are arranged around two quadrangles the similarities seem to end there. The second design by van Lokhorst has an irregular shape with one side being considerably narrower than the other. This design also has a contrast in building height as part of the building is only one story tall while the rest is two stories tall. The design by Vrijman is much more regular in shape. The building is almost a perfect rectangle with only some minor setbacks in the facade. Also the height of the building is mostly the same. This illustrates the difference between the extrovert design driven by the interior functions van Lokhorst and the more Introvert and formal design by Vrijman.

The architecture of these building also has consequences for the coherence of the campus. The Mechanical and Marine Engineering building is placed with its formal main facade towards the Schie-Canal, the same as the Geodesy building and the Physics and



IV.17 Coherent building group along the Schie-Canal

Electrical Engineering building. These Technische Hogeschool buildings clearly stand out from the surrounding houses and buildings. Their clear historical styles and complex roof line adorned with towers, dormers and gables, defines the silhouette of the Technische Hogeschool along the Schie-Canal. They form the transition between the old city and the modernity of the Technische Hogeschool. The Buildings achieve a formal character because of the architecture of their prominent façades and their location along the open space provided by Schie-Canal and the two roads on either side. There is even a strip of landscaped parkland between the Schie-Canal and the Mechanical and Maritime Engineering Building enhancing this formality even



IV.18 The Mining Engineering building with no connecting road

further. These three buildings therefore form a coherent group of clearly distinguishable Technische Hogeschool buildings along the Schie-Canal (img. IV.17). This effect would later be lessened by the construction of the Laga Rowing clubhouse in front of the Mechanical and Maritime Engineering Building in the former location of the park. The Mining Engineering building by then was not yet part of a coherent complex of Technische Hogeschool buildings as at this time it was the only building facing towards the Wippolder instead of the Schie-Canal (img. IV.18). This would, however, soon change as the Technische Hogeschool refined its campus and moved further into the Wippolder.

V.

The campus is within reach: Creating cohesion

¹⁵Letter concerning the progress of the construction of the Mining Engineering building, Government Architect for Education J.A.W. Vrijman to the Board of Curators of the Technische Hogeschool, September 12th 1912, National Archive (The Hague), Archive TH-Delft until 1956 (acc.nr. 3.12.09.01), inv.nr. 556

¹⁶Provisional Systematic Plan of Action, Board of curators to the Senate, March 18th 1908, National Archive (The Hague), Archive TH-Delft until 1956 (acc.nr. 3.12.09.01), inv.nr. 517

¹⁷Letter, Government Architect for Education J.A.W. Vrijman to the Board of Curators, May 29th 1909, National Archive (The Hague), Archive TH-Delft until 1956 (acc.nr. 3.12.09.01), inv.nr. 501

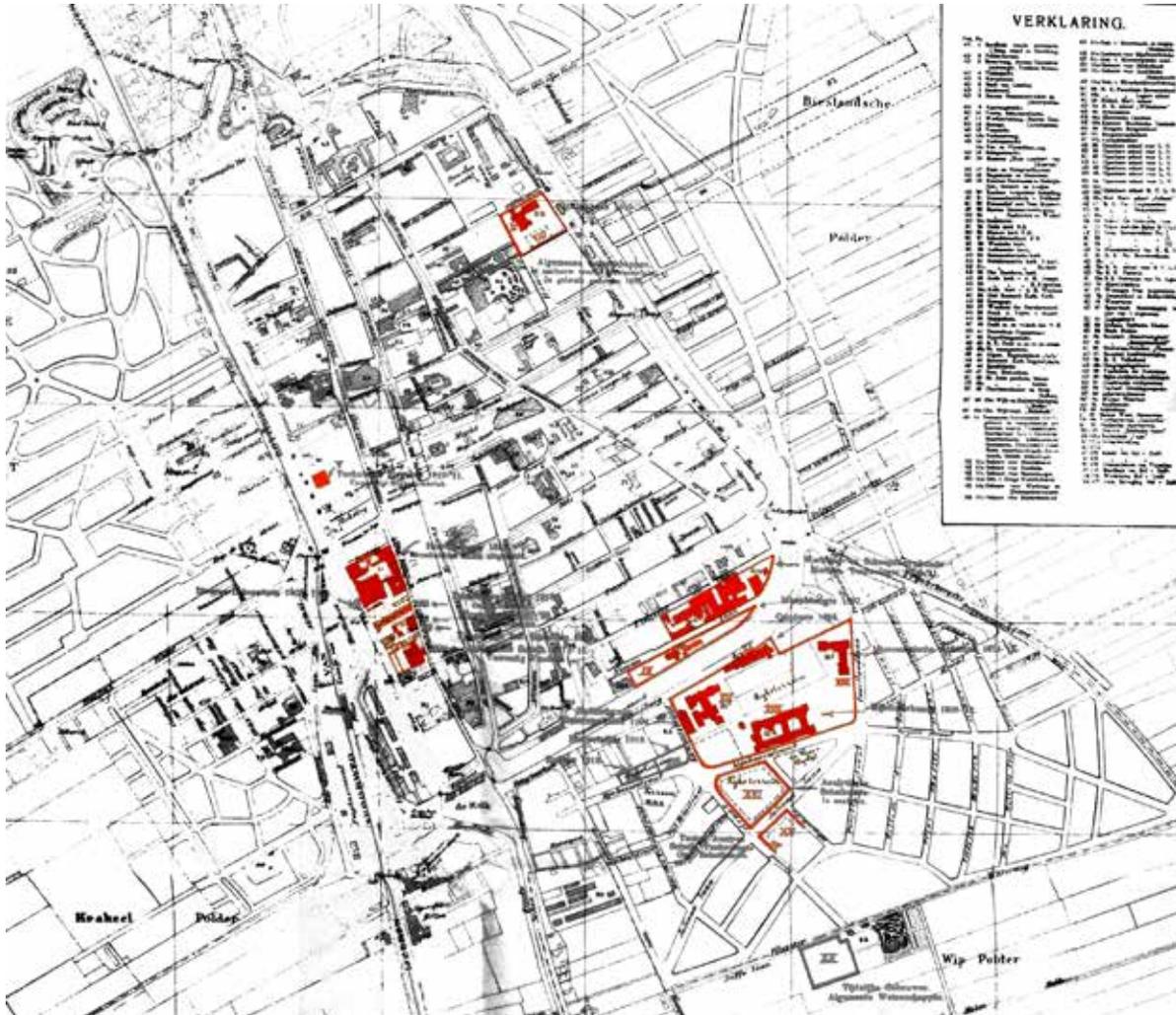
In 1912 the Campus was out of the starting blocks although it could not in all fairness be called a campus yet. Although the building along the Schie-Canal formed a formal and coherent display of Technische Hogeschool buildings this could not be said of the three other buildings in the Wippolder on the south-east side of the Schie-Canal. They did not form a coherent and formal complex of buildings. The new Mining Engineering building was basically standing in the middle of a field only accessible through a dirt road due to the slow progress of road building in the 1908 Wippolder expansion plan¹⁵. The Geodesy building and the Physics and Electrical Engineering building basically had their backs towards the Wippolder. Seen from the Wippolder these buildings formed a fragmented collection of individual buildings standing close to one another.

The systematic plan of action, moving back to the old city

The fragmentation of Technische Hogeschool buildings would only be made worse by the provisional results of inquiry about the future needs of the different departments and the following provisional systematic plan of action¹⁶. The provisional plan was made by the Board of Curators in cooperation in cooperation with the Government Architect Vrijman. It was finished on the 18th of March 1908. As mentioned before the plans excluded the already existing buildings of Microbiology, Geodesy and Physics and Electrical Engineering right from the beginning. It also excluded the by then already far developed plans for the buildings for Mechanical and Maritime Engineering and for Mining Engineering. Although this provisional plan included the founding of four new buildings in the Wippolder it also included the construction of a complex of buildings on a new location on the Verwersdijk consisting of administrative buildings, a library and new buildings for the departments of Architecture and Water and Road Engineering. The Government Architect for Education later explained an important

reason as to why the new Technische Hogeschool buildings can now be build outside of the Wippolder or the Oude Delft. Because all the previous buildings where constructed around the power plant of the Technische Hogeschool in the Wippolder and the city of Delft had build a reliable electrical grid, the new Technische Hogeschool buildings can now be built anywhere in the city. Not having to take the location of their own power plants into account¹⁷.

The Senate of the Technische Hogeschool had already suggested in an earlier letter that they would prefer it if the land of the university on the Verwersdijk where to be sold and the money used to purchase land in the Wippolder. When the senate responded to the provisional plan of action the opinion of the senate was somewhat divided. Some members thought that the location in the city centre was closer to where the students, teachers and professors lived and this could be seen as an advantage. They considered the fact that you had to cross the Schie-Canal to reach the Wippolder by means of two possibly opened bridges a disadvantage of the Wippolder. Others thought that it would be better to build all the new buildings, excluding the buildings on the Oude Delft, in the Wippolder. They wanted to limit the amount of different locations of the Technische Hogeschool in the city in order to limit travel time between these different locations. They also mentioned that the travel time from the housing of students, teachers and professors in the city centre would be limited as all the buildings would be close to one another and they could walk from building to building. The conclusion of the letter to the Board of Curators is that they did not come to a definitive conclusion and wished to only offer the board of their opinions for consideration¹⁸. The final Systematic Plan of Action by the Board of was completed on April 15th of 1908¹⁹. It differed very little from the provisional plan. In the end only two of the proposed building on the Verwersdijk where eventually build. The first of these two buildings,



V.2 Map illustrating the unwanted spread of Technische Hogeschool buildings the proposed Library was completed in 1915 (img. V.1).

Not only was the Technische Hogeschool Senate critical of the spread of buildings through the city; in 1920 the Dutch Society of Social Democratic Engineers also sends a critical letter to the Dutch Minister of the Interior explaining their concern about the



V.1 The library in the Verwersdijk area

development of the Technische Hogeschool²⁰. This concern was illustrated with a map (img. V.2) showing all the buildings of the Technische Hogeschool displaying their spread throughout the city. They advised not to build the new building for Water and Road Engineering on the Verwersdijk but in the Wippolder and to move the main building from the Oude Delft to the Wippolder as well. There is also some advice considering the infrastructure in and to the Wippolder. There was to be a better connection between the two sides of the Schie-Canal and if a tram route would be build through Delft as planned, it should form a connection between the train station, the library on the Verwersdijk and the Wippolder. Despite the advice in 1923 the building for Water and Road engineering was completed in the Verwersdijk Complex. The tram connection between the train station and the Wippolder was partly build in 2014: 94 years later.

Even foreign visitors noticed and disliked the scattering of building trough the city. A British visitors to the Technische Hogeschool Delft in 1915 described it as follows: "Instead of forming imposing quadrangles, the academic building are scattered at random

¹⁸Letter concerning the provisional systematic plan of action, Senate of the Technische Hogeschool to the Board of Curators, March 27th 1908, National Archive (The Hague), Archive TH-Delft until 1956 (acc.nr. 3.12.09.01), inv.nr. 517

through the town, and no well-kept lawn or stately avenues enliven the endless vista of red brick” (Hoogenbeek & Verbrugge, 1982, p. 159).

¹⁹Record concerning the Systematic Plan of Action, Board of curators, April 15th 1908, National Archive (The Hague), Archive TH-Delft until 1956 (acc.nr. 3.12.09.01), inv.nr. 517

²⁰Letter concerning the spread of buildings of the Technische Hogeschool through Delft, Dutch Society of Social Democratic Engineers to the Dutch Education, Science and Arts Minister, June 3th 1920, National Archive (The Hague), Archive TH-Delft until 1956 (acc.nr. 3.12.09.01), inv.nr. 517

Connecting the buildings with formal squares and gardens

1908 was an important year for the development of the recognisable campus with two events that had great influence on the campus appearance. The development of two landscaped zones in the Wippolder campus, the Botanical Gardens and the de Vries van Heijstplantsoen was initiated. These new landscaped areas would help to fix the above mentioned problem of the lack of “well-kept lawns or stately avenues” (Hoogenbeek & Verbrugge, 1982, p. 159) around the Technische Hogeschool buildings in the Wippolder.

The first of these landscaped zones was the de Vries van Heijstplantsoen. It was part of the Delft city expansion plan of 1908 by city architect Hartman. The de Vries van Heijstplantsoen was a small landscaped park in front of the planned Mining and Chemical Engineering Building although the park was already planned before the definitive location of the Mining Engineering building was known. This might explain the fact that the park is not perfectly centred in front of the building. But this may be forgiven as the park still gives the mining engineering building a rather grand and formal appearance.

The development of the Botanical Gardens started in 1908 when the famous professor G. van Itterson wrote a letter to the department of Mining and Chemical Engineering requesting the formation of a new laboratory for Microscopic Anatomy (img. V.3). The current accommodation in a building on the Oude Delft, which was acquired in 1905, was too small for the growing number of students following the courses (Meijden, 2015). In this request he asked for the creation of a new building with laboratories and lecture halls, and also a garden to grow crops and plants that were needed for the research of the department. The most logical location for the new building with its gardens was next to the existing building of Microbiology as there is a close cooperation between the departments. However this option is



V.3 Microscopic Anatomy building

quickly dismissed as there was not enough land available near the Microbiology building for the new building and accompanying gardens and also for future expansions. An alternative would be to build the complex in the Wippolder as there was ample space available there. A condition of this location in the Wippolder would be that space should be reserved to later move the Microbiology building next to this new Microscopic Anatomy building. This was a likely scenario as the building for Microbiology was already too small by then. This would then reunite these two departments.

The new Laboratory building for Microscopic Anatomy (img. V.4-7) was again designed by Government Architect Vrijman, who also designed the Mechanical and Marine Engineering building and the Mining Engineering building. The Microscopic Anatomy was much smaller than these two buildings. The shape of the facade of the new building resembled these earlier buildings but Neo-Renaissance detailing was much less expressive than in the previous buildings. An important element that was used again was the bay window above the main entrance of the building, although it did not have the same elaborate Baroque sculptures as the bay



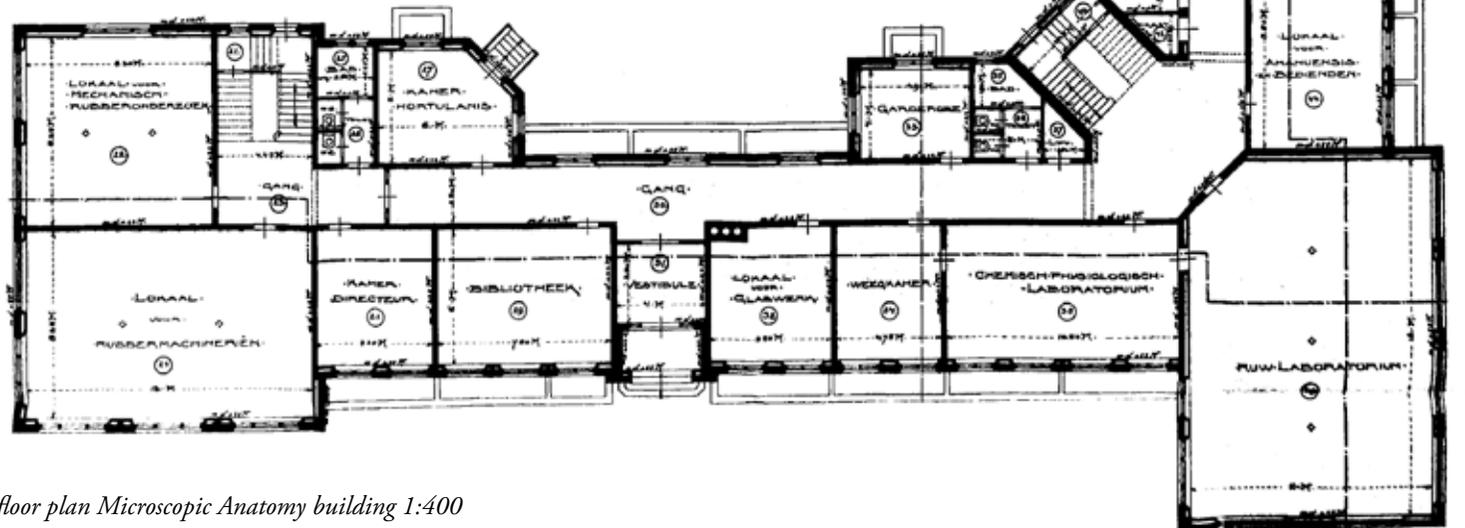
V.4 Main façade Microscopic Anatomy building 1:400



V.5 Right façade Microscopic Anatomy building 1:400



V.6 Less elaborate bay window above the entrance



V.7 Ground floor plan Microscopic Anatomy building 1:400



V.8 The Botanical Gardens connecting the Technische Hogeschool buildings



V.9 The Botanical Gardens forming a quadrangle

window above the entrance of the Mining Engineering building did. These two bay windows did however create coherence between the two buildings that is also expressed in the stark expression of the main facades. An important Neo-Renaissance element of the earlier building was also left out. The new laboratory did not have the stepped gables with volutes that dominated the two earlier campus buildings by Vrijman. Instead it had simple pointed gables. But the biggest difference between the new building and the two previous buildings by Vrijman was in the layout and massing of the new building. Unlike the front facade, which still had the same stark formalism as the Mining Engineering building and the Mechanical and Marine Engineering building, the back of the

Microscopic Anatomy building broke with this formalism. Instead of using a regular plan with a more or less continues building height around quadrangles like the Mining Engineering building or in an E-shape like the Mechanical and Marine Engineering building the new building used a more random arrangement of shapes and building heights in a L-shaped plan. These different masses in the back of the building expressed the interior functions. It recalls the approach used by van Lokhorst for the Physics and Electrical Engineering Building which also consisted of a more or less formal facade behind which the needed spaces where functionally arranged and expressed in the exterior architecture.

When the Microscopic Anatomy building and the Botanical garden where completed after 1917 the foreign visitor that looked at the complex (img. V.8) in 1915 might have gotten a more positive impression. His request for more formal landscaping around the building was answered by the new gardens that now filled in the area between the Geodesy, Physics and Electrical Engineering, Mining and Chemical Engineering and Microscopic Anatomy buildings was now filled in with beautifully landscaped gardens tying the buildings together. The formally designed west part of the botanical gardens even formed a quadrangle (img. V.9) in between the formal rear facade of the Mining and Chemical Engineering building and the veranda on the rear facade of the Geodesy building. The other side of the quadrangle where formed by the side of the Physics and Electrical Engineering building on one side and the rest of the botanical gardens on the other side. The coherence of the group of building around these botanical gardens was also helped by similarities in the architecture of the four buildings. They were all arranged in with rather formal facades towards the road and where all designed in historical styles incorporating Gothic, Renaissance and Baroque elements. The buildings were also much larger than the surrounding residential structures.

VI.

The end of pre-war campus development: Optimism and downfall

²¹Letter concerning the proposed acquisition of land in the Wippolder, Senate of the Technische Hogeschool to the Board of Curators, March 9th 1914, National Archive (The Hague), Archive TH-Delft until 1956 (acc.nr. 3.12.09.01), inv.nr. 501

²²Letter concerning the proposed acquisition of land in the Wippolder, Government Architect for Education J.A.W. Vrijman to the Board of Curators, November 24th 1916, National Archive (The Hague), Archive TH-Delft until 1956 (acc.nr. 3.12.09.01), inv.nr. 501

On March 9th 1914 the senate of the Technische Hogeschool wrote a letter to the Board of curators requesting the purchase of land in the Wippolder²¹. This land was being offered for sale by the city of Delft in the Wippolder city expansion plan of 1908. The senate argued that it was wise to purchase this land because they wanted to prevent future Technische Hogeschool building from having to be built in a completely new location.

The development of modern campus architecture

By 1914 the university had four locations in Delft. These four locations were the old Buildings on the Oude Delft, the new library on the Verwersdijk, the buildings north-west of the Schie-Canal and the complex of buildings in the Wippolder. The buildings north-west of the Schie-Canal and the buildings in the Wippolder were very close to one another and formed a group. A new location was not preferred by the Senate because the travel times the students had between the existing locations had already been causing problems with the scheduling of lectures. As there

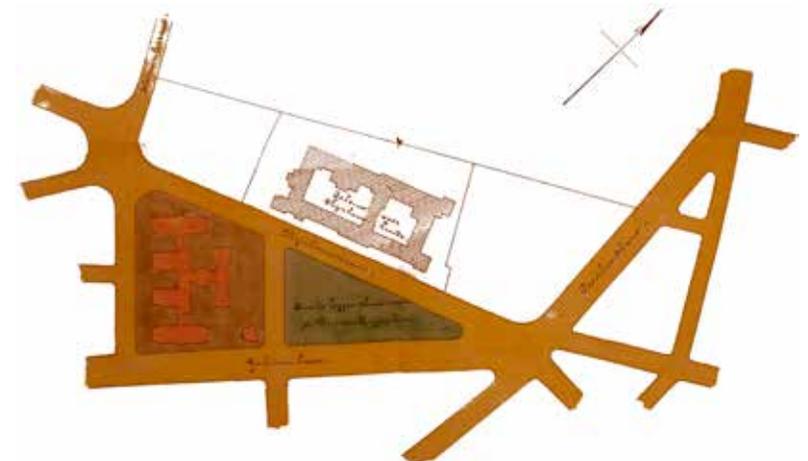
was no space available anymore on the Oude Delft, and the area north-west of the Schie-Canal and the land on the Verwersdijk had already been appropriated to planned new buildings, the only possible location to build new Technische Hogeschool buildings near existing ones was the Wippolder. This made it necessary to buy the land in the Wippolder offered by the city of Delft, before it was sold to another party for residential projects.

In 1916 there is a negotiation between the Government Architect for Education J.A.W. Vrijman and the Delft City Architect M.A.C. Hartman about the possibility of making the land in the city expansion plan across from the existing building for Mining Engineering in the Wippolder suitable for Technische Hogeschool buildings²².

The systematic plan of action called for the erection of a new laboratory for Analytical Chemistry as the current Chemistry complex on the Oude Delft in the city centre was getting too small for the growing number of students. The first new Technische



VI.1 The Analytic Chemistry building



VI.2 The Analytic Chemistry building on the de Vries van Heijstplantsoen



VI.3 University of Utrecht hospital building designed by J. van Lokhorst



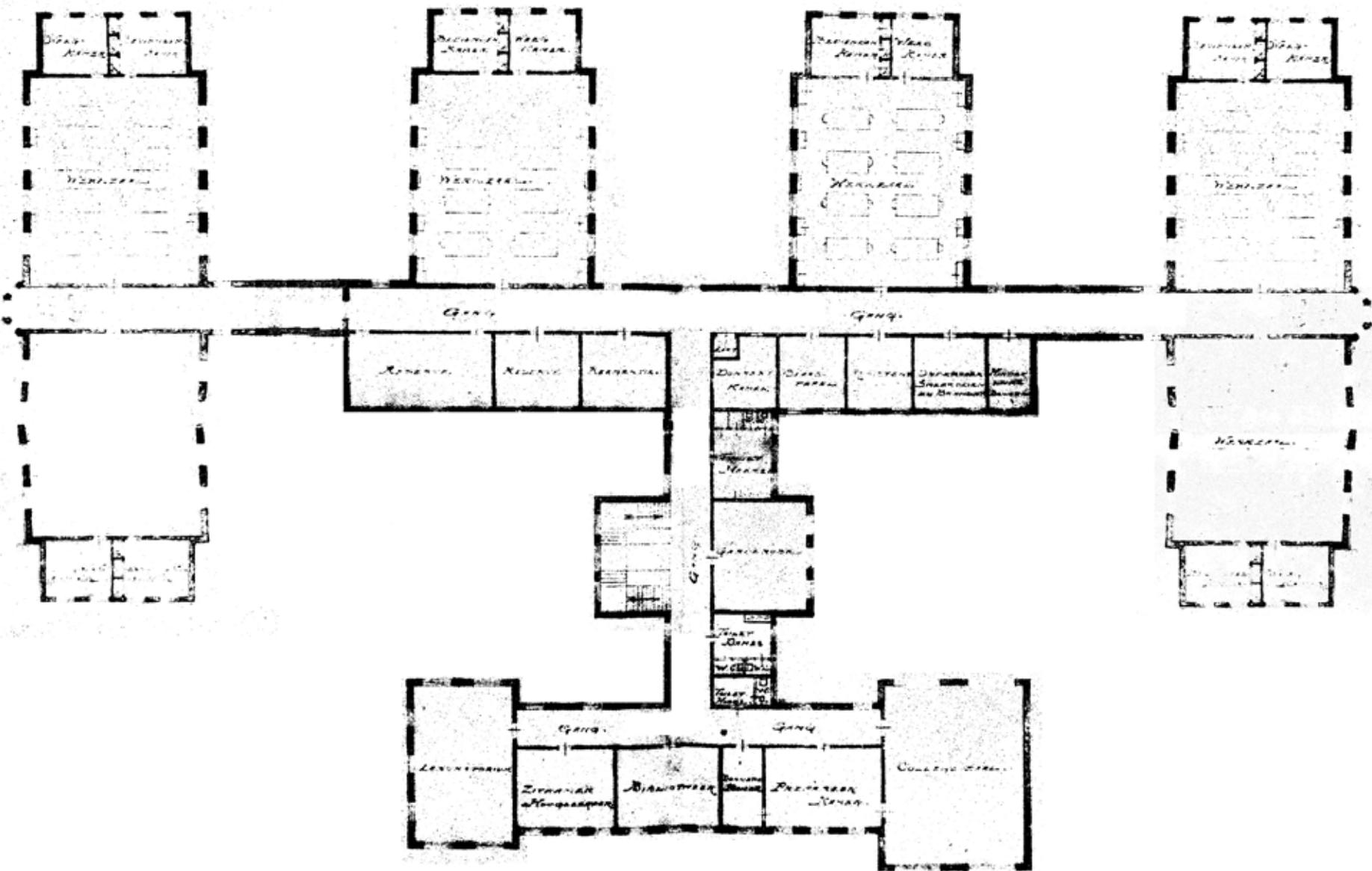
VI.4 Aerial photograph of the Analytic Chemistry building



VI.5 Main façade Analytic Chemistry building 1:400

Hogeschool building developed in the Wippolder after the completion of the Microscopic Anatomy building was therefore the building for Analytic Chemistry (img. VI.1). The building was meant mainly for laboratories it demanded high quantities of natural light. The new laboratory building was part of the Mining and Chemical Engineering department so a location close to the Mining Engineering building was practical. The new building was going to be build in the Wippolder on the south-west side of the de Vries van Heijstplantsoen (img. VI.2). Construction of the new laboratory for Analytic Chemistry was completed in 1923 (Hoogenbeek & Verbrugge, 1982, p. 163).

The new building was personally designed by Vrijman. It is the only Technische Hogeschool building from the office of Vrijman, that was certainly designed by Vrijman himself (Mácel, 1994, pp.??). This building seemed to combine the approach of van Lokhorst displaying the interior functions on the exterior with the formal approach of Vrijman. This exterior expression of the functions is made clear by the fact that the two main functions of the building; offices and lecture halls and laboratories, are clearly expressed in the architecture of the building. The building consist of two main parts each housing one of the two main functions. These two parts each have a clearly different architectural expression. The first part of the building contains the offices and lecture halls and also contains the main entrance. The facade is slightly asymmetrical and has a pitched roof and a highly decorated entrance. The facade is somewhat comparable in arrangement and materials to the formal street façades of the three earlier buildings by Vrijman; only this street facade is even smaller than the one of the Microscopic Anatomy building. The second part of the building contains the laboratories and consists of four wings with a corridor connecting them. This part of the building is completely symmetrical. On both ends of the corridor connecting the four wings there was a small tower containing a stairwell. The formal approach of Vrijman is expressed in the symmetry of the building and the regularity of the setbacks. The design has a great resemblance to a hospital building J. van Lokhorst designed for the University of Utrecht (img. VI.3)



VI.6 First floor plan Analytic Chemistry building 1:400



VI.7 Analytic Chemistry building entrance with "Amsterdam School" ceramics



VI.8 "Amsterdam School" style interior tiles in the Analytic Chemistry building

(Saxa Loquuntur, 1903, pp. 17-20).

The architectural style of the Microscopic Anatomy building (img. VI.4-8) is also interesting and marks a change in the design of Technische Hogeschool buildings. Although the shape of the office and lecture hall section of the new building still closely resembled the Neo-Renaissance style of the previous buildings by Vrijman, the decorations were different. While the Microscopic Anatomy building already had very little renaissance decoration, the new Analytic Chemistry building has close to none. Instead ceramic Amsterdam School style decorations are used around the entrance of the building and around the exhaust vents on the exterior. The Amsterdam School style decorations are also visible on the interior of this building, especially in the elaborately decorated main hall and stairwell, which is completely covered in decorative ceramic tile. An interesting aspect of the interior ceramics is the cooperation of Doric capitals into the tiles on the columns in the entrance hall and stairwell giving these spaces an interesting combination of historical and modern architecture.

The peak of building optimism followed by inevitable fall

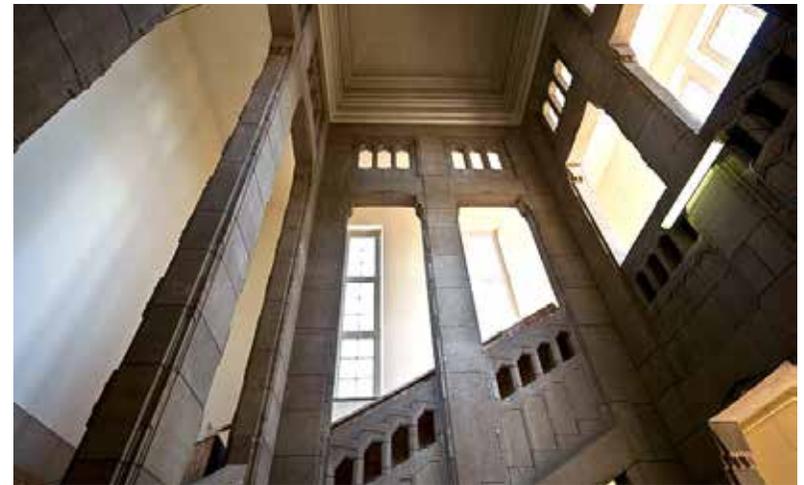
In 1917 the designs were made for two new Technische Hogeschool buildings. One for a new building for Microchemistry and Metallurgy that would later become the new Physics building and one for a new building for Chemistry. This Chemistry building would later be known as the "Red" Chemistry building. These new designs were made because the current accommodation of these departments on the Oude Delft was in such bad repair, that immediate action was required. This combined with the growing number of student enrolling in the department prompted the designs for these two buildings. The design was again made in the office of Government Architect for Education Vrijman. These designs are a part of a group of three designs with similar proportions and detailing. The third building in this group is the Road and Water Engineering building (img. VI.14) completed in 1923 outside of the campus on the Oostplantsoen, near the library on the Verwersdijk. It is known that an employee of Vrijman, G. van Drecht, supervised the

design of the Road and Water Engineering building and most likely also had great influence the design for this building (Mácel, 1994, pp. 47-48). As these tree building are very similar in architectural arrangement he probably also had a great influence on these buildings.

The Microchemistry and Metallurgy building (img. VI.9-13) was planned for a corner plot between the Physics and Electrical Engineering building and the Mining Engineering building closing of a corner of the group of Technische Hogeschool Buildings around the Botanical Gardens. The building has an L-shape with a large stair tower with a cupola on the corner. The two street facing façades of the building are very formal and do not show the functions inside while this is more clearly visible in the rear of the building, not unlike the Microscopic Anatomy building. The decoration and detailing of the building is a combination of more modern Amsterdam School style decorations and historical neo-renaissance elements. The Amsterdam School elements are mainly around the entrance to the building and in the interior stairwell. Like the Analytic Chemistry building the stairwell is decorated with Amsterdam School elements. In this building natural stone elements are used instead of ceramics. The Neo-Renaissance elements in the building are the gables with curvy volutes although the actual styling of the volutes is Amsterdam School style. Because of the use of the neo-renaissance gables the building ties in very well with the Mining Engineering building next to it greatly helping the coherence of the campus area around the botanical gardens. This combination of Amsterdam School styling with historical elements was also visible in the interior of the analytic Chemistry building. These two building therefore form a sort of architectural transition zone towards the “red” Chemistry building which is designed completely in the Amsterdam School style. Even though there are many similarities in decoration between the Microchemistry and Metallurgy building and the Analytic Chemistry building the overall proportions of the buildings differ greatly, the window shapes, massing, roof and floor plan style are very different. This might be



VI.9 Mixture of “Amsterdam School” and Neo-Renaissance in the volutes



VI.10 Physics building stairwell with “Amsterdam school” stonework

explained by the above theory that G. van Drecht has designed the Microchemistry and Metallurgy building instead of Vrijman.

The “Red” Chemistry Building (img. VI.15-17) - named after the



VI.11 Main façade Physics building 1:400



VI.12 Rear façade Physics building 1:400



VI.13 Plan and location of the Physics building

red bricks used - was going to be built on a site across from the Mining Engineering building on the de Vries van Heijstplantsoen on the strip of land the Technische Hogeschool had acquired in 1917. The design for the building was of a scale that had never been seen before in Technische Hogeschool buildings. It was very wide with tall stories. The floor plan consisted of a number of wings extending from the middle of the building where the entrance was also located. The exterior of the building was extremely formal.

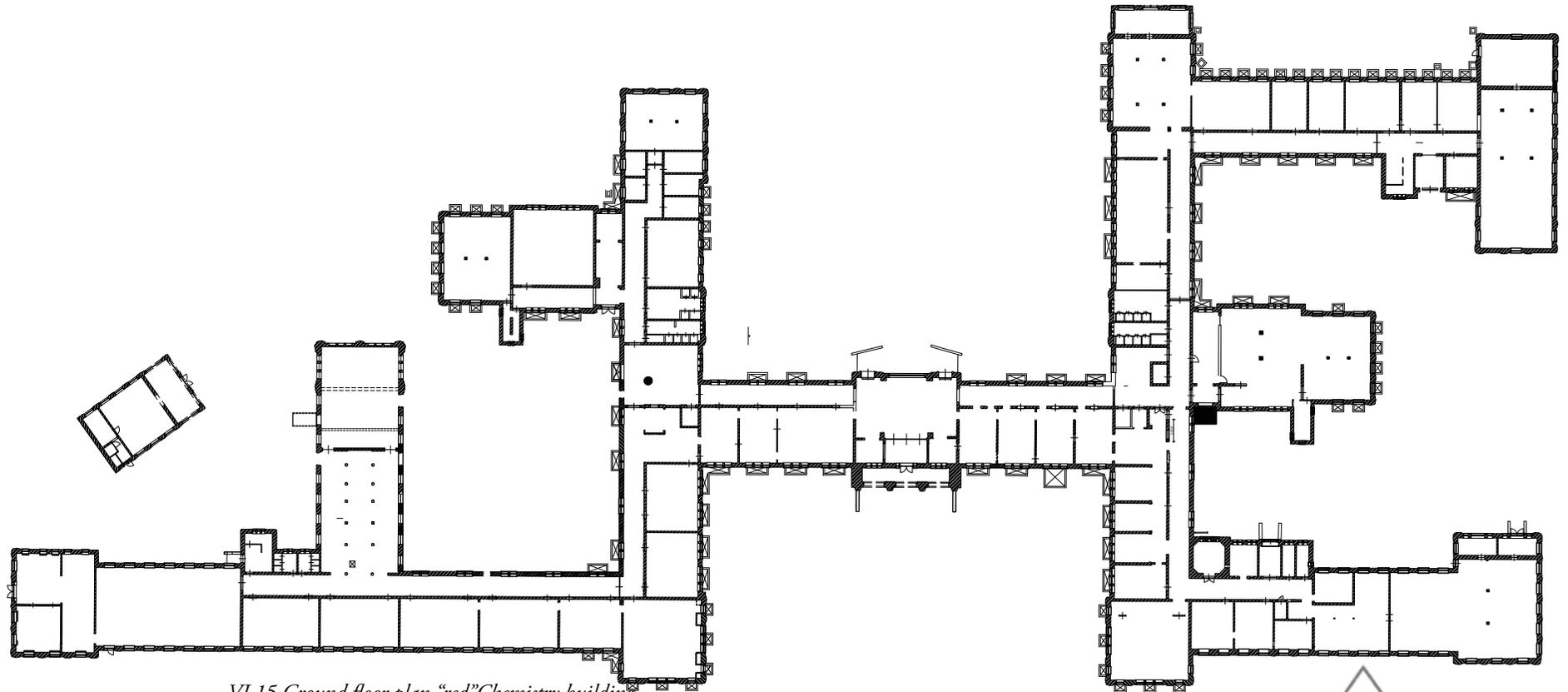


VI.14 Road and Water Engineering building

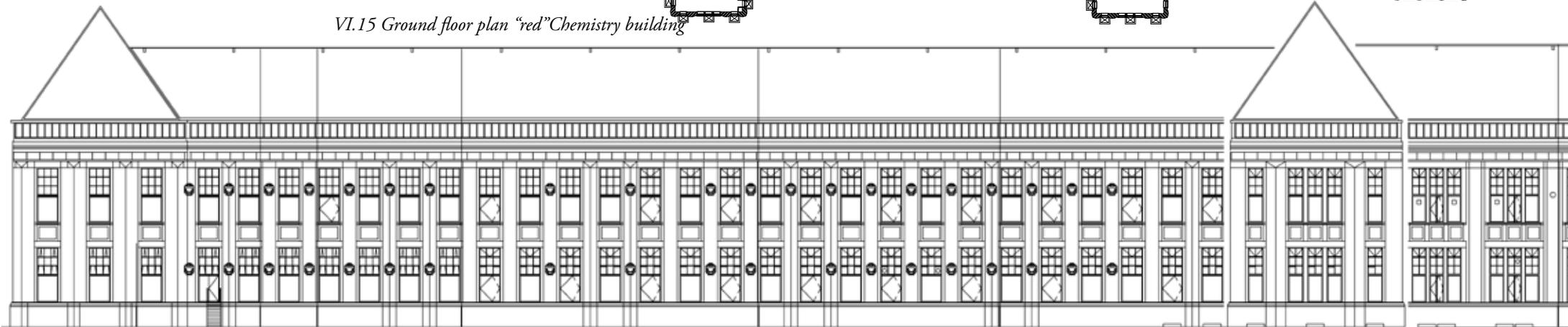
Nothing could be seen of the interior functions behind the exterior walls. Unlike the previous building that always had at least some minor historically inspired decorations the "Red" Chemistry building's decorative elements are all in the Amsterdam School style. The decoration consists of abstract tuff stone sculpture work and ceramic exhaust vent surrounds. The building also has a large water tower topped with tuff stone sculpture work and a copper cupola. Although there are no historically inspired decorations, the grandeur, size and stark appearance of the main facade on the Julianalaan makes the building look almost Classical.

The construction of these two buildings started after 1917, but by 1923 the construction work on both buildings had slowed down to a crawl and eventually came to a complete stop. The Dutch government had a severe budget deficiency and could no longer afford the expensive Technische Hogeschool project. This was not helped by the fact that the expected growth in the number of chemistry students was not reached making the new buildings too large. Both buildings had already exceeded the budget considerably, because of their size and the expensive materials used. (Mácel, 1994, pp. 41-48).

By 1923 the shell of the "Red" Chemistry building had been completed, but most of the interior, windows and doors were still missing. A fence was placed outside of the building to keep out



VI.15 Ground floor plan "red" Chemistry building



VI.16 Main façade "red" Chemistry building 1:400

vandals, although it did not matter much. The building was handed over to the elements and unwanted visitors. Attempts were made to no avail turn the building into an office building for the Dutch Government and a Light bulb Factory for the company Phillips.

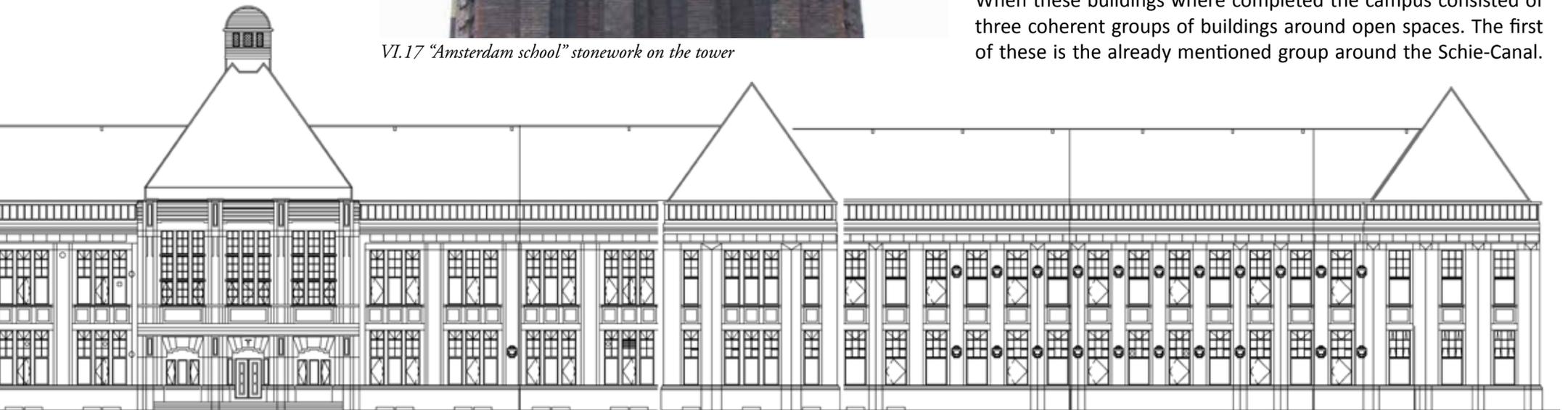


VI.17 "Amsterdam school" stonework on the tower

Finally in 1948 after having been used by the German oppressors in the Second World War the building was converted into the main building of the Technische Hogeschool and the faculty of Mathematics.

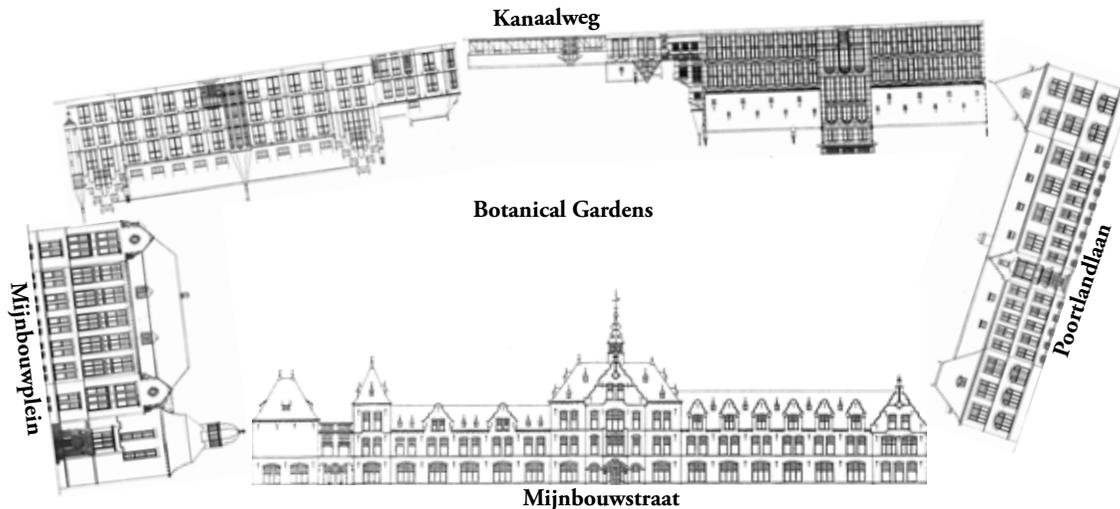
In 1925 the construction Microchemistry and Metallurgy building was further along, all the windows were already in place, this, as well as the unfinished state of the "red" Chemistry building can be seen in a 1925 aerial photo (img. VI.18). It took until 1929 before the completion of the interior of the building started. Instead of being used as the Microchemistry and Metallurgy building it was converted to be used as the new Physics building. This meant the Physics department moved out of its previous building on the Kanaalweg that it had shared with Electrical Engineering giving the Electrical Engineering department more space as well. This way off expanding a department by moving out another department in the same building had already been described in the 1908 systematic plan of action. The building was too large for its new function though. This is made clear by the fact that the building had 47 rooms and was used by only 31 people (Mácel, 1994, p. 37).

When these buildings were completed the campus consisted of three coherent groups of buildings around open spaces. The first of these is the already mentioned group around the Schie-Canal.





VI.18 Coherent building group around the Botanical Gardens

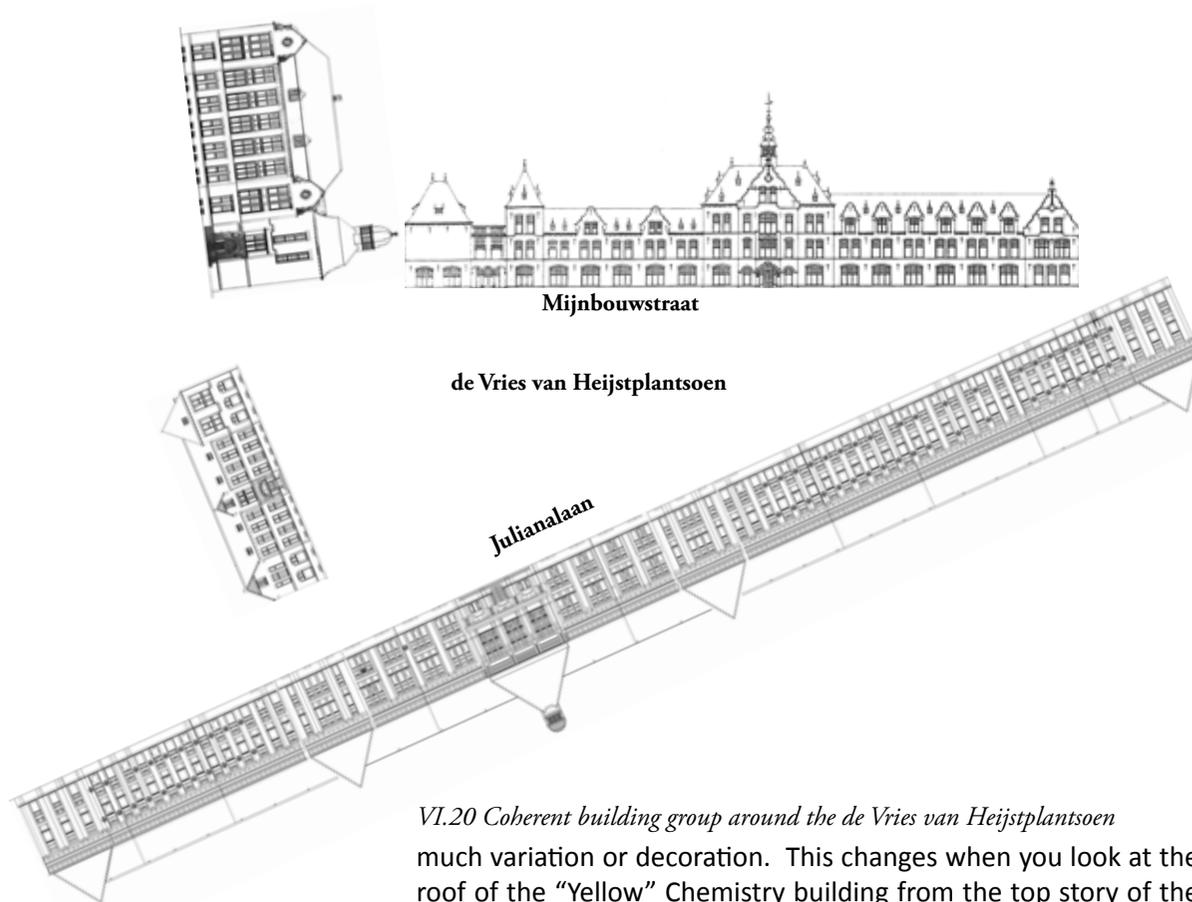


VI.19 Coherent building group around the Botanical Gardens

The second group (img VI.19) is arranged around the botanical gardens although the main façades of the buildings of this group all face towards the surrounding streets, although the Mining Engineering buildings rear façade that faces the botanical gardens

is almost is formal and grand as its main facade facing the street. This is likely due to the mistrust the Technische Hogeschool had in the city of Delft actually building a street along the main facade. If the street was not to be build, an access road could be built to the still representative rear façade. This group was completed with the construction of the building that would later be the new Physics faculty. This second group finds its coherence in a communal usage of historical styles. All the buildings contain some elements of either Neo-Gothic or Neo-Renaissance architecture. Often combined or combined with others styles such as Neo-Baroque in the Mining Engineering Building and Amsterdam school in the new Physics building. The third group (img. VI.20) consists of the buildings surrounding the de Vries van Heijstplantsoen. They all have their main façades facing towards this small park. A smooth transition between the historical styling of the Mining Engineering building on one side of this park and Amsterdam School styling of the “red” Chemistry building on the other side is visible. This transition is formed by the new Physics building and the Analytic Chemistry building which both contain both elements of historical styles as well as more modern Amsterdam School elements.

These buildings marked the inglorious end of rapid expansion and consecutive building in the Wippolder Campus. It was not until 1938 that a start was made for another building in the Wippolder. It was again a building for Chemistry as there was still no new building for this department. The new Chemistry building, called “yellow” Chemistry again for the colour of the brick used was not designed by Vrijman. In the disastrous year of 1923 Vrijman had been fired as Government Architect for Education after he was wrongly convicted of corruption that related to the “Red” Chemistry building. The new “Yellow” Chemistry building (img. VI.21-24) was designed by the new Government Architect G.C. Bremer. It was a much less elaborate more utilitarian building. The building occupies a large plot of land as it is only two stories tall. Like the “Red” Chemistry building the new building was very formal and it did not show the interior functions on the exterior of the building. The building therefore had a rather rigid and stark exterior without



VI.20 Coherent building group around the de Vries van Heijstplantsoen much variation or decoration. This changes when you look at the roof of the “Yellow” Chemistry building from the top story of the “Red” Chemistry building. The roof shows a fascinating landscape of different shaped skylights, ever changing roof heights and courtyards exposing all the functions beneath. The architecture of the building is a combination of Nieuwe zakelijkheid, or New Objectivity, and Art Deco. The Art Deco elements mainly concern the decorations of the building and are rather richly detailed. The entrance to the building is a combination travertine flooring, colourful geometric tile, stained glass and richly detailed brass



VI.21 The “yellow” Chemistry building



VI.22 The “yellow” Chemistry building roof landscapes

doors creating one of the most elaborate building entrances of the pre-war Campus. The large interior lecture hall also has Art Deco decorations. It consists of two parabolic shells one containing the slope for seating and one consisting of a patterned glass roof letting in the daylight.



VI.23 Ornate Art Deco entrance portal of the "yellow" Chemistry building



VI.24 Art Deco style in the main lecture hall of the "yellow" Chemistry building

VII. Conclusion

The Polytechnische School and Technische Hogeschool took a very different shape than what would have been expected after the completion of the Geodesy building in 1893. Instead of only a single building being constructed outside of the old city because it was demanded by the specific research, almost all the new university building where afterwards build in the Wippolder. The technical school in Delft also grew much faster than anyone could have guessed in 1893. By 1923 9 new buildings where standing in the Wippolder. The most important area of the university had shifted from the old city centre to this new Wippolder development.

In order to answer the research question: “How did the Polytechnische School and Technische Hogeschool buildings in the Wippolder develop into a coherent campus on an urban and architectural level between 1893 and 1938” it is important to first look at the factors that contributed to the climate in which this development was possible. After this the above research question can be answered.

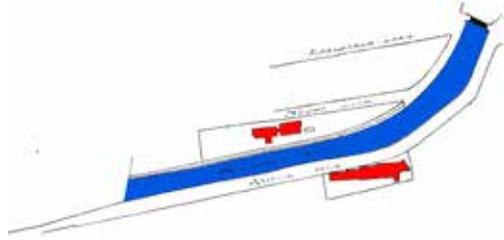
The fast development was due to a large growth in the number of students from the 1890's onwards, combined with more funding per student; especially after the Polytechnische School became a Technische Hogeschool giving it the same financial position as the three Dutch Government Universities. This created a climate in which the rapid expansion of Polytechnische School and the Technische Hogeschool was possible. The fast growth of the technical school and the aging older buildings in the city centre required new modern buildings, that where made possible by the increase in per student funding. These new modern buildings required large plots of land as well as enough daylight. The buildings also needed enough space for future expansions. The first of these buildings where founded in the Wippolder because no suitable space could be found in the old city centre of Delft. Especially in the case of the Geodesy building the research required the building to be in an open landscape.

The development happened in stages and during the first stages it certainly did not look like a coherent campus. As there was no real master plan the feeling of a real coherent campus had to grow over time as more buildings where constructed near to one another.

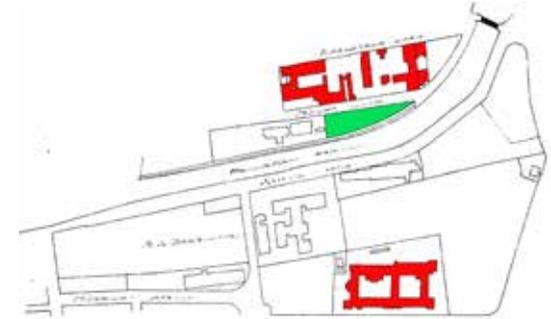
At first the new building did not show much coherence, apart from the fact that they were somewhat close to one another. It was more of a collection of loose buildings.

It all started with the Geodesy building and followed by the Microbiology building three years later (img. VII.1). The second stage was the construction of the Physics and Electrical Engineering Building in 1903 (img. VII.2). This building marked the real start of the grouping of Polytechnische buildings in the Wippolder.

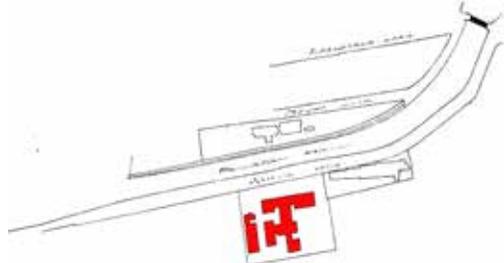
The third stage consisted of the construction of the Mechanical and Maritime Engineering and the Mining Engineering buildings that were completed in 1911 and 1912 (img. VII.3). This stage still did not show a real plan for a coherent campus. It was more or less the practical grouping of building close to one another. The fourth stage started to display real ambitions towards a coherent and beatified campus showcasing the Technische Hogeschool. It was designed within the new Delft city expansion plan of 1908. It consisted of the construction of the Microscopic Anatomy building, and more important, the Botanical Gardens (img. VII.4). These gardens created a landscaped area around witch the buildings stated to form a more and more coherent campus. The new building and the gardens where mostly completed in 1917. After this construction started on the Analytic Physics building next to the newly created de Vries van Heijstplantsoen. It was completed in 1923. In the sixth stage started in 1917 both the group of buildings around the Botanical Gardens and the group around the de Vries van Heijstplantsoen where completed by the addition of two new buildings of which the construction was halted in 1923 due to financial problems (img. VII.5). The building designed for Metallurgy and Microchemistry building that would eventually



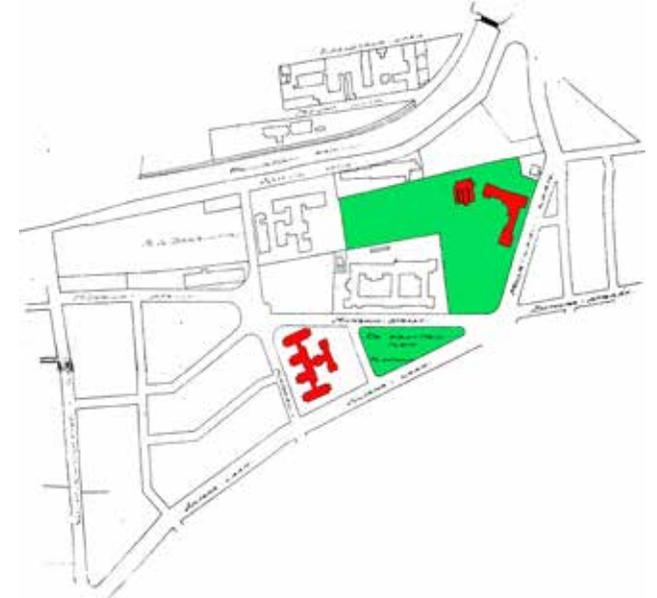
VII.1 *The first phase of Wippolder expansion*



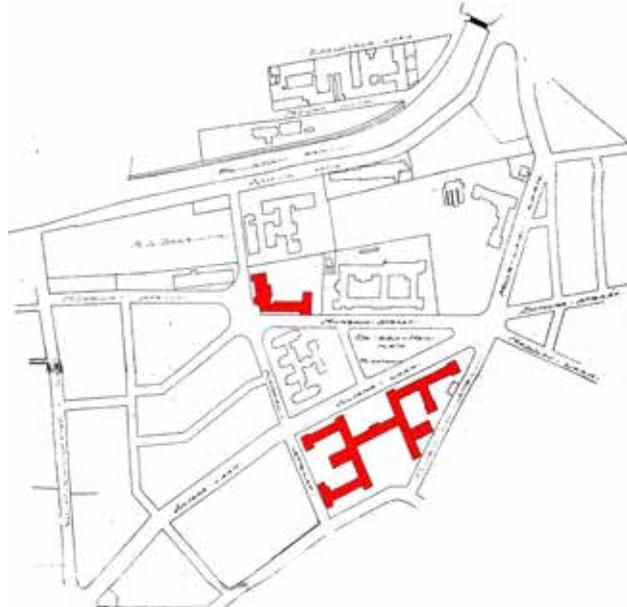
VII.3 *The third phase of Wippolder expansion*



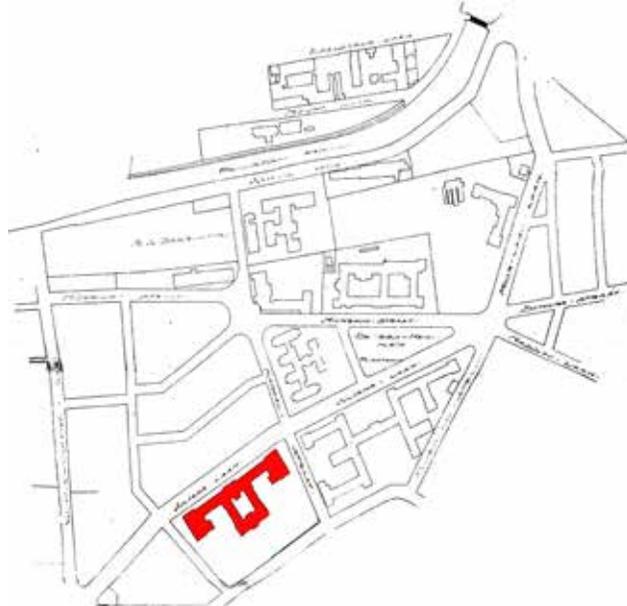
VII.2 *The second phase of Wippolder expansion*



VII.4 *The fourth phase of Wippolder expansion*



VII.5 *The first phase of Wippolder expansion*



VII.6 *The first phase of Wippolder expansion*

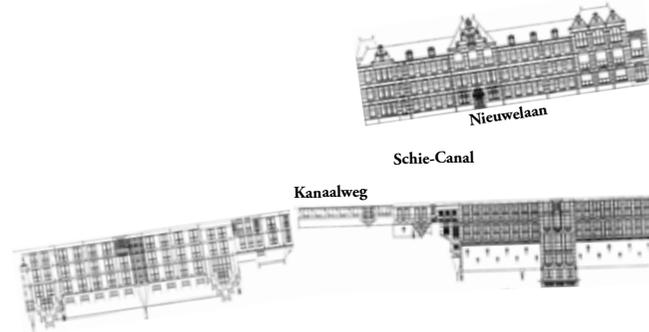


VII.7 *The complete Campus*

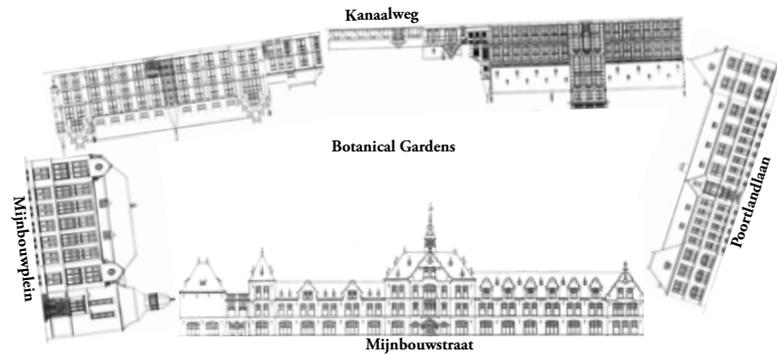
be used for Physics in 1930 and the “red” Chemistry building that would stand empty until after the end of the Second World War. This would be followed by the construction of the “yellow” Chemistry building in 1938 (img. VII.6,7). Except for its location next to the campus this building did not form a unity with the rest of the campus buildings.

This answers the research question only partially. To fully answer it, it is now important to look at how this collection of buildings developed into a coherent campus. In the end all these buildings, except the “yellow” Chemistry building, were arranged around three open spaces. In spirit you could compare the arrangement of the buildings around open spaces comparable to the traditional British quadrangles. Around these open spaces they formed coherent groups of buildings, forming a real campus. This coherence was achieved both by their formal arrangement around these three open spaces and by their architecture.

This first group (img. VII.8) more linear as it was arranged around



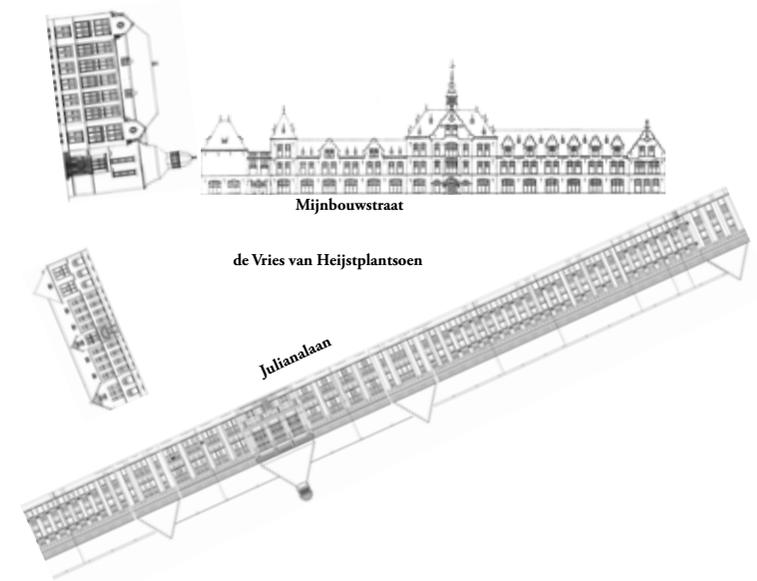
VII.8 The first open space or “quadragle” - The Schie-Canal



VII.9 The second open space or “quadragle” - The Botanical Gardens

the Schie-Canal. None the less it formed an imposing group of impressive buildings on the edge of Delft. The architectural relation of this group is formed by the fact that these three buildings all have a clear historically inspired architectural style with a complex roof-line containing gables, towers, turrets and dormers. This complex historical architecture combined with their large size compared to surrounding buildings made these three buildings a coherent group defining the relation between the old city and the new buildings in the Wippolder.

It was followed by the second group (img. VII.9) located around the botanical gardens. The buildings closed off a city block having their main façades facing the street and their rear façades towards the Botanical Gardens. All these buildings like the first group have a



VII.10 The third open space or “quadrangle” - The de Vries van Heijstplantsoen clear historical style tying them together architecturally. They also all have formal façades towards the surrounding streets.

The third group (img. VII.10) was arranged around the de Vries van Heijstplantsoen that was part of the 1908 city expansion plan. The architectural relation between these buildings is somewhat of a change. Instead of being tied together with similar historical styles the buildings of this group offer more architectural diversity. One building is still completely historical in style and one building is completely designed in the more modern Amsterdam School style. The two other buildings of this group combine these two styles tying the others together and creating the desired coherence.

The campus was never visible in its full glory though before the Second World War as the “red” Chemistry building only completed afterwards. Until that time its gloomy and derelict shell stood watching over the de Vries van Heijstplantsoen. The only moment the campus could have been seen in its completeness was when this building was completed after the war.

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