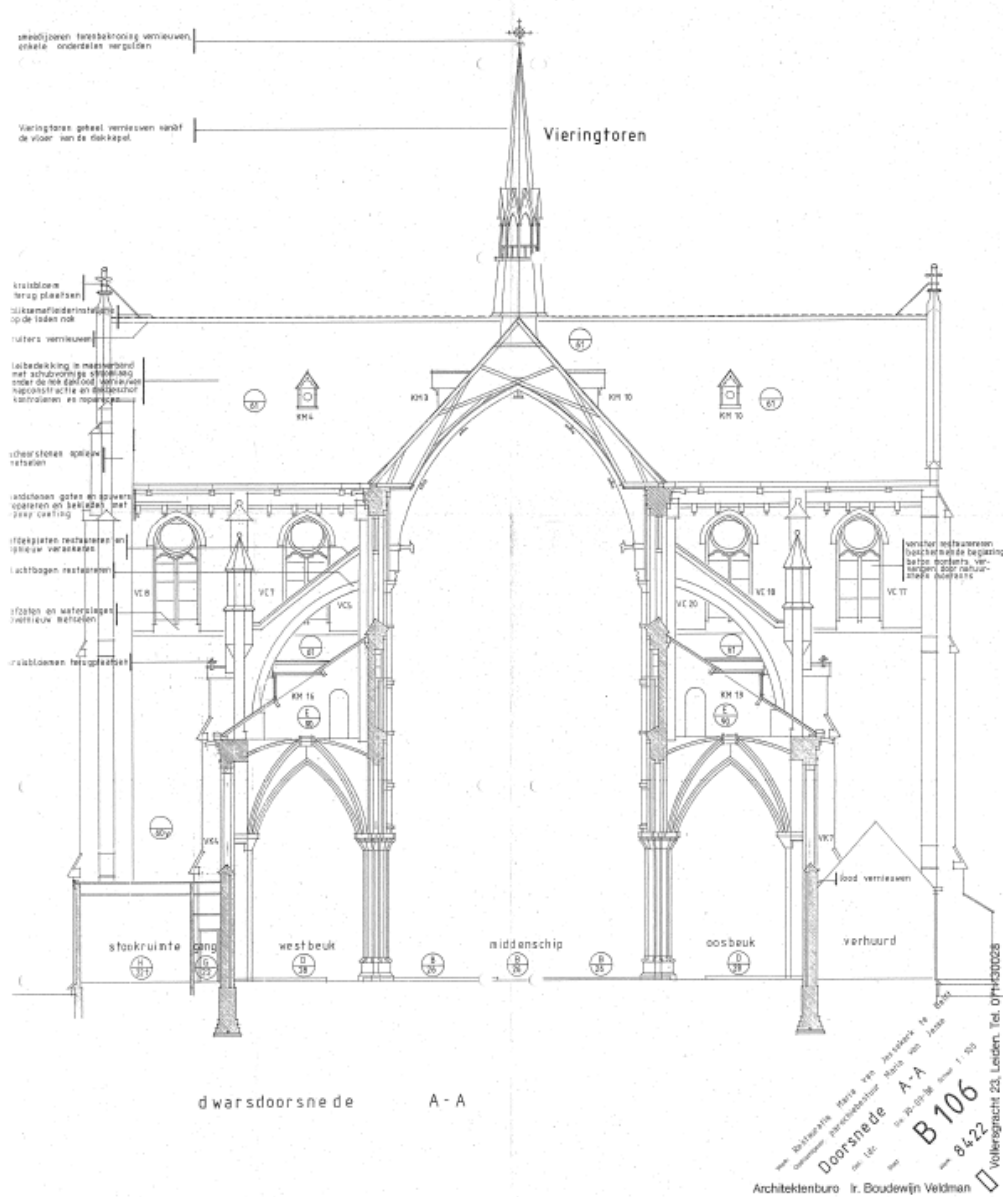


Wooden Roof Structures in Catholic Churches



History Thesis

Marit Vegt

17-04-2025

TU Delft MSc. Architecture - AR2A011

Tutor: Carola Hein

Table of Contents

Chapter 1. Introduction	2
Chapter 2. H. H. Maria en Ursulakerk	4
Chapter 3. Maria van Jessekerk	11
Chapter 4. Sint Josephkerk	19
Chapter 5. Synthesis and Discussion	26
Chapter 6. Conclusion	28
Chapter 7. Bibliography	30
7.1 Books	30
7.2 Articles	30
7.3 Reports	30
7.4 Websites	31
7.5 Primary Resources and other Images	32

Chapter 1. Introduction

If you practice the Catholic religion and you are going to church, your church is important to you, isn't it? It is more than just a religious building. It is the pride of your beliefs. It is where you meet your relatives, neighbors, acquaintances, and others; in other words, your community. The church hosts not only spiritual rituals, but also social connections. In this sense, churches are more than architectural objects; they are carriers of memory and meaning. They reflect how a community views itself and how it wishes to be seen.

Some members of the Catholic community have expressed their appreciation for an analysis of their churches. For them, this provides a deeper understanding of what these buildings mean, not only emotionally or spiritually, but also architecturally. Catholic churches were, and in many ways still are, central to the communities they serve. Over the centuries, their architectural language has evolved, often shaped by the political climate and urban development of their time, with Catholic architecture expressing openness and grandeur and applying the latest building techniques of the relevant centuries. These roofs carry symbolic, spatial, and material significance. They show us how Catholic communities worked with available techniques and styles to create sacred spaces, even when faced with restrictions or changes in societal attitudes.

General research has been done on the history of the Catholic religion and its churches, including some specific case-studies in the Netherlands, other than the case-studies in this dissertation. Hellemans (2012) and Reith (1954) describe the changes within the Catholic religion from century to century via a literature review and small descriptions of some churches in the Netherlands. Wesselink (2018) analyses the reasoning behind the building of churches from 1800-1970, including Catholic churches in the Netherlands via a religious, stylistic, technical, and urban perspective. Lianto & Trisno (2020) provide, via their research, a framework to analyze case-studies with the focus on liturgical activities in the Catholic church and what this means for the typology via literature review and spatial diagrams. Janse (1989) has done extensive literature and archival research on wooden roof structures in the Netherlands from 1000-1940 including churches and the history of wood itself. Bakker et al (1993) have done an extensive literature review about the history of building technology in the Netherlands between 1800-1890, including information about the material 'wood'. One report (Beer, 2022) about Dutch clandestine churches has mentioned one of the case-studies in this dissertation, 'Oud-katholieke kerk H. H. Maria en Ursulakerk' via pictures and text, including other churches in order to provide information about the importance of the churches to the Dutch heritage. Smaller sources provide information about the architects and/or builders of the churches.

No archival history research has been found for the three case-studies in this dissertation. This research focuses on wooden roof structures in Catholic churches in the region Delft-Leiden, built between the 18th and 20th centuries. The following research-question is answered: *'How did wooden roof structures in Catholic churches in the Delft-Leiden region between the 18th and 20th centuries reflect the influence of symbolism on the typological development of the church buildings?'*. Hence, this research links material use, typology, symbolism, and architectural history and provides a new framework to better understand and appreciate the history and significance of Catholic churches in the region Delft-Leiden.

The research examines the three case studies 'H. H. Maria and Ursulakerk' (Old-Catholic clandestine church, built in 1743), 'Maria van Jessekerk' (Roman-Catholic, built in 1875-1882), and the Sint Josephkerk in Leiden (Roman-Catholic, built in 1924-1925). Each church is built in a different century, corresponding to the main research-question. The selection of these three churches allows for a focused yet varied analysis of wooden roof structures within Catholic architecture over a period of three centuries. Each church represents a different historical moment and construction period, offering different architectural, material, and symbolic contexts. By analyzing these specific cases side by side, the research can explore how wooden roof structures were approached under different conditions, technically, stylistically, and spatially, while remaining within the same regional and religious framework.

This comparative approach helps to reveal patterns and contrasts in design decisions without aiming to be exhaustive or representative of all Catholic churches.

Each chapter (2, 3, and 4) focuses on one church and follows the structure defined by the sub-questions. The chapters explore not only the design and structure of the roofs, but also the role of the architects, the stylistic choices, and how these churches relate to the surrounding city. These insights provide a layered understanding of how material, symbolism, and spatial layout interact over time. Chapter 5 (Synthesis and Discussion) offers a comparative analysis of the three churches, highlighting their differences and shared characteristics. This is followed by the conclusion in Chapter 6. Chapter 7 presents the bibliography.

This dissertation is an architectural history research. The literature review has been used to identify a research gap and establish a theoretical foundation. Besides, the literature review functions as a way to help understand the case-studies of this research. The case-studies are analyzed via the existing literature and their archival architectural drawings (plans, sections, and elevations). The archival architectural drawings are obtained from the City Archives (Stadsarchief Delft and Erfgoed Leiden en Omstreken and connected restoration architects).

The following sub-questions support the research:

1. How did the suppression of the Catholic religion in the 17th and 18th centuries influence the design and symbolism of Catholic churches in the region Delft-Leiden?
2. How has Catholic church symbolism influenced the typology of the church buildings?
3. What are the technical aspects of the wood usage (e.g., spans, vaults, supporting structures)?
4. Which wood types were used in the case-studies?
5. What is the relationship between the roof structures and the applied architectural style?

Chapter 2. H. H. Maria en Ursulakerk

In The Netherlands, the Catholic religion was being oppressed from 1588-1795 by the Reformed Church, which meant that, among other religions, Catholicism wasn't tolerated. Because the Republic was at war with the Spanish regime, and the Catholic religion was associated with the Spanish regime, and the Catholic religion was being led by the Pope in Rome (Beer, 2022).

From 1580-1620, the Catholics had to find a way to practice their faith without being seen. They had to practice their faith in living areas like attics. From 1620 onwards, small houses were transferred to churches, and barn-churches began to appear. From the late 17th century onwards, clandestine churches were allowed to be built in the cities (Beer, 2022).

In the 18th century, the rules loosened up, since it became obvious that a strict policy wasn't preferred and was unenforceable. Catholics wouldn't stop practicing their religion, and it was allowed to build churches, as long as they weren't recognizable from the streets (Beer, 2022).

An important exception within this context was the rise of the Old Catholic Church. The Old-Catholics, who appreciated the Catholic religion from before the Reformed took over, had a conflict with Rome and paved their own way from 1723 onwards. This created more tolerance for the followers of the Old-Catholic Church, since this Dutch Church regime detached itself from Rome (Beer, 2022).

One example of this period is the H.H. Maria en Ursulakerk, an Old Catholic clandestine church located in Delft. Built in 1743 and commissioned by Pastor Nicolaas Broedersen (1682–1762), the building exemplifies how religious identity was preserved through hidden architecture. The term 'clandestine church' was created in the 19th century. This term refers to churches that were built behind other buildings, such as houses, or had façades resembling residential homes to blend in with the surrounding architecture (Beer, 2022). This can be seen in Figure 1 and Figure 2: the church is built within the building blocks and has no direct link to the streets. Most of the other churches on this map do have this link with the streets.

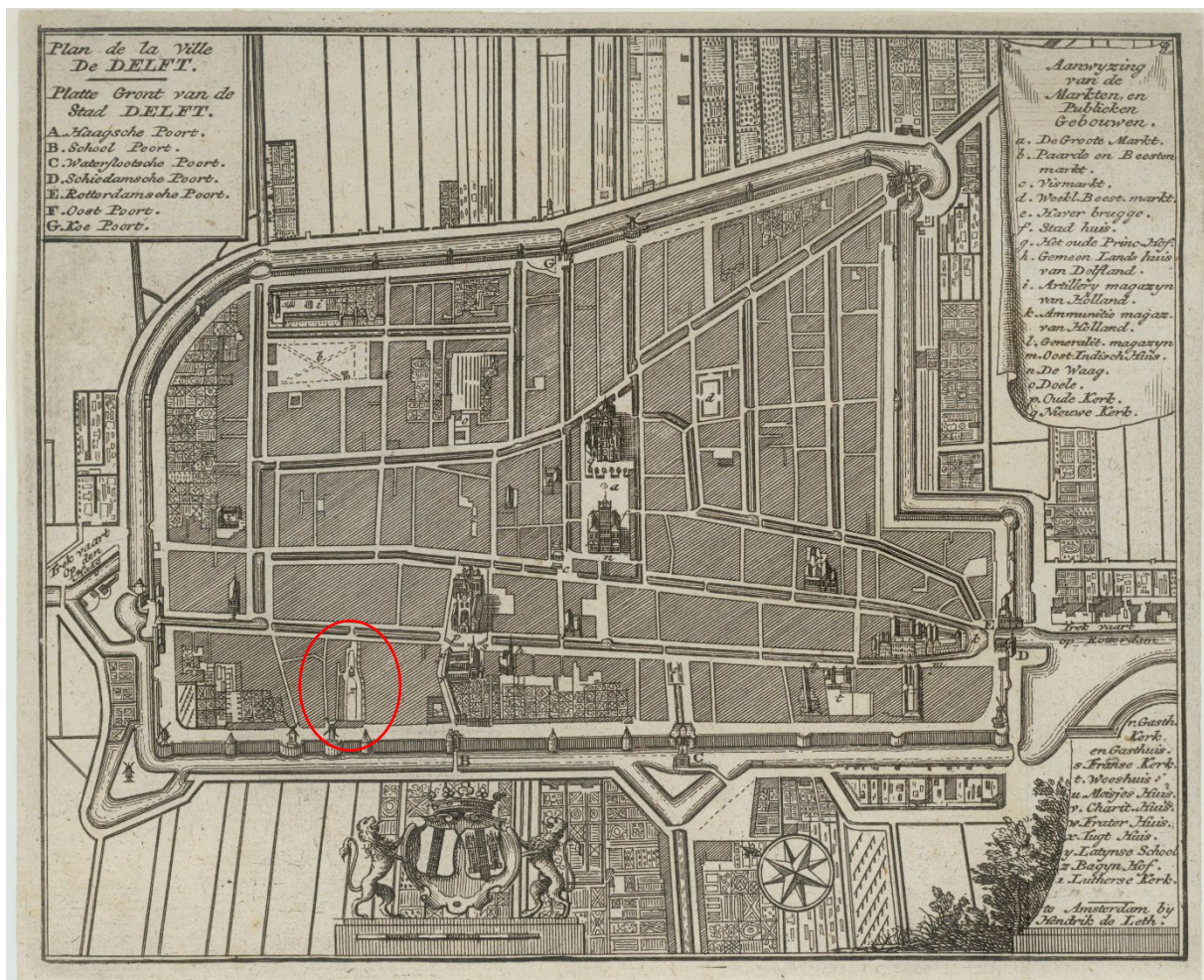


Figure 1. Plan de la Ville De DELFT. Platte Gront van de Stad DELFT. From "Erfgoed Delft Stadsarchief," by H. de Leth, 1764-1773 (https://zoeken.stadsarchiefdelft.nl/detail.php?nav_id=8-2&index=0&imgid=210991274&id=210991251). Licensed under CC PDM 1.0.

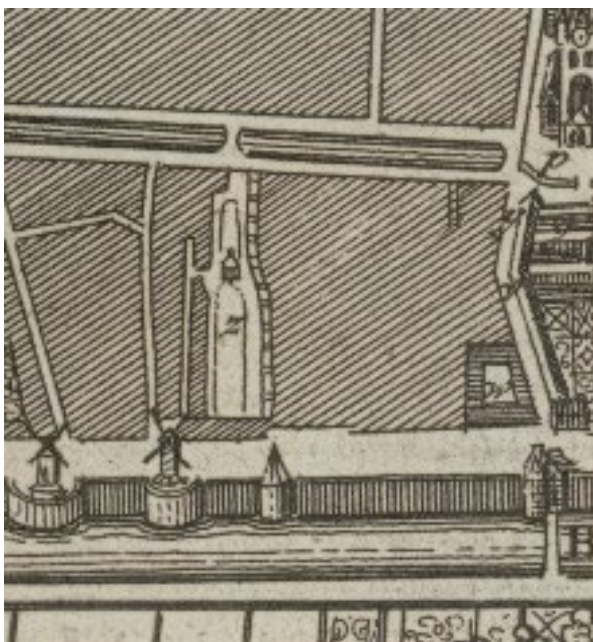


Figure 2. Plan de la Ville De DELFT. Platte Gront van de Stad DELFT. From "Erfgoed Delft Stadsarchief," by H. de Leth, 1764-1773 (https://zoeken.stadsarchiefdelft.nl/detail.php?nav_id=8-2&index=0&imgid=210991274&id=210991251). Licensed under CC PDM 1.0.

The design is created by architect Gerrit van der Giessen (à 1692-1750) in late-baroque Lodewijk-Styles (Beer, 2022). Little is known about Van der Giessen, except that he was also active as an illustrator in The Hague (Van der Aa, 1862). This lack of biographical detail makes the building itself all the more valuable as a source of interpretation. This invites a closer reading of the building itself, as it becomes one of the few remaining ways to interpret the architect's intentions.

Lianto & Trisno (2020) have described what the general zoning of the Catholic church looks like in relation to liturgical activities during a visit to the church (Figure 3). It is important to understand this in order to be able to read a Catholic church. To emphasize the significance of the sanctuary, the holiest place of the church, it is typically elevated above the rest of the church. This area is reserved for priests and Eucharistic ministers, and the altar that is placed there serves as the focal point for all liturgical ceremonies (Lianto & Trisno, 2020).

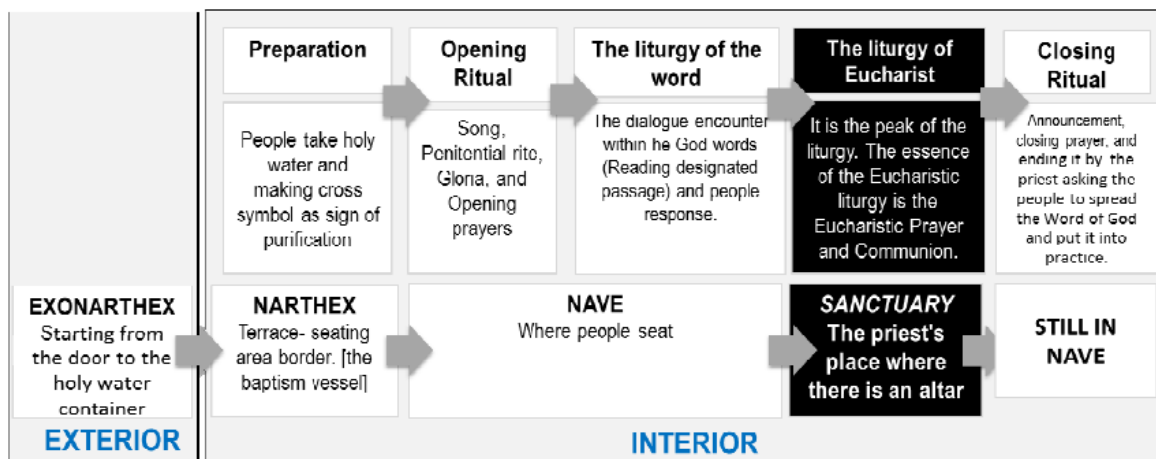


Fig. 1 Zoning of the liturgical activity

Figure 3. Fig. 1 Zoning of the liturgical activity. From "A Liturgical Relation with the Spatial Configuration and Architectural Form of The Catholic Church," by Lianto & Trisno, 2020, p. 844.



Figure 4. Bagijnhof Delft Zuidelijke Wand – Voorgevel Oud. Kath. Kerk. From "Erfgoed Delft Stadsarchief," by J. Kruger, n. d. Archiefnummer 444 Oud-Katholieke Kerk Delft, inventarisnummer 279.

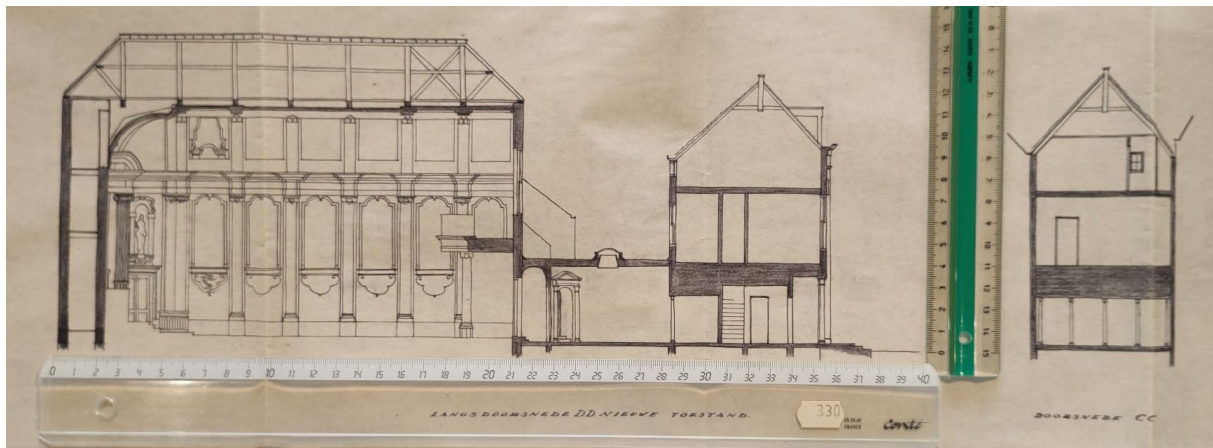


Figure 5. Langsdoorsnede DD. Nieuwe Toestand. From "*Erfgoed Delft Stadsarchief*," by J. Kruger, 1956. Archiefnummer 444 Oud-Katholieke Kerk Delft, inventarisnummer 279.

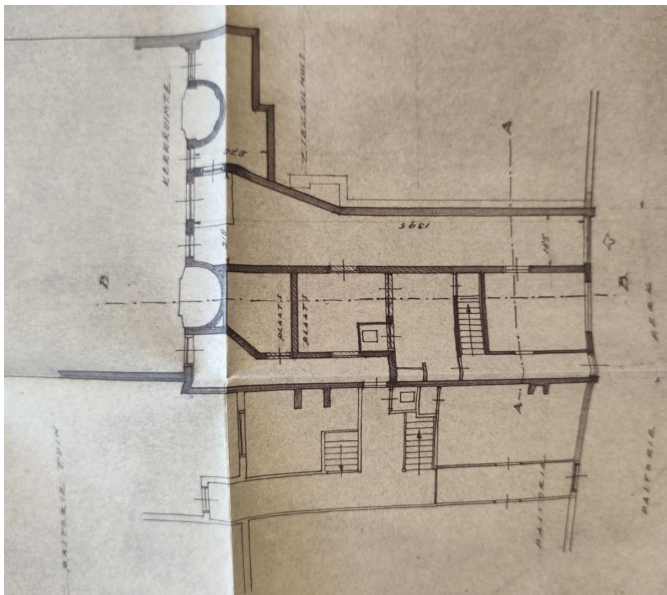


Figure 6. Pastorie Kerk. From "*Erfgoed Delft Stadsarchief*," by J. Kruger, 1956. Archiefnummer 444 Oud-Katholieke Kerk Delft, inventarisnummer 279.

Figures 4 and 5 show how this church is unrecognizable from the street-point-of-view. As is shown in Figure 6, a visitor needs to enter the church via the parsonage. This parsonage is slightly elevated in comparison with the street level (Figure 3). There is a hallway that leads towards the 'interior'. In Figure 5, you can see how the ground floor of the church itself is elevated in comparison with the parsonage. Furthermore, Figure 5 shows how the 'sanctuary' is elevated in comparison with the rest of the church. Hence, the visitor is invited to sit down at the 'nave' and focus their attention on the 'sanctuary'. This sequence of spaces guides the visitor both physically and symbolically, from the secular to the sacred.

Lianto & Trisno (2020) mentioned that height plays an important role in the symbolism of the church: the vertical shape represents the wish of humans to be closer to God. It is seen as a way to connect with Him and show their desire to be near Him. Figure 5 shows how the parsonage has a slightly lower height than the church itself, stressing the difference between the two parts.

Lianto & Trisno (2020) have also described that symmetry plays an important role in the symbolism of the church: "These geometric forms are sacred because it is believed to be a representation of the orderliness of the cosmos structure; a symbol of world stability, as well as a symbol of nature harmony." (Lianto & Trisno, 2020, p. 846). Figure 7 shows how the interior of the church consists of a geometric form and how the sanctuary is placed to catch/demand the attention of

the visitor. Behind the curved sanctuary, there is another space with a rectangular façade. This spatial clarity reinforces the sacred focus of the building and reflects how architectural geometry supports theological hierarchy.

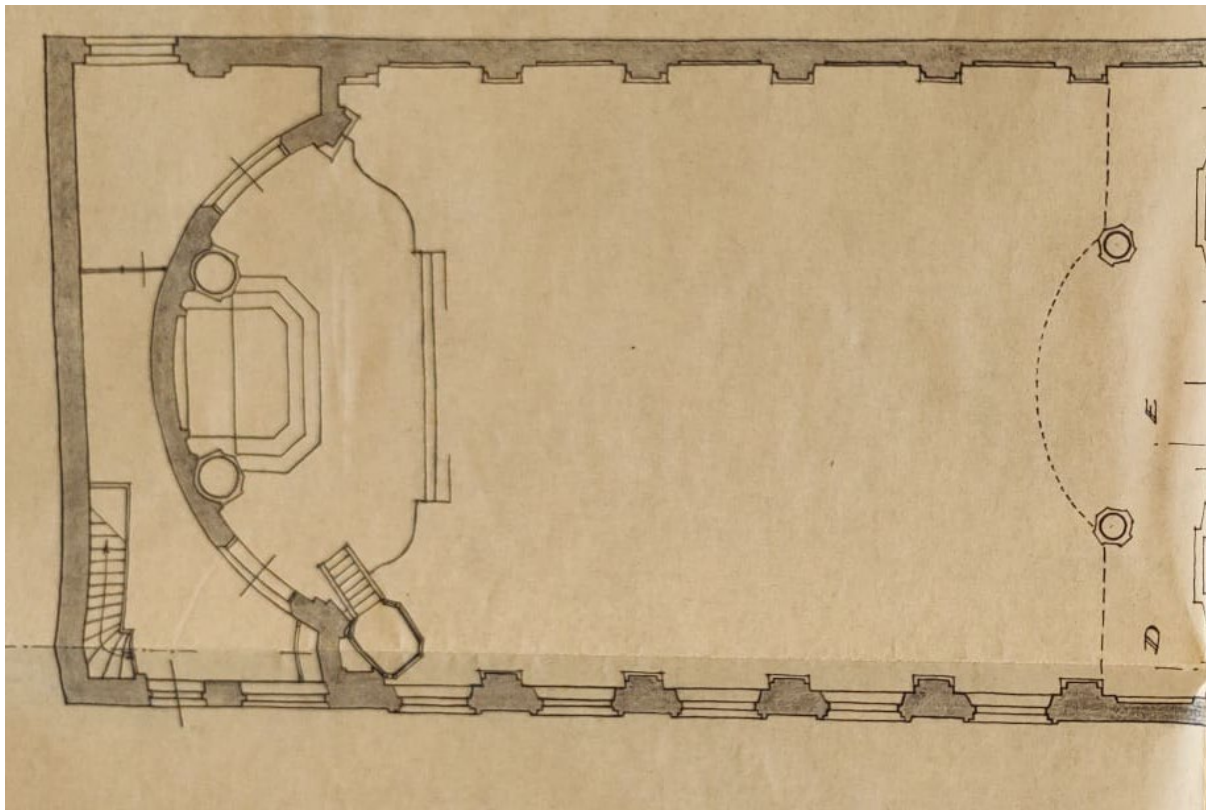


Figure 7. Begane Grond. From "*Erfgoed Delft Stadsarchief*," by J. Kruger, 1956. Archiefnummer 444 Oud-Katholieke Kerk Delft, inventarisnummer 279.

How the span of the plan is created becomes clear in Figure 8. Figure 8 and Figure 9 show that the church measures approximately 12.25 meters wide, 27,60 meters long, and 13,5 meters high. The interior width of the wooden roof structure is 11,55 meters, and this structure begins at around 7,5 meters above ground level. The roof design is visually striking for its simplicity and structural clarity: this wooden roof consists of two scissor trusses (the horizontal beams). These are supported by sloping posts. On the lower scissor trusses are three posts. Above these are the upper scissor trusses. On the upper scissor trusses, there are three king posts (posts that extend into the ridge) (Janse, 1989). A ridge truss has also been created, which serves to support the ridge purlin. This consists of two braced posts. Purlins are placed on the scissor trusses, on which the rafters are supported. The rafters also rest on the facade. The result is a symmetrical roof with two main structural layers, efficient in both form and function. This structure mirrors the symmetry and spiritual order expressed in the layout of the interior.

The wood types used in the period around the construction of this church were oak (hardwood) and pine (softwood) (Janse, 1989). These wood types were used as solid wood for the roofs. Softwood was increasingly used as hardwood was in short supply. Indeed, what is the difference between hardwood and softwood is that hardwood grows more slowly and therefore has a higher density than softwood. Since softwood is a fast-growing type of wood, this made it possible to meet the increasing demand for wood (Blaazer, 2011). Although the archival records do not clarify how softwood was used in comparison to hardwood in the church, the general shift from oak to pine reflects broader material transitions in 18th-century construction.

Thus, as can be seen and read in the descriptions and pictures in this chapter, the architecture of the church is stately, symmetrical, and decorated. This seems to be inspired by the designer Daniël Marot (1661-1752) (Bagijnhof 21, 2611 AN te Delft – Rijksmonumentenregister, n. d.), who brought the

corresponding Lodewijk XIV-style to the Netherlands. The Lodewijk XIV-style is a baroque-style (Erfgoed Bekeken, n. d.a). Baroque forms were richer and more varied than the Renaissance humanism and idealism. (Melvin, 2018). The choice for this style, rich but hidden, reinforces the dual identity of the church as both a sacred space and a discreet presence in the city.

Furthermore, it seems that the rooftops were designed to be tall enough to emphasize the distinction between the parsonage and the church, highlighting the church's greater importance, yet low enough to remain unnoticed by passers-by on the street. This subtlety is reinforced by the fact that the church has no direct connection to the street. This balance between expression and being hidden is typical for clandestine churches, architecture that had to carry meaning without being seen.

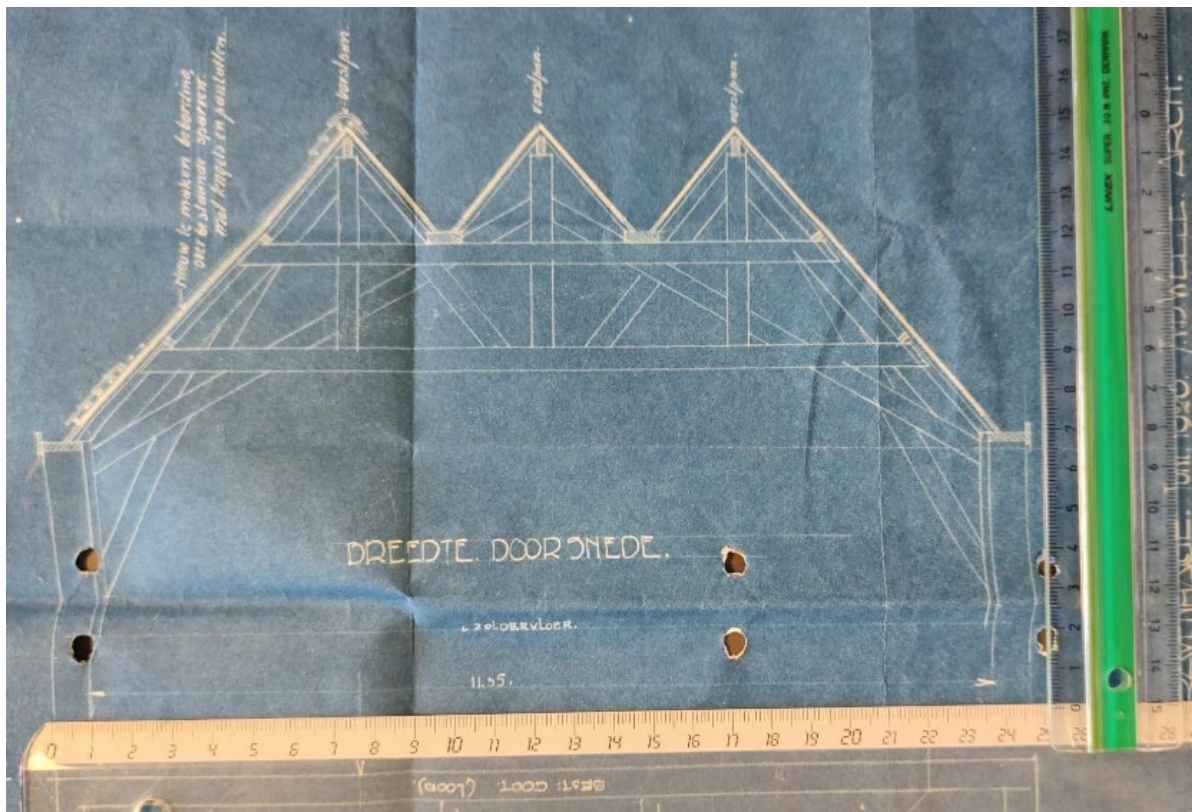


Figure 8. Doorsnede. From "*Erfgoed Delft Stadsarchief*," by J. v.d. Weele, 1926. Archiefnummer 444 Oud-Katholieke Kerk Delft, inventarisnummer 278.

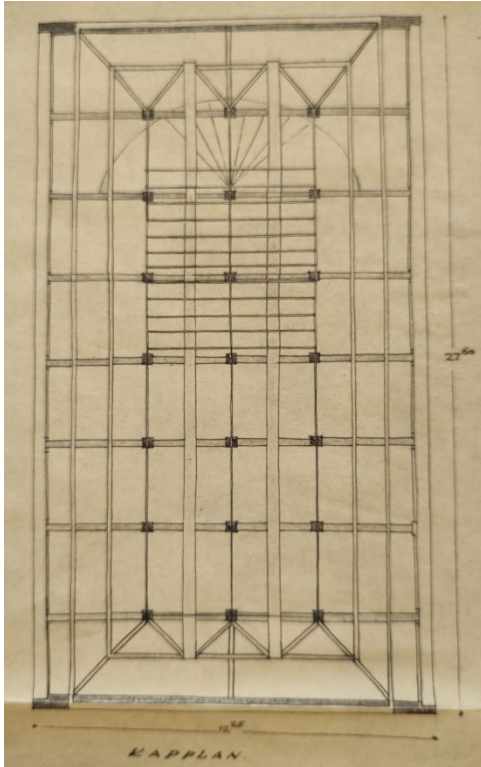


Figure 9. Kapplan. From "*Erfgoed Delft Stadsarchief*," by J. Kruger, 1956. Archiefnummer 444 Oud-Katholieke Kerk Delft, inventarisnummer 279.

Chapter 3. Maria van Jessekerk

In February 1795, the Rights of Man and of the Citizen were officially announced in The Netherlands. This was followed, in August 1796, by a government decision that no ruling church could or would be tolerated in the Netherlands. A few years later, in April 1798, a new constitution was created, stating that all religions were equal. It also required religious groups in each town to agree on how to share or return church buildings based on the number of followers in the area (Reith, 1954).

However, in 1801, a new policy reversed this somewhat: it was decided that each denomination would remain in possession of what it owned at the beginning of the century. The 1814, the constitution still recognized equal rights for all religions, but the Dutch nation was once again considered Protestant. Catholics had legal rights, but in practice, they were still treated unequally. They were allowed to build new churches, but their status remained secondary (Reith, 1954).

It wasn't until the 1848 constitution that true and lasting religious freedom was established. Even then, until 1875, church construction remained under government oversight, and after 1875, this arrangement was ended. (Reith, 1954). Hence, architects/builders/designers had more freedom from 1875 onwards. This shift marked the beginning of a new architectural chapter, one in which Catholic identity could once again be openly expressed in the built environment.

One example of this renewed freedom is the Maria van Jessekerk, a Roman Catholic church located in Delft, built between 1875 and 1882. It was designed by the architect Everard Margry (1841–1891). The maps in Figure 10 and Figure 11 show the position of the church in relation to the building blocks. However, the drawing of the church in these maps isn't realistic. Figure 12 shows the exact proportion in relation to the building blocks. What stands out immediately is that, unlike the earlier case of the H.H. Maria en Ursulakerk, this church has direct connections to two streets, with the main entrance located on the Burgwal. This prominent positioning reflects the newly reclaimed visibility of Catholic institutions during this period.

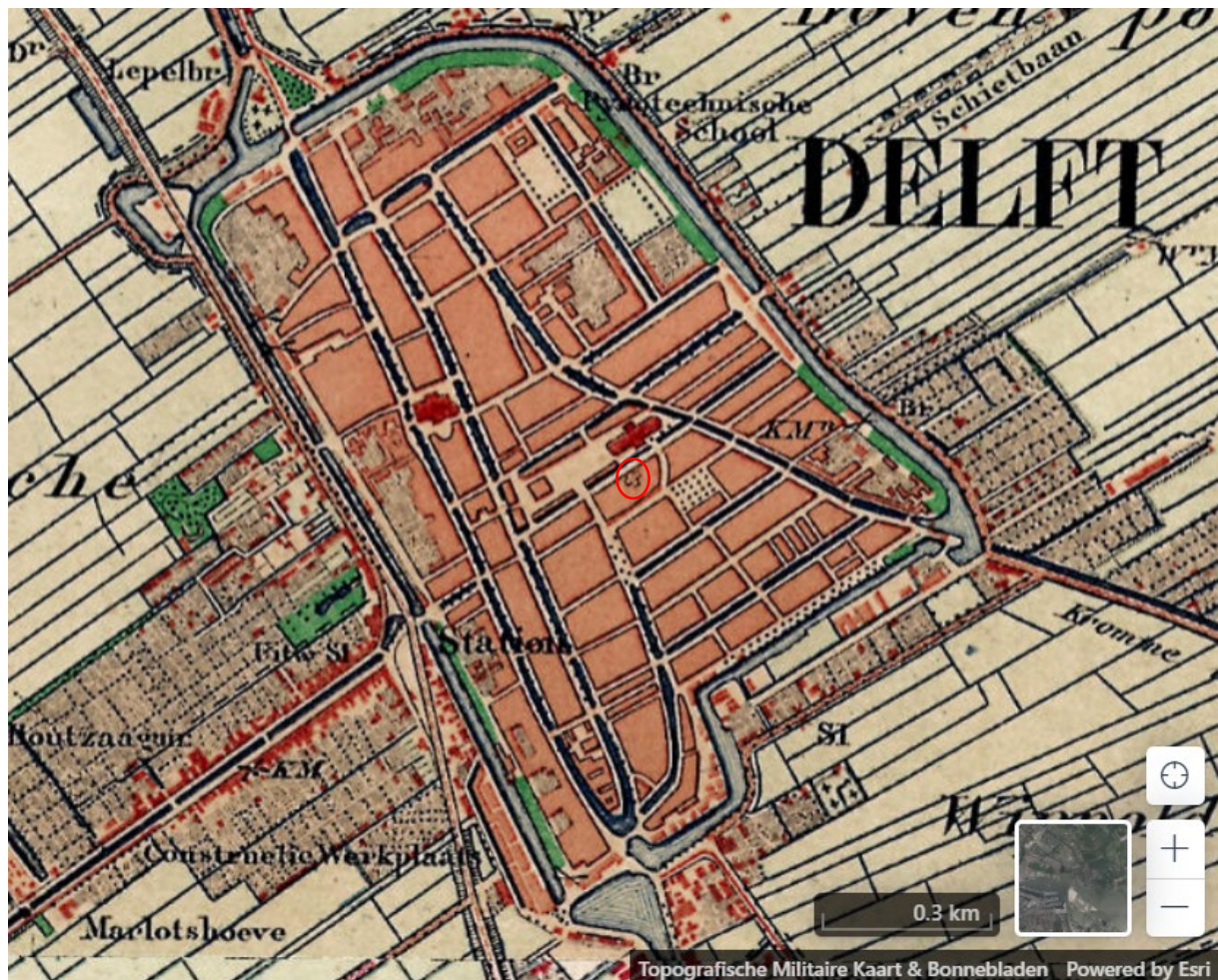


Figure 10. Kadaster - Topotijdreis. (Collector). *Topografische Militaire Kaart & Bonnebladen* [Map].
<https://www.topotijdreis.nl/kaart/1883/@84174,447574,10>



Figure 11. Kadaster - Topotijdreis. (Collector). *Topografische Militaire Kaart & Bonnebladen* [Map].
<https://www.topotijdreis.nl/kaart/1883/@84174,447574,12>

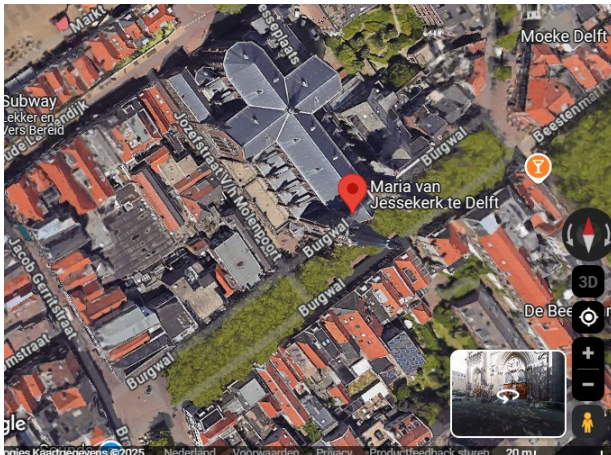
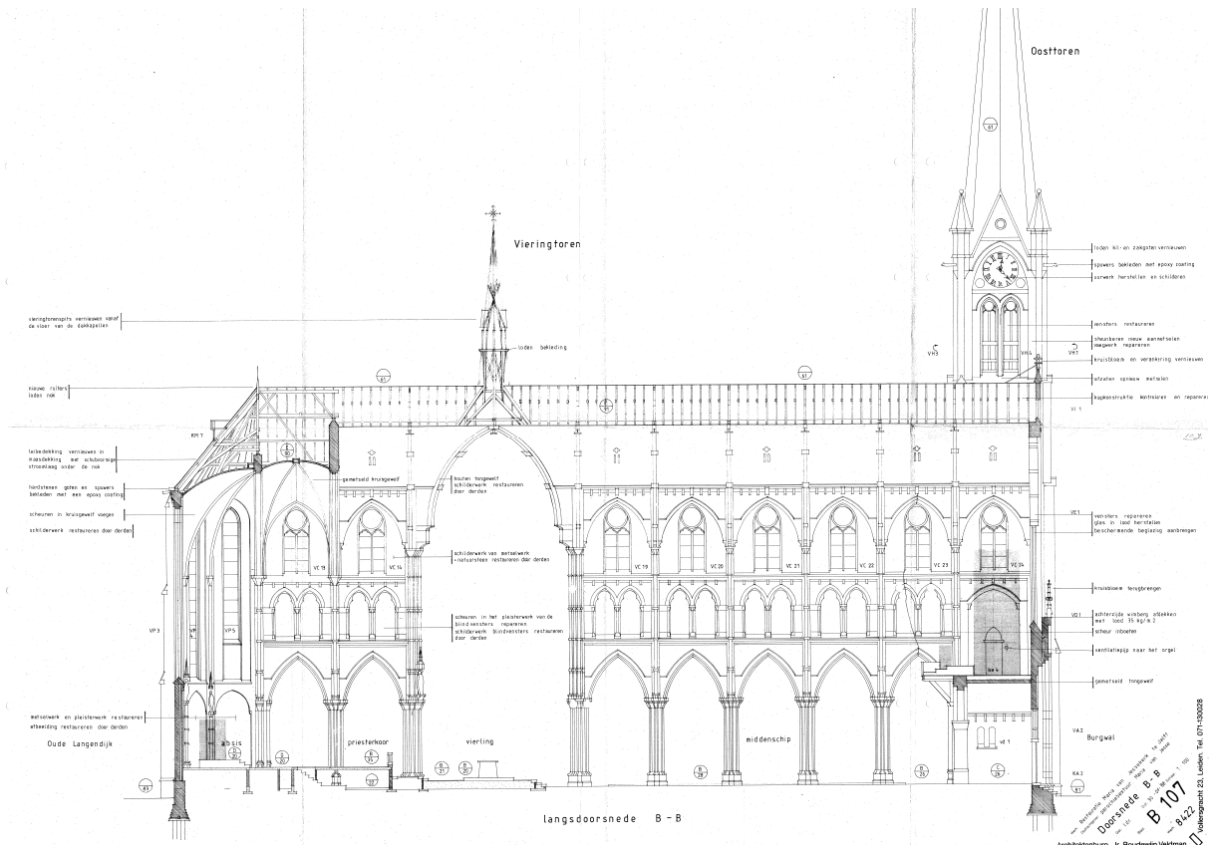


Figure 12. Google Maps location of the Maria van Jessekerk te Delft. From "Google Maps," by Google, 2025 (https://www.google.nl/maps/place/Maria+van+Jessekerk+te+Delft/@52.0112569,4.3602113,245m/data=!3m1!1e3!4m6!3m5!1s0x47c5b5c272380e3b:0xd540dd1b11b41417!8m2!3d52.0113108!4d4.3610928!16s%2Fg%2F1q5bmk8qg?hl=nl&entry=ttn&g_ep=EgoyMDI1MDQxNC4xKXMDSoJLEwMjExNDU1SAFQAw%3D%3D). Copyright by Google.

Margy has studied architecture in Amsterdam and learned as an intern under the guidance of the architect P. J. H. Cuypers. Cuypers was known as a church-builder and as a propagandist of the neo-Gothic style (Het Nieuwe Instituut, n. d.a). Neo-Gothic style entails being inspired by medieval Gothic architecture. Margy founded his own architectural firm in 1865, focusing almost exclusively on Catholic assignments. His dedication to the Neo-Gothic style made him an ideal architect for a church like Maria van Jessekerk, which needed to communicate both spiritual meaning and communal pride.

The symbolism in his design decisions is deeply intertwined with the church's history. For example, he designed two towers: one refers to the Nieuwe Kerk and the other refers to the Oude Kerk, two major churches in Delft that had once been Catholic but were later claimed by the Reformed Church (Ursulaparochie Delft, n.d.). These towers serve as a visual and symbolic reminder of the Catholic community's historical presence in the city, as can be seen in Figure 13. Besides, whereas the Maria en Ursulakerk had no visible entrance and was hidden from the public eye, the Maria van Jessekerk is highly recognizable from the street as a church. The central entrance is larger than the flanking doors, and it clearly signals its function and invites visitors into the church's sacred space (Figure 13 and 14).



Once the visitor has recognized the church, they have to use the stairs to enter. This is because the church is placed on an elevated level in comparison with the street-level, as can be seen in Figure 14. Then, the visitor enters the portal ("portaal") of the church. Just like the H. H. Maria en Ursulakerk, this portal has the lowest ceiling. Then, the visitor can take place in the nave, as Lianto & Trisno (2020) have described. If they are invited, they can walk up to the crossing ("viering"). The crossing has the highest ceiling with a tower on top, to express the connection of the visitor to God once they enter the crossing. However, their attention is directed to the sanctuary, the holiest part of the church ("priesterkoor"). This attention is mostly created by the provided highest elevation of the sanctuary, to also elevate the sanctuary spiritually in relation to the visitors.

This spatial sequencing reflects liturgical symbolism and reveals the carefully designed architectural layout. This becomes even more visible when looking at the symmetry and spatial sequencing of the plan (Figure 15).

a higher ceiling is created and less structural material is needed. Facades provide, therefore, more space for windows.

Thus, as can be seen and read in the descriptions and pictures in this chapter, the applied architectural style to this church resembles medieval Gothic architecture. Gothic cathedrals were designed to symbolize heaven on earth. With its pointed barrel vault and vast structure, light and stone were used to evoke a sense of heaven. Stained-glass windows filtered sunlight into vibrant colors, creating an almost supernatural atmosphere. The structure has a vast scale and precise mathematical proportion, and this allowed, for example, this church to express a heavenly vision through its architecture alone (Melvin, 2018). This heavenly vision is recognizable from the streets it is connected to, since the main entrances are directly accessible from the street. Margry's design for Maria van Jessekerk is clearly part of this tradition. Through form, structure, and material, the church becomes more than a building: it becomes a spatial embodiment of faith, reflecting how architecture and symbolism were used to express a renewed Catholic identity in the 19th century.

Chapter 4. Sint Josephkerk

In 1901, the Dutch government introduced the Housing Act ('Woningwet'). New building regulations were created and enforced. Community building and beautification became important to urban planning. The new building regulations included that public buildings, such as churches, could be placed more in sight and more integrated in the building block and street plan. The denominations benefited from these new statements via a growing collaboration between denominational housing associations and Catholic architects. This way, by placing the churches more in sight, the denominations were trying to fight the occurrence that more and more people were either leaving the church community or never participating at all. The denominations wanted to strengthen their community this way (Wesselink, 2018). This change in regulations forms the context in which the church Sint Josephkerk in Leiden was designed and built.

Constructed between 1924 and 1925, the Sint Josephkerk was one of the first major architectural assignments for Leo van der Laan (1864–1942) and his son Jan van der Laan (1904–1991). This church reflects the new societal conditions and changing liturgical needs in relation to Catholic architecture (Herensingel 3, 2316 JS te Leiden – Rijksmonumentenregister, n. d.) (Nederlands Architectuurinstituut, n. d.). Neo-Gothic was the building principle in the 19th century. However, in the 20th century, different spatial and liturgic wishes arose: the style of the church is Expressionism, related to the 'Nieuwe Haagse School' (Wesselink, 2018). The Sint Josephkerk captures this transition, blending tradition with innovation, and expressing Catholic identity through a new architectural approach.

Figures 17 and 18 show a map of Leiden in ca. 1930. What can be seen here is that the church, including parsonage, was integrated into a building block, but that no buildings were directly attached. This openness provided the church with a more visible and independent position within the urban context, something unthinkable for clandestine churches in earlier centuries.

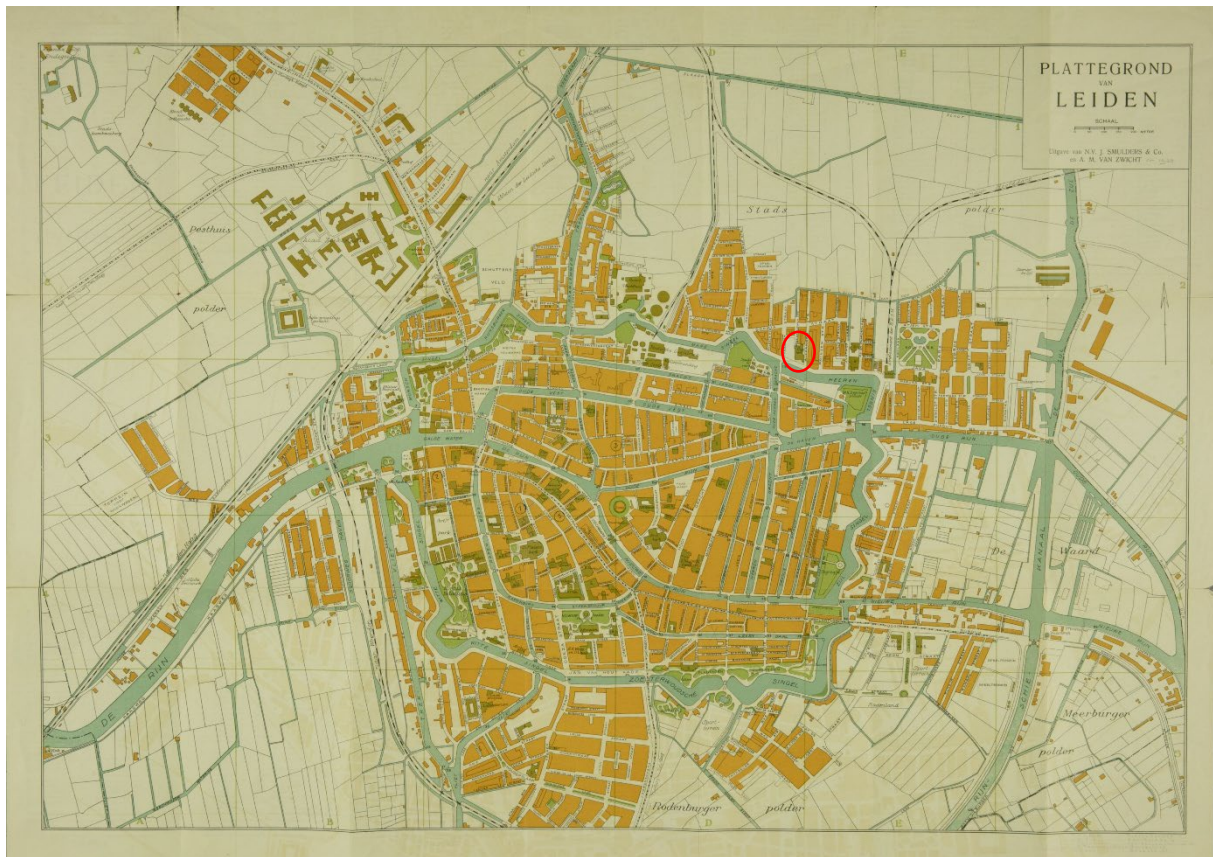


Figure 17. Plattegrond van Leiden. From "*Erfgoed Leiden en Omstreken*," by N. J. V. Smulders & Co. & A. M. van Zwicht, ca. 1930 (<https://www.erfgoedleiden.nl/collecties/beeldmateriaal/zoeken-in-beeldmateriaal/detail/ec164ebe-26bc-11e3-9981-3cd92befe4f8/media/3854936?mode=detail&view=horizontal&q=plattegrond%20leiden%201930&rows=1&page=2>). Licensed under CC PDM 1.0.



Figure 18. Plattegrond van Leiden. From "*Erfgoed Leiden en Omstreken*," by N. J. V. Smulders & Co. & A. M. van Zwicht, ca. 1930 (<https://www.erfgoedleiden.nl/collecties/beeldmateriaal/zoeken-in-beeldmateriaal/detail/ec164ebe-26bc-11e3-9981-3cd92befe4f8/media/3854936?mode=detail&view=horizontal&q=plattegrond%20leiden%201930&rows=1&page=2>). Licensed under CC PDM 1.0.

In 1880, Leo was acquainted with the architecture firm 'Margry en Snickers'. As has been described in Chapter 3, Margry focused on creating neo-Gothic architecture. Leo became highly inspired by their work and started his own firm in 1891 in Leiden. The Catholic community was very closed off from the other communities, hence Catholic assignments only remained within this community. Leo and Jan started working together in 1921 as father and son. Leo had studied architecture by himself while Jan had studied at the Technische Hogeschool Delft (Het Nieuwe Instituut, n. d.b).

The architects showed an open and thoughtful approach to changes in architecture, religion, and society and came from a strict Catholic background and therefore valued craftsmanship, purity, and social responsibility. These values connected them to the traditionalist movement in Dutch architecture during the 1920s and 1930s. Father and son Van der Laan became well-known as leading Catholic architects in Leiden. They designed many different types of buildings, such as schools, churches, homes, shops, business premises, and care facilities (Het Nieuwe Instituut, n. d.c). Their work includes a wide range of buildings, but the Sint Josephkerk marked a key moment where their personal values met a broader architectural and societal shift. A passer-by or a visitor saw the church from the outside, as is shown in Figure 19.

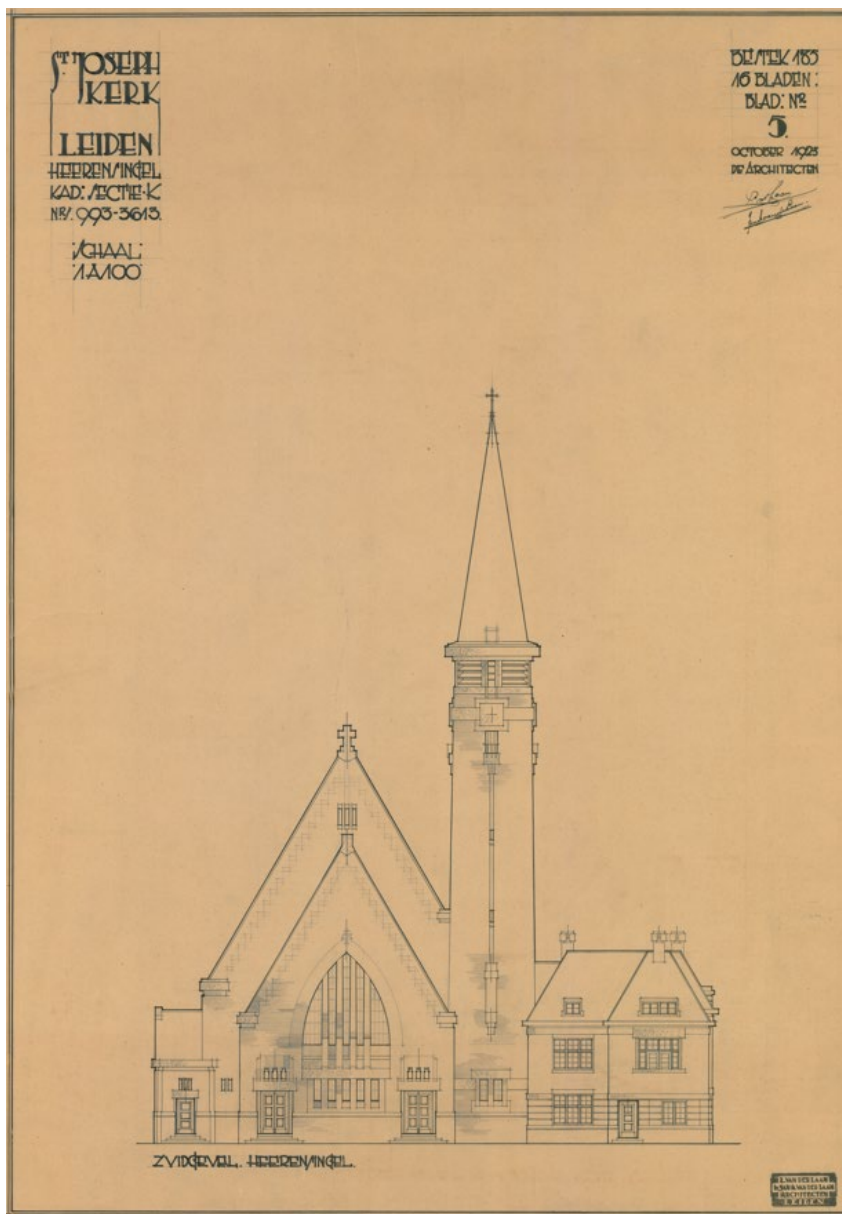


Figure 19. Zuidgevel Heerensingel. From "*Veldman Rietbroek Architecten*", by L. van der Laan & Jan A. van der Laan Architecten, 1923. Nummer r370-8.

This church has two main entrances, as can be seen in Figure 19. Two doors have the same elevation and measurements. These doors look relatively small in relation to the church. The church isn't hidden from the street view, the parsonage is placed on the right side. This contrasts with the two case-studies in Chapter 2 and 3.

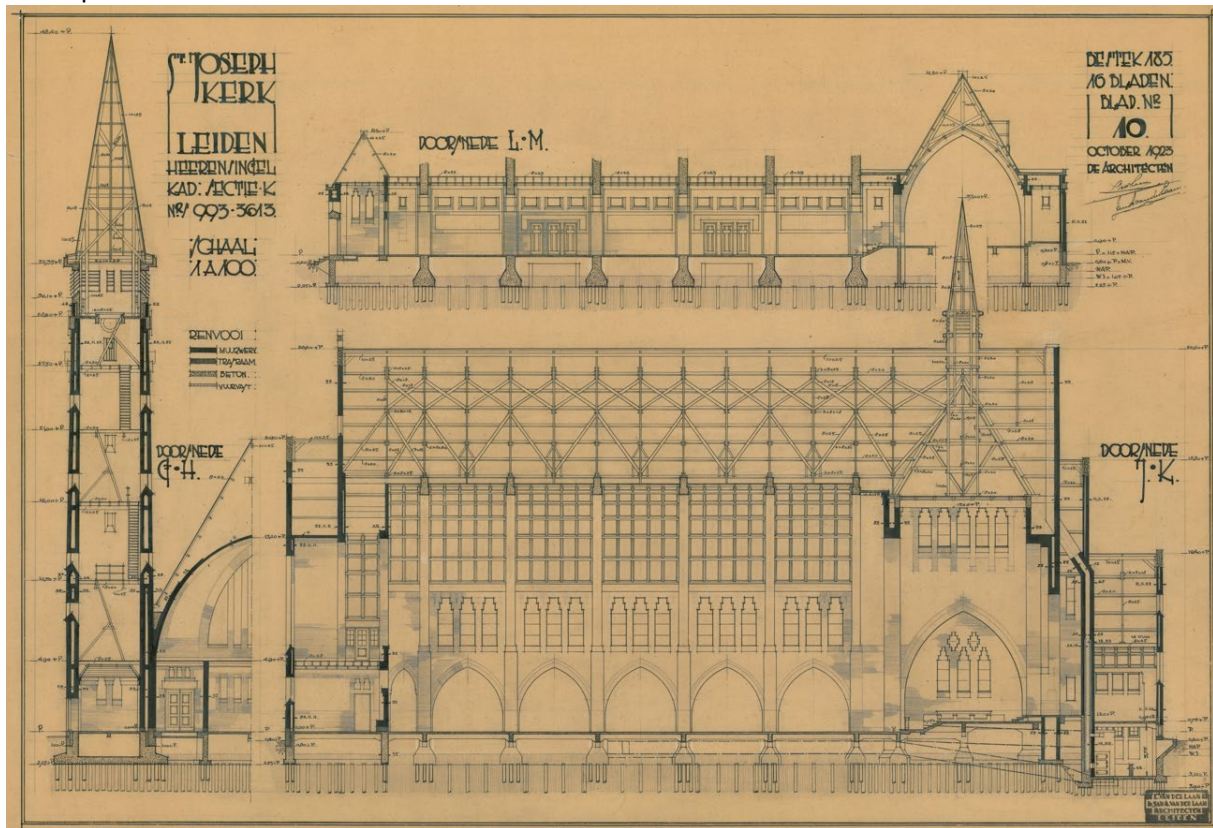


Figure 20. Doorsnede J-K. From "*Veldman Rietbroek Architecten*", by L. van der Laan & Jan A. van der Laan Architecten, 1923. Nummer r370-7.

However, the ceiling height and floor-elevation are roughly the same as in the Maria van Jessekerk: Figure 20 shows that the church is placed on an elevated level in comparison with the street-level. The visitor has to use the stairs to enter the church. Then, the visitor enters one of the two portals of the church. The portal has the lowest ceiling. Then, the visitor can take place in the nave, directed to the sanctuary, with the highest elevation. In between the nave and the sanctuary, the crossing is placed with an elevation in comparison with the nave. The crossing has a tower on top, and the nave has the highest ceiling. Both aspects express the vertical connection with God, just like the different elevations show the symbolic progression from secular to sacred. The symmetry of the church plan adds to the connection with God, as Lianto & Trisno (2020) have described (Figure 21).

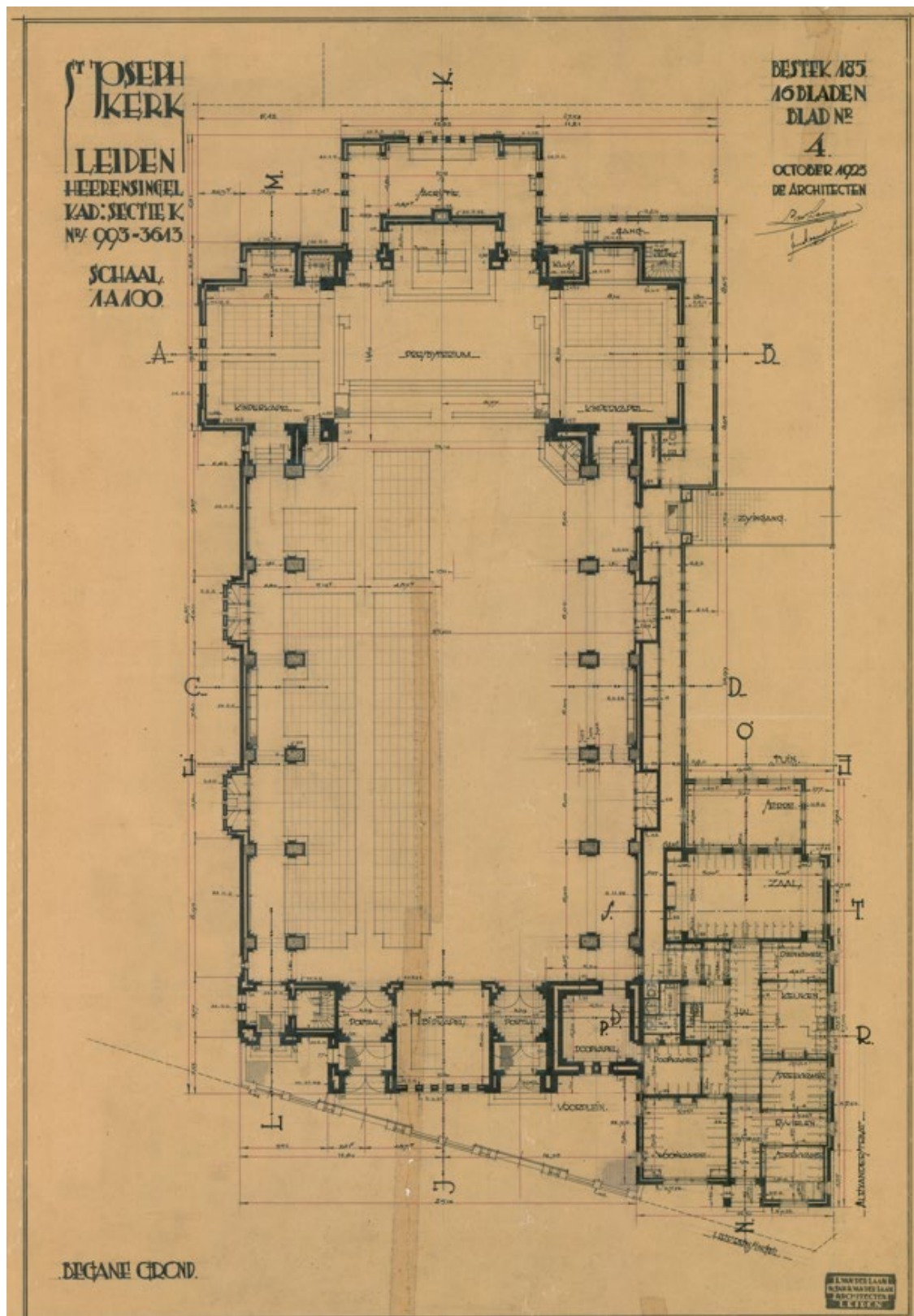


Figure 21 shows the symmetry of the church. In this church, there are two chapels with the crossing in-between. These chapels were only meant for the children. This entire church and its spaces are rectangular, with a space behind the sanctuary, the sacristy. How the transverse span is created becomes clear in Figure 22.

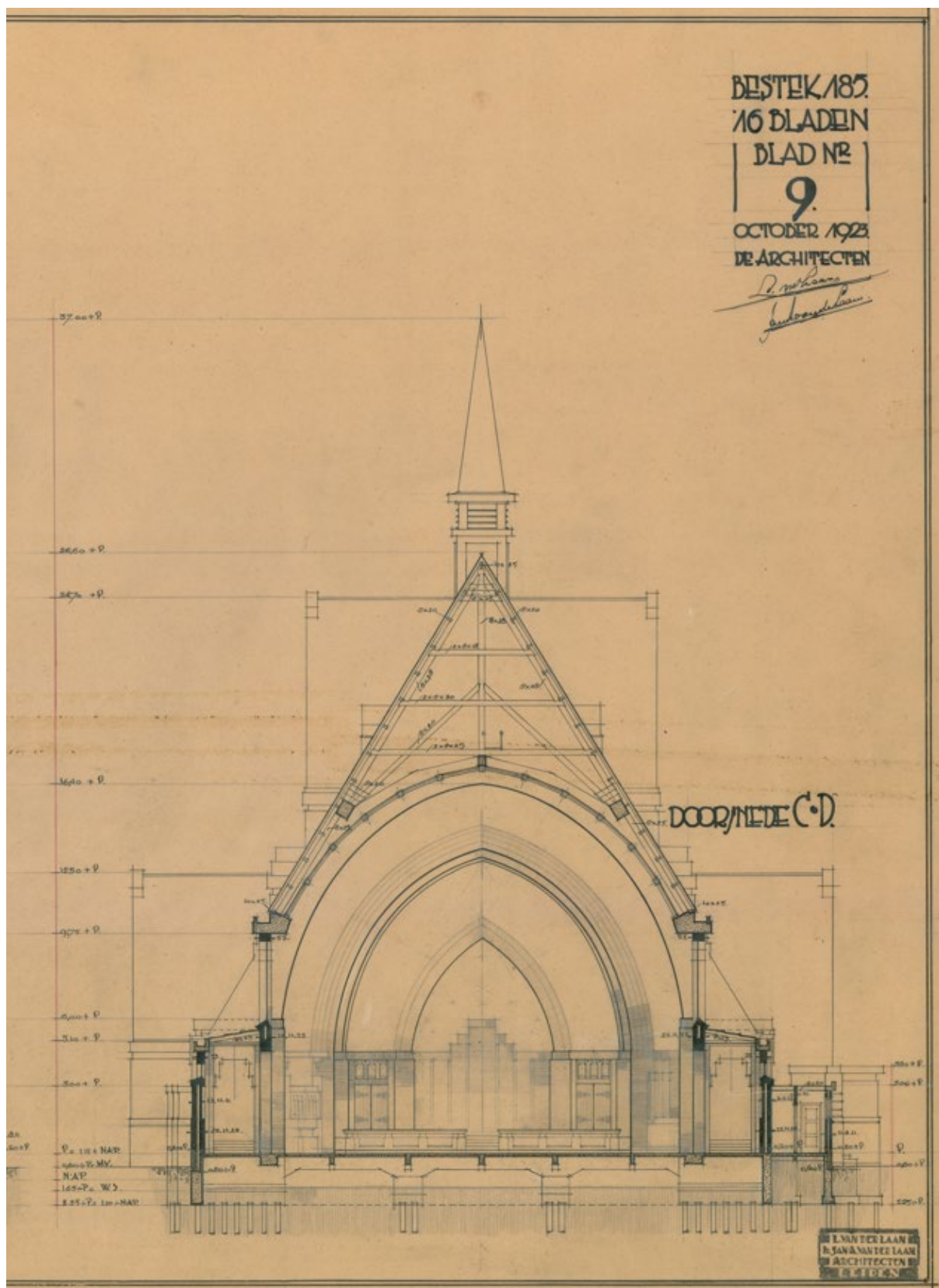


Figure 22. Doorsnede C-D. From "Veldman Rietbroek Architecten", by L. van der Laan & Jan A. van der Laan Architecten, 1923. Nummer r369-6.

Figure 22 shows the wooden roof structure, which begins at a height of 9.15 meters and reaches up to 16.85 meters. The transverse span is approximately 20 meters. What makes this roof unique compared to the previous case studies is its integration with a reinforced concrete arch structure (Figure 23), which supports the wooden layers. And at the time surrounding the construction of this church, concrete was used in combination with softwood. (Janse, 1989). Three horizontal trusses, or tie beams, are installed. These are connected to a post that continues as a king post into the ridge purlin. This post is supported by two braced posts. The ridge beam also consists of two small tie beams. The tie beams hold the principal rafters in place. On these principal rafters are purlins, on which the roof boarding and roofing are placed. So, with the reinforced concrete arch structure, which is supported by the brick façade, a larger span than before and a high pointed arch ceiling were created. Besides, the concrete structure supports the multiple-layered wooden roof structure, and it starts quite low to the ground. This hybrid approach, (soft)wood combined with concrete, allowed for greater spans and more verticality, linking material choice directly to spatial ambition.

This indeed relates to the combination of architectural Expressionism and the Nieuwe Haagse School (with inspiration from Gothic architecture). The former was founded on the belief that buildings could communicate ideas or emotions without depending on traditional styles or conventions. In the period following World War I, this concept gained prominence as architects began to explore bold and expressive forms. This movement played an important role in shaping the early ideas that would eventually influence the development of modern architecture (Melvin, 2018). The latter can be seen as a stylistic midpoint between Amsterdam's expressive architecture and the more angular, functional style of Rotterdam, just as The Hague itself lies geographically between the two cities. While architects in The Hague, like the Amsterdam expressionists, made use of brick and ornamental details, these elements in The Hague were shaped with a distinctly angular and cubist character (Erfgoed Bekeken, n. d.b).

While inspired by Gothic architecture, the Sint Josephkerk does not copy it. Instead, it translates Gothic themes, height, verticality, and light, into a more modern language using brick, concrete, and wood. It shows how a Catholic church could be part of the modern city, visible, functional, and expressive, while remaining rooted in liturgical symbolism and sacred hierarchy. In sum, the Sint Josephkerk reflects how early 20th-century Catholic architecture combined tradition with innovation.

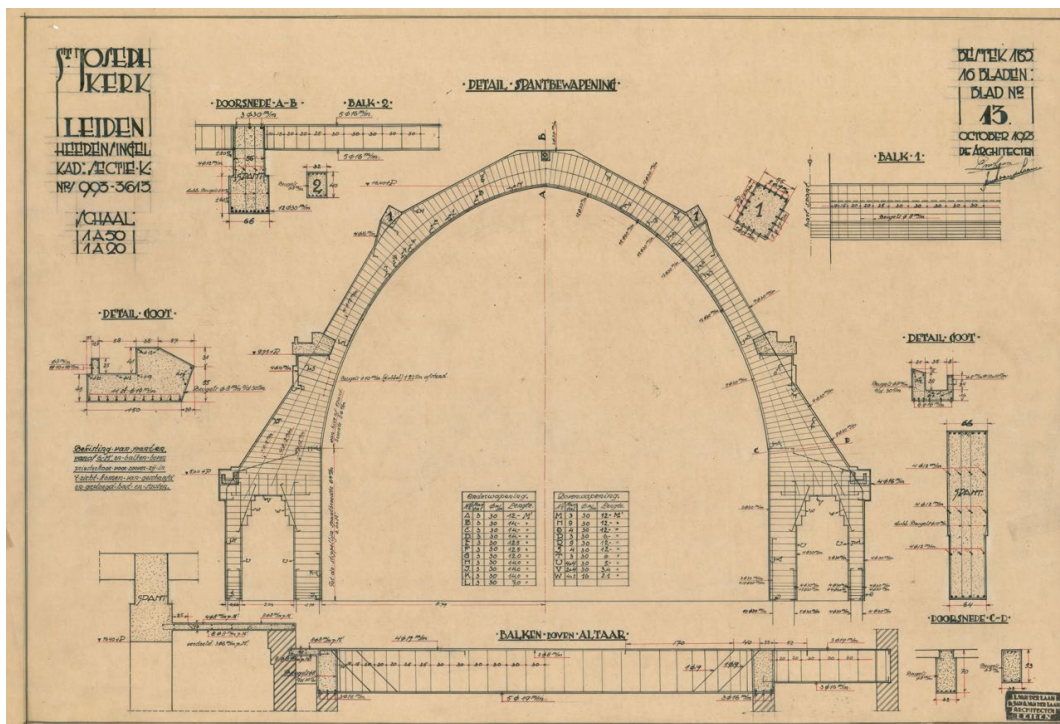


Figure 23. Detail - Spantbewapening. From "Veldman Rietbroek Architecten", by L. van der Laan & Jan A. van der Laan Architecten, 1923. Nummer r370-12.

Chapter 5. Synthesis and Discussion

This chapter synthesizes the findings from the three case studies to explore how wooden roof structures in Catholic churches in the Delft-Leiden region between the 18th and 20th centuries reflected the influence of symbolism on the typological development of the churches. By comparing these churches across time, the analysis offers insights into the connection between material use, typology, symbolism, and architectural history, while also acknowledging the research's limitations and suggesting recommendations for future research.

The three churches are built in three different centuries and the differences in relation to the Catholic acceptance are noticeable: in 1743, the Old Catholic clandestine church H. H. Maria en Ursulakerk was built in Delft. The Old Catholics were allowed to practice their beliefs, under the condition that their buildings would be hidden from public view. In contrast, a Roman Catholic church, the Maria van Jessekerk, was built in 1875-1882 in Delft, a church that celebrated the restored religious freedom of Catholicism via good street visibility. Finally, the Sint Josephkerk was built in Leiden from 1924-1925, a Roman Catholic church. This church is built in an era when Catholic churches were fully accepted and put in prominent places in the urban context. These shifts reflect the changes in religious freedom and its influence on the design and symbolism of the churches.

The interior architectural organization in all three case-studies shares the same vertical symbolism, some parts of which are designed differently: all three churches are elevated in relation to the street-level, to stress the difference between the Earth and the divine. The portal has the lowest ceiling in all three churches. The portal and the nave have the lowest elevation, which is the space for the visitors to enter and sit, and the sanctuary has the highest elevation in all the churches, expressing the holiest place in the church. The nave has the highest ceiling in the H. H. Maria en Ursulakerk and the St Josephkerk, while the crossing of the Maria van Jessekerk has the highest ceiling. The crossing of the H. H. Maria en Ursulakerk is also presented and elevated, but still within the geometric layout. The crossings in both the Maria van Jessekerk and St Josepkerk are elevated, which also have a tower on top of the roof, stressing the connection with the visitor and God.

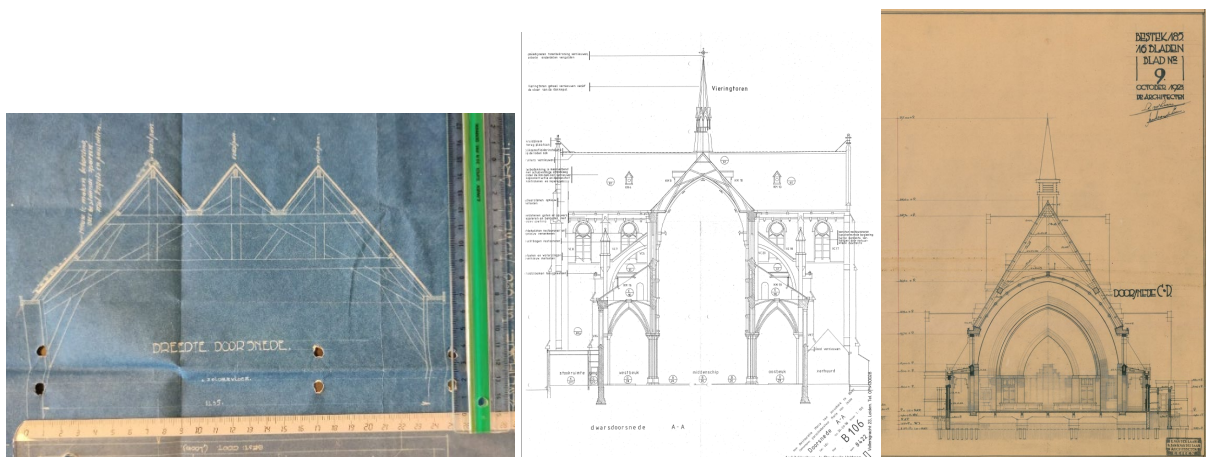
To elaborate on the interior architectural organization, the typological development reflects the increasing spatial freedom and the symmetry: the plan of the H. H. Maria en Ursulakerk church has a relatively simple typology while hosting the basic symbolic places within the church and the rest in the parsonage. The H. H. Maria en Ursulakerk has no special crossing unlike the other two churches. In contrast, the Maria van Jessekerk has an extensive plan in relation to the H. H. Maria en Ursulakerk with two more sanctuaries and many spaces next to the typical symbolism/liturgical spaces in the church-building. This again reflects the restored religious freedom. While the Sint Josephkerk has two decentralized entrances, which still guide the visitor to the nave, and two chapels are meant for the children. All the side-spaces are placed in the parsonage. This stresses the blending of traditional architecture and modernity.

Roof structures further illustrate technical and symbolic progress. Below, one can see the three different wooden roof structures next to each other in historical order. What stands out, is that the H. H. Maria en Ursulakerk has a modest and straight ceiling with three ridges, while the Maria van Jessekerk has a pointed barrel vaulted ceiling, and the Sint Josephkerk has a pointed arch ceiling with one ridge. King posts are only used in the first and latter, while in the latter, the king post is placed much higher in relation to the ceiling. This has been made possible by the multiple horizontal beams and the support of the reinforced concrete barrel vault/arch structure. In the Maria van Jessekerk, one horizontal beam and multiple braced trusses have been placed, unlike in the other two wooden roof structures. Less structural material is needed, and facades provide therefore more space for windows. The hybrid approach of the Sint Josephkerk, (soft)wood combined with concrete, allowed for greater spans and more verticality, linking material choice directly to spatial ambition. Furthermore, it is most likely that a combination of hardwood and softwood is used in the H. H. Maria en Ursulakerk, while probably only softwood is used in the two other case-studies, (but this is not certain since no

documentation was found in the city archives). Each roof type responds both to structural demands and contributes to the symbolism of the interior architectural organization.

These roof structures are directly connected to the architectural styles of the churches: the architecture of H. H. Maria en Ursulakerk is stately, symmetrical, and decorated. The choice of the style of Lodewijk XIV in combination with being a clandestine church, rich but hidden, reinforces the dual identity of the church as both a sacred space and a discreet presence in the city. The applied architectural style to the Maria van Jessekerk resembles medieval Gothic architecture, symbolizing heaven on earth. With its pointed barrel vault and vast structure, light and stone are used to evoke a sense of heaven. The architecture of the Sint Josephkerk indeed relates to the combination of architectural Expressionism and the Nieuwe Haagse School (with inspiration from Gothic architecture). While inspired by Gothic architecture, the Sint Josephkerk does not copy it. Instead, it translates Gothic themes, height, verticality, and light, into a more modern language using brick, concrete, and wood. It shows how a Catholic church could be part of the modern city, visible, functional, and expressive, while remaining rooted in liturgical symbolism and sacred hierarchy.

To conclude, this research has limitations. Only three case-studies have been researched, no measurements have been found in the archives of the Maria van Jessekerk, and no data on the wood types used have been found. Besides, most drawings are created later in time by restoration architects in order for them to understand the design before restoring it. Therefore, a suggestion for further research would be to analyze more Catholic churches from the 18th - 20th centuries, work together with a restoration architect, and only analyze churches that have original drawings to strengthen the observations and conclusions.



Chapter 6. Conclusion

This research aims to answer the main question, *'How did wooden roof structures in Catholic churches in the Delft-Leiden region between the 18th and 20th centuries reflect the influence of symbolism on the typological development of the church buildings?'* via the five sub-questions.

To begin with, the first sub-question focuses on the way the suppression of the Catholic religion in the 17th and 18th centuries influenced the design and symbolism of Catholic churches in the Delft-Leiden region. The H. H. Maria en Ursulakerk (1743) was built during this Catholic suppression and is therefore a clandestine church. In contrast, the Maria van Jessekerk (1875-1882) celebrated the restored religious freedom of Catholicism via good street visibility. Finally, the Sint Josephkerk (1924-1925) reflects the fully celebrated Catholicism and is put in a prominent place in the urban context.

The second sub-question focuses on how Catholic church symbolism influenced the typology of church buildings. A symbolic spatial hierarchy can be recognized throughout the three case-studies: the portal is the least sacred place, while the sanctuary is the most sacred place. The crossing is designed as a holy place for the visitors, and the nave is where the visitors sit. The H. H. Maria en Ursulakerk has limited differences in height and plan-layout: the portal and the nave have the same level, while the crossing and sanctuary are elevated, the nave has the highest ceiling, and the grid is geometric and symmetrical. The Maria van Jessekerk follows the same differences in the floor-plan height, while the crossing has the highest ceiling with a tower, and has an extensive symmetrical plan. The Sint Josephkerk also follows the same differences in the floor-plan height, while the nave has the highest ceiling with a tower, and it has decentralized entrances within a more modern geometrical and symmetrical plan.

Next, the third sub-question examines the technical aspects of wood usage (e. g. spans, vaults, and supporting structures). The H. H. Maria en Ursulakerk has a modest and straight ceiling with three ridges, while the Maria van Jessekerk has a pointed barrel vaulted ceiling with one ridge, and the Sint Josephkerk has a pointed arch ceiling with one ridge. The Maria van Jessekerk distinguishes itself by having multiple braced trusses, and the Sint Josephkerk distinguishes itself by having a combination of multiple horizontal wooden beams and a reinforced concrete barrel vaulted ceiling.

In regard to materials, the fourth sub-question looked into the types of wood used in the case studies is most likely that a combination of hardwood and softwood is used in the H. H. Maria en Ursulakerk, while probably only softwood is used in the two other case-studies.

Finally, the fifth sub-question focuses on the relationship between the roof structures and the applied architectural styles. The style applied to the H. H. Maria en Ursulakerk is the Lodewijk XIV, corresponding with the stately and symmetrical wooden roof structure. The style applied to the Maria van Jessekerk resembles medieval Gothic architecture, which can be recognized in the pointed barrel vault, which allowed for more verticality, symbolizing heaven on earth. The style applied to the Sint Josephkerk is a combination of Gothic architecture, Expressionism, and the Nieuwe Haagse School, which can be recognized in the application of brick, concrete, and wood, which allowed for greater spans and more verticality.

In conclusion, the typological development of the three Catholic churches in the Delft-Leiden region between the 18th and 20th centuries reflects a growing religious freedom of expressing the Catholic symbolism in the church architecture, which is reflected in the wooden roof structures.

During the Catholic suppression, the H. H. Maria en Ursulakerk (1743) was designed as an Old-Catholic church. It has a modest and straight wooden roof structure with minimal spatial hierarchy, which is fitting for a clandestine church in Lodewijk-XIV style. After the religious freedom was restored, the Maria van Jessekerk (1875-1882) was designed as a Roman-Catholic church in medieval Gothic style. It shows verticality through a pointed barrel vault made possible by braced wooden trusses, stressing the sacred character of the crossing and the sanctuary. When Catholicism became a more prominent aspect of the modern urban context, the Sint Josephkerk was designed as a Roman-Catholic church in the styles of Expressionism, the Nieuwe Haagse School, and Gothic architecture. This is recognizable

via the combination of wood and concrete in a pointed arch roof structure, which allowed for greater spans and more verticality, strengthening the connection with God.

Thus, the wooden roof structures were both technical solutions and carriers of symbolic meaning in relation to the typology of the churches. Over time, they developed in line with the development of the church typology and the strengthening of the Catholic church symbolism.

Chapter 7. Bibliography

7.1 Books

- Bakker, M. S. C., Homburg, E., Lente, van, E., Lintsen, H. W., Schot, J. W. & Verbong, G. P. J. (reds.). (1993). *Geschiedenis van de techniek in Nederland. De wording van een moderne samenleving 1800-1890. Deel III. Textiel. Gas, licht en elektriciteit. Bouw*. Walburg Pers, Zutphen.
- Blaazer, A. (2011). *Bouwproducten*. (3rd ed.). ThiemeMeulenhoff b.v.
- Hellemans, S. (2012). Tracking the New Shape of the Catholic Church in the West. In S. Hellemans, & J. B. M. Wissink (Eds.), *Towards a New Catholic Church in Advanced Modernity* (pp. 19-50). LIT Verlag.
- Janse, H. (1989). *Houten kappen in Nederland 1000-1940*. Delftse Universitaire Pers, Delft / Rijksdienst voor de Monumentenzorg, Zeist.
- Melvin, J. (2018). *Architectuur begrijpen* (1st ed.). Librero b.v.
- Reith, B. (1954). *Honderd jaar kerkbouw in Nederland* (1st ed.). De Spaarnestad.
- Van der Aa, A. J. (1862). *Biographisch Woordenboek der Nederlanden* (Vol. 7). J. J. van Brederode.
https://resources.huygens.knaw.nl/retroboeken/vdaa/#source=aa_001biog08_01.xml&page=183&accessor=accessor_index&view=imagePane

7.2 Articles

- Lianto, F. & Trisno, R. (2020). A liturgical relation with the spatial configuration and architectural form of the Catholic Church. *International Journal On Advanced Science Engineering Information Technology*, 10(2), ISSN: 2088-5334.
<https://doi.org/10.18517/ijaseit.10.2.6184>
- Wesselink, H. E. (2018). *Een sterke toren in het midden der stad: Verleden, heden en toekomst van bedreigde Nederlandse kerkgebouwen*. Vrije Universiteit Amsterdam.

7.3 Reports

- Beer, de, R. (2022). *Schuilkerken*. Rijksdienst voor het Cultureel Erfgoed. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.catharijneconvent.nl/documents/303/Rapport_Schuilkerken.pdf
- Het Nieuwe Instituut. (n. d.a). *Margry, E.J. (Everhardus Johannes) & A.Th.J. (Alphons Theodoor Joseph) / Archivalia*. Het Nieuwe Instituut. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://zoeken.nieuweinstituut.nl/images/archives/pdf/MARG.ead.pdf

7.4 Websites

Bagijnhof 21, 2611 AN te Delft - Rijksmonumentenregister. (n. d.). *Bij Bagijnhof 21, 2611 AN te Delft*. Retrieved March 31, 2025, from <https://xxxxx> <https://monumentenregister.cultureelerfgoed.nl/monumenten/11709>

Erfgoed Bekeken. (n. d.a). *Lodewijkstijlen (1700 – 1810)*. Retrieved March 31, 2025, from <https://erfgoedbekeken.nl/bouwstijlen-nederland/lodewijkstijlen/>

Erfgoed Bekeken. (n. d.b). *Nieuwe Haagse School in het Laakkwartier*. Retrieved March 31, 2025, from <https://erfgoedbekeken.nl/bouwstijlen-nederland/nieuwe-haagse-school/>

Herensingel 3, 2316 JS te Leiden – Rijksmonumentenregister. (n. d.). *Herensingel 3, 2316 JS te Leiden*. Retrieved April 2, 2025, from <https://monumentenregister.cultureelerfgoed.nl/monumenten/515023>

Het Nieuwe Instituut. (n. d.b). *LAAX Laan, L. (Leonardus) en J.A. (Johannus Antonius) van der / Archief*. Retrieved April 2, 2025, from <https://zoeken.nieuweinstituut.nl/nl/archieven/details/LAAX/descgrp/bioghist/keywords/van%20abbemuseum/withscans/0/start/0/limit/10/flimit/5/filters:ead.eadheader.eadid/LAAX/section/description/path/4.1>

Het Nieuwe Instituut. (n. d.c). *Laan, Leonardus van der (1864-1942)*. Retrieved April 2, 2025, from <https://zoeken.nieuweinstituut.nl/nl/personen/detail/1f439311-16bc-5366-9bd5-be73bdad68ac>

Nederlands Architectuurinstituut. (n. d.). *Leo en Jan van der Laan*. Retrieved April 2, 2025, from https://web.archive.org/web/20160304075932/http://www.nai.nl/collectie/bekijk_de_collectie/item/_rp_kolom2-1_elementId/1_8080

Ursulaparochie Delft. (n.d.). *Historie Maria van Jessekerk*. Retrieved February 2nd, 2025, from <https://www.rkdelft.nl/parochie/kerken/maria-van-jessekerk/historie-maria-van-jessekerk>

7.5 Primary Resources and other Images

Figure 1 and Figure 2. De Leth, H. (1764-1773). Plan de la Ville De DELFT. Platte Gront van de Stad DELFT. From "*Erfgoed Delft Stadsarchief*," (https://zoeken.stadsarchiefdelft.nl/detail.php?nav_id=8-2&index=0&imgid=210991274&id=210991251). Licensed under CC PDM 1.0.

Figure 3. Lianto & Trisno, 2020, p. 844. Fig. 1 Zoning of the liturgical activity. From "*A Liturgical Relation with the Spatial Configuration and Architectural Form of The Catholic Church*."

Figure 4. Kruger, J, 1956. Bagijnhof Delft Zuidelijke Wand – Voorgevel Oud. Kath. Kerk. From "*Erfgoed Delft Stadsarchief*". Archiefnummer 444 Oud-Katholieke Kerk Delft, inventarisnummer 279.

Figure 5. Kruger, J, 1956. Langsdoorsnede DD. Nieuwe Toestand. From "*Erfgoed Delft Stadsarchief*". Archiefnummer 444 Oud-Katholieke Kerk Delft, inventarisnummer 279.

Figure 6. Kruger, J, 1956. Pastorie Kerk. From "*Erfgoed Delft Stadsarchief*". Archiefnummer 444 Oud-Katholieke Kerk Delft, inventarisnummer 279.

Figure 7. Kruger, J, 1956. Begane Grond. From "*Erfgoed Delft Stadsarchief*". by Archiefnummer 444 Oud-Katholieke Kerk Delft, inventarisnummer 279.

Figure 8. V.D. Weele, J. 1926. Doorsnede. From "*Erfgoed Delft Stadsarchief*". Archiefnummer 444 Oud-Katholieke Kerk Delft, inventarisnummer 278.

Figure 9. Kruger, J, 1956. Kapplan. From "*Erfgoed Delft Stadsarchief*". Archiefnummer 444 Oud-Katholieke Kerk Delft, inventarisnummer 279.

Figure 10. Kadaster - Topotijdreis. (Collector). *Topografische Militaire Kaart & Bonnebladen* [Map]. <https://www.topotijdreis.nl/kaart/1883/@84174,447574,10>

Figure 11. Kadaster - Topotijdreis. (Collector). *Topografische Militaire Kaart & Bonnebladen* [Map]. <https://www.topotijdreis.nl/kaart/1883/@84174,447574,12>

Figure 12. Google. (2025). [Google Maps location of the Maria van Jessekerk te Delft]. Retrieved April 3, 2025, from https://www.google.nl/maps/place/Maria+van+Jessekerk+te+Delft/@52.0112569,4.3602113,245m/data=!3m1!1e3!4m6!3m5!1s0x47c5b5c272380e3b:0xd540dd1b11b41417!8m2!3d52.0113108!4d4.3610928!16s%2Fg%2F1q5bmk8qg?hl=nl&entry=ttu&g_ep=EgoyMDI1MDQxNC4xIKXMDSoJLDEwMjExNDU1SAFQAww%3D%3D

Figure 13. Architectenburo Ir. Boudewijn Veldman. 1988. Bestektek. zuid-oostgevel a/d. Burgwal. From "*Veldman Rietbroek Architecten*". Nummer 8422 B102.

Figure 14. Architectenburo Ir. Boudewijn Veldman. 1988. Doorsnede B-B. From "*Veldman Rietbroek Architecten*". Nummer 8422 B107.

Figure 15. Architectenburo Ir. Boudewijn Veldman. 1988. Plattegrond Begane Grond. From "*Veldman Rietbroek Architecten*". Nummer 8422 B101c.

Figure 16 and Figure on cover page. Architectenburo Ir. Boudewijn Veldman. 1988. Doorsnede A-A. From "*Veldman Rietbroek Architecten*". Nummer 8422 B106.

Figure 17 and Figure 18. Smulders, N. J. V. & Van Zwicht, A. M. (ca. 1930). Plattegrond van Leiden. From "*Erfgoed Leiden en Omstreken*," (<https://www.erfgoedleiden.nl/collecties/beeldmateriaal/zoeken-in-beeldmateriaal/detail/ec164ebe-26bc-11e3-9981-3cd92befe4f8/media/3854936?mode=detail&view=horizontal&q=plattegrond%20leiden%201930&rows=1&page=2>). Licensed under CC PDM 1.0.

Figure 19. L. van der Laan & Jan A. van der Laan Architecten. 1923. Zuidgevel Heerensingel. From "*Veldman Rietbroek Architecten*". Nummer r370-8.

Figure 20. L. van der Laan & Jan A. van der Laan Architecten. 1923. Doorsnede J-K. From "*Veldman Rietbroek Architecten*". Nummer r370-7.

Figure 21. L. van der Laan & Jan A. van der Laan Architecten. 1923. Begane Grond. From "*Veldman Rietbroek Architecten*". Nummer r370-6.

Figure 22. L. van der Laan & Jan A. van der Laan Architecten. 1923. Doorsnede C-D. From "*Veldman Rietbroek Architecten*". Nummer r369-6.

Figure 23. L. van der Laan & Jan A. van der Laan Architecten. 1923. Detail - Spantbewapening. From "*Veldman Rietbroek Architecten*". Nummer r370-12.