Grote- of Mariakerk

Research Booklet

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Introduction

Over the last decade, the number of ecclesiastical within the Dutch population has declined steeply, as from 1970 (74%) till 2018 (48%) the amount of ecclesiastical has declined by 26% (Centraal Bureau Statistiek, 2019). As a result, the relevance of the church within the Netherlands has become close to none and many of the church buildings are now facing the threat of vacancy. The church buildings in many cases represent significant parts of Dutch history, function as urban landmarks, or even as symbols of local Identity. The loss of these buildings would mean the disappearance of important parts of Architectural and Dutch heritage.

Within the Heritage and Design graduation studio Revitalizing Heritage: Zero-waste studio we are presented with the task of revitalizing a vacant church building by choice through a well-informed zero-waste redesign. Aside from intervening with the Heritage building, the zero-waste part of the assignment requires us to take a position regarding the idea of producing no waste. Furthermore, it challenges us to reuse possible objects or materials that become free through intervention in the church building.

Of course, all meaningful and well-informed design is built upon relevant research. Part of the overall research conducted over the year-long graduation period is the ABC-analysis and Zero-Waste research, or better said, research into the chosen church, in this case, the Grote- of Mariakerk in Meppel. Throughout this booklet research on the heritage value, history, relevance, typology, building technology, materials, and elements of the Grote- of Mariakerk is conducted, not to forget the site of Meppel.

Apart from research into the history, context, Zero-Waste and value assessment of the Grote- of Mariakerk, the largest part of the research is structured based on Steward Brand's Shearing layers. Within the ABC-analysis part of the booklet, the shearing layers function as a way of dissecting both the research and the church within topics that represent different parts of the building (site, structure, skin, services, space plan, and stuff). Through this structure (and the topics mentioned before) the research is conducted from different angles and through different scales throughout this document. By doing so, capturing the essence of the Grote- of Mariakerk and laying the foundation for our redesign.

HISTORY

History

The Grote- of Mariakerk, a local landmark that marks the historic city center of Meppel with its peaking tower, is deeply rooted in the history of the northern city. While briefly named in a charter from 1141, the village of Meppel was not much more than a group of farms at the time (Bergh & Van Den Bergh, 2019). That changed, however, when Meppel split off as an independent kerspel from Kolderveen in 1422 (Aa & van der Aa, 1851), symbolized by the construction of the then Mariakerk (named after the Catholic's most important saint). The church was a sign of independence, as Meppel had grown large enough to have its parish church, and large enough to function as a church congregation. The Grote or Mariakerk is still there, although it has changed over the centuries to accommodate the needs of the now city of Meppel and the growth that the city showed over the past centuries (Poortman, 1976).

Meppel flourished in the 16th century because of the peat excavations in the Northern Netherlands, since Meppel was an important transit port between the Drentsche Hoofdvaart and the Hoogeveense Vaart. Through this connection, the Zuiderzee could be reached, and from there, the rest of Drenthe and the West Netherlands. The town's growth as a harbor village was rewarded by acquiring city rights in 1809 (and again in 1815) from Lodewijk Napoleon and later King Willem 1. Currently, the Amsterdam of the north (nickname stemming from its canals) does not function as a transit city anymore due to the narrowing of the Hoogeveense Vaart in 2005, as a result, the canals in the historic center have also been drained (Meppel, n.d.).

To accommodate the growing amount of residents and new needs of a growing city the Grote- of Mariakerk was rebuilt and expanded several times throughout the past centuries. The changes in size, structure and even the addition of architectural styles are reflected in the national monument that we still see towering on the kerkplein today.

Throughout the expansion of collection of farms, to a harbor village, and eventually a city, the Grote- of Mariakerk remained an important Landmark for Meppel. In this first chapter of the ABC-Analysis, the history of the Grote- of Mariakerk and the role it played in the history of Meppel is discussed. By analyzing the growth of Meppel, the changes to the church and its surroundings, the changes to the Grote- of Mariakerk building itself, the local monuments and churches, and the important historical events connected to the church, the history of the Grote- of Mariakerk is analyzed through different scales and lenses.

2022

Historic Growth of Meppel (Middle scale)

Originally, in 1422, the Grote- of Mariakerk was not located in the centre of Meppel. The church was placed between the Hoofd- and Kruistraat on the border of the two oldest farms in Meppel and the canal bordering of this part of the “city”. However, whilst the church was not the geographical center of Meppel, it was the center of Meppel’s city life. The Kerkplein was the place where the markets were held and due to the position by the canal (the lifeline of the harbour city). (Poortman, 1976)

As mentioned before, Meppel flourished from village to city due to the peat excavation in the Northern Netherlands, and as a result Meppels urban footprint grew significantly as well. However, as the city expanded, The Grote- of Mariakerk was not just the center of city life anymore, as its geographical position had shifted to the center of Meppel.

Especially as Meppel continued to expand on an even larger scale from 1900-1990, The Grote- of Mariakerk’s position as center of Meppel and face of the historic city center was solidified. From the growth of Meppel through the centuries we can conclude that whilst the Grote- of Mariakerk originally was not at the center of the village, it organicly became the center of Meppel through the centuries due to central role the church played within the city life.

1650

The village of Meppel around 165 years before acquiring city rights

1865

The City of Meppel around 50 years after acquiring city rights

1900

The City of Meppel slowly starting to expand outside of the histroric center

1930

The City of Meppel in between the 1st and 2nd world war

1960

The City of Meppel after the 2nd world, starting the largely expand with multiple housing blocks and industry slowely starting to take shape

1990

The City of Meppel close to now, expansion now slowing down near the center and housing blocks now being build more outside the city (moving borders)

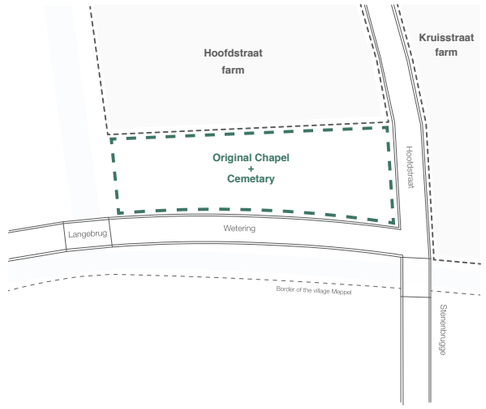
2022

Historic growth of the Kerkplein (Small scale)

Just like its location within Meppel, the church also has the two oldest farms and canal to thank for its akward placement on the church square. The Grote- of Mariakerk started as a small church with a single beech. However, due to the expansive growth of Meppel as a harbor city, the church had to grow to accomodate the rising number of attendees and need for ancillary functions. Since the fishermen even used the height of the pillars in the church to dry their fishing nets (Poortman, 1976).

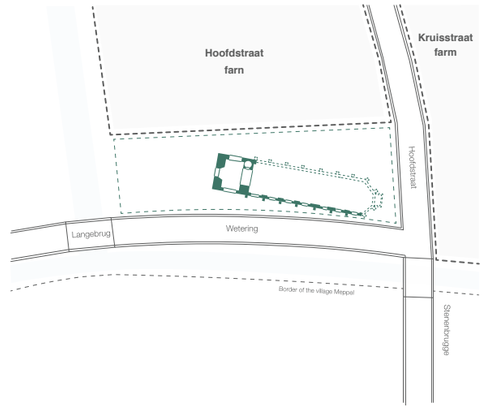
The expantion of Meppel is reflected in the changes made to the church through the centuries. With the addition of second (at first) smaller northern beech in 1540, the enlargement and addition of a new classical facade in 1780, and the construction of trading- and pastor's house short after to accomodate local trade and the church services (Van Rij, 2006). The akward positioning on the side of the Kerkplein became even more aparent with the drying of the adjacent canal. The only constant within all these changes is the iconic churchtower.

The changes of the church in relation to the growth of Meppel shows us that the Grote- of Mariakerk of today is a product of its changing environment. Physically showing the marks of history and the significans the building has had for the City of Meppel. Especially the one exception to the rule, the iconic churchtower that has remainded a symbol for the church and the city of Meppel.



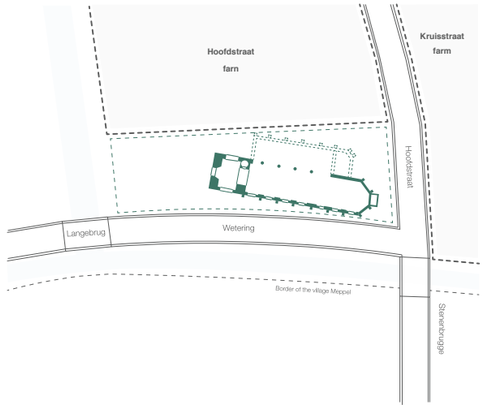
< 1400

Orginally there was a chapel and cemetary located on the location of the current the Grote- of Mariakerk, however its appearance is unknown



1422

In 1422 the original Grote- of Mariakerk was named a parish church (built)



1540

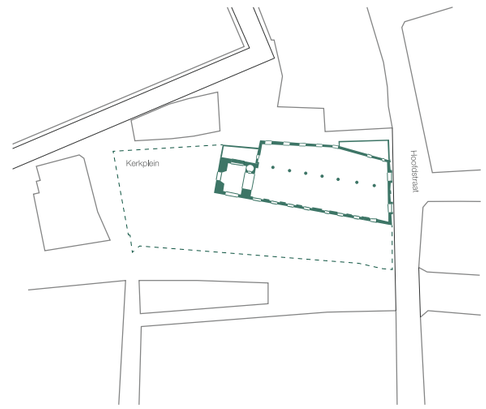
The church was rebuilt/enlarged for the first time with the addition of a new north beech to accommodate more people

1780

The church was enlarged a second time by extending east facade with a new classic facade to accommodate even more people, and the North beach was enlarged with the additional new facade and nod we see today

1780 - 1790

To accomodate priest and the local trade a vicar's room and a trade house were built as small outbuildings



1955

Finally, the church square gained more ground as the canals originally used for the supply of local goods were dryed out

Building phases of the Grote- of Mariakerk

The Grote- of Mariakerk was not always the church as we know it today. You can already see from the mixture of different building styles that this church has undergone several metamorphoses.

In 1422, the previously founded chapel became a parish church under the name ‘Mariakerk’. At this time, the church was still Roman Catholic. The church consisted of a hall church with a nave with a Gothic choir. (Van Rij, 2006)

The first expansion of the church took place around 1540, with the arrival of the second nave. This was smaller than the existing first nave.
(Van Rij, 2006)

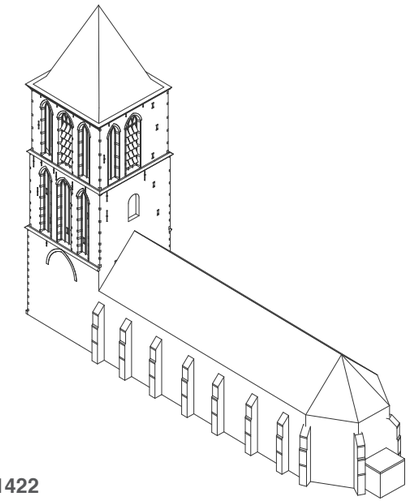
During the period of the Eighty Years’ War (1568 - 1648), the church suffered a lot of damage. For instance, between 1623 and 1627, soldiers stationed in the church housed soldiers, and by the end of the 12-year truce, the church was completely ruined. Few records have been found about the church from this period until 1765. (Van Rij, 2006)

Around 1760, the trader’s house, adjacent to the north side of the church tower, was built. Around 1780, the second enlargement of the church took place. This enlargement was already being discussed in 1765, but it did not go ahead at the time. In this enlargement, the church was drastically changed and the choir and buttresses were demolished. The aisles were lengthened and a classicist gable was added on the east facade. The pastor’s house was also added to the north aisle. As a result, the windows adjacent to it were shortened at the bottom and bricked up as they are today. The trader’s house was also given a connection to the church in this conversion. (Van Rij, 2006)

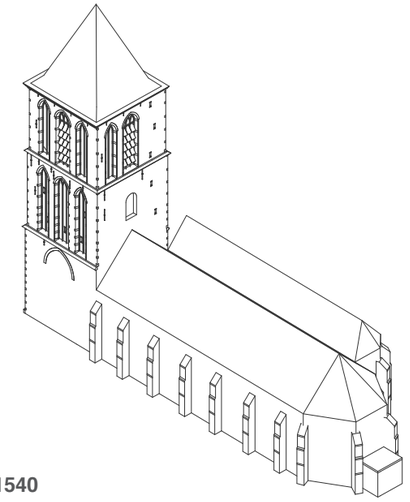
The year 1827 was an important year for Meppel. In this year, they received compensation from the king to make repairs to the tower of the church. Thus, the roof of the tower, which at the time was characterized by a pyramid spire, was replaced by a spire with a dome. This is the appearance of the church tower as we know it today. (Van Rij, 2006)

During World War II, many bells were requisitioned to be melted down for making weapons and the like. Other than that no exterior changes were made in this period. The last major changes to the church were carried out during the restoration between 1959 and 1963. This involved tackling the entire church and the most notable change was the addition of buttresses to the south facade. (Van Rij, 2006)

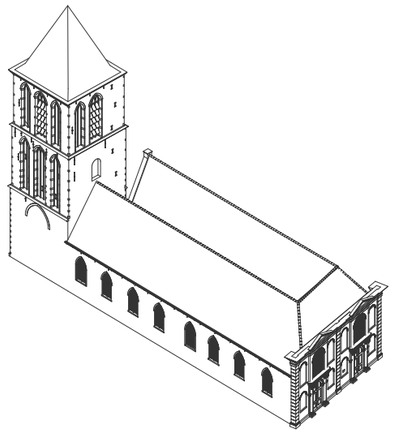
From this timeline of the Grote- or Mariakerk it can be concluded that many adjustments have been made over the years, which are associated with the growth of Meppel as a city. In addition, it can be stated that the constant adjustment and addition of elements to the building symbolizes the appreciation that the people of Meppel had for the church. Nevertheless, they wanted the church to keep all the setbacks that the building had to endure, at all costs.



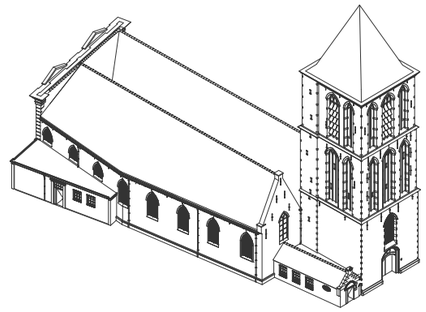
1422



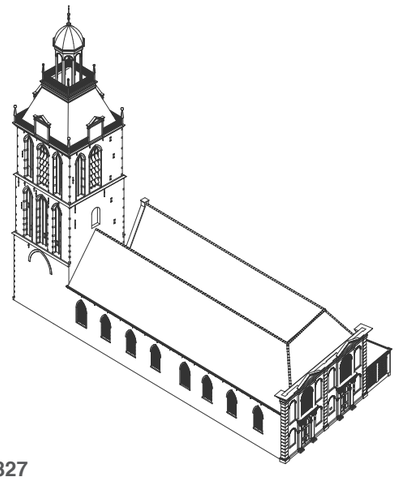
1540



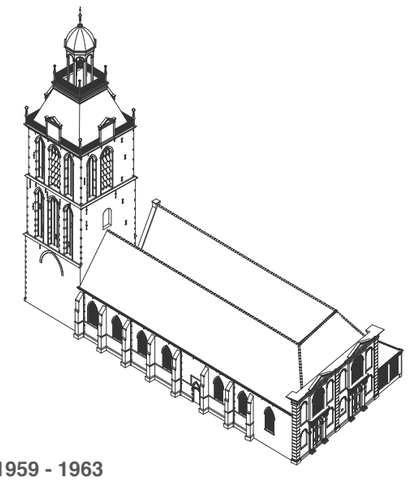
1780



1780 - 1790



1827



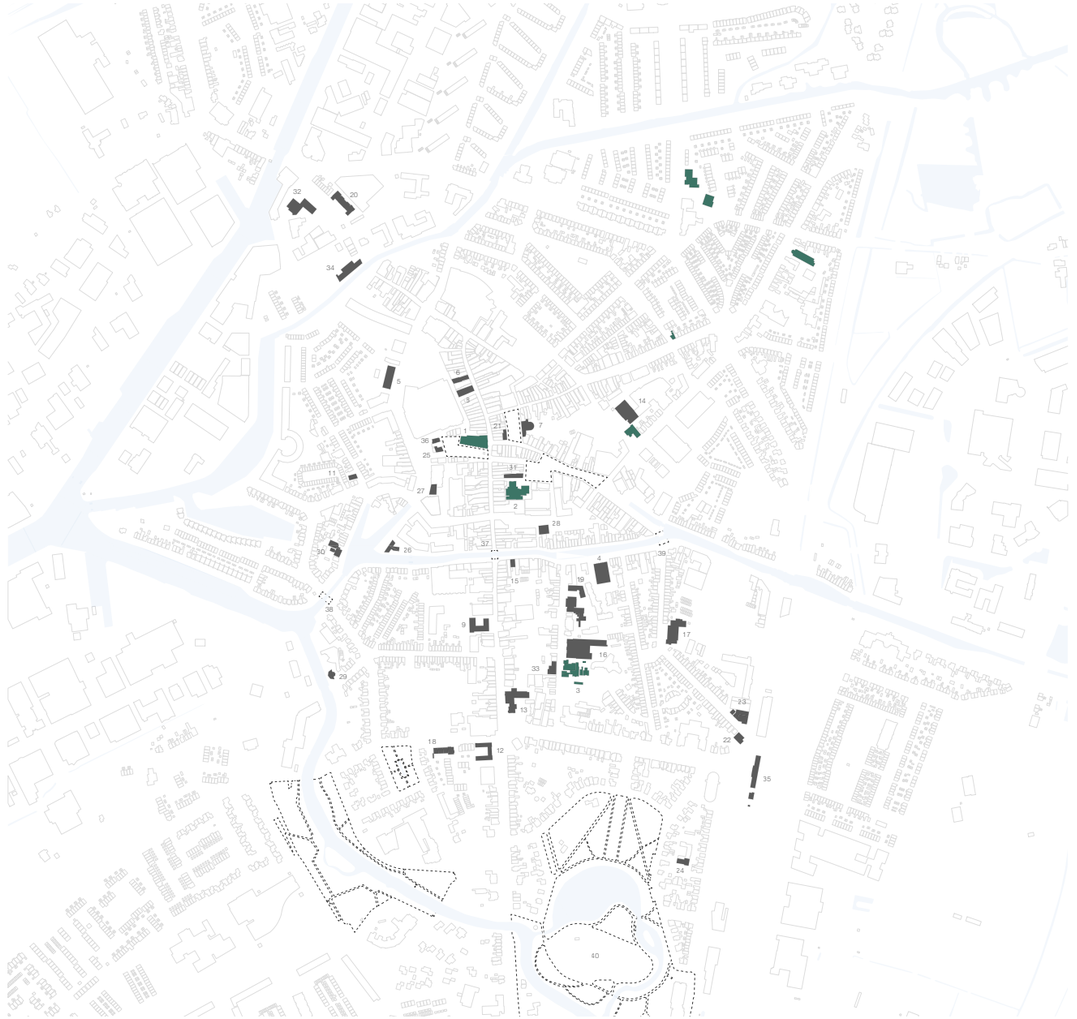
1959 - 1963

Monuments and churches in Meppel (Middle scale)

The Grote- of Mariakerk is part of a relatively large group of monuments in Meppel. The city is home to 55 national monuments (Monumenten.nl, 2022) and 37 municipal monuments (Wikipedia-bijdragers, 2020), two of these national monuments are the Grote- of Mariakerk and its church tower. Most of these monuments are houses that date from the period of 1790 - 1910, schools (like number 12, 13, 19, etc.), bridges like the Sluisbrug, and farms more towards the outside of Meppel (Alma et al., 2001) (Monumenten.nl, 2022).

Of course, the number of monuments solidifies the idea of there being a historic city center and rich building history in Meppel, but more so the idea that Meppel has an active community in regards to the registration of their buildings. Especially considering that Meppel is a small municipality of only 33.564 residents. This shows an appreciation for the built or even the entire history of Meppel from the local population, a sense of pride from the residents towards the city of Meppel.

Elaborating on this, it also provides background to the appreciation that the local population has for the Grote- or Mariakerk. From this, we can take away that the local appreciation for the Grote of Mariakerk isn't just because the church is a city symbol, but that it stems from a local pride towards the history of Meppel. So, logically, there is a rooted sense of admiration toward perhaps the key monument within Meppel, The Grote- of Mariakerk, which is a symbol of the city's history.



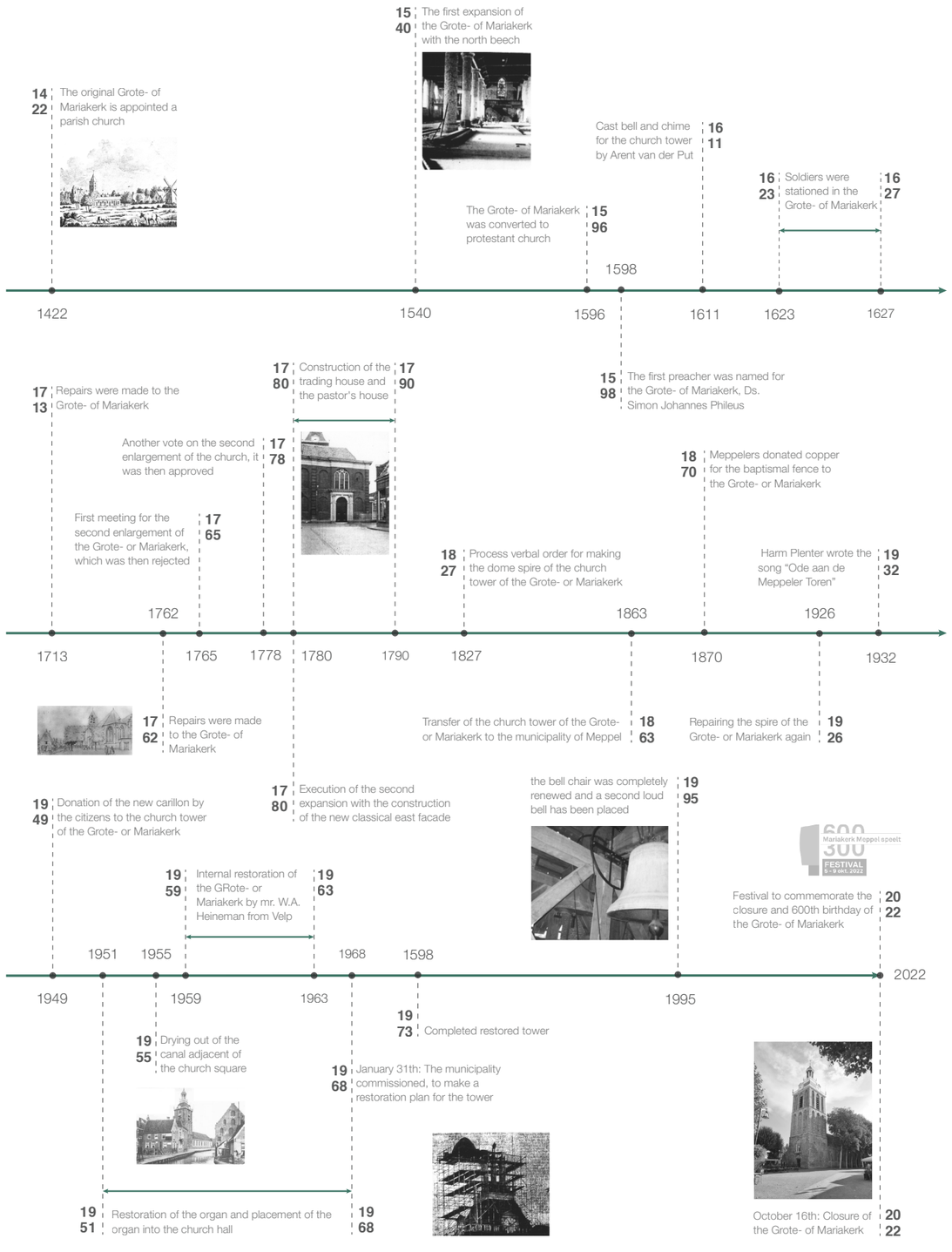
1	(Herv.) Grote of Mariakerk
2	Geref. kerk
3	Vrije Evang. Gemeente
4	Remonstr. kerk
5	R.K. St.-Stephanuskerk
6	Stadhuis
7	Stadsherberg annex waag
8	postkantoor Hoofdstraat 28
9	postkantoor Zuideinde 28
10	Stadsziekenhuis
11	Kantongerecht
12	Rijks Hogere Burger School
13	Rijkslandbouwwinterschool
14	openbare lagere school Vledderstraat 3
15	Rijkskweekschool
16	Catharina Ambachtschool
17	Johannes Calvijnschool
18	openbare lagere school Prinses Marijkestraat 1
19	Wilhelminaschool
20	school Noordeinde 22-24
21	café De Beurs
22	hotel-restaurant Stationsweg 51
23	hotel-café De Poort van Drenthe
24	jeugdherberg Parkhoeve
25	pakhuis Kerkplein 10
26	pakhuis Stoombootkade 10
27	pakhuis Kleine Oever 11
28	pakhuis Kromme Elleboog
29	molen De Weert
30	molen De Vlijt
31	drukkerij-uitgeverij Groenmarkt 13
32	Coöperatieve Landbouwersbank Meppel
33	confectiefabriek Catharinastraat 40-42
34	garage Noordeinde 1
35	Station
36	Trafohuis met bovenwoning
37	Zuiderbrug
38	Sluisbrug
39	Tipbrug
40	Wilhelminapark

Historical timeline of the Grote- of Mariakerk

Aside from the Grote- of Mariakerk's expansion as a building and changes regarding the growth of Meppel through time, the church has also been a part of several other historic events. If anything, many of the stories surrounding the church might even contribute more to its long survival and historic relevance than its form and geographical location. The timeline shows many of these historic events, most of them being about the building, but some also about the use of the building.

Aside from the expansions, several other events strike as important throughout the centuries. The church housed soldiers during the 80-year-long war and had to undergo great repairs after the soldiers had completely demolished the building, the church was converted from Catholic to Protestant, and the tower was transferred to the municipality of Meppel to make sure it could be maintained. It's also interesting that apart from the first 100 years, there has always been something going on around the Grote- or Mariakerk, it was always an active object within Meppel.

From the historic timeline, we can again conclude (in a different way) that there is a deep historic appreciation for the Grote- of Mariakerk. Not only from its geographical location or age but most of all from the active local effort to maintain the church as a significant part of daily life. The multiple expansions to house multiple people and more than anything the many gifts from the local community and the constant repairs to the church show this active effort. So, in conclusion, the timeline shows that the local community has actively cared for the Grote- of Mariakerk throughout the centuries, even until today by hosting a festival to commemorate its closing and 600th birthday, which shows a historic local appreciation for the church.

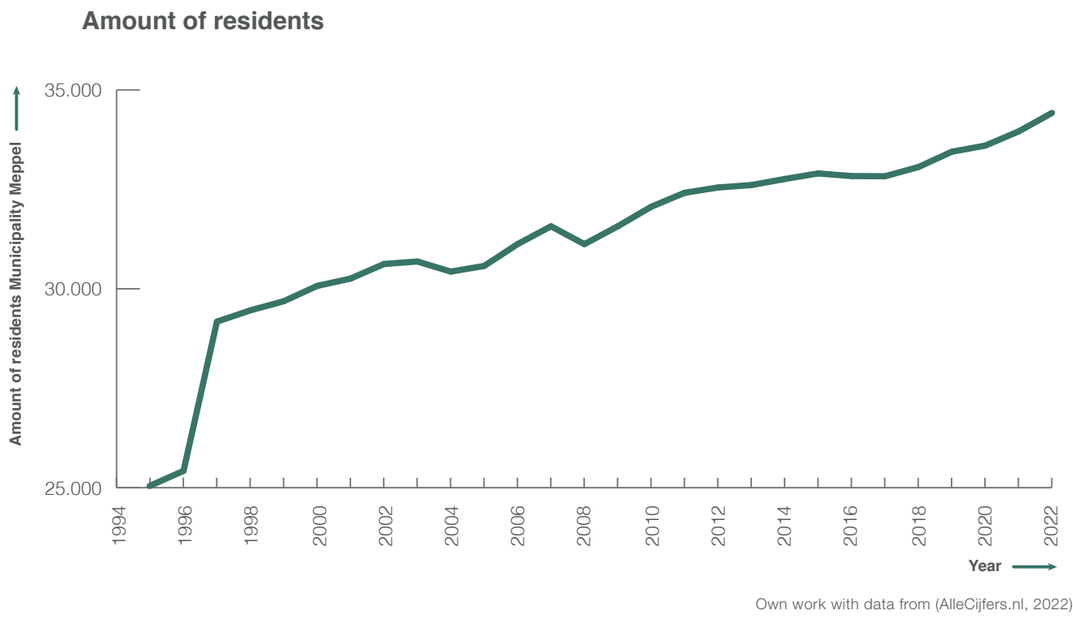


CONTEXT

Context

The Grote- of Mariakerk, as established earlier, is a significant component and symbol of Meppel's history. Aside from its historic and (as will be clarified later) urban significance, the church also has great cultural significance. This became apparent during our site visit, guided tour of the church, and interactions with the local community. Since everyone we spoke with felt some type of way or had an about the repurposing and closing of the church. While to us the church was nothing more than a case study, and, well, church, however, to the people of Meppel the Grote- of Mariakerk is somewhat of a local icon.

To find out whether our interactions are representative of the ideas surrounding the church and the average resident of Meppel, research into the context of Meppel and the church is conducted. Through demographic research, a better understanding of who the residents of Meppel are is created, and by investigating local publications the local trend around the church, the closure of the church, and the repurposing of the Grote- or Mariakerk is investigated. By doing so, positioning the church within the context of Meppel, creating a better understanding of its closure, and developing somewhat of an idea about the residents and local appreciation of the Grote- of Mariakerk.



Own work with data from (AlleCijfers.nl, 2022)

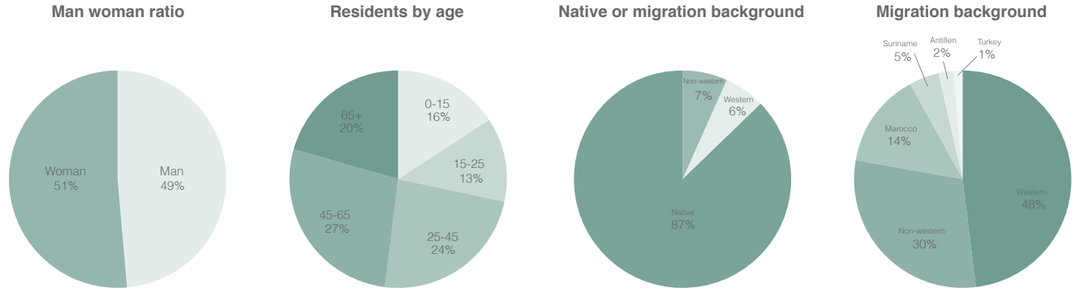
Demographic Research of Meppel

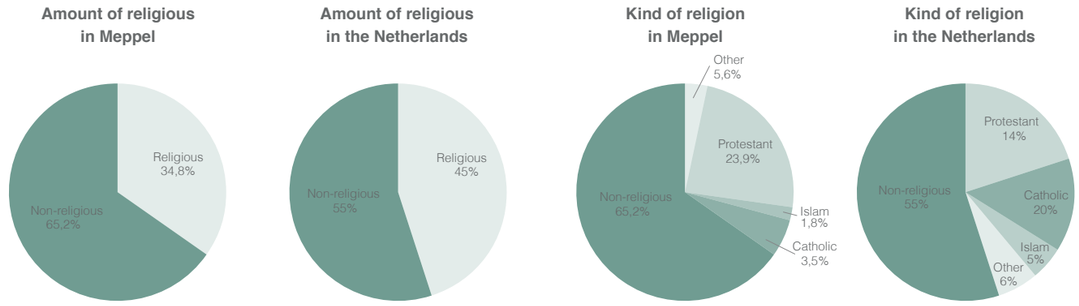
First and foremost, to understand who is visiting, appreciating, critiquing, or harboring no feelings towards the Grote- of Mariakerk, it's important to create an idea about who the inhabitants of Meppel are. As of today, the population of the municipality of Meppel consists of 34.761 residents. Over the last two decades, Meppels population has experienced stable growth, growing with about a couple hundred people a year. Apart from the periods of 1994 - 1997 when the population grew significantly and in 2007 - 2008 when the growth stagnated. From the overall trend, we can assume a stable growth of hundreds of people a year to continue. (AlleCijfers.nl, 2022)

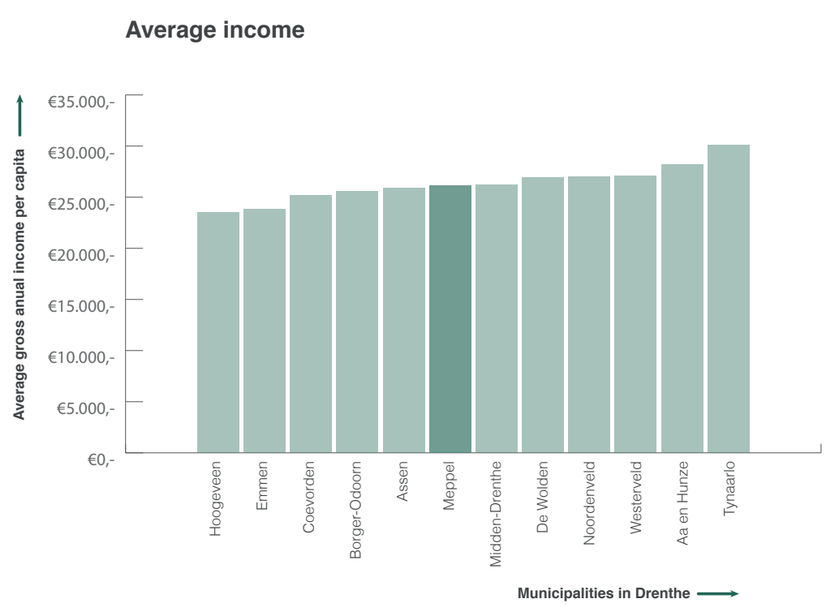
Within the population, male and female residents and the different age groups are presented equally. Furthermore, the numbers are on par with the national average, with the age group between 45-56 being the largest. In Meppel most residents are native (87%) and only a small group (13%) has a migration background, most of the migrants are western (48%). Whilst most of the residents are native, we can conclude that in Meppel (while slight) diversity exists, asking us to not solely focus on a single target group during the repurposing (AlleCijfers.nl, 2022)

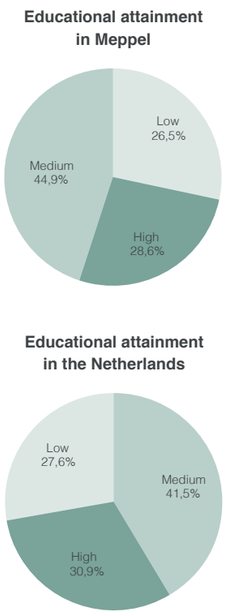
Furthermore, the closure of the church seems logical as the religious involvement in Meppel is lower than the already low national average, with a difference of 10,2%. Within the religious groups, the protestant is represented most, also way above the national average, which seems about right considering Meppel is a Protestant municipality.

The level of education in Meppel is evenly divided and is very close to the national average, the different levels of education are also widely spread among the municipality. In a way this is also represented in the average annual income, at €26,100,- Meppel is average among the other municipalities within Drenthe, and the middle class is well represented. So, with the combination of all the data, a better idea is sketched of the residents of Meppel. (AlleCijfers.nl, 2022)









Own work with data from (AlleCijfers.nl, 2022)

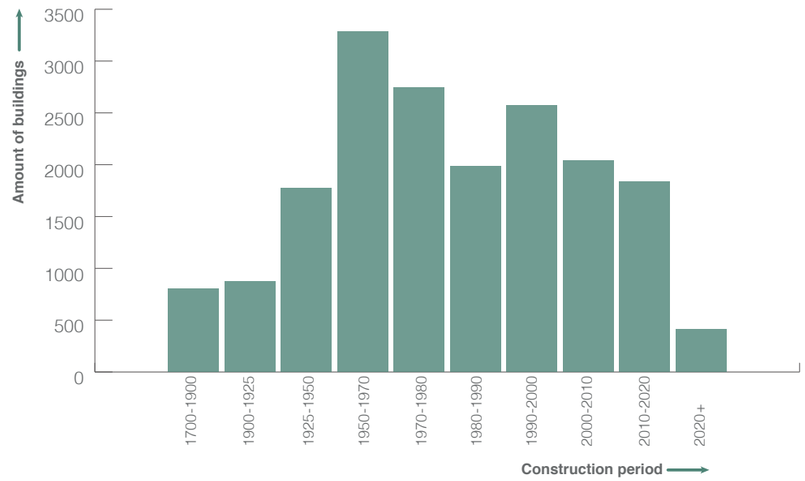
Urban statistics of Meppel

Next to the citizens of Meppel and who they are, there is also an urban context within Meppel, where are people living, how old are most buildings, what is there to do in Meppel, and what types of buildings surround the Grote- of Mariakerk. To lay a foundation for the urban context, before doing more specific research, an investigation into the urban statistics of Meppel was carried out.

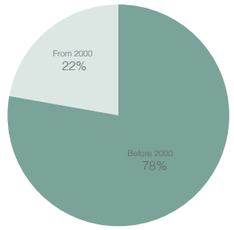
Most buildings in Meppel are owner-occupied and from the 42% rental buildings of the buildings stock, only 11% is privately owned. A positive addition to this is that only 4% of the total building stock is unused, which shows the active occupation of Meppel. The largest part of Meppel's building stock is made up of a total of 15.983 houses, which are mainly single-family houses. Most of the buildings were constructed before 2000, which is in line with the earlier research into the urban growth of Meppel. Furthermore, again in line with the earlier investigation, the largest number of buildings were constructed in the period between 1960 - 1980. When looking at other functions apart from housing, most of the addresses are assigned to industrial, care, and retail programs, but there is a lack of "other" programs. Only 65 addresses fit the description of other programs, such as musea, places for gatherings, etc. this shows which could imply a need for addresses that provide "something to do", as vague as that may sound. A place to hang out, visit, take a trip to, or something that makes people gather like nightclubs, art galleries, etc. (AlleCijfers.nl, 2022)

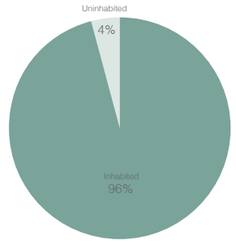
So, most notable from the research into the urban context of Meppel, is that there is a lack of "other" types of programs, something that draws people together or provides a day out. A function description that is quite in line with that of a church when you take away the religious load. So, in conclusion, we can quietly state, that the first idea of a need for Meppel is quite in line with the "normal" uses of the church, which is a positive trend regarding the preservation of the Grote- of Mariakerk's identity.

Construction period

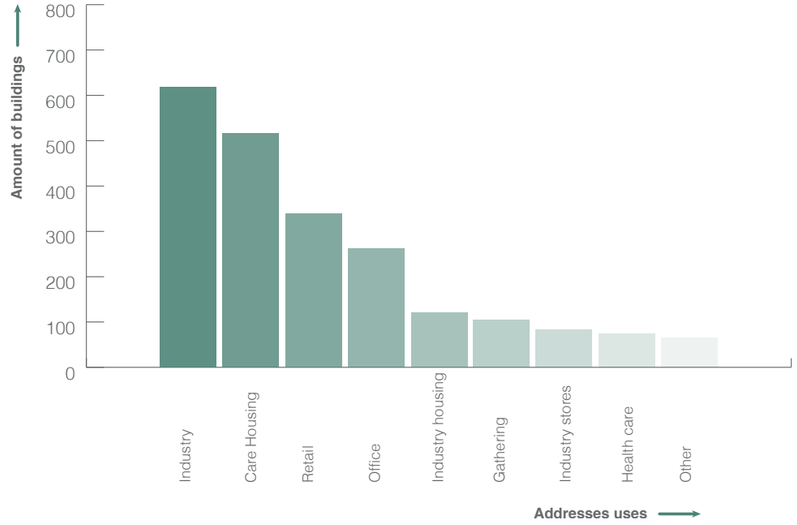


Habitation

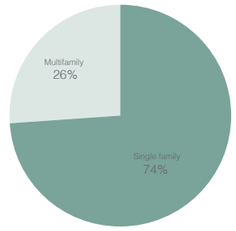




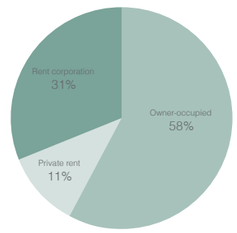
Addresses uses



Type of house



Ownership



Own work with data from (AlleCijfers.nl, 2022)

Context of the Grote- of Mariakerk

Aside from its historical context, the surrounding buildings, and the residents of Meppel, there is also the context surrounding the Grote- of Mariakerk. Why is the church closing, what are the local thought about the repurposing, do people care that the church is closing, and do people still appreciate the church as they did in the past? Through investigation of local news publications and talks with people from the local archive Stichting Meppel and Leo tadema, who is active in the process of selling the church a better understanding of the context was created.

First and foremost, it is safe to say that people still care about the church, as is reflected in the sheer amount of newspaper articles and the fact that the locals of Meppel hosted a week-long festival to commemorate the church's closing and 600th birthday. Based on almost all the newspaper articles and the interactions we had with people in Meppel, we can say that no one wants to see the church go. Furthermore, most people have an opinion or wish regarding the repurposing of the church, if someone plans to buy it, as close to no of the locals want housing in the Grote- of Mariakerk, some would like the church to stay, but most people would like a social function to be placed in the church. From the active publishing of the newspaper articles, even after the festival, we can also conclude that it is a lively topic, at least important enough to write about.

So, considering the appreciation and compassion for the Grote- of Mariakerk, why is it closing? The Grote- of Mariakerk was not sustainable anymore as a church. With the national steep decline of churchgoers and the already below-average amount of churchgoers in Meppel, the church was not able to fund both the Grote- of Mariakerk and the Oudekerk anymore. The church is a voluntary institution that mainly survives on donations and voluntary funding, due to the declining amount of churchgoers the church had a budget deficit of €150.000,- (a result of the annual cost to maintain the churches). As a result, they had to choose which church they wanted to maintain and since the Grote- of Mariakerk is a national monument (harder to change due to legislation), they chose to renovate the Oude Kerk and sell the GRote- of Mariakerk.

So, from the organized festival, active publishing of articles considering the church, and the reason for closing we can conclude that there is a local interest in the correct redevelopment of the Grote- or Mariakerk. While in itself this is not an eye-opening finding. Creating a better understanding of the context surrounding the Grote- of Mariakerk does provide useful inside that the church is not just appreciated and relevant from a historic and urban point of view, but still is relevant and appreciated by the locals today.

SITE

Site

Meppel, the home to the Grote- of Mariakerk, is a northern city located just above the border of Overijssel in Drenthe. From when Meppel was still a bunch of farms until the relatively small city of just 34.761 residents (AlleCijfers.nl, 2022) it is today the church has been present. Whilst it is already established that the church is intertwined with Meppel's history from a cultural, historic, and geographical point of view, many facets of the relationship between the Grote- and Mariakerk are still unknown. It can be assumed that the church is also Deeply intertwined in the workings of Meppel's urban fabric, especially when considering that the church has been around since the earliest moments of Meppel.

This assumption was quickly confirmed during our first site visit to the Grote- of Mariakerk, as the church was almost instantly visible during our 1-kilometer walk from the train station. First, portrayed as the symbol of the city center (see the drawing presenting our first impressions), and second the actual church tower as we proceeded to walk a long 1-minute further. The closer we got, the more often we saw the church towering over the residential blocks, and the more we got the idea that the church plays a special role within Meppel in both position and presence. We just could not grasp why this was the case.

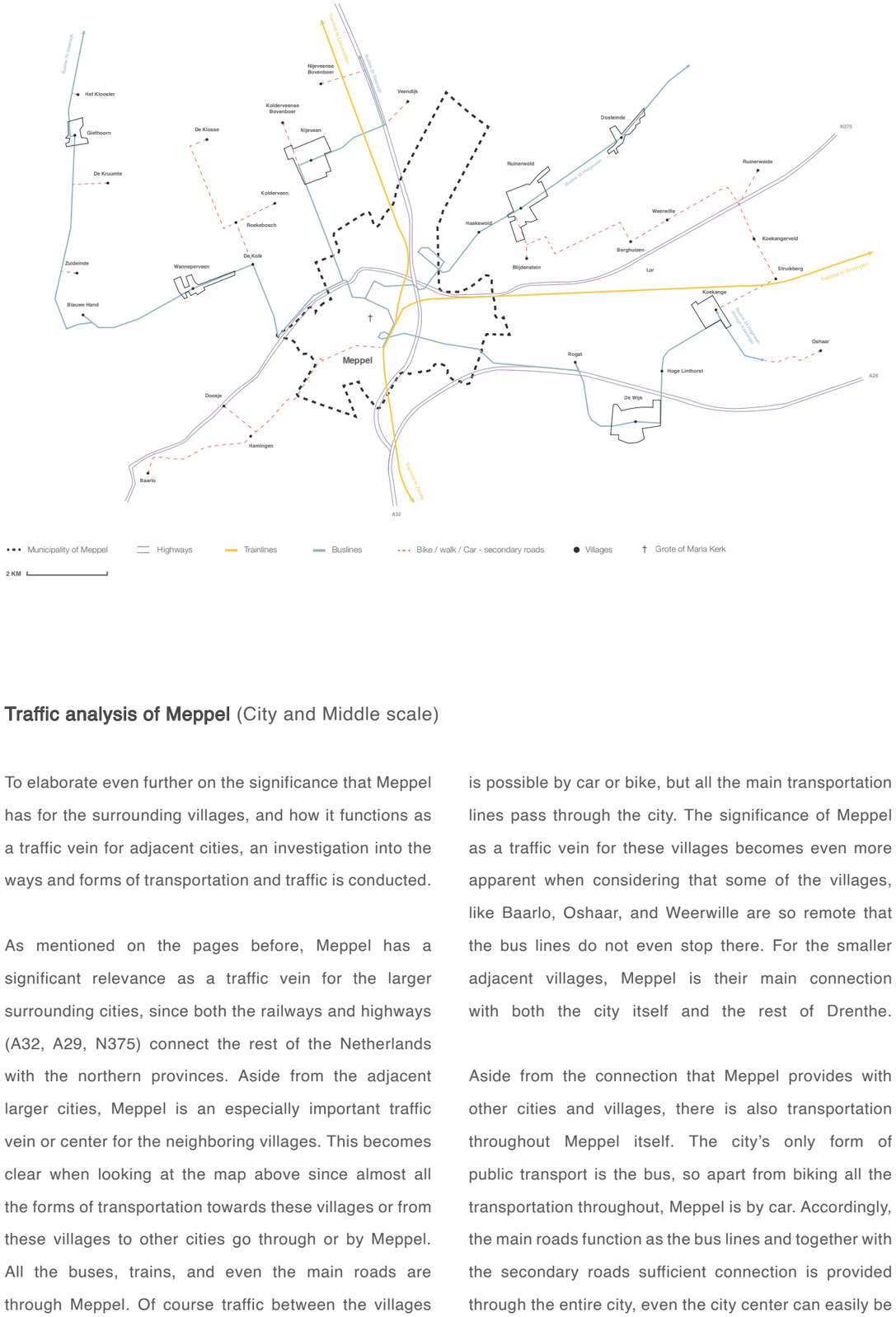
To create a better understanding of The Grote- of Mariakerk's role within the sit of Meppel, or as Steward Brand describes, the geographical setting in which the building is positioned (TU Delft OpenCourseWare, 2020), research is conducted into the role of the church through different scales. By analyzing the positioning and relevance of Meppel regarding surrounding cities and villages, the facilities and working of Meppel, and how the church positioning affects both the surrounding buildings and on a larger scale the city, the urban role, and relevance of the Grote- of Mariakerk is discussed.

Meppel and surrounding villages and towns (City scale)

As mentioned before, Meppel is located just above the border of Overijssel in the province of Drenthe. To create a better grasp of the city on the scale of the inner city and site of the Grote- of Mariakerk, first, the Meppel is analyzed regarding surrounding cities and villages. By doing so, investigating the relevance of Meppel, positioning it in a geographical context, and formulating some background as to why the city might work the way that it does, as Meppel isn't the center of the world. If anything, Meppel would even seem quite irrelevant at first glance.

On the Provence scale (see upper map), Meppel is somewhat of an urban island, as between Zwolle (123.861 residents) the capital of Overijssel, and the first significantly sized cities in Leeuwarden and Groningen in Heerenveen (50.257 residents) and Assen (67.963 residents), there are no significant cities apart from Meppel (34.761 residents) (AlleCijfers.nl, 2022). Furthermore, Meppel functions as a transport vein between Overijssel and the Northern provinces, as Meppel functions as the split towards Groningen and Leeuwarden. Yet, in between the almost twice as large cities, Meppel still seems insignificant, as in between the Gap of Zwolle (20 minutes from Meppel), Assen, and Heerenveen (both 30 minutes from Meppel), there isn't that much apart from small villages.

This does, however, provide an interesting insight, as whilst in comparison to Zwolle, Assen, and Heerenveen (in size at least) Meppel does not seem to provide much of a "city experience", but to the surrounding villages, Meppel is the "city experience". Especially, when considering that most of the surrounding villages have less than 300 residents apart from 7 villages that range between 1500 and 3000 residents. So, from the geographical positioning of Meppel regarding surrounding cities and villages, we can conclude that on a province scale Meppel is relevant as a traffic vein, but as a city quite irrelevant, as people would probably head for Zwolle, Assen, or Heereveeen for a more urban setting. Yet, to the surrounding villages, Meppel is of great relevance, as there isn't anything like it close by. This will only become more apparent in the investigations of both traffic and the functions of Meppel.

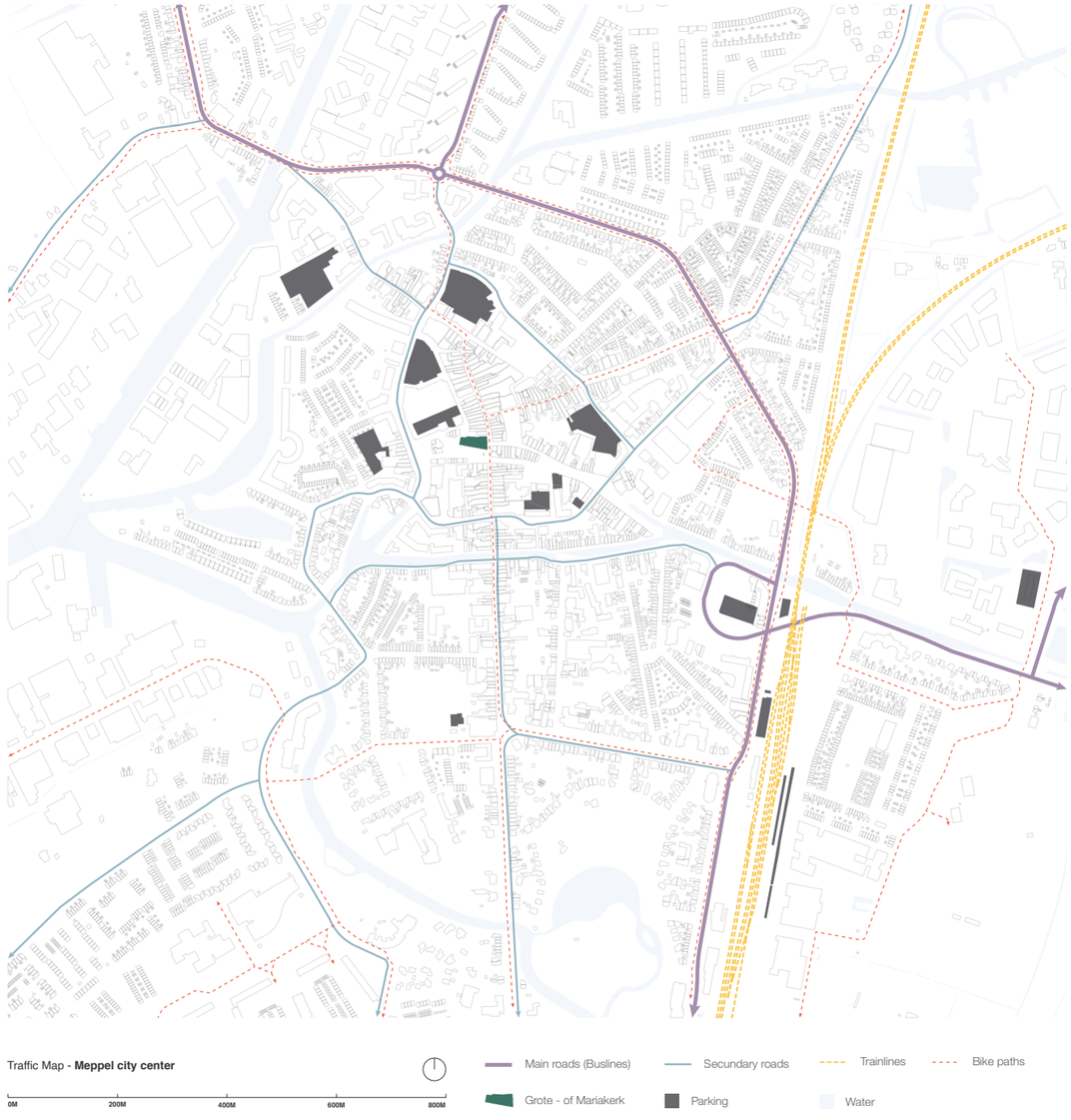


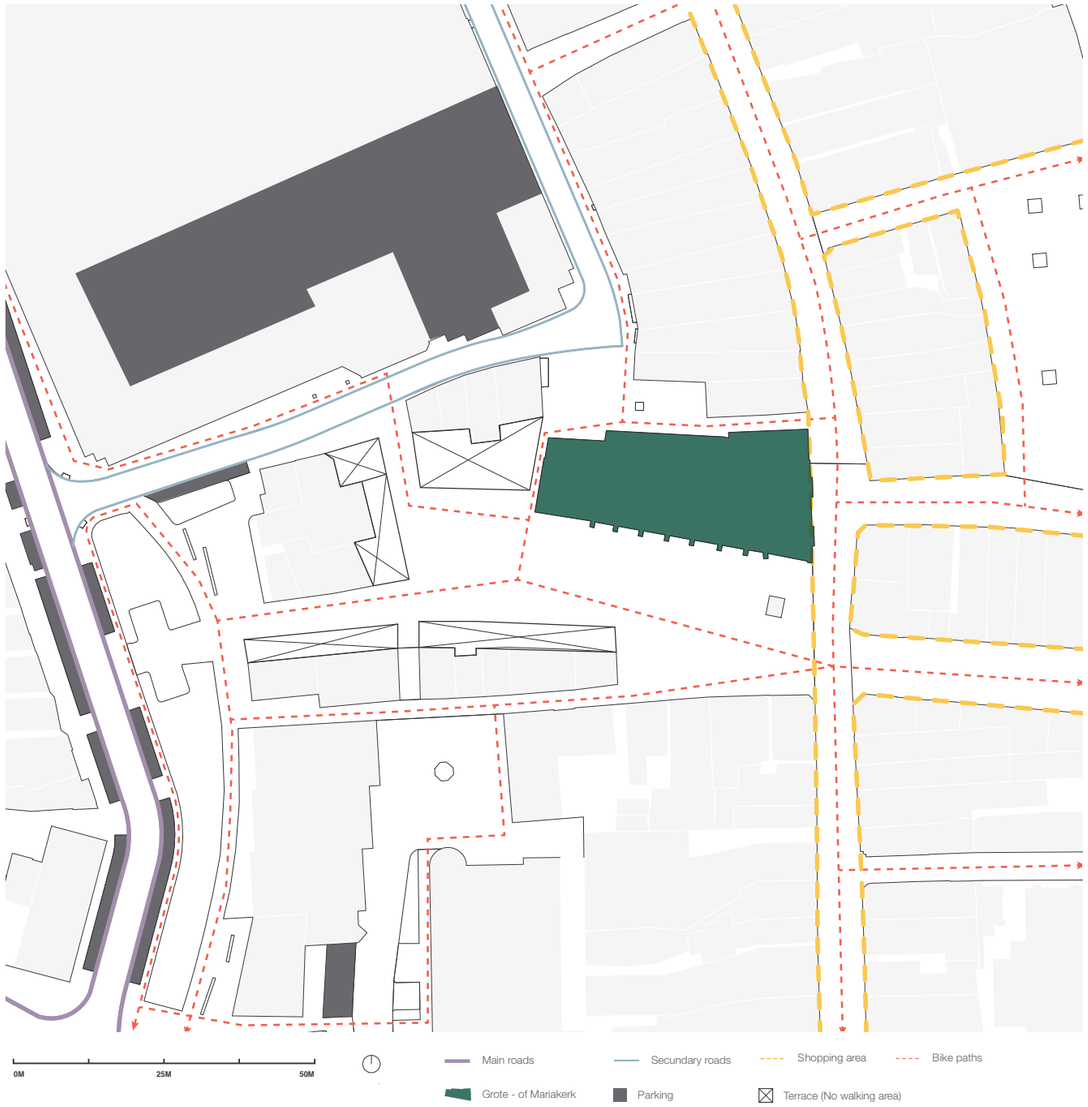
Traffic analysis of Meppel (City and Middle scale)

To elaborate even further on the significance that Meppel has for the surrounding villages, and how it functions as a traffic vein for adjacent cities, an investigation into the ways and forms of transportation and traffic is conducted.

As mentioned on the pages before, Meppel has a significant relevance as a traffic vein for the larger surrounding cities, since both the railways and highways (A32, A29, N375) connect the rest of the Netherlands with the northern provinces. Aside from the adjacent larger cities, Meppel is an especially important traffic vein or center for the neighboring villages. This becomes clear when looking at the map above since almost all the forms of transportation towards these villages or from these villages to other cities go through or by Meppel. All the buses, trains, and even the main roads are through Meppel. Of course traffic between the villages is possible by car or bike, but all the main transportation lines pass through the city. The significance of Meppel as a traffic vein for these villages becomes even more apparent when considering that some of the villages, like Baarlo, Oshaar, and Weerwille are so remote that the bus lines do not even stop there. For the smaller adjacent villages, Meppel is their main connection with both the city itself and the rest of Drenthe.

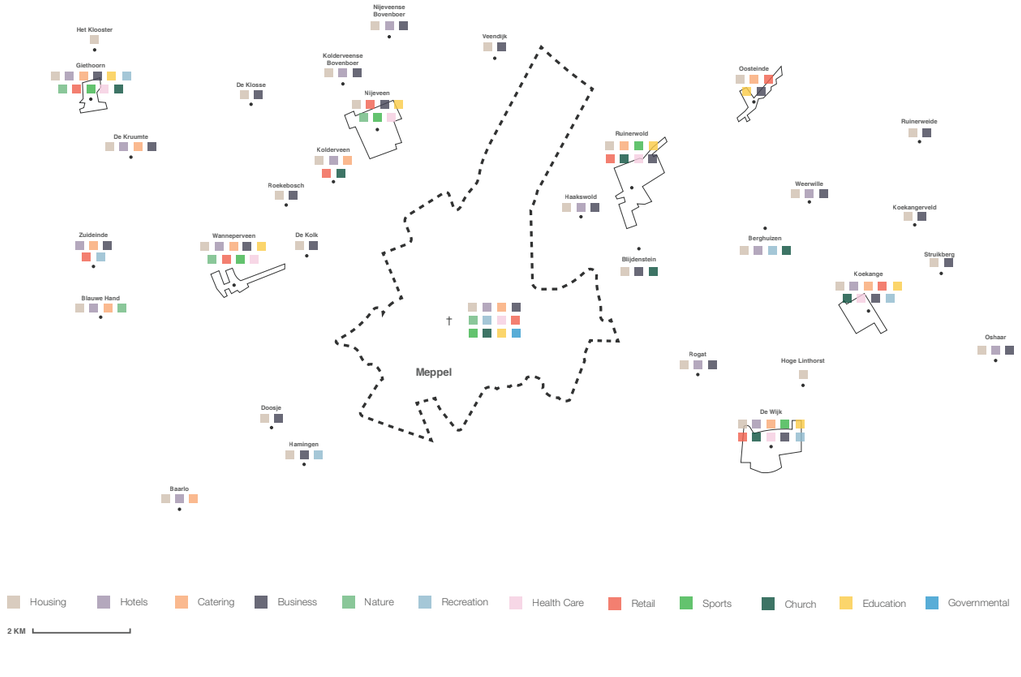
Aside from the connection that Meppel provides with other cities and villages, there is also transportation throughout Meppel itself. The city's only form of public transport is the bus, so apart from biking all the transportation throughout, Meppel is by car. Accordingly, the main roads function as the bus lines and together with the secondary roads sufficient connection is provided through the entire city, even the city center can easily be reached. Especially when considering Meppels relatively small size and the number of parking lots that the city provides, as on the borders of the city center alone there are 9 variously sized parking lots. The areas outside of the center are not as well equipped, but as they are mostly housing or industry areas they will probably only host destination traffic where parking is already supplied. All, and all Meppel is well connected both internally and outside of the city. Regarding the Grote- of Mariakerk, this also means that there are no problems in regards to reaching and hosting large events in or around the church, as both ways for transport and sufficient parking is present.





Traffic analysis of the area surrounding Kerkplein (Small scale)

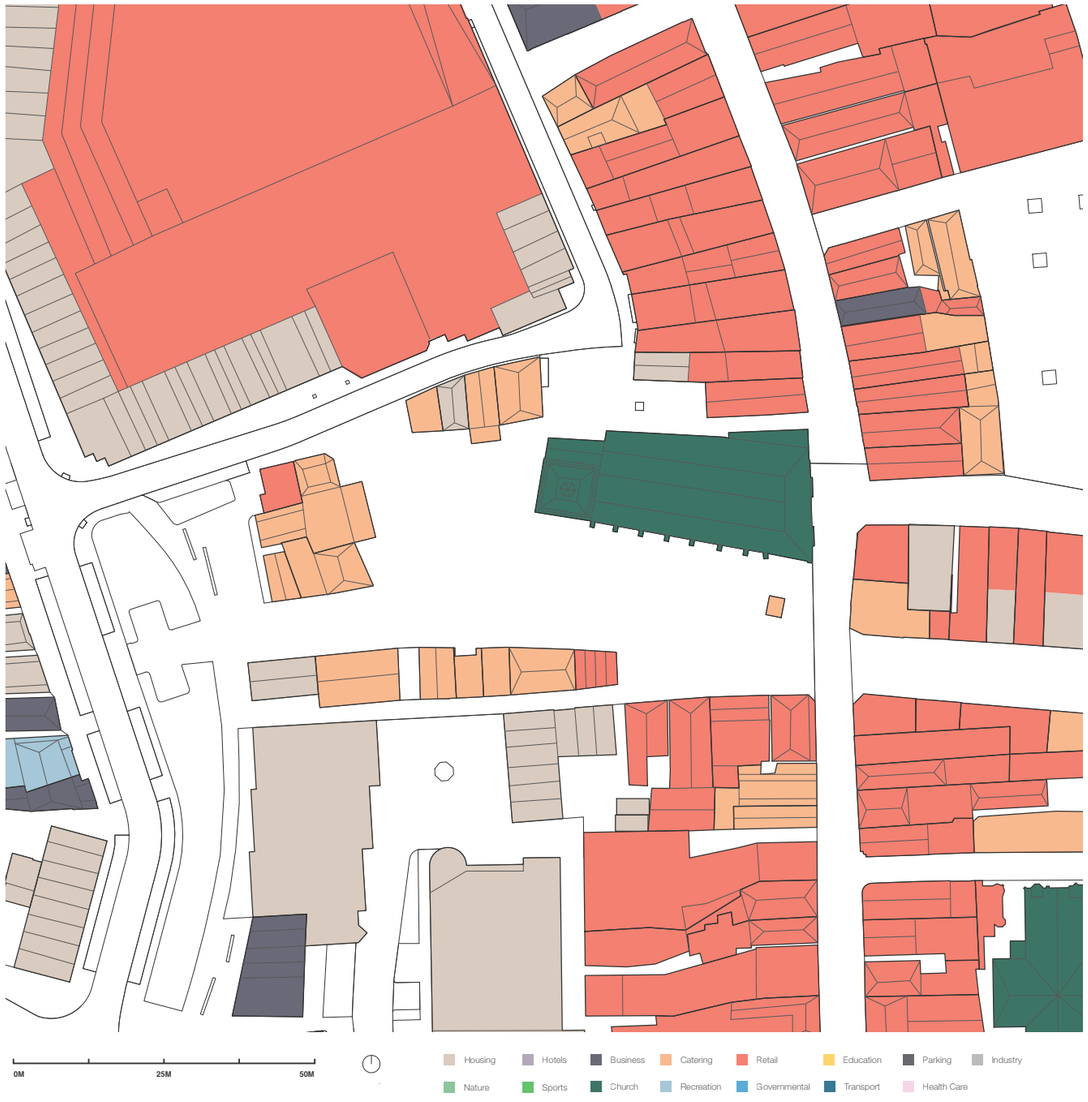
That there are options for transport and parking around the Grote- or Mariakerk becomes even more apparent when zooming in on the scale of the church square. There is a road adjacent to the church square that provides parking and the shopping center the square is also equipped with a parking lot, and even some parts of the shopping area are occasionally used by cars. Since we are looking at quite a small scale, the pedestrian traffic also becomes more apparent. While logically the sidewalks and shopping areas are mainly used, the movement around the church proves to be rather interesting, as during our visit we found the alley above the church to be used quite a lot as a cut-off road, even by bikers. This shows an opportunity, as there is room for interaction between the pedestrians and the church on that side, that on paper seems like a “non-active facade”. Furthermore, the entrances to the church square (as later studies will show) have a lot of interaction with the church tower and east facade. So, both the accessibility by care and the pedestrian traffic provides opportunities during the redesign.



Program analysis of Meppel (City and Middle scale)

Apart from Meppels relevance as a transport vein for the adjacent villages, there is another need that the city provides, as most of these small villages do not have access to a great variety of programs. Most of these villages are not even self-sufficient as they lack a supermarket, health care, or even a cafe. All of the smaller villages (below 300 residents) mostly only provide housing, some small at-home businesses (farms, webshops, etc.), and some small hotels in the form of Airbnbs at local farms. So, for about anything to supply themselves they would already have to move to the larger villages like Nijeveen, Giethoorn, or Koekange to fulfill their basic needs such as grocery shopping, general practitioners, or visiting a restaurant. Yet, even in the larger villages, which have a greater variety of programs, it is all still quite local, a single supermarket, 2 to 3 bars, and restaurants, some small shops, elementary Schools, and in some cases even high schools. For anything more or a larger volume of programs these villages still fall short, nothing out of the ordinary as they are not cities and are relatively small. So, as established earlier, these villages have to go to Meppel if they want anything more, as it is the only city nearby that can provide those needs, which means that when placing a new function in the church we should also consider the neighboring villages.

In Meppel itself, as was already slightly investigated during the research into the context, there is about anything one would need from a city, and most of the building stock is compiled of housing. Meppel can be separated into different zones, as adjacent to the center of Meppel, it is mostly industry or business areas, apart from the odd housing areas. The different types of programs are spread quite evenly across the city, apart from the center which is predominantly made up of retail or commercial programs. While the spread and placement of the different types of the program provide more context, the conclusion from the research into the context still stands. As a result of its size and probably the neighboring city of Zwolle, not enough program is provided that gives the residents “something to do”. Furthermore, there are not many functions that would draw people from adjacent cities to Meppel. New types of a program like a museum, urban living room, concert hall, or a mix could provide the residents (also the younger generations) with the opportunity to have a day out or a regular meeting spot. It would also introduce a new dynamic into the shopping-filled city center that could invigorate the church as an active part of daily life again.



Program analysis of the area surrounding Kerkplein (Small scale)

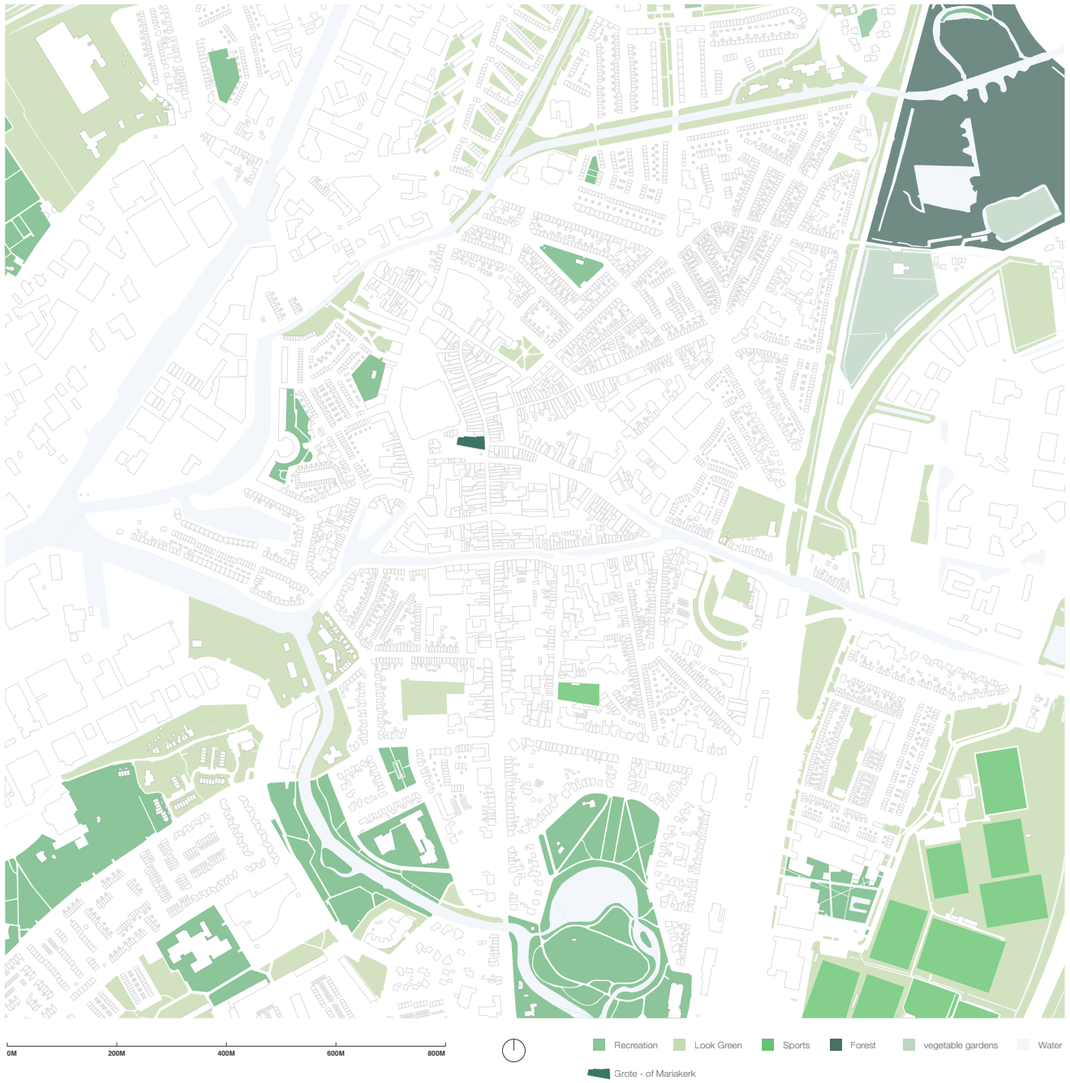
The lack of recreative or “public interior” functions in the city center becomes more apparent when zooming into the city square. In the area, there is mostly commercial/ retail program in the form of the main shopping area of the city that is supported by catering programs like bars, cafes, and restaurants. Apart from the east facade the church hall -and tower mostly interact with the cafes adjacent to the church square. While these functions in themselves do not provide many leads, they could act as a supporting program to the repurposed church. In the scenario of a new function that draws the public, the adjacent cafes could provide for the visitors. As a result, creating a lucrative relationship between the church and the adjacent catering, as the catering provides sociability and an active church square and the church provides new revenue for the cafes. So, with the placement of the right recreative or public program, the church could add a new and needed dynamic to the city center.

Program Longitudinal section

0M
15M
30M

Program Cross section

0M
15M
30M



Green analysis of Meppel (Middle and small scale)

Within Meppel the various types of greenery are mostly spread across the borders of the city. The city center is almost entirely without green apart from the sporadic green patches and trees that are placed on the church square, which all basically “look greenery”. Interesting, however, is that much of the greenery throughout Meppel is useful, there is a lot of “look greenery” placed around the train tracks, highways, and some occasional patches around housing, but besides that, there is a lot of recreative green in the form of the Wilhelmina park, playgrounds, part of the forest or the large vegetable garden areas. Not to forget, the various sporting facilities throughout Meppel. Soccer fields, athletics, tennis courts, rugby, etc. When it comes to sports, about anything one would like to practice is present in the city. So, in conclusion, while greenery is quite absent in the city center, there isn’t a screaming need to place much greenery since there is a sufficient amount of active or useable greenery outside the city center, which spreads out use through the city. If there is an opportunity to incorporate greenery in the redesign it would be nice, but it is not necessary.

Morfologic analysis of Meppel (Middle scale)

When looking at the city structure of Meppel through the morfologic analysis, we are in a way building further on the historic growth and program analysis of the city. The city can be distilled into 5 groups of structures that are each made up of different building blocks as is seen on the left page. The Historic city center is made from larger blocks that are a collection of separate buildings, the housing areas that branch off from the city center are made from housing blocks surrounding backyards, the business area is mostly composed of large free-standing blocks, the industrial area made from mostly large free-standing blocks, and the housing area in the north composed of urban stamps. The most notable, however, is that the Grote- of Mariakerk is a free-standing element separate from all these structures. So, in the event of adding new structures to the church, you can neglect the existing city structures during the transformation of the church, and keep the church as the solitary and free-standing element that it is.

1

Grote of Mariakerk

Unique shape

2

Looierij - City center

Enclosed by organic shapes

3

Wolkade - North Meppel

Enclosed by different types of row housing and singular blocks

4

Noteboomstraat - CIty center

Enclosed by row housing

5

Woldstraat - City center

Organic collection of singular building blocks

6

Piet Heinstraat - City center

Back to back row housing

7

Trompstraat - North Meppel

Back to back row housing

8

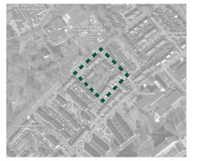
Stationsweg - South Meppel

Enclosed by singular blocks

9

Heinsiusstraat - North Meppel

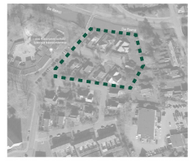
Stamp of row housing



10

Jan Tooroplaan - South Meppel

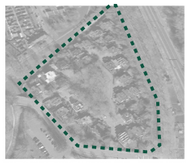
Stamp of row housing



11

Vincent van Goghlaan - South

Stamp of singular shapes



12

Tweelo - North Meppel

Stamp of singular shapes

13

Shopping street - City center

Solid block of seperate shapes

14

Wijkzorg - North Meppel

Unique shape (small)

15

Concordia keuken - West Meppel

Unique shape (middle)

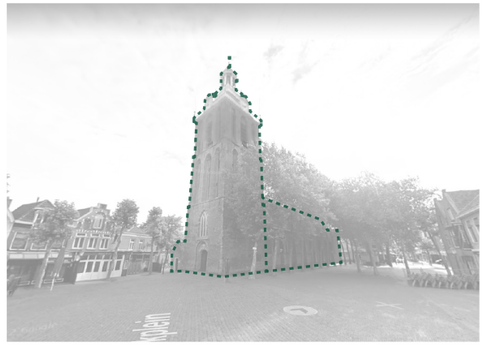
16

Drenthe College - East Meppel

Unique shape (large)

Sightline analysis of the Grote- of Mariakerk (Middle scale)

As was mentioned in the introduction of the site analysis, one of the first things we noticed was how quickly the church was visible, really making its presence known in the city. Through the sightline analysis of the city, it becomes apparent that our experience was not accidental, as the church, or specifically, the church tower, is an unmissable element that shapes the skyline of Meppel. Through investigation of several points of view from different distances, the analysis shows that the church is still visible from 850m away, or for reference, from the borders of the housing areas of Meppel. As a result, the church tower's presence is felt throughout large parts of the city, really creating and adding to its identity as a landmark for Meppel, both physical and symbolic. So, in the event of changing the church tower, it is of the utmost importance that we are aware of the tower's reach and how it has been part of the urban memory and marked the city skyline for decades.



Sightline 1 - from Kerkplein (50,0 m)

Sightline 2 - from Prinsenplein (260,0 m)

Sightline 3 - from Galmanspand (270,0 m)

Sightline 4 - from Gemeente Meppel (300,0 m)

Sightline 5 - from Sluisgracht (500,0 m)

Sightline 6 - from Pelikaanstraat (850,0 m)

Sightline 7 - from Soembastraat (700,0m)

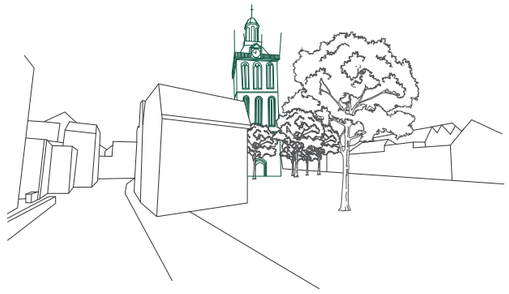
Sightline 8 - from Parallelweg (750,0 m)

Sightline analysis of the Grote- of Mariakerk (Small scale)

Apart from the church tower and its visibility throughout the entire city, there is also the visibility of the Grote- of Mariakerk when approaching it. Through analysis of the several points of approach towards the church. The building parts that mark the first impression of the building were investigated. There are 6 main points from which the church can be approached, which are the shopping area streets, the entrances of the church square, and the earlier mentioned back alley. From all these points, two parts of the building jump out the most, as from the side of the church square the church tower and west facade are visible first, and from the shopping area, the classic east facade is the first element that appears. This shows that when approaching the buildings these two sides of the building mark one first impression. So, during the redesign, it is important to incorporate the church tower, west facade, and east facade as entrances or active parts of the building, as they are the building's sign or most visible elements.

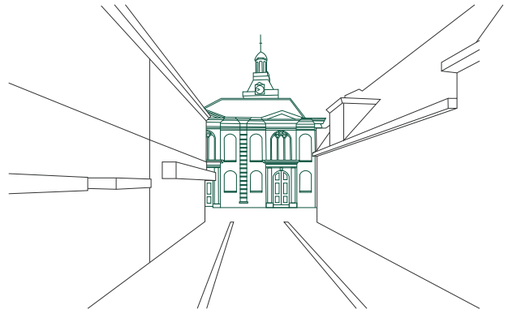
Sightline 1

Approaching the Grote- of Mariakerk from the Hoogetin onto the Kerkplein



Sightline 2

Approaching the Grote- of Mariakerk from the Kleine Akkerstraat onto the Kerkplein

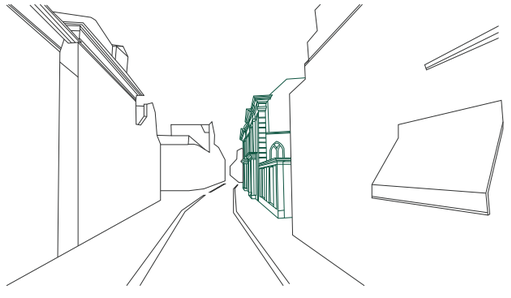


Sightline 3

Approaching the Grote- of Mariakerk from the Grote Kerkstraat

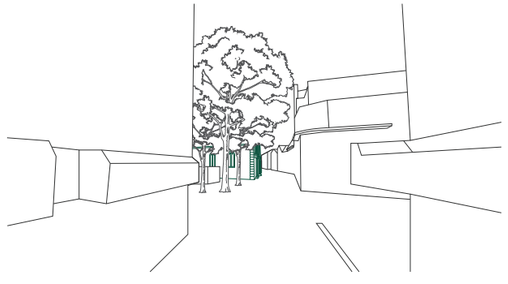
Sightline 4

Approaching the Grote- of Mariakerk from the Grote Akkerstraat



Sightline 5

Approaching the Grote- of Mariakerk from the north of the Hoofdstraat



Sightline 6

Approaching the Grote- of Mariakerk from the south of the Hoofdstraat

Building heigts analysis of the Grote- of Meppel (Small scale)

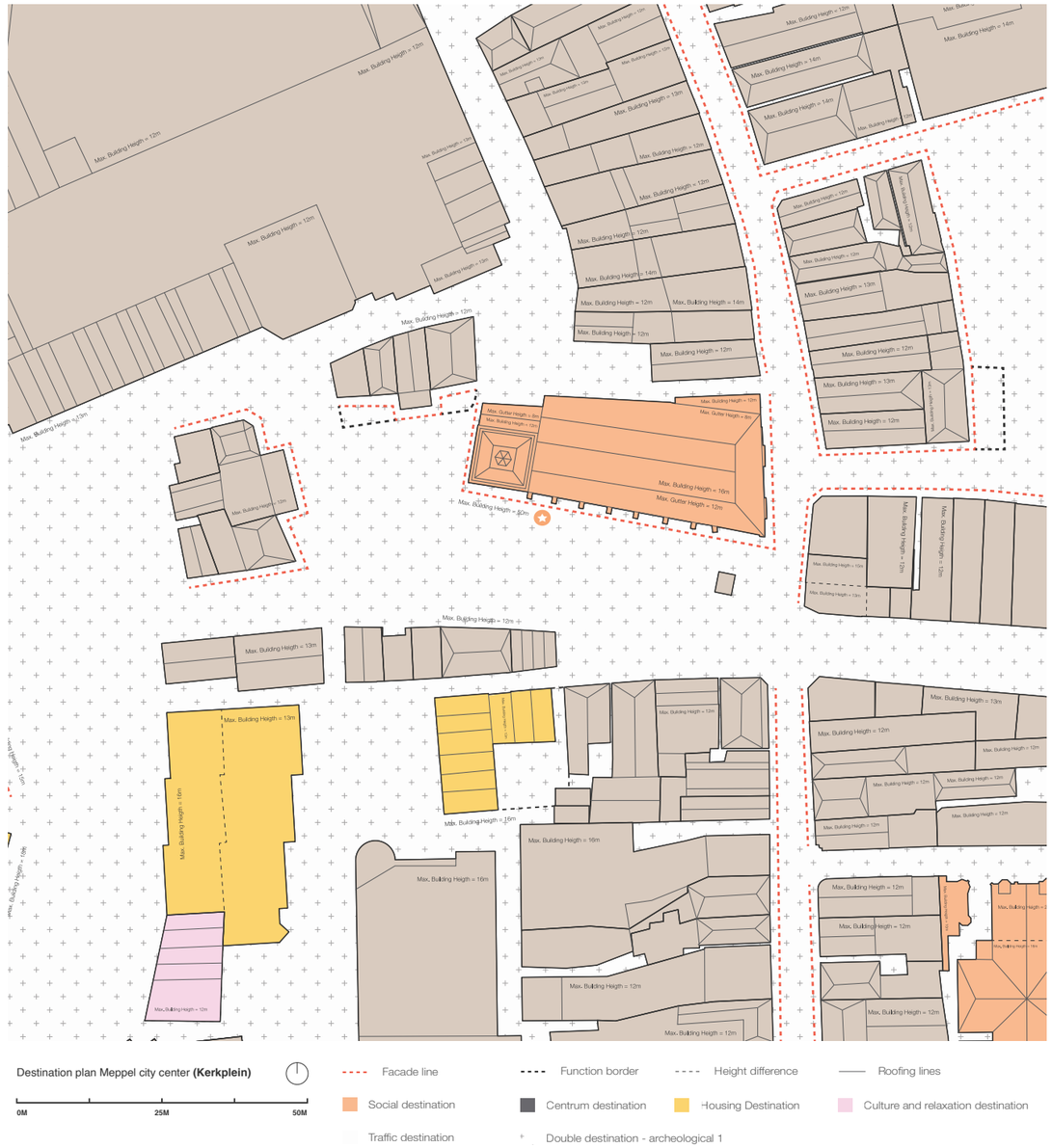
Not surprising, as it already was quite clear from the sightline analysis, is that the Grote- of Mariakerk's tower is the largest building in both the city center and the entire city. What is interesting, however, is how the church hall interacts with the surrounding buildings, as their height is much more in line. Yet, even the church hall jumps out, as its main building and rooftops are higher than most of the surrounding buildings. All the buildings around the church square are about the same height, apart from some rooftops being a bit higher. The only buildings next to the Grote- of Mariakerk that jump out in the area are the Oude Kerk, which church tower comes closest to the Grote- of Mariakerk's tower, some of the apartment buildings south of the church square, and the shopping mall south of the Grote- of Mariakerk. So, as a conclusion that supports the sightline analysis, the church tower and -hall of the Grote- of Mariakerk jump out of the environment with their height, which is something that should be considered during the transformation, as it makes the building very visible.

South facade

0M 15M 30M

Plot and Destination plan of Meppel (Small scale)

Next to buildings' relation to the site or appearance, there are also the existing plans and legislations connected to the building that should be taken notice of. While the building plots in the area are, well, what they are, it is important to note that not all parts of the church square can be used in the event of the expansion of the Grote of Mariakerk. So, only the marked area around the church can be used (where the trees are now), as the other space needs to be kept free for terraces and pedestrian movement.



The building's height, function as a landmark, striking appearance, and iconic character of the building are also points of discussion regarding the destination plan of the building. The Grote- of Mariakerk is assigned with the social destination, which means that it can only be used for social programs, and housing is only permitted on the first floor of the building (if there was one). Furthermore, the Grote- of Mariakerk is assigned a star in the vision document, which means that the building is seen as a significant element within the plans for Meppel. So, apart from the assigned program, we should take note of the important status assigned to the building, which will probably also come out of the value assessment later on in the analysis, as the building is also a national monument.

Solar study of the Grote- of Mariakerk (Small scale)

In addition to earlier studies concerning the height and sightlines towards the Grote- of Mariakerk, a small solar study was conducted. The biggest effects of the orientation towards the sun are of course the large shadow of the church tower, and more positively, the optimal orientation of the church hall and the church square, as they receive sunlight during the entire day. Less positive, is that the south is also the dominant wind direction in Meppel, which could hinder activities on the square. While the large shadows produced by the tower are what they are, the north side of the building is rather dark due to the small distance from the adjacent buildings and its building height. So, it is important to note that in the event of a top-up, we need to be aware of the effect it has on the daylight access of the surrounding buildings and the north side of the Grote- of Mariakerk.

Sound analysis of Meppel (Small scale)

Then finally, there are the levels of sound present in the area surrounding the Grote- of Mariakerk, which are important for the placement and possible choices regarding the program. Luckily, the sound levels in the area are relatively low, except for the roads and the loading and unloading area of the mall south of the church, and even those levels aren't that high. Furthermore, all the program in the area is mostly designated for a high volume of people (bars, shops, etc.), which means that there is not a big roadblock when repurposing the church to most types of program. Unless we plan to build a factory inside of the church. So, all and all, there is not much to note about the sound levels in the area in and around the Grote- of Mariakerk, which is a positive conclusion.

STRUCTURE

Structure

After entering the church hall, one of the first things that you take note of is the stately freestanding pillars that facilitate the open floorplan of the Grote- of Mariakerk. Only as we spent some more time in the church hall and started looking for how the building was put together, we found that many of the other structural elements were also clearly in sight. The beams on top of the columns, the structure of the galleries, and due to the age of the building we could already kind of assume the facades to be loadbearing. While the main structure was quite apparent, the double-tilted roof structure and the church tower left us guessing.

To find out how the entire structure of the Grote- of Mariakerk works, an investigation into the structure of the building was conducted. Through analysis of the main structures of the church tower, hall, and the two side buildings, a better understanding of the foundation, load-bearing elements, how many there are, and where they are placed is created. Building further on these topics, some of the structural elements are placed under a loop, as the roof structure, gallery structures, and the materials in which all the structural components are applied are investigated. As a result, clarifying the Grote- of Mariakerk's structure and finding out how far off our assumptions were.

Renvoy church structure:

Tower:

1 Foundations
2 Ground floor structure
3 Wooden beam structure first floor
4 Wooden finishing first floor
5 First floor structure
6 Wooden beam structure second floor
7 Wooden finishing second floor
8 Second floor structure
9 Railings and church bells
10 Wooden beam structure third floor
11 Wooden roof structure
12 Roof decking and roof tiles
13 Railings
14 Steeple
15 Wooden dome structure
16 Copper roofing dome

Church hall:

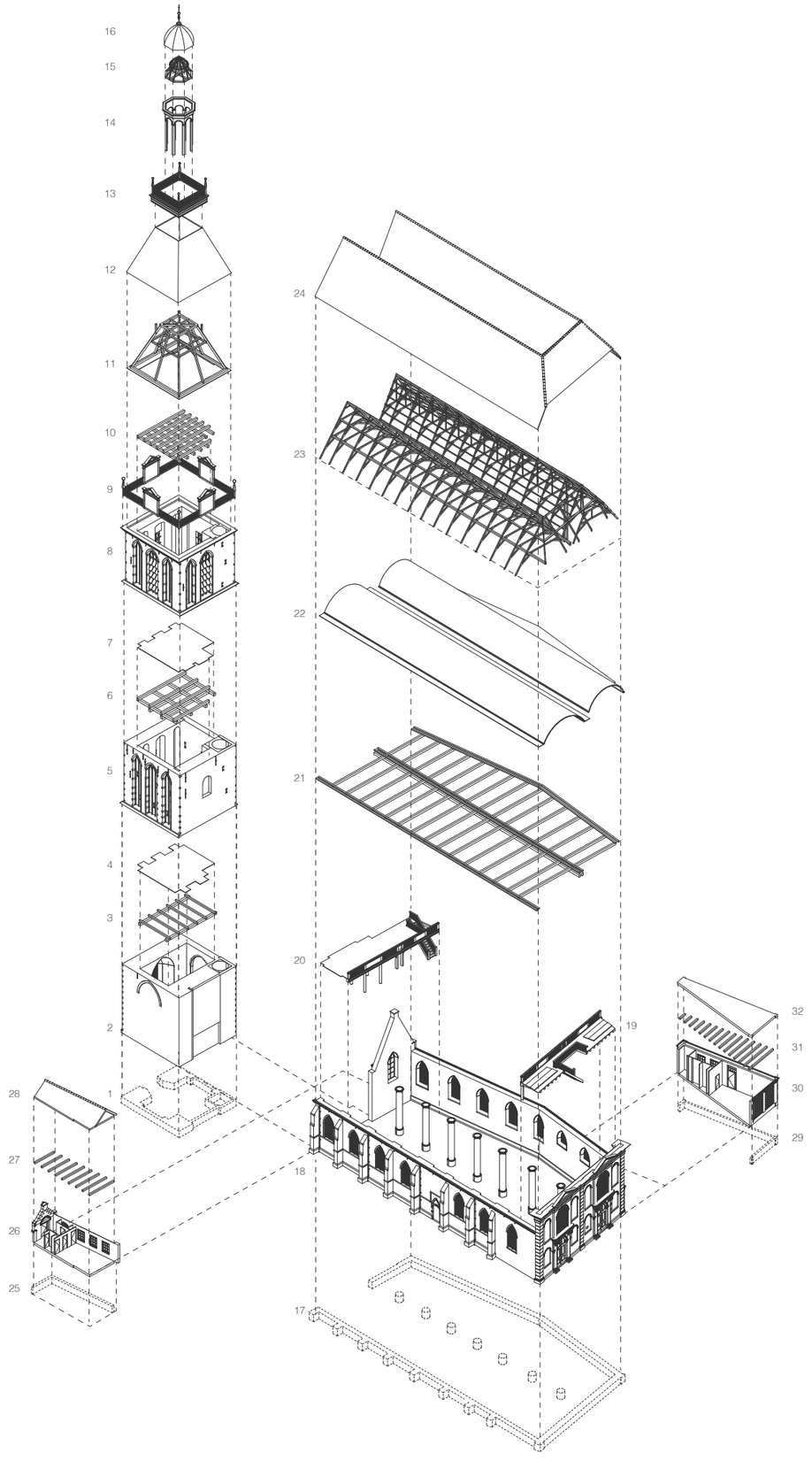
17 Foundations
18 Ground floor structure
19 East gallery
20 West gallery
21 Wooden beam structure
22 Wooden arch ceilings
23 Wooden roof trusses and stability features
24 Roof decking and roof tiles

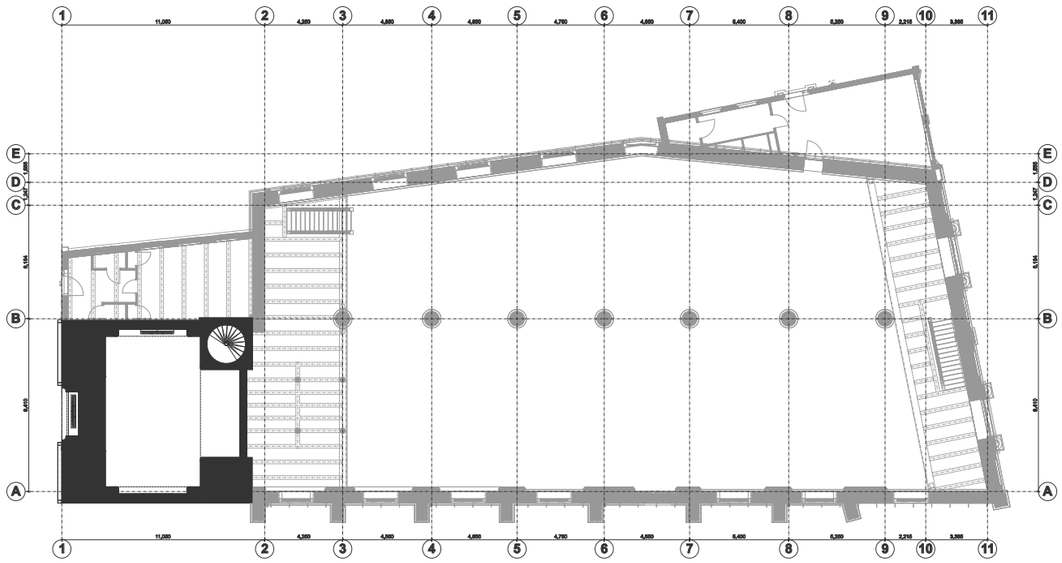
Trade house:

25 Foundations
26 Ground floor structure
27 Wooden beam structure roof
28 Roof decking and roof tiles

Pastor's house:

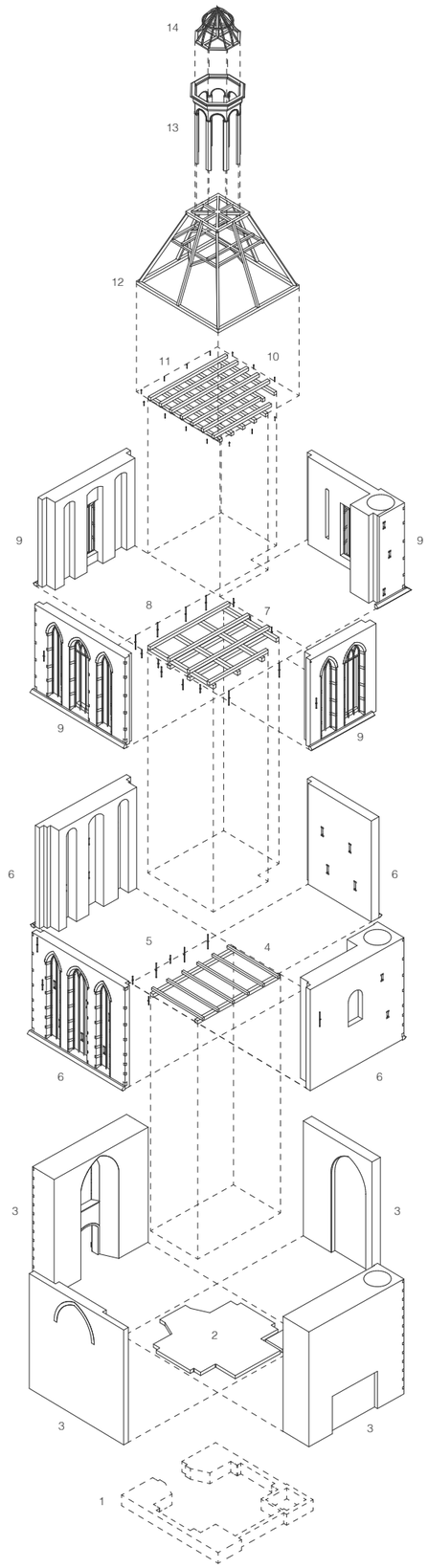
29 Foundations
30 Ground floor structure
31 Wooden beam structure roof
32 Roof decking

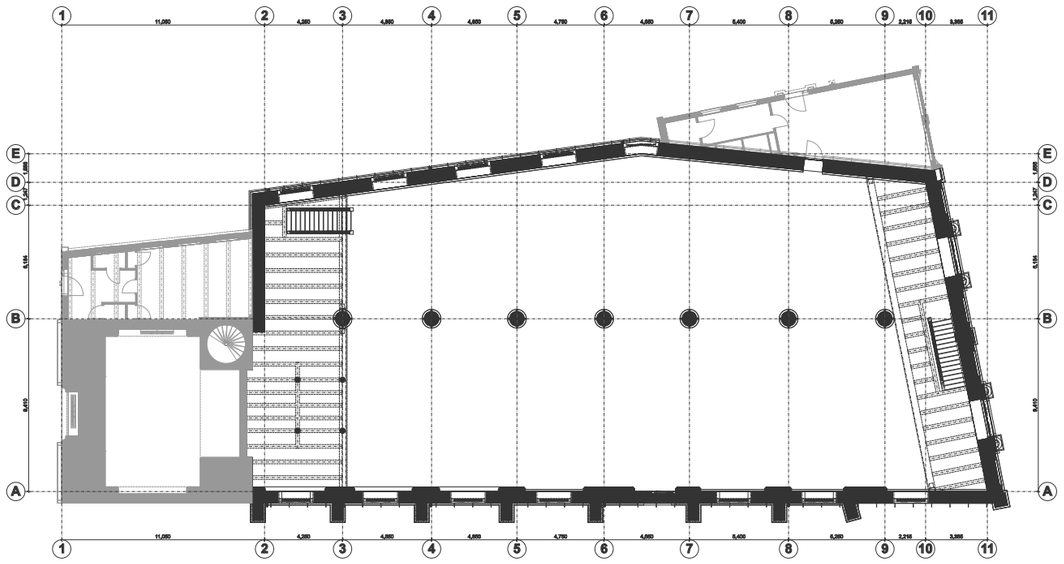




Bearing structure - Church Tower

The load-bearing structure of the tower of the Grote- of Mariakerk in Meppel consists of a brick core that extends from the ground floor to the third floor of the tower. This brick core has a total height of 29.4 metres and varies in thickness. The corners of the tower consist of massive brick parts measuring about 2.3 metres by 2.3 metres, with the exception of the north-east side that houses the stairwell. Between these massive corners, there are rejuvenations in the brick, with the force being transferred by pointed arches and in some cases round arches. The foundation on which the church tower rests consists of brick, but not much is known about the depth of the foundation, The load-bearing structure of the storey floors consists of wooden joists, and the roof structure of the tower and the dome situated on it consists of wood. In conclusion, the bearing structure of the tower does not offer much possibility for modification, as it is already constructed as thin as possible. Were it not for the fact that the tower has been designated a national monument, modifications to this bearing structure would still be inadvisable.

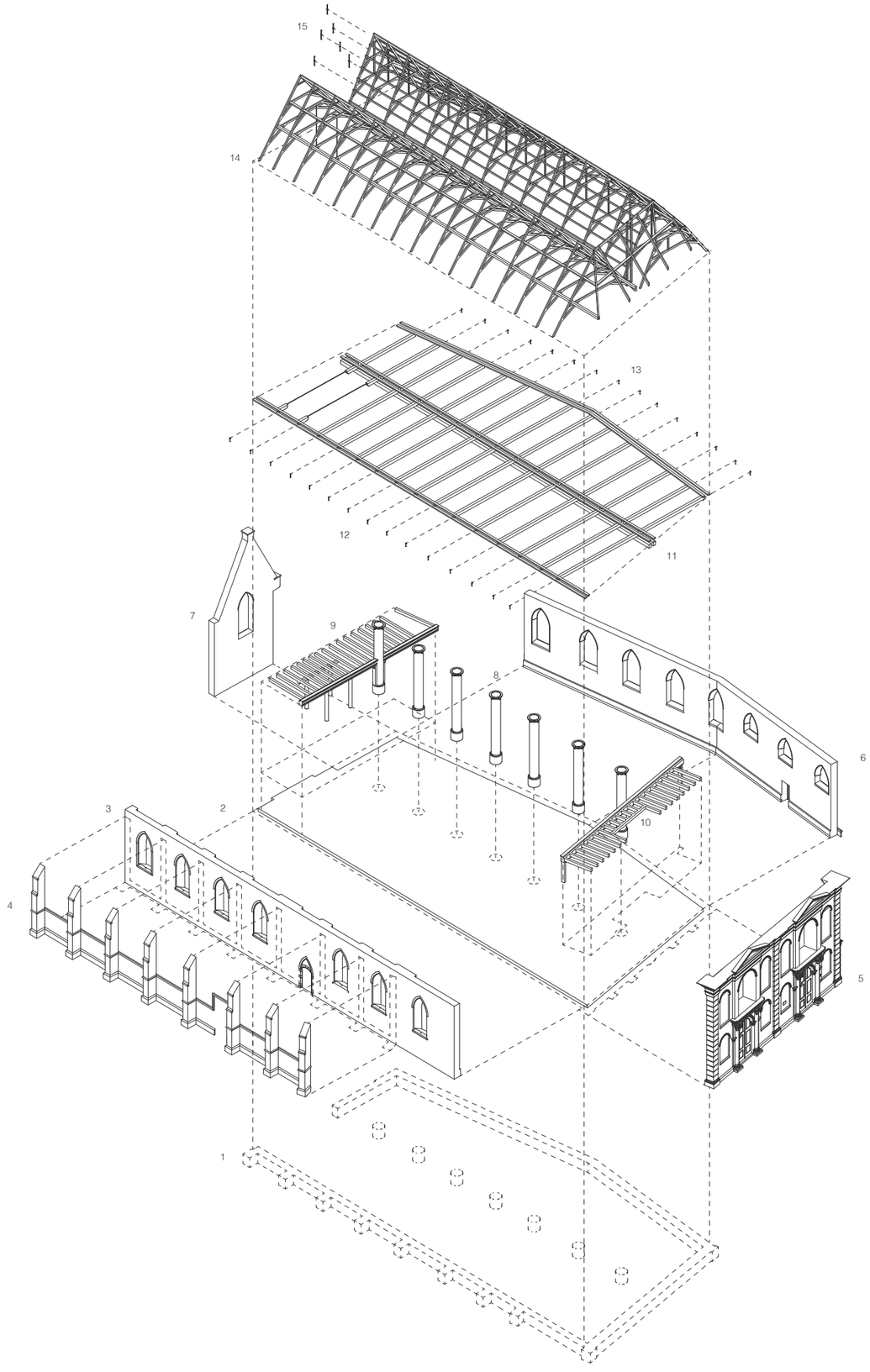


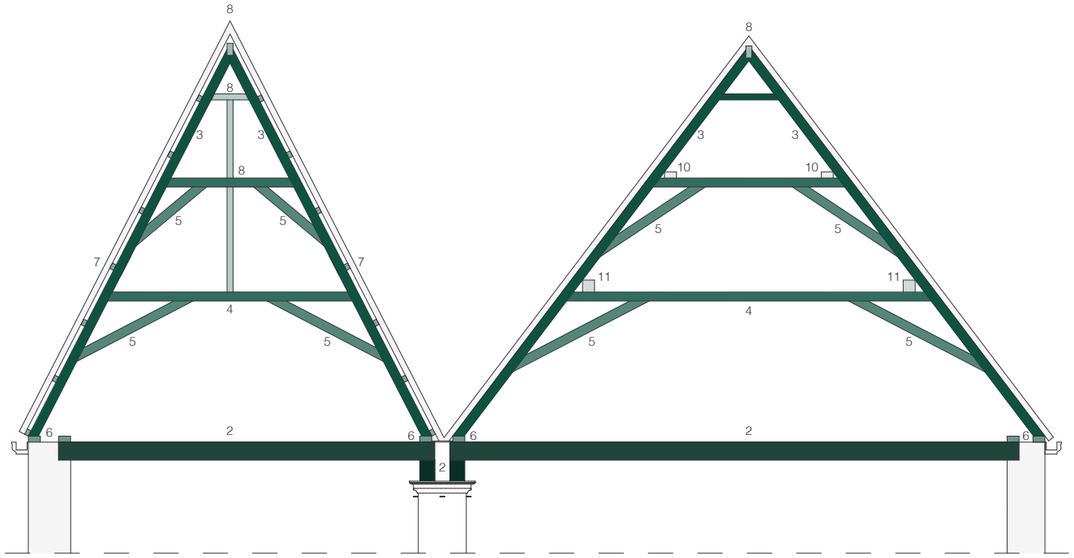


Bearing structure - Church Hall

The load-bearing structure of the Church Hall of the Grote- of Mariakerk in Meppel can be divided into two parts, the north and south aisles. These aisles consist of load-bearing solid brick outer walls on the north and south facades, and the two aisles are separated by a row of seven solid brick pillars. Through this row of pillars, the two naves are made into one large open space. On these supporting walls and pillars rests the roof construction, consisting of a horizontal beam and wooden rafters connected by wooden stability beams. Later, wooden galleries were added to the building, resting on the outer walls and pillars.

The load-bearing brick walls and brick pillars have been found to be overdimensioned, as galleries could be added later. Therefore, this load-bearing structure offers opportunities to add any secondary structure in a transformation, as long as it is a lightweight structure.



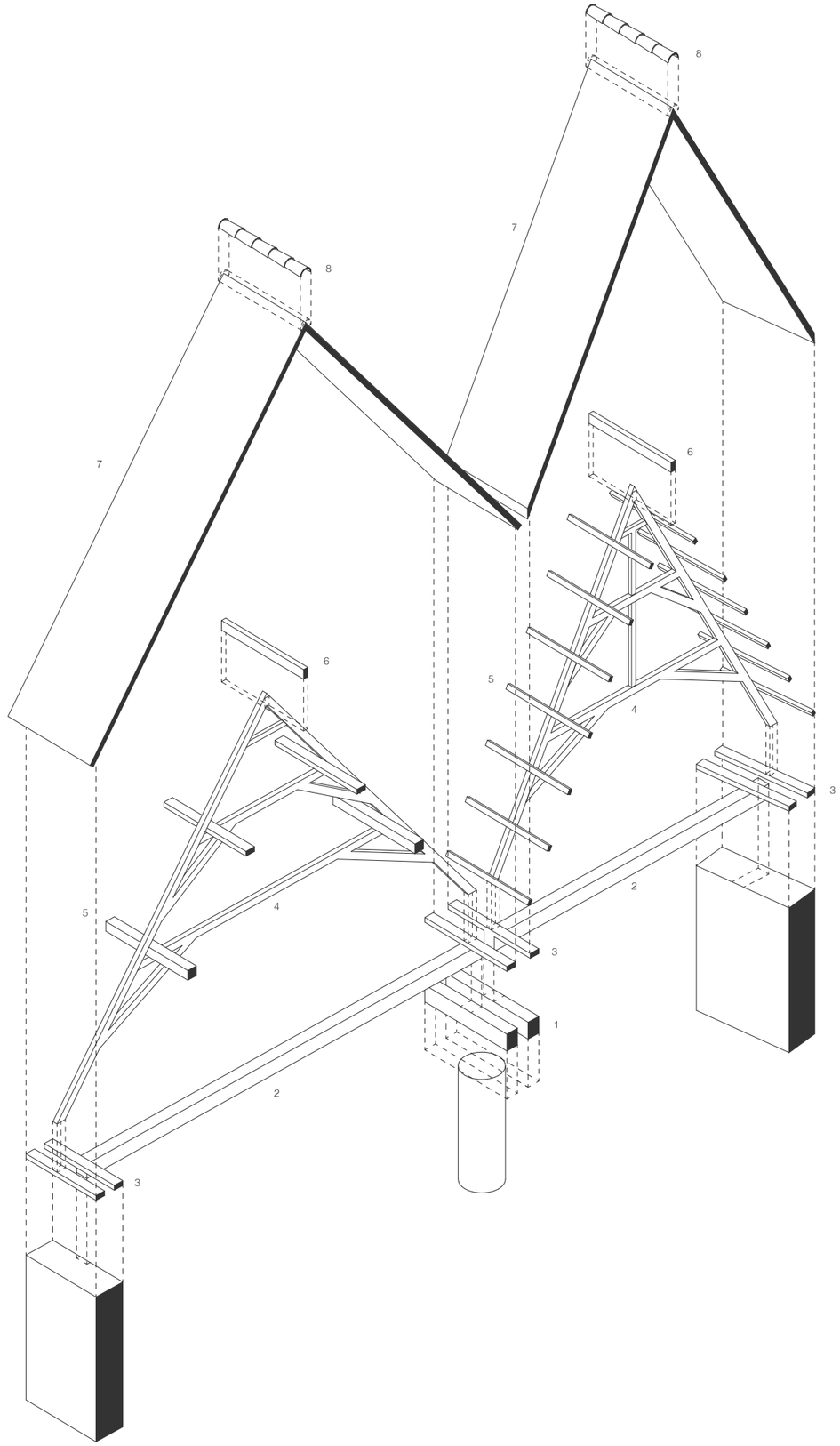


1. Horizontal beam	350 x 250 mm
2. Horizontal beam	300 x 250 mm
3. Truss bone	200 x 100 mm
4. Collar beam	150 x 100 mm
5. Collar brace	150 x 100 mm
6. Wall plate	100 x 200 mm
7. Batten	70 x 100 mm
8. Ridge beam	200 x 100 mm
9. King post	100 x 70 mm
10. Horizontal beam	200 x 200 mm
11. Horizontal beam	100 x 200 mm

Roof structure

Looking more closely at the roof structure of the church hall, a few things stand out. The row of pillars consisting of seven pillars is connected by means of two wooden beams that make them work together and provide more stability. On top of these two wooden beams rest wooden draw beams that span towards the load-bearing outer walls, thus creating more stability in the other stiffness. On each wooden beam rests its own wooden truss. Because the walls of the church hall run outwards on the north side, different spans are created between the row of pillars and the north facade. As a result, on the north aisle, the width of each truss differs, which is reflected in the roof shape.

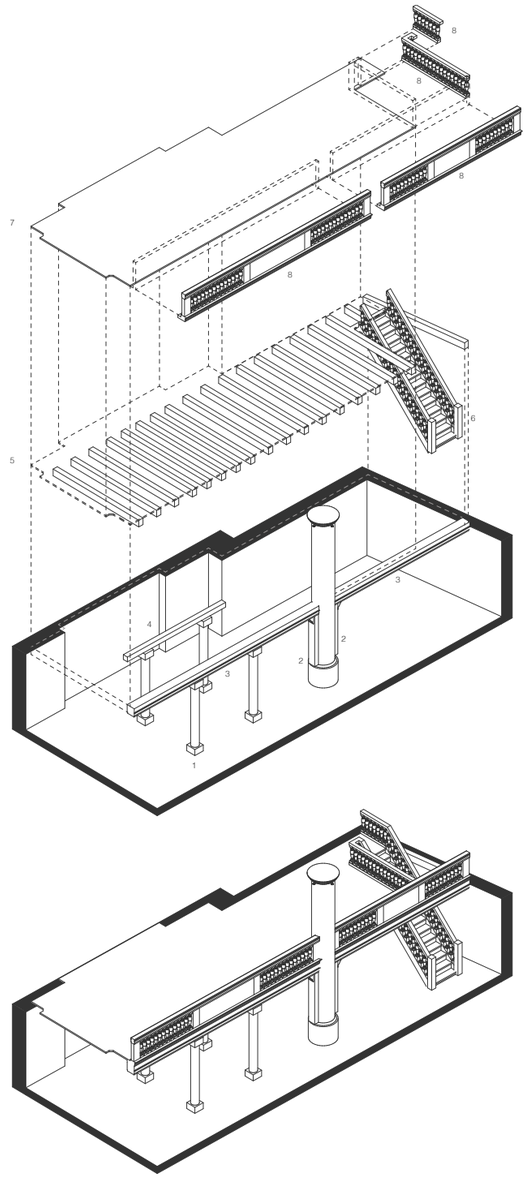
The roof structure of the church hall is lightweight and no additional structures can be added without making adjustments to this roof structure. The height between the different collar beams of the trusses is 2.35m, 1.75m and 1.31m from bottom to top, so in all cases, adjustments will have to be made to the trusses if a user function is to be located here due to regulations regarding minimal height.



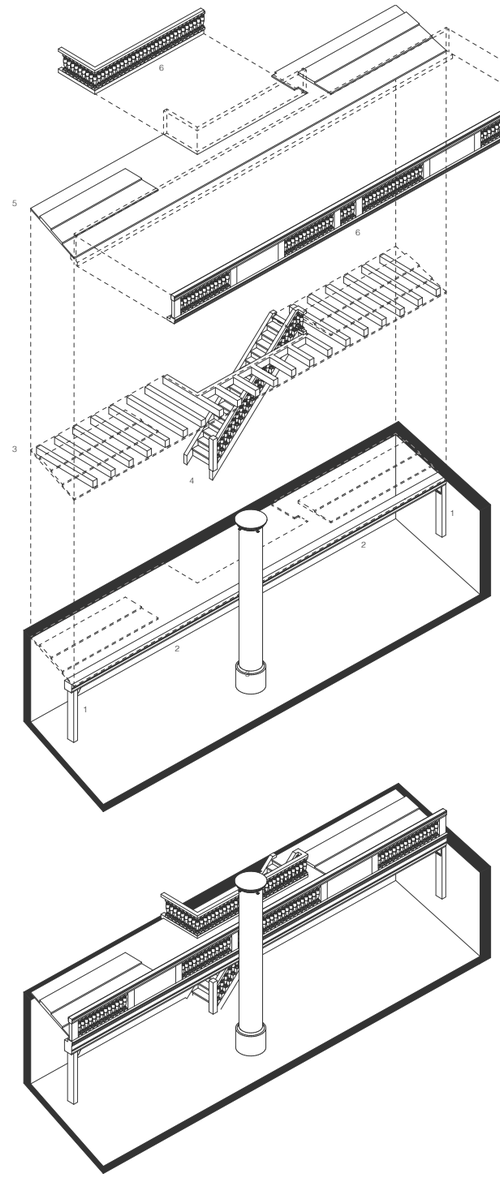
West gallery & East gallery

At first glance, the west gallery and the east gallery appear identical in structure, yet they are different from each other. Both galleries consist of a wooden edge beam that rests on the pillar on one side and on the load-bearing outer wall on the other. In the other direction, a wooden beam rests on which the wooden floor is placed. The difference between the two galleries lies in the secondary construction of the west gallery. Near the organ, four wooden columns and an additional wooden beam were added here to support the additional weight of the organ.

The galleries consist of lightweight wooden construction and any additions would require strengthening or replacing the structure to support the weight.

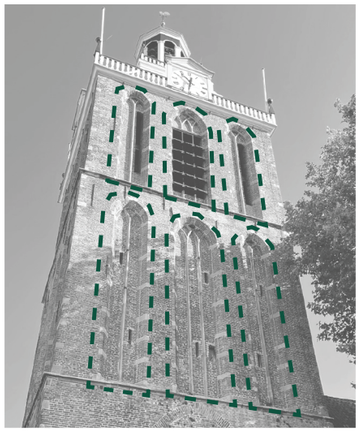


West galery



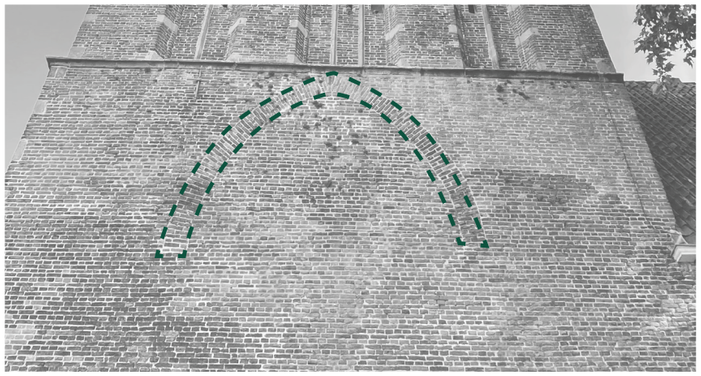
East galery

1 Segmental nature stone door arch

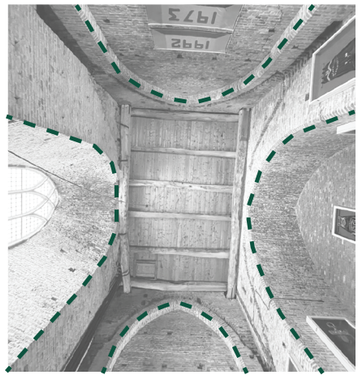


2 Segmental masonry / nature stone arches

3 Nature cornerstones



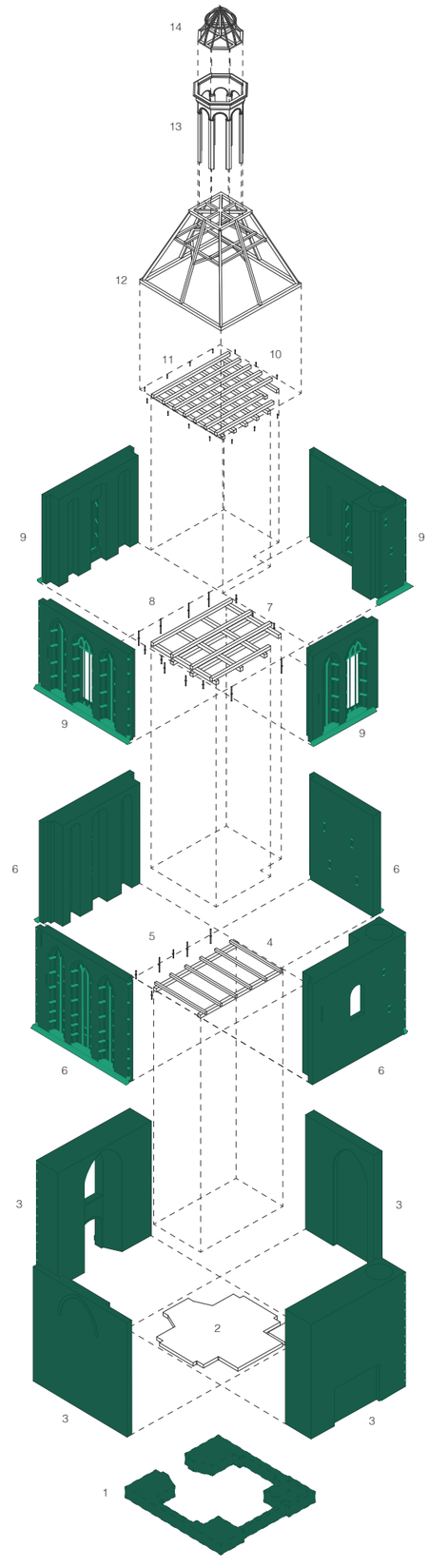
4 Gothic masonry arch of old opening still visible

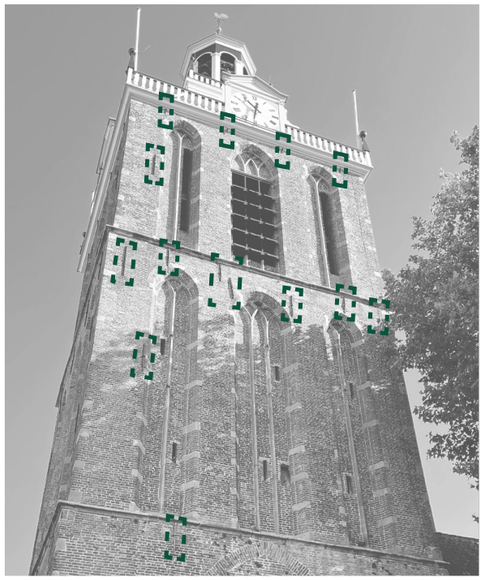


5 Gothic masonry arches inside tower

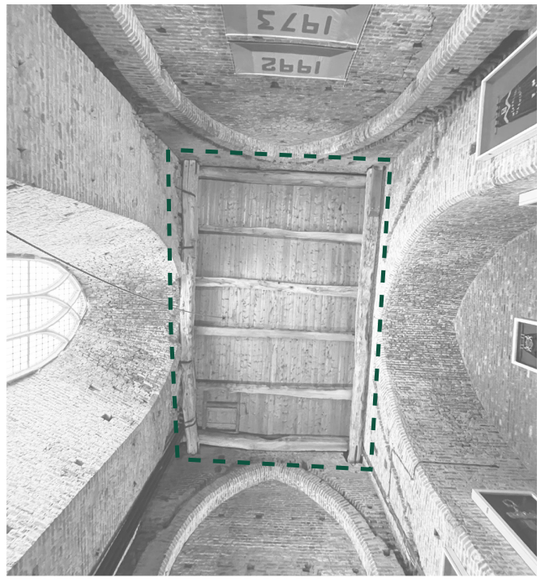
Materials - Church Tower - Brick & Nature stone

The core of the tower consists mainly of brick and this material is present in the foreground of the tower. At the location of wall openings and windows, a combination of brick and natural stone has been used in some places. Natural stone corner stones have also been used at the corners of the tower. The natural stone material seems to have been applied for aesthetical instead of structural reasons, and the core of the tower could theoretically have been made entirely of brick.





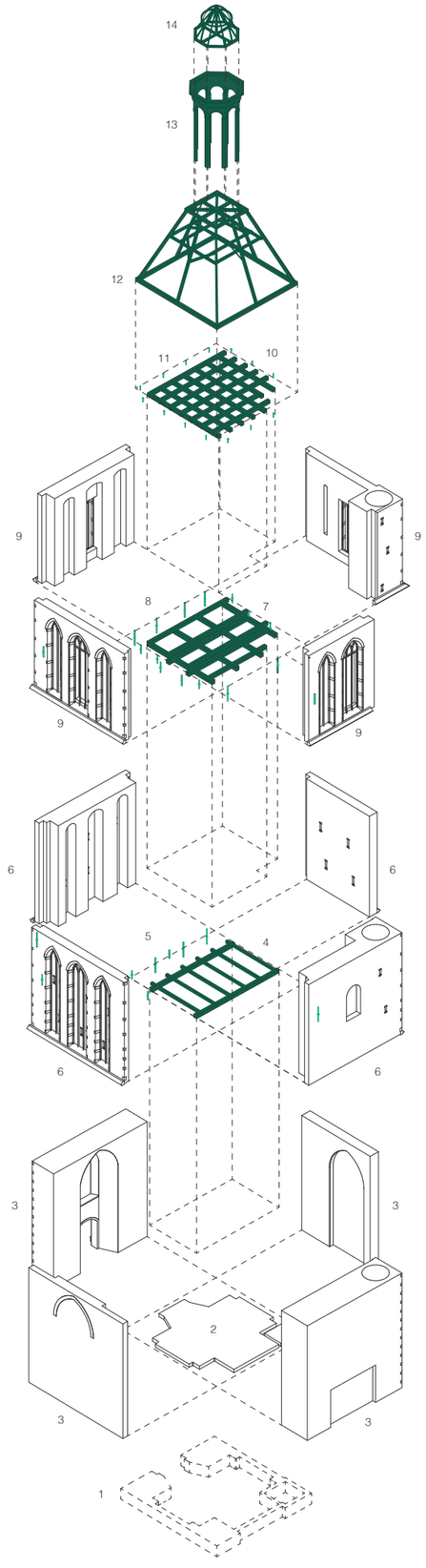
1 Iron floor anchor in facade

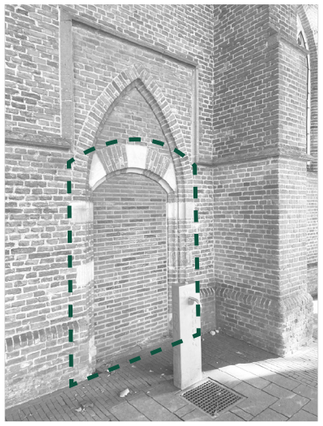


2 Wooden beams first floor

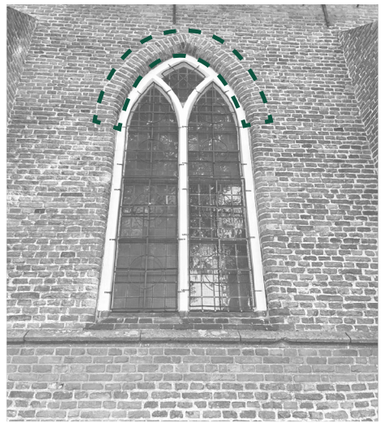
Materials - Church Tower - Wood & Iron

As the floors have to span large distances, they take the form of a wooden beam with a layer of planks on top as a floor finish. The carillon is located on the second floor. The bells of the carillon are very heavy, so a three-layer wooden beam construction in two different directions was used on this floor to make it as stiff as possible and also to create the lightest possible construction. Iron wall anchors were used to clamp the floor beams between the brick walls to make the entire core of the tower more rigid and prevent the walls from sagging.

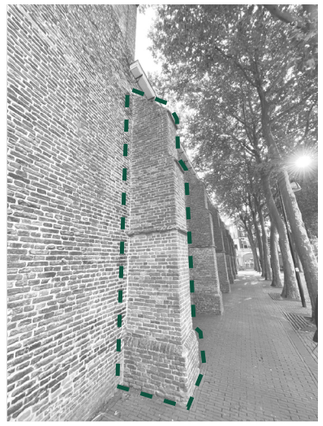




1 Segmental masonry / nature stone arch



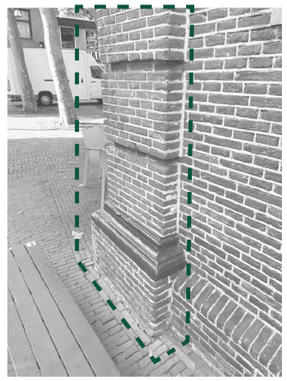
2 Gothic masonry arch



3 Masonry buttresses

4 Semicircular masonry arch

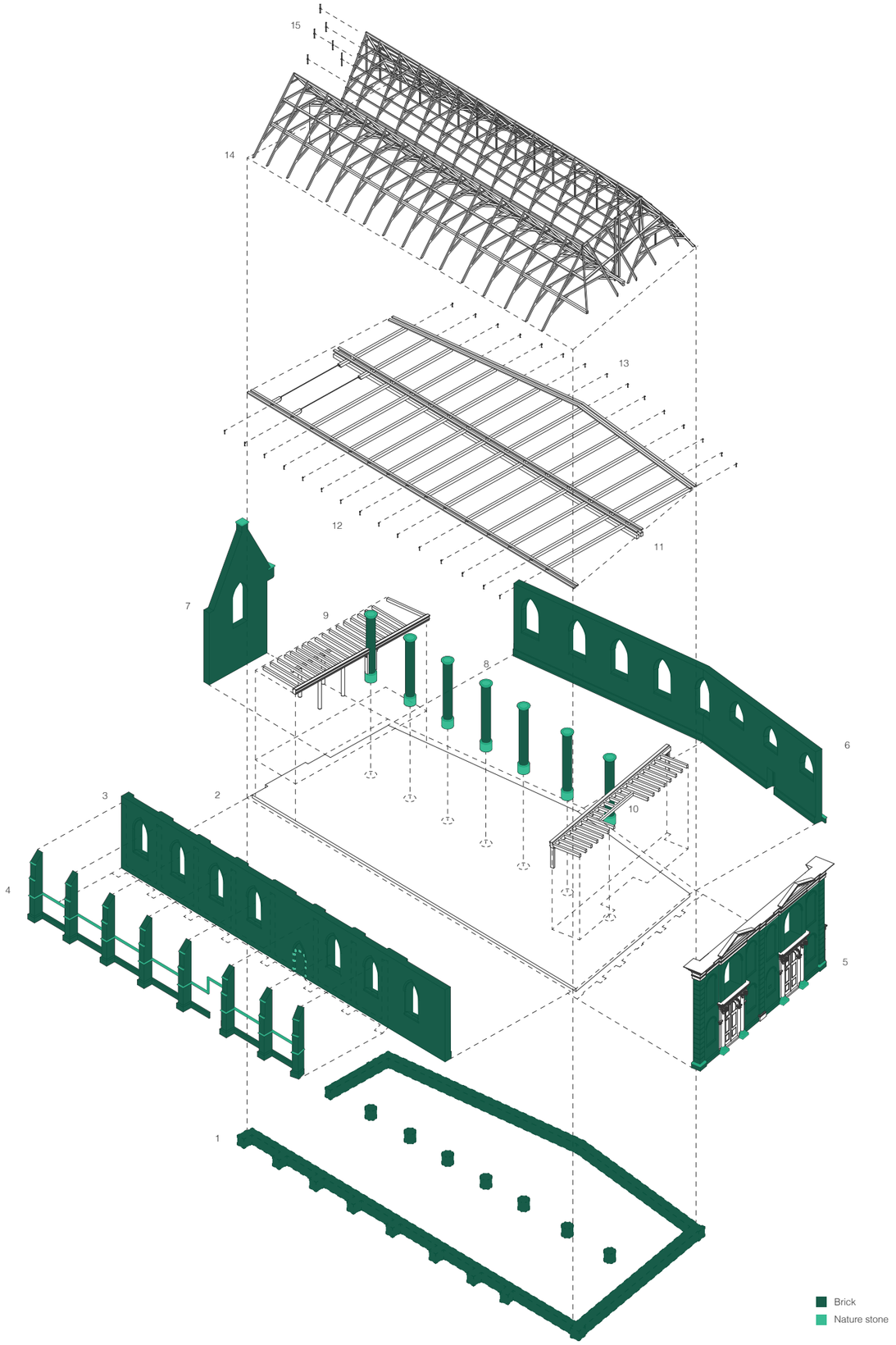
5 Plastered masonry pillars supporting the roof



6 Corner of east façade

Materials - Church Hall - Brick & Nature Stone

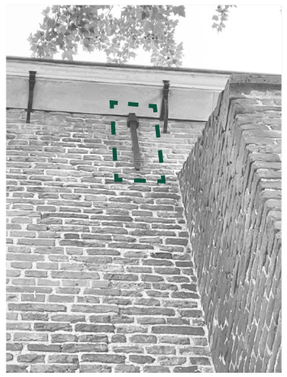
The load-bearing elements of the church hall consist entirely of brick, with a white stucco finish on the inside of the walls and at the pillars and a bare finish on the outside. The later added buttresses also consist largely of brick. Further natural stone elements have also been applied to these parts, at the buttresses, the sills of the church windows, the pillars inside the church, the base of the pillars on the east facade and the segmental pointed arch of the bricked-up door on the south facade. These natural stone elements are mainly of aesthetic value and, again, could theoretically also be executed in brick.



1 Wooden supporting column

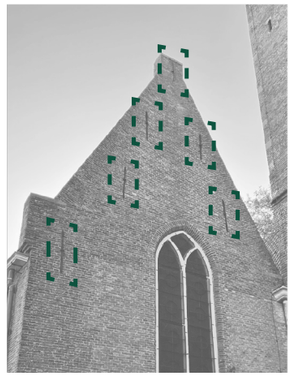
2 Wooden support on pillars

3 Wooden beam supports in wall



4 Iron floor anchor in façade

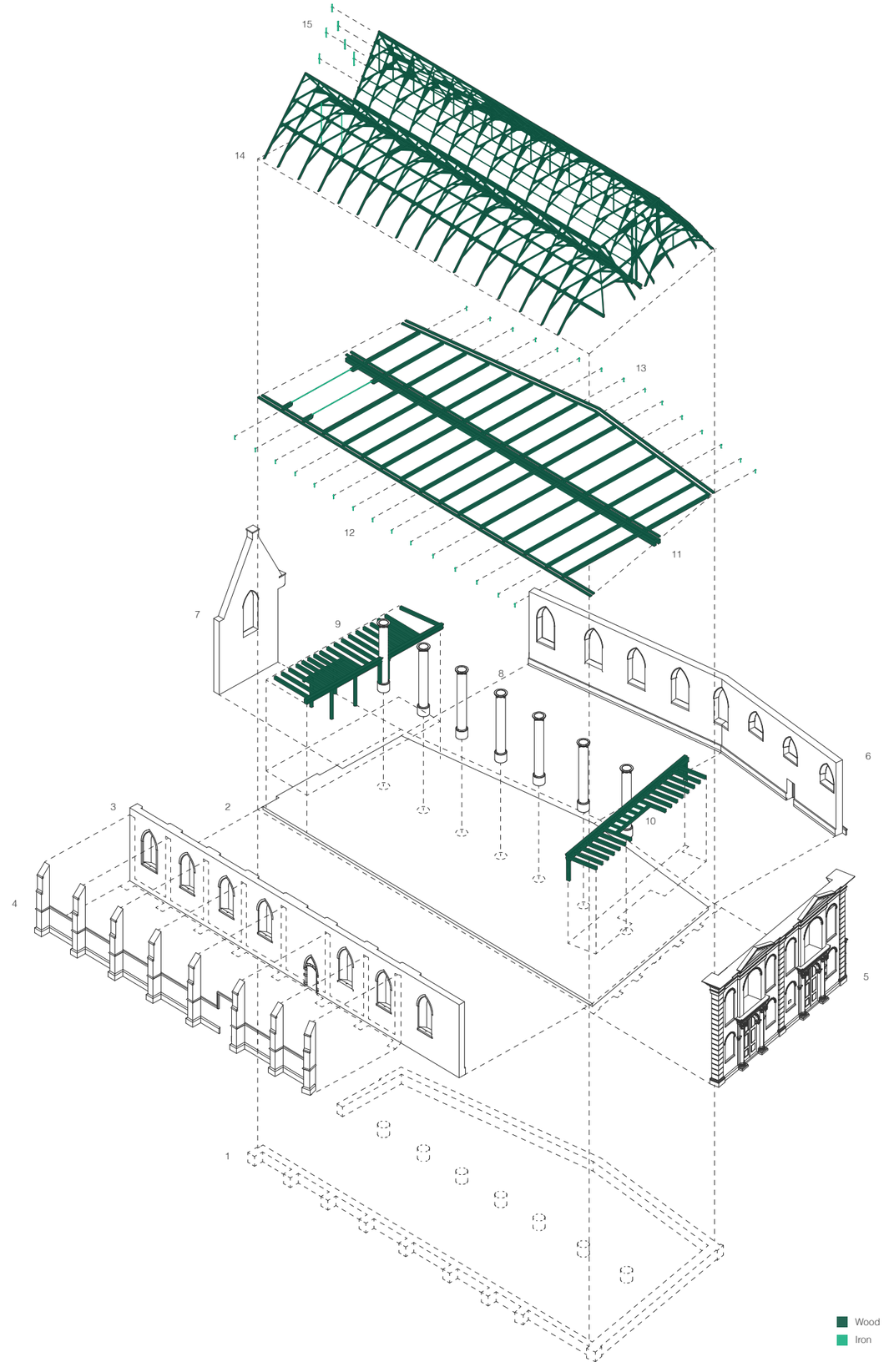
5 Wooden beams supported by pillars



6 Iron anchors of roof truss

Materials - Church Hall - Wood & Iron

A separation can clearly be seen in the materials of the floors and roofs from the rest of the building, just as it was seen in the construction of the church tower. The floor and roof construction consist entirely of wooden beams with these held in place by wallwalls to prevent the walls from sagging.



SKIN

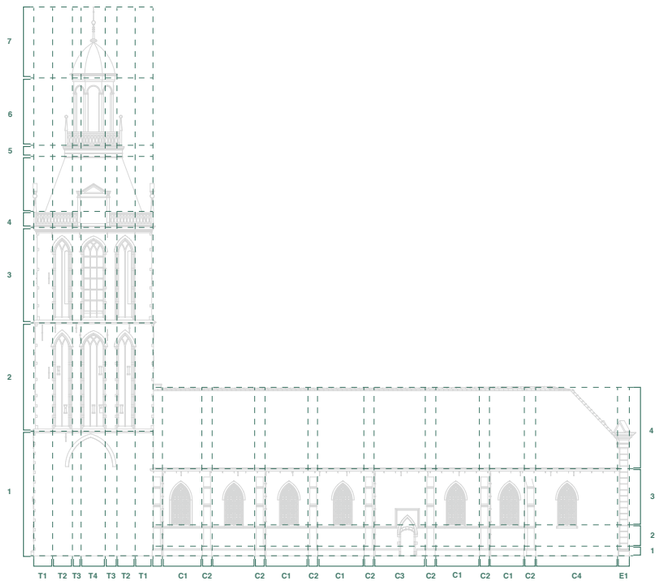
Skin

The Grote- of Mariakerk, the first thing we noticed apart from the characteristic tower, was that the building was not as sober and minimalistic as we thought. The brickwork lintels that were bricked at an angle, the natural stone ornaments and blocks placed by the gothic window openings, and not to forget, the classic east facade with its wooden detailing. The more we got to know the church during our walk around it, the more we became in awe of its at first simple-looking facades. Even as we finally got to go inside and found a model of the church, we were surprised by the 90 degrees east part of the roofing. The facades of the Grote- of Mariakerk, or the “skin” of the building, did not fail to surprise us and left us wanting to know more.

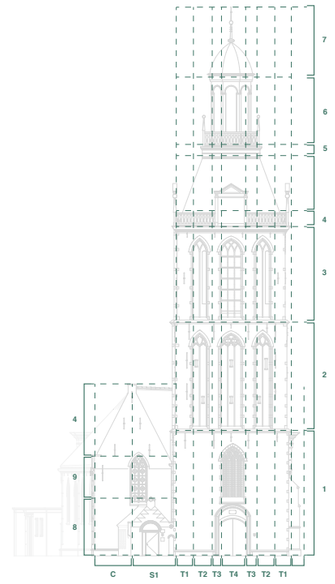
To grasp the entirety of the skin of the Grote- of Mariakerk, research is conducted into the layers, composition, and materials of the skin of the building. Through analysis of the rhythm of the facade and the open-closed ratio of the facade, the composition is investigated. Building further on these topics the physical and daylight access of the building is distilled, and by doing so getting a better idea of the facade works as an intermediary between inside and outside. By inventorizing the facade materials and their placement, we create an understanding of the volume of the materials, the variation in their application, and the difference between structural elements and decoration. As a result, finding out the various layers and ideas of the Grote- of Mariakerk’s skin and what made us so intrigued about it in the first place.

Facade rhythm

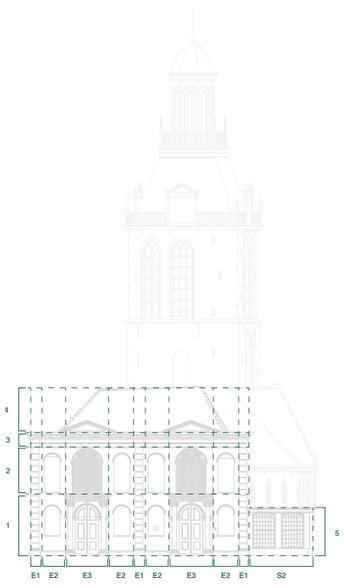
The Grote- of Mariakerk, as was found during the historic analysis, is composed of 4 different buildings, or even more when considering the various expansions of the church hall. While this is not noticeable at first sight on the entire building, it does become clear when we examine the rhythm of the facade. The biggest difference is, of course, notable between the tower and the church hall, both in height, form, and window placement and the rhythm of both facade compositions is completely different, which is logical as they function as separate building elements. The two small side buildings, however, also do not fit into the rhythm of the church hall, like they are deliberately falling outside of the main rhythm. Not to forget the different east facade that does not even match the rhythm of the church hall. These differences are easy to explain of course, due to the multiple changes and expansions to the building throughout different centuries. This is even visible in the different building components themselves, as the occasional jumps in rhythm in the church hall show the marks of expansion. While the 4 builds, each with their rhythm may feel a bit uncomfortable, the opposite is true, as these differences bring opportunities. During the event of an addition to the building, it gives us the freedom the jump outside of the existing rhythms, and even when expanding the 4 separate components, we are not bound by the rhythm of the whole building. So, the differences in the rhythm of the facade not only show the earlier investigated marks of time but also provide design opportunities.



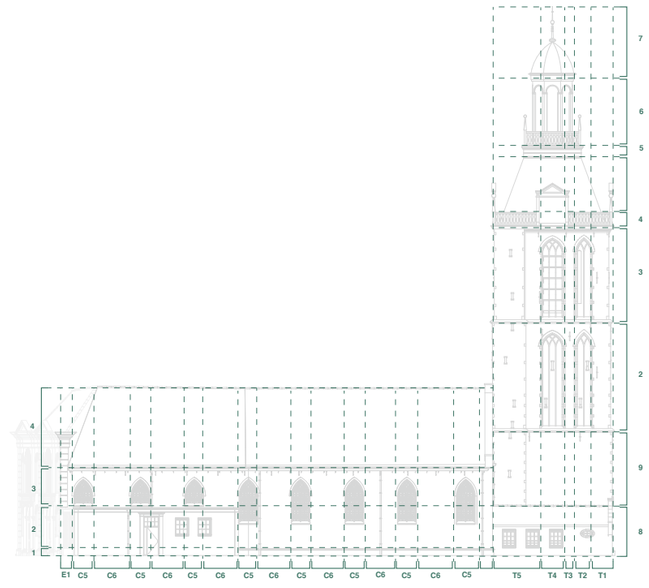
South Facade



West Facade



East Facade

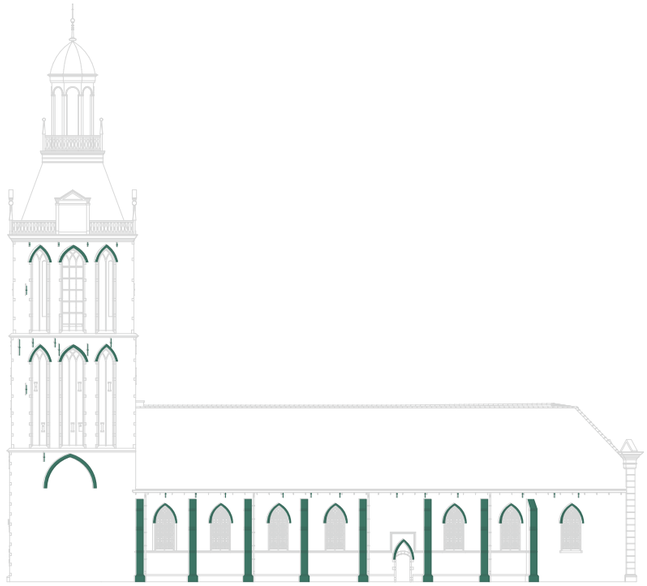


North Facade

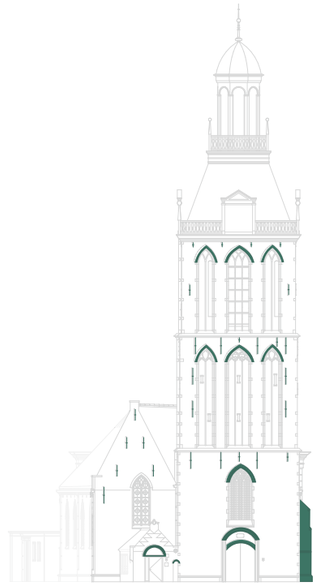
Facade rhythm analysis

Facade visible bearing structure

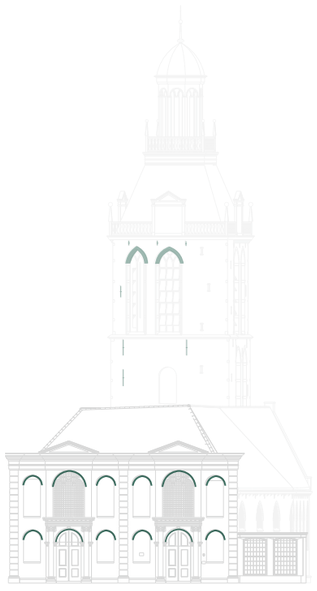
As was already distilled from the structural analysis, the facades are entirely load-bearing, and multiple structural connections or supporting structures are also visible in the facade. While the same detailed structural analysis of these components won't be addressed here, it is important to note that almost all of these elements seem like decoration. Through this analysis, an overview is given of the difference between ornamentation and structural elements. The buttresses act as supporting structures, the roller layers function as lintels, and the floor anchors act as the connection between the roof and the facade. So, if alterations are made to the facade, these elements have to be bypassed or replaced to maintain structural integrity, however maintaining them would be better for the preservation of the overall style of the Grote- of Mariakerk.



South Facade



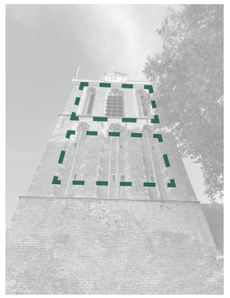
West Facade



East Facade

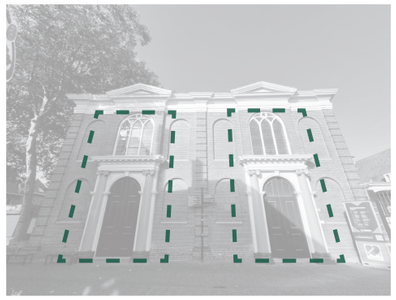
North Facade

Structure changes analysis

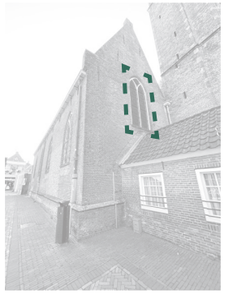


1 Church tower facade openings

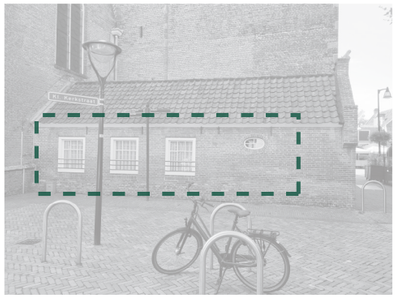
2 South facade facade openings



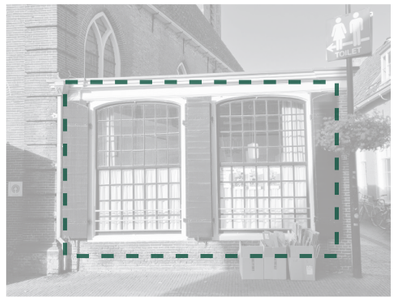
3 East facade facade openings



4 West facade stained glass



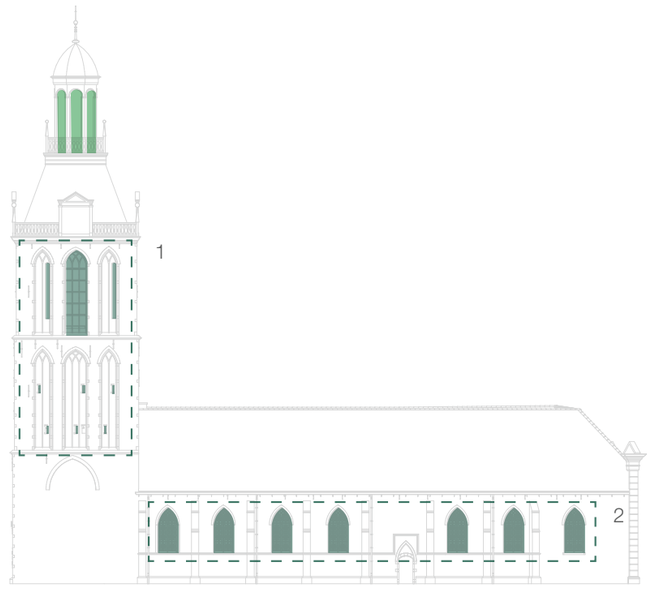
5 Trade house facade openings



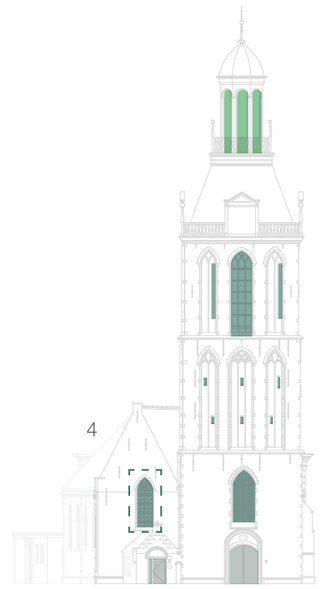
6 Preachers house facade openings

Facade open - closed ratio

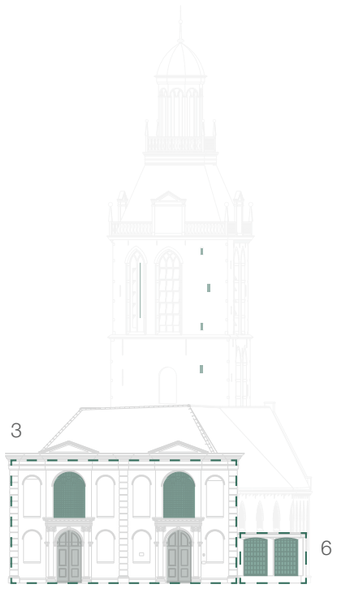
While many hints of openings in the facade of the Grote of Mariakerk are made it is mostly closed. Some of these hints refer to openings that were originally there, but even when counting those the building is still predominantly a brick box. Within the open parts of the building a variety of facade openings exist, from windows to doors to holes, all in varying shapes, styles, and sizes. Most of the openings are windows, which are present in all of the facades, and apart from the completely open tower top, all the other openings make up the entrances of the building. While the low ratio of openings would suggest there is a need for more, the following studies show this proves to be wrong, as the building has enough access to daylight and the building itself is also easily accessible. So, if anything, it would be more important to stay close to the current ratio to preserve the internal ambiance and overall style of the building, unless the design concept is to break from the closed character of the Grote of Mariakerk.



South Facade



West Facade



East Facade

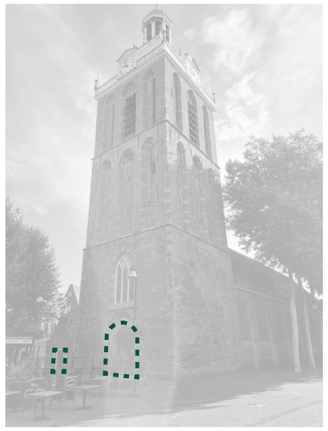
North Facade

Facade open - closed ratio analysis

Window openings Door openings Open

Facade accessibility

Building further upon the facade openings we investigated the accessibility of the Grote- of Mariakerk. The church is currently accessible from the west, east and south facades, with the south facade not only being the facade with the largest surface but also the only one without an entrance. Originally, however, the south facade had an entrance as is shown in picture 6. The main entrance of the church is present in the church tower, as seen in the spacious and decorative design of the gate. The east facade functions as an entrance from the shopping area, and the side buildings each provide secondary entrances to both the side buildings and the church hall. The addition of entrances does not seem necessary, as the west and east entrances provide a nice way of splitting large streams of possible visitors, and the entrances of the side buildings act as staff entrances. So, during the redesign, extra entrances shouldn't necessarily be incorporated.

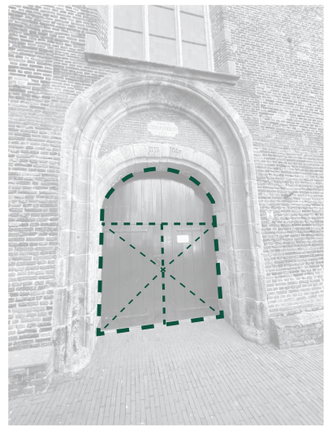


1 Church front (Entrance 4 & 5)

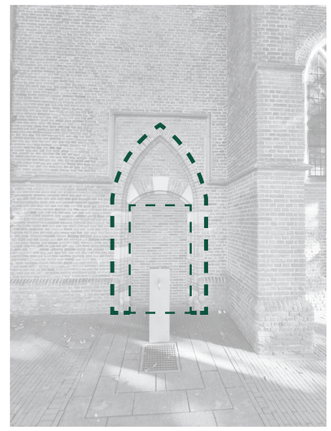
2 Eastern facade entrance

3 Church tower to church hall entrance

4 Tradehouse entrance

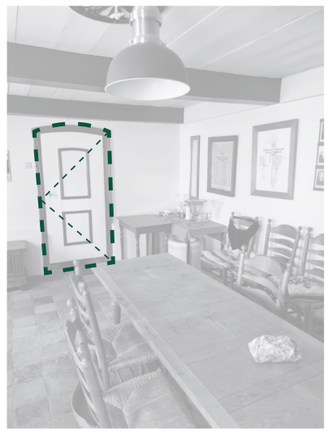


5 Church tower entrance



6 Side entrance on the south facade

7 & 8 Church front (Entrance 4 & 5)



9 Tradehouse to church hall entrance

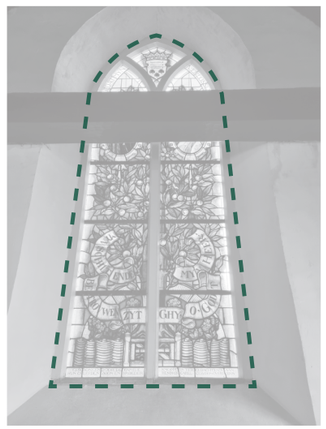
6 Inside view of the closed side entrance

1 Side facade windows

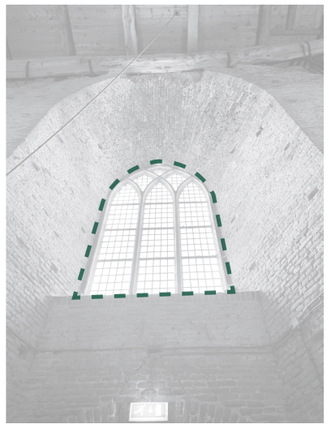
2 Trade house windows

3 East facade window

4 Preacher's house kitchen window



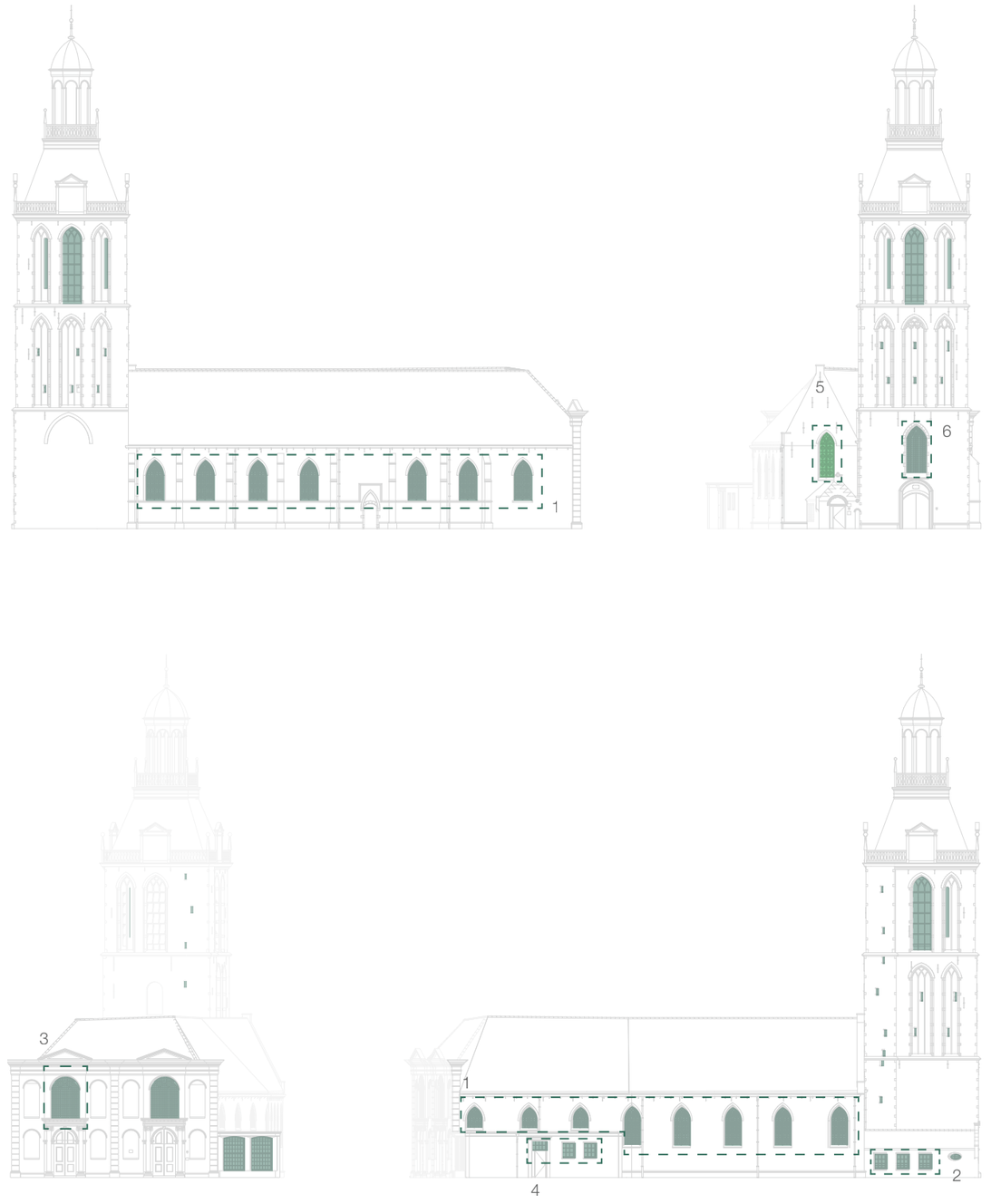
5 stained glass



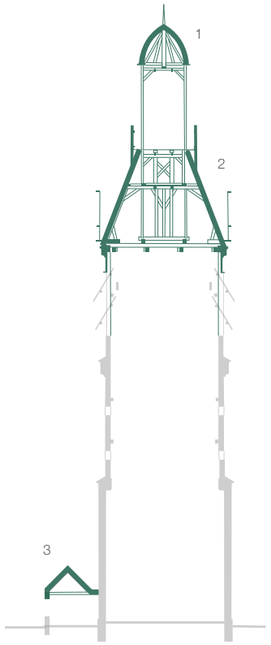
6 Church tower window

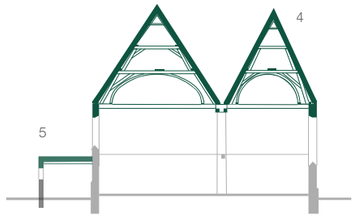
Facade daylight acces

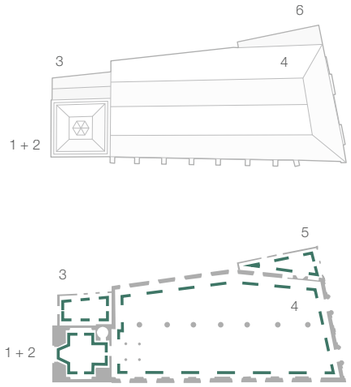
Contrary to the limited number of windows, the church hall has access to a sufficient amount of daylight. Especially, the 7 windows in the south facade provide large amounts of sunlight due to their favorable orientation which is supported by the open floorplan and white-painted interior. While the north facade has a less favorable orientation, it does provide the space with some extra sunlight and adds to the light feeling of the church hall. Even though both of the side buildings are oriented north, they also have access to enough daylight, as can be seen from pictures 2 and 4. The only unknown variable is the church tower, as we could not access it, however, based on the number and size of the facade openings, the spaces would seem dark. Furthermore, it is important to note that the windows do not provide much of a view to the outside, apart from the sky, or trees and rooftops. Which is a result of the height at which the windows are placed. So, if extra windows are added to the building, this should only be to create a better view of the outside, as there is sufficient access to daylight.



Facade daylight access analysis







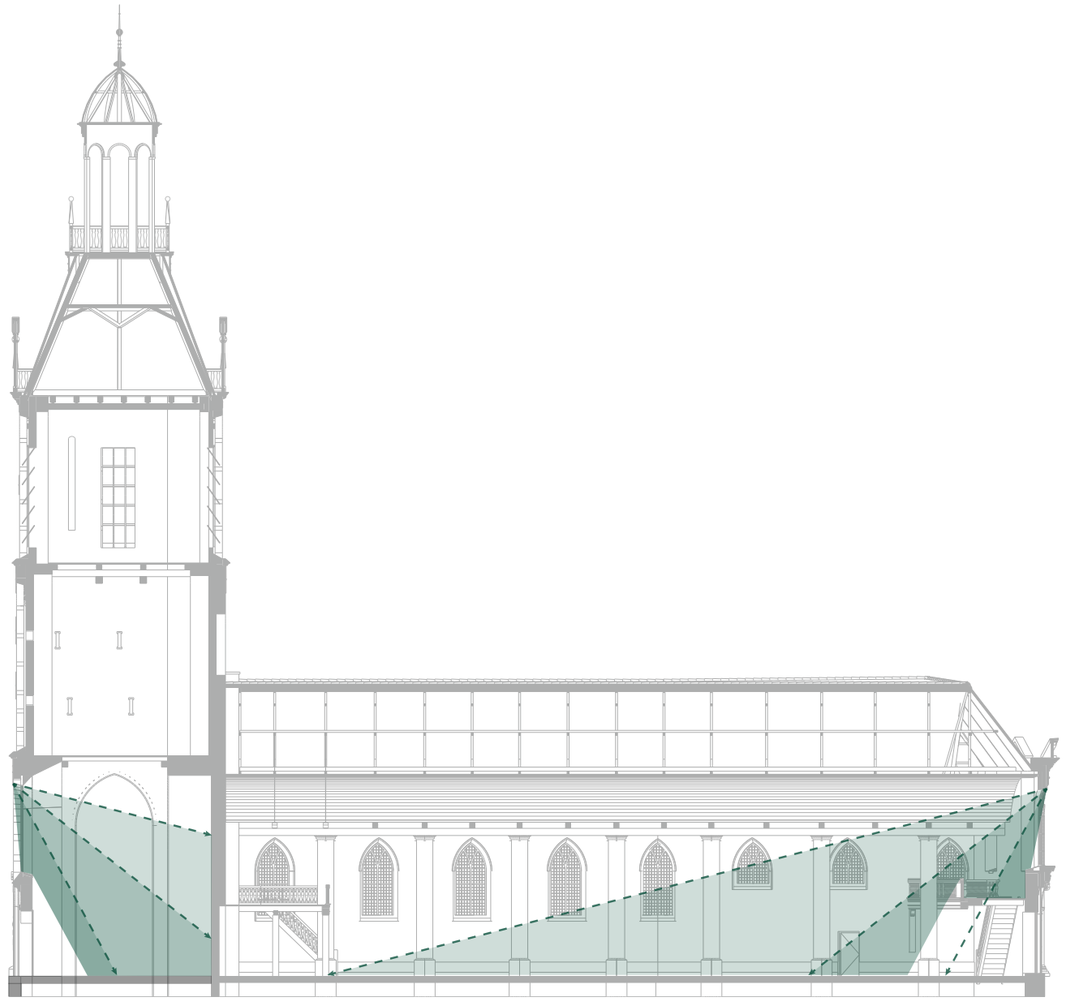
Roof types analysis

1 Hexagonal roof
2 Mansard roof
3 Tilted roof
.4 Double gabled roof
5 Flat roof

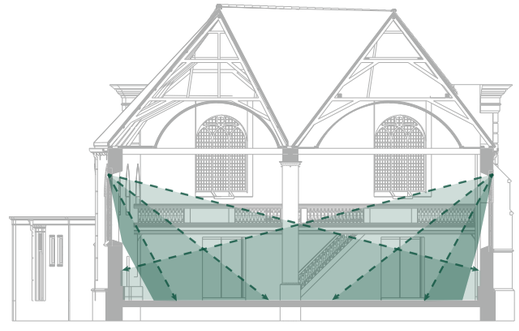
Facade daylight acces + Rooftop types

Furthermore, the angle of incidence of the sun has been studied using cross-sections to provide more support to the findings regarding access to daylight in the church hall. By studying the changing angle of the sun during the changing seasons, it became apparent that the church tower entrance and church hall are always well-lit. During the winter months, the angle of incidence through the east facade is almost enough to light up the entire church hall, only the galleries provide a partial sunblock. Section B-B also supports the argument that the east and north facades strengthen each other regarding sunlight access, and that the height of the windows only provides a view from an angle upward, or more specifically, towards the roof- and treetops. So, again, the addition of windows is only necessary for improving the view, not for access to daylight

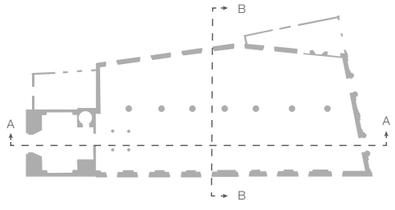
Aside from the daylight access, the sections also show the various roof types present on the Grote- of Mariakerk. The church has a total of 5 different roof types, split across the church tower, hall, and side buildings. Most notable is the double-tilted roof of the church hall, which is a result of the addition of the north beach. Whilst it is not visible from street level, it is an important characteristic of the Grote- of Mariakerk.



Longitudinal section A - A



Cross section B - B



Facade / Section daylight acces

Winter sun (61,5 degrees angle)
Average sun (38 degrees angle)
Winter sun (14,5 degrees angle)

1 Masonry bond (under angle)

2 Masonry bond

3 Masonry bond church tower

4 Masonry bond buttresses

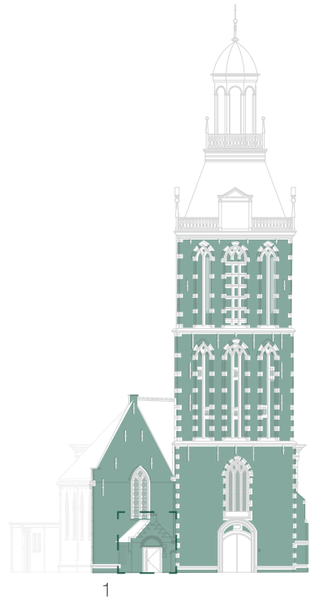
5 Masonry bond east facade

6 Masonry bond and ornaments

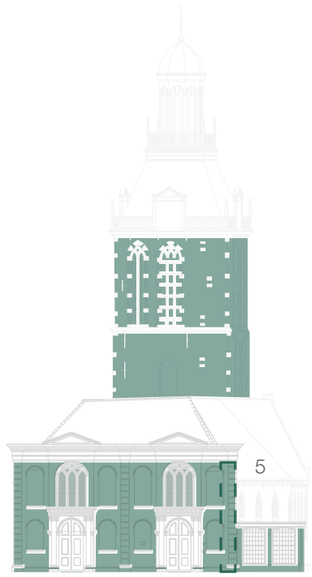
Facade materials - Brick

Despite all the previously mentioned differences between the 4 building parts, these differences were not immediately noticeable, due to the use of brick. The bricks and masonry bonds function as the binding factor between the components of The Grote- of Mariakerk. As was already sort of described during the analysis of the visible structural element, brick is applied in a variety of ways. In most parts of the facade Brick is applied in a standard stretcher bond, as shown in photo 2, and sometimes at an angle as shown in photo 1. As brick is also a structural material in this church, the roller layers and buttresses are also made from brick. Furthermore, the material is used for ornamentation, in many cases in combination with natural stone. So, next to being the most common material used, brick has a variety of functions in the facade of the Grote- of Mariakerk, and it functions as a binding element between the 4 different building components.

South Facade



West Facade



East Facade

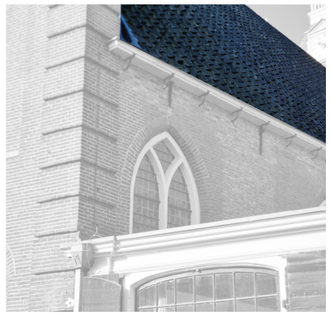
North Facade

Facade materials - Brick

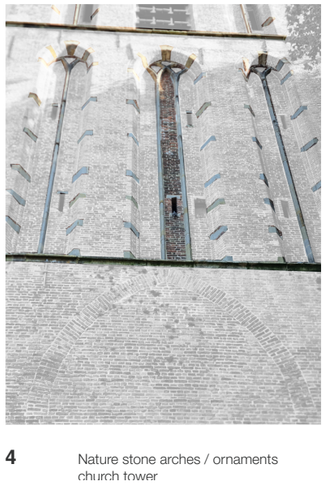
Brick

1 Nature stone arches / ornaments

2 Nature stone arches

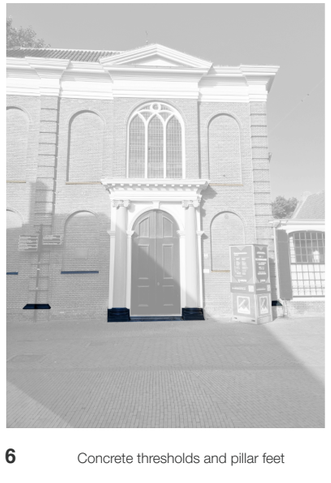


3 Ceramic roof tiles



4 Nature stone arches / ornaments church tower

5 Nature stone blocks and ornaments

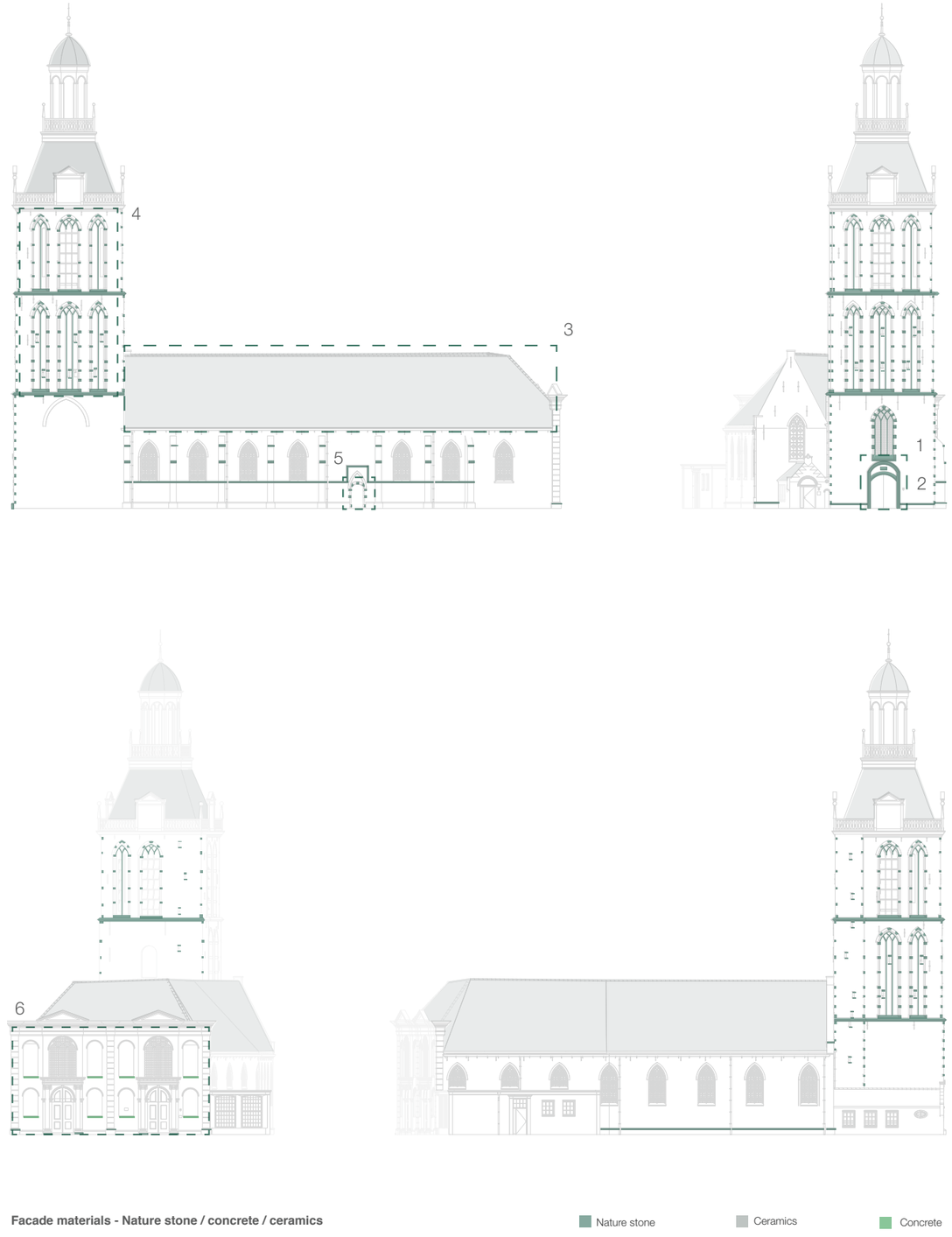


6 Concrete thresholds and pillar feet

Facade materials - Natural stone / Concrete / Ceramics

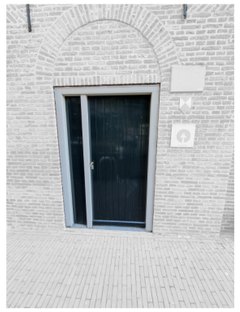
Besides brick, several other stony materials are present in the facade of the Grote- of Mariakerk. The most common of these materials is Nature stone, as it is frequently used in combination with brick as decoration or as ornamentation around the windows in both the facades of the church tower and the church hall, as is shown in pictures 4 and 5. Natural stone is also applied to create a more stately entrance for the church tower, or to commemorate events of the past, as shown by pictures 1 and 2.

Possibly applied in the highest volume is ceramics, since this material is applied in the shape of the roof tiles. On 4 of the 5 different roof types across the different building parts of the Grote- of Mariakerk ceramic roof tiles are applied, and in abundance in the case of the double gabled roof, since it covers a large surface. The stony material least present throughout the entire church is concrete, as it is only found in the east facade as sills.



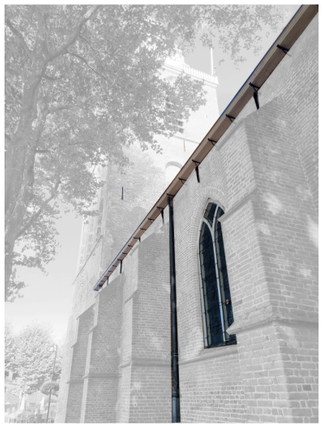
Facade materials - Nature stone / concrete / ceramics

1 floor anchors, rain pipe and windows



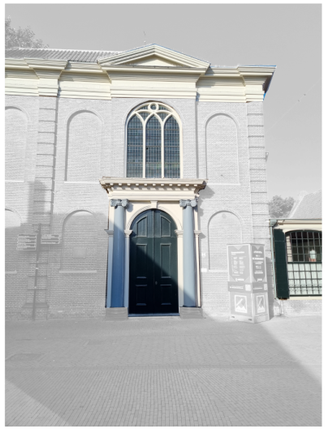
2 Wooden door and window frame

3 Wooden tower elements and iron floor anchors



4 floor anchors, rain pipe and windows

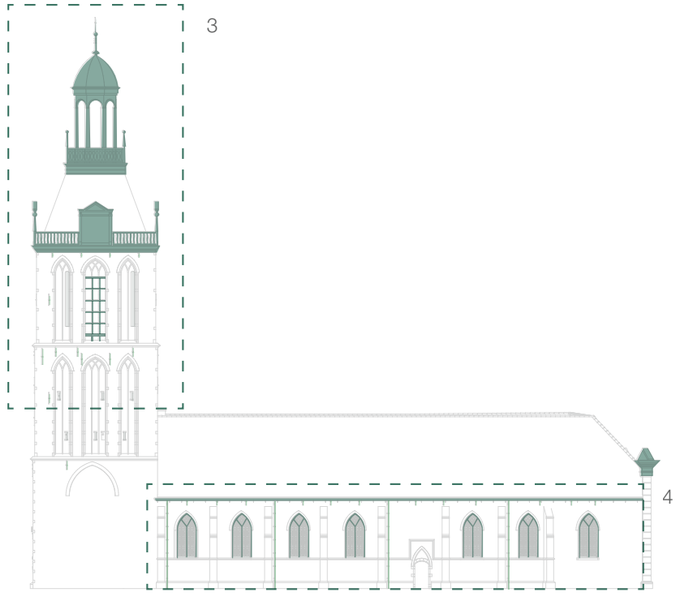
5 Wooden tower elements and iron floor anchors and window frames



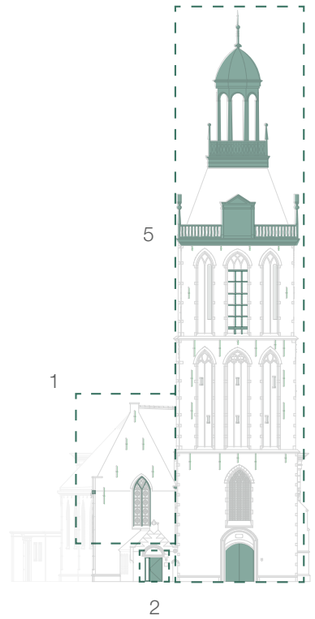
6 Wooden ornaments and window frames

Facade materials - Wood / Glass / Iron

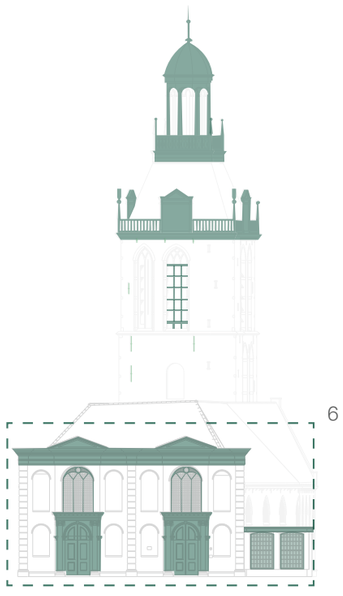
Finally, applied for structural, service, and decorative purposes, are the materials wood, glass, and iron. Wood is found mostly in the east facade, as it is applied for the characteristic classical detailing. Aside from the east facade, the material is used voor the finishing of the gutters, the window frames, and the detailing of the eaves. In all of these cases, the wood is painted white. Glass is solely used for the windows, and the only notable way of applying the glass is the stained glass in the west facade as is shown in picture 1. While the use of iron seems mostly decorative, it is actually for structural and service purposes, as was established in the structure and will be mentioned in the service analysis. The iron flooring anchors as shown in pictures 1, 3, 4, and 5 are applied throughout the entire building, as logically, they show the connections of the floor and roofing structures throughout the building. Furthermore, iron is applied in the form of the drainpipes, window grilles, and the connections of the gutters to the facades. Although each of these materials is not used very often, it is remarkable that the use of wood and iron in particular has an emphatic effect on the experience and design of the facades. Especially, in how both materials help create the refined details that we became so intrigued by during our first visit to the Grote- of Mariakerk.



South Facade



West Facade



East Facade

North Facade

Facade materials - Wood / Glass / Iron

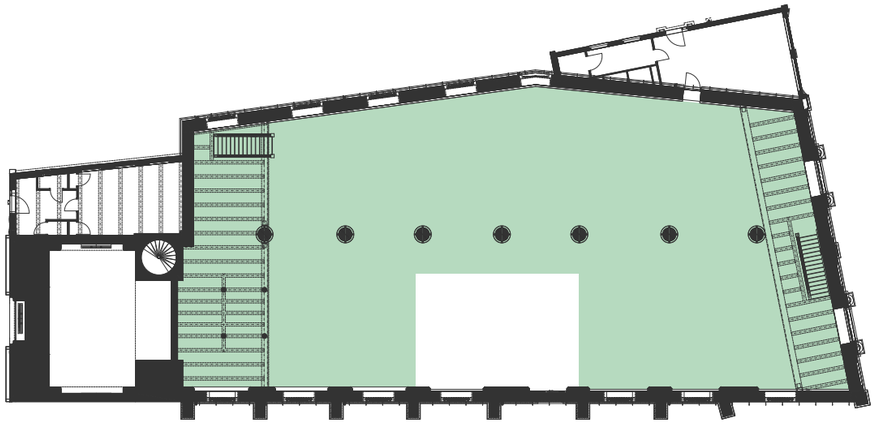
Wood Glass Iron

SERVICES

Services

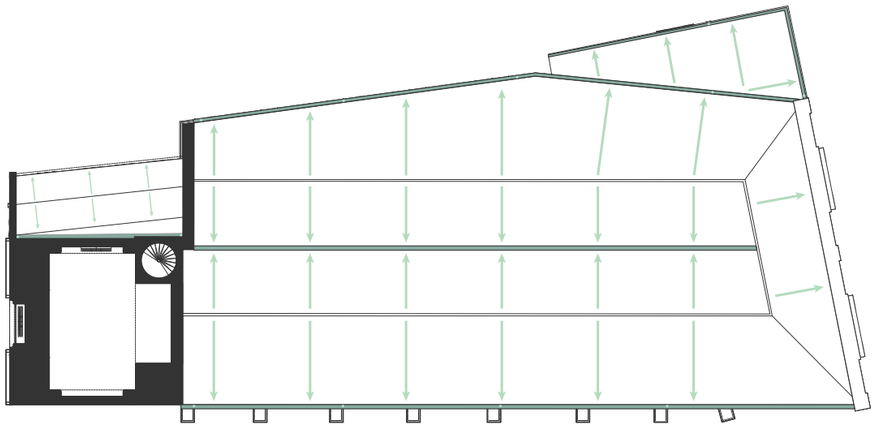
Seen as the Grote- of Mariakerk is a 600-year-old building, services might be the last thing that you think about regarding the church. The prominent placement within the urban fabric, its iconic tower, the ornamentation, and architectonic styles, are all things that come to mind before services. It even made us wonder, are there even any services within the building? Since the building has been expanded several times throughout the centuries and has been used for the last couple of years, it is safe to assume that some form of service is present in the building. Especially, as we know for a fact, that there is lighting, rain drainage, and a kitchen present, but is there more?

Through investigation of the services, or as they are addressed by Steward Brand, the working guts of the building (TU Delft OpenCourseWare, 2020), we study the services present inside and outside of the Grote- of Mariakerk. By looking at the way the building is heated, cooled, provided with lighting, how it deals with water/rain, and what moving elements are present in the building, a better understanding of the working guts of the church is created. Furthermore, answering our age-old question, what services even are present in the Grote- of Mariakerk?



Ground floor

Underfloor heating



Roof view

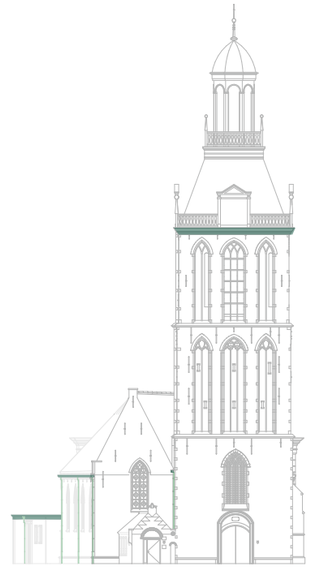
Gutter

Rainwater drainage

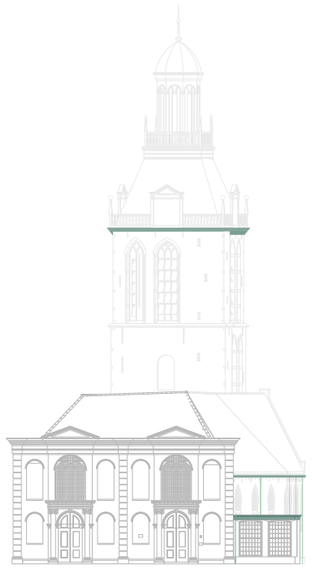
Services in the Grote- of Mariakerk

From 1959 to 1963, the Grote- or Mariakerk underwent a major renovation. Among other things, complaints were made about the cold in the church, especially in winter it was very cold. Previously, the church was heated by two large pot stoves. This was very labor-intensive, which is why it was decided to insulate the floor and provide it with underfloor heating. Old graves in the floor are still visible in the preacher's chair. There is no underfloor heating here. The roof also leaked at the time and the hood of the roof was also replaced during this renovation. The roof of the church hall consists of two gable roofs, with the water transfer taking place on the north and south facade. Every two church windows, a rainwater drain runs down the facade. The trader's house and the preacher's house have their own water drainage

South Facade



West Facade



East Facade

North Facade

Gutter

Rainwater drainage

Services

SPACE PLAN

Space plan

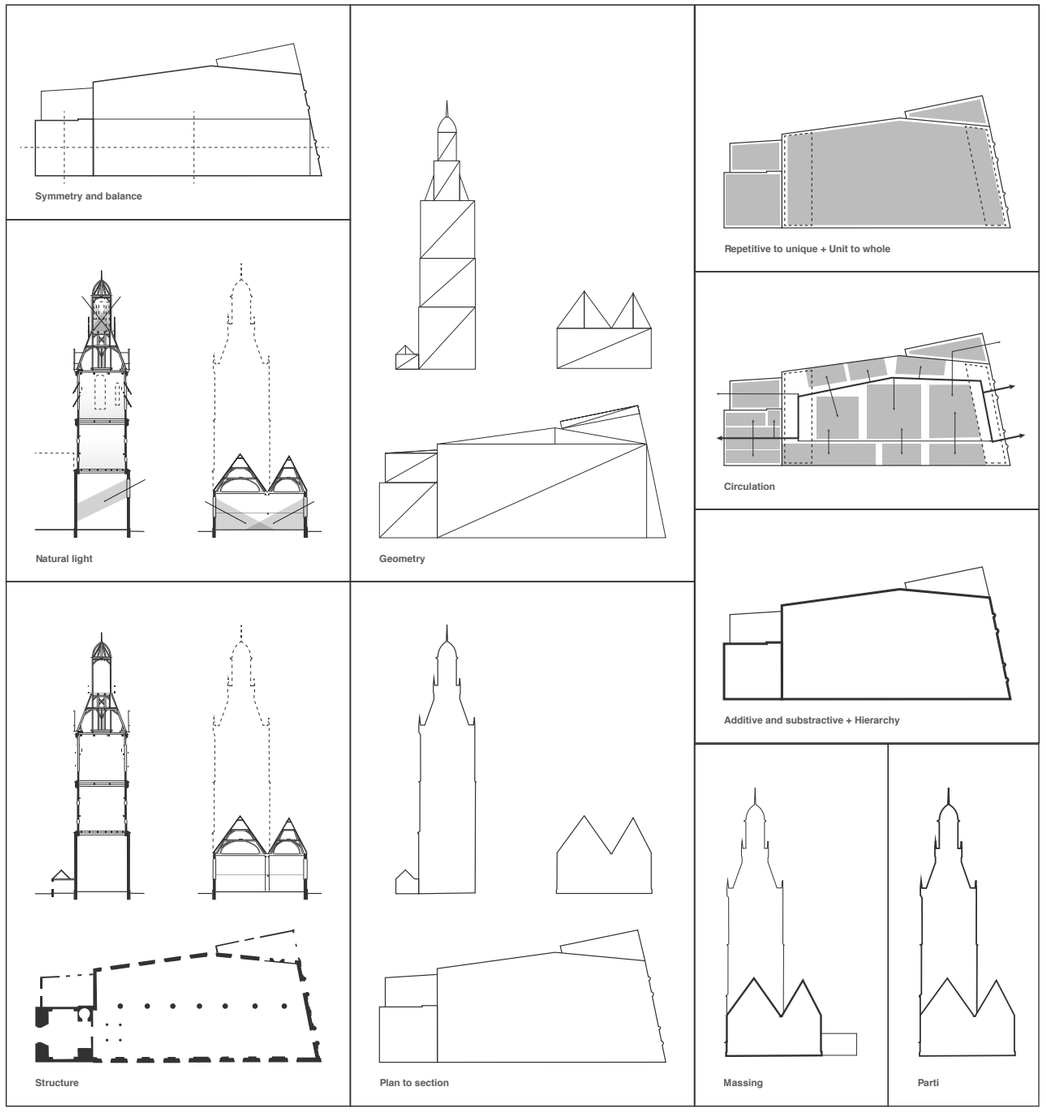
The church tower, the facades, the church's position on the church square, the stately columns, and the characteristic east facade, are all elements of the Grote- of Mariakerk that draw your eye, but aside from the building itself, there is also the space that it captures. During the site visit, we walked through the spaces and got a grasp of its layout, but logically we were so busy with all the physical components of the building and its history provided by the tour guide, that you kind of forget to stand still and experience the spaces as they are. As mentioned before, there are 4 separate building parts and the open space plan of the church hall, but how do they work alone and as a whole?

Through analysis of the space plan, or how Steven Brand describes them, the interior layout of the walls, ceilings, floors, and doors (TU Delft OpenCourseWare, 2020), we analyze the inner workings of the Grote- of Mariakerk. To conduct this analysis, the theories of both Clark & Pause and Ching are applied. By doing so, creating a better understanding of the space plan, and all the things we missed during our initial visit to the Grote- of Mariakerk.

Spatial analysis CLARK & PAUSE

The theory of Clark & Pause or precedence in architecture can be used to briefly summarize the key concepts of a building. While this focuses on both the ex- and interior, it does provide an overview of how both relate to each other. Some of the elements touched upon have already been investigated more thoroughly, so for this space plan analysis, we will focus on the parts that have not been discussed yet.

In the spatial hierarchy, we find the Church hall and tower to be the most important spaces since the hall is used most actively for the ceremonies and the function of the tower as the main entrance, landmark, and ambiance that is created on an hourly basis by the carillon. These are also the elements that mainly define the massing and parti of the building, or better said, the main concept, as the combination of church tower and hall, represents the building. The spatial layout of the building is spread across the 4 unique building parts, which are each defined by their particular shapes. The circulation of the building will be further elaborated on in the Ching part of the spatial analysis. So, in conclusion, this part of the analysis kind of confirms the findings of the earlier analysis, as the main layout of the building is spread across the 4 separate and distinct building parts, with the church hall and tower as the most important components.

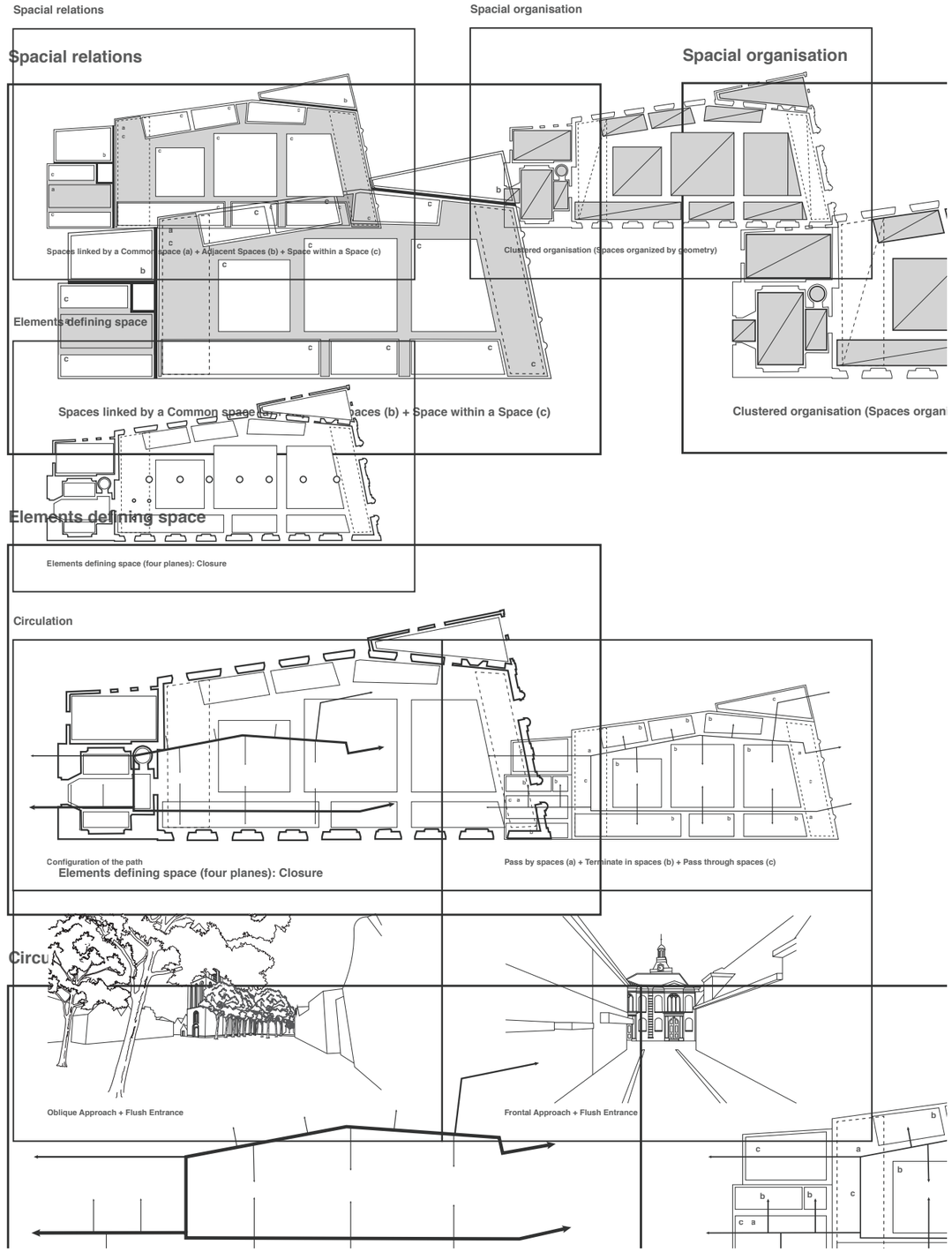


Spatial analysis CHING

Through the analysis of parts of the theory of Ching, the spatial relations, organization, and circulation are analyzed further. Each of the 4 building parts are adjacent spaces as elaborated many times before, but within the church tower and hall, other relations exist. The church tower is composed of spaces within the larger space in the form of the fire department museum, which is linked by the main room/entrance of the tower towards the church hall. Inside the church hall, the concept of spaces within a space is also present, as the galleries and seating spaces, function as spaces within the large church hall, and the totality of the hall functions as the space that links them all together.

The organization of these spaces is clustered, which is bound by the geometrical shapes of each of the 4 parts of the Grote- of Mariakerk. Each of these spaces is mostly defined by the walls that capture them.

Regarding the circulation between the 4 building parts, the main flow of circulation is from the church tower towards the east entrances, as is shown by the configuration of the path. Through these spaces, several forms of movement are present. While the side buildings only are used to pass through the spaces, the church hall and tower combine several types. Through both building parts there is movement through the space, but whilst doing so, there is movement passed spaces like the fire department museum, tower staircase, and the seating spaces. The movement towards the earlier mentioned spaces is defined as terminating in said space. Both entrances of the church are flush and know an oblique or frontal approach. So, in conclusion, while the organization, relations, and circulation between the 4 parts of the Grote- of Mariakerk seem quite messy, it is the combination of these separate parts that define the space plan of the Grote- of Mariakerk as it is, something important to take note of in the event of an expansion.

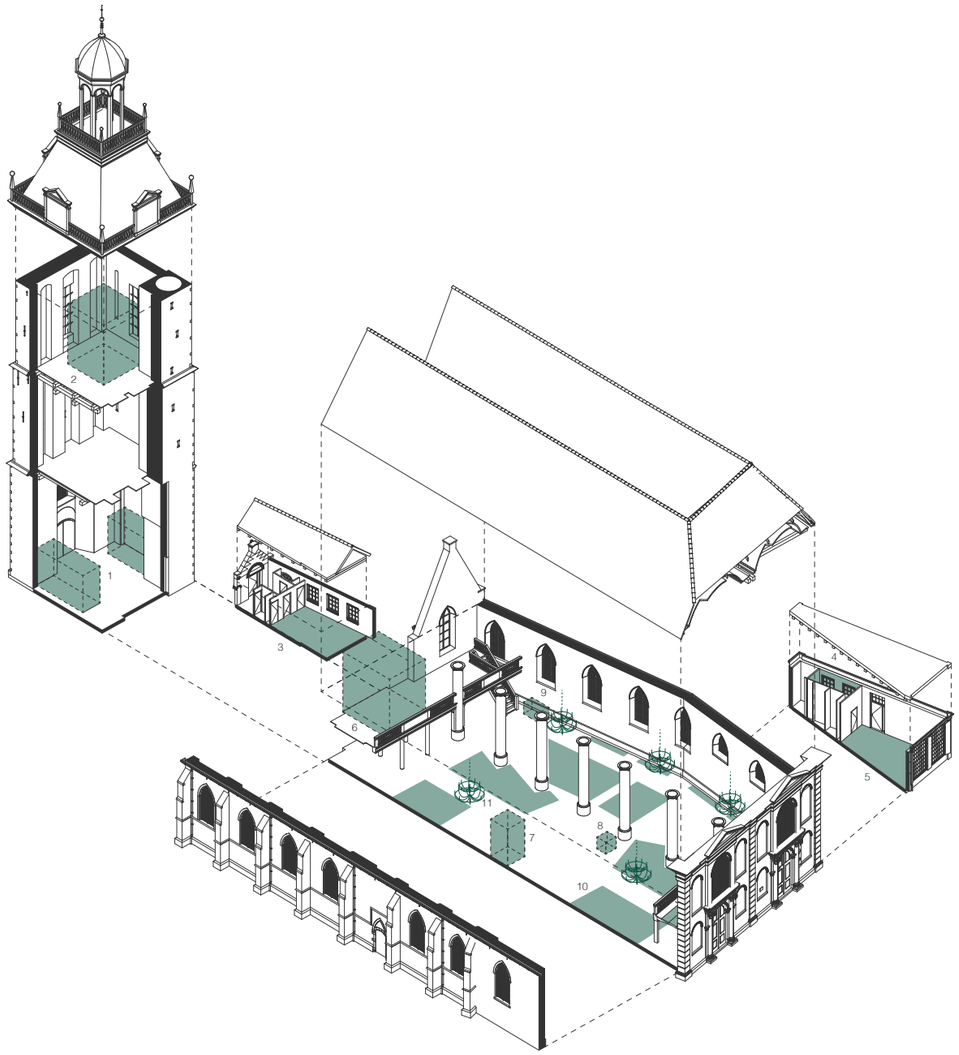


STUFF

Stuff

During the first visit to the Grote- of Mariakerk, we logically directed our focus toward the building itself, its history, and the context that surrounds it. However, it is important to note, that aside from the spaces that the building encaptures, there are also a lot of other things present in the building. Chairs, tables, kitchen pantries, even a scaled model of the church, and as the Grote- of Mariakerk is, well, a church, all the religious objects that facilitate the clergy to practice their ceremonies and beliefs. Aside from the values that these objects represent, they also provide the opportunity for meaningful reuse, seen as this Zero Waste redesign has the goal of reusing all these elements.

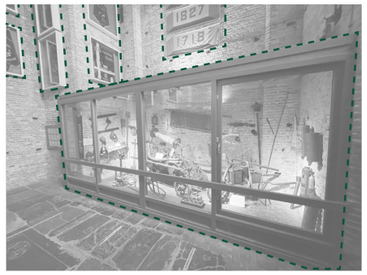
To create both a better understanding of the objects found in the church and the volume and value they represent, an investigation of the stuff, or as Steward Brand names it all the stuff that is around daily to monthly within the building (TU Delft OpenCourseWare, 2020) is conducted. By inventorizing the stuff within the building, addressing if they carry monumental or religious values, and determining the volume of the objects, a better understanding of the stuff in the Grote- of Mariakerk is created.



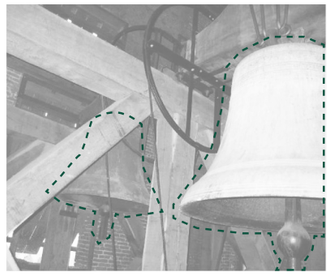
Stuff in the Grote- of Mariakerk

The church tower contains the fire brigade museum on the ground floor and the church carillon on the second floor. In the church hall itself, the fixed elements are the copper candle crowns, the organ and the preacher's chair and the loose elements are the baptismal font, the scale model of the church and the wooden chairs. Finally, the trade house and the preacher's house contain a unique interior with its own story, consisting of fixed elements and separate elements.

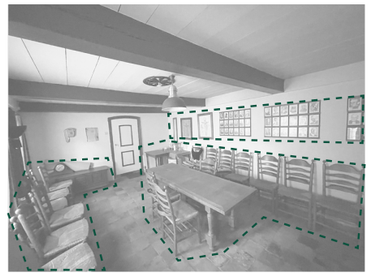
It can be concluded that the church contains many individual elements in its interior. The value of each part can be disputed about this, but in any case it will have to be taken into account when transforming the Grote- or Mariakerk and a choice will have to be made with regard to the preservation, reuse or removal of these parts.



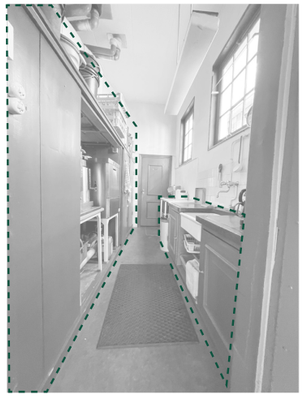
1 Fire brigade museum



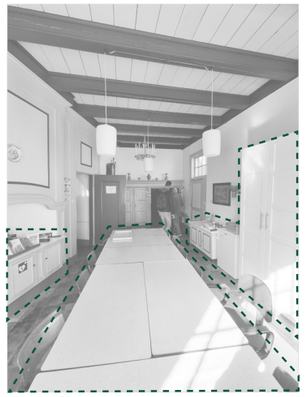
2 The carillon



3 Interior of trade house

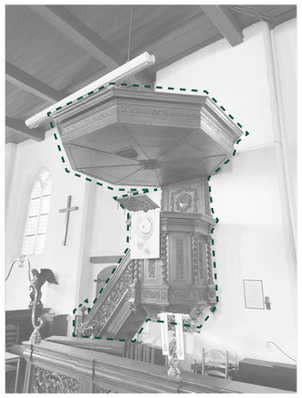


4 Kitchen of pastor's house

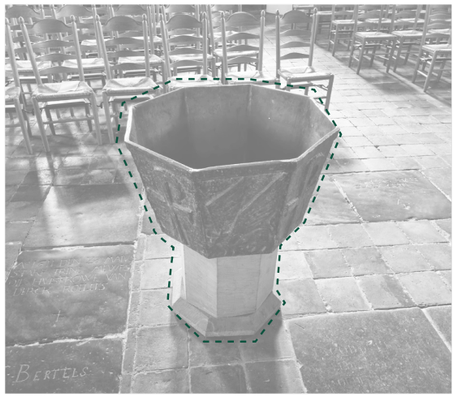


5 Interior of pastor's house

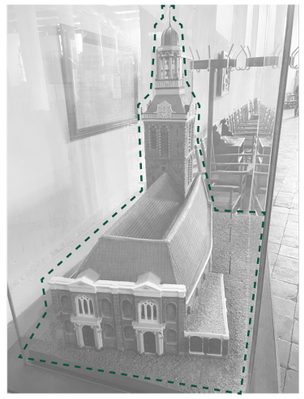
6 Church organ



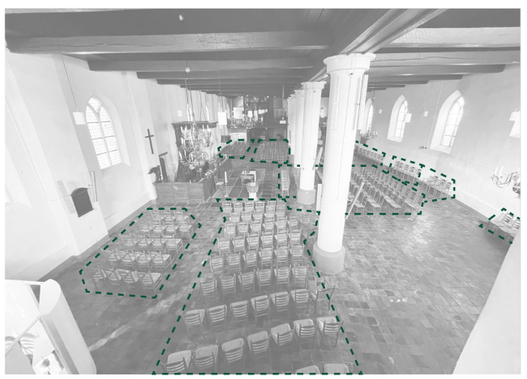
4 Preacher's chair



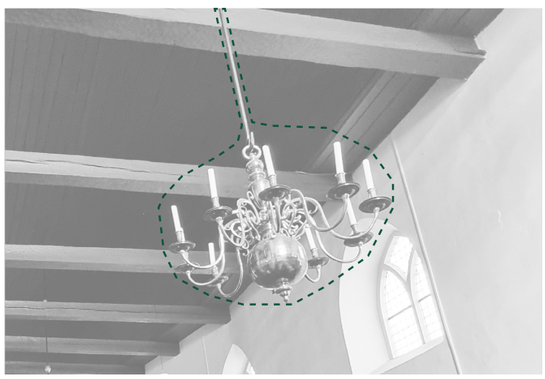
5 Baptismal font



6 Scale model of the church



10 Wooden chairs inside church hall



11 Copper candle crowns

VALUE ASSESSMENT

Value assessment

The Grote- of Mariakerk, the first thing we noticed apart from the characteristic tower, was that the building was not as sober and minimalistic as we thought. The brickwork lintels that were bricked at an angle, the natural stone ornaments and blocks placed by the gothic window openings, and not to forget, the classic east facade with its wooden detailing. The more we got to know the church during our walk around it, the more we became in awe of its at first simple-looking facades. Even as we finally got to go inside and found a model of the church, we were surprised by the 90 degrees east part of the roofing. The facades of the Grote- of Mariakerk, or the “skin” of the building, did not fail to surprise us and left us wanting to know more.

To grasp the entirety of the skin of the Grote- of Mariakerk, research is conducted into the layers, composition, and materials of the skin of the building. Through analysis of the rhythm of the facade and the open-closed ratio of the facade, the composition is investigated. Building further on these topics the physical and daylight access of the building is distilled, and by doing so getting a better idea of the facade works as an intermediary between inside and outside. By inventorizing the facade materials and their placement, we create an understanding of the volume of the materials, the variation in their application, and the difference between structural elements and decoration. As a result, finding out the various layers and ideas of the Grote- of Mariakerk’s skin and what made us so intrigued about it in the first place.

Values of the Grote- of Mariakerk

The first thing that stands out, is that the Grote- of Mariakerk mainly carries ‘historic-symbolic’ and ‘age-maturity’ values. Each of the document types values the church as such, which shows that these values are unquestionable. The other valuations, however, show different outcomes. The national monument listing predominantly values the physical building and the workmanship it possesses. Whereas, the ‘Books & researches’ and the ‘News articles & local publications’ mainly value the social and economic aspects of the church. Especially, the ‘emotional collective’ valuation stands out, as the Grote- of Mariakerk is almost entirely valued by the ‘News articles & local publications’ as such. So, the distribution of values shows us that all three of the document types value the Grote- of Mariakerk as a building and the ‘News articles & local publications’ also value the ‘emotional-collective’ aspect of the church highly.

Attributes of the Grote- of Mariakerk

Regarding the attributes, the most notable is the number of tangible assets present, or more specifically, the amount of ‘building-element’ assets. All three document types assigned the ‘building-element’ assets to the Grote- of Mariakerk. Aside from these assets only the asset ‘building’ stands out. Furthermore, only the ‘News articles & local publications’ assigned the ‘community/ people’ and ‘area’ assets to the church. So, again, we conclude that the building and its elements are the most important assets according to the three document types.

ATTRIBUTES

Intangible

Asset related

Concept or artistic trend

Relation context - location

Character

Societal

Use, function

Knowledge, traditions, customs

Relation context - association

Community / people

Process

Management process

Development or evolution

Tangible

Asset

Building element

Building

Urban element

Natural element

Area

Ensemble

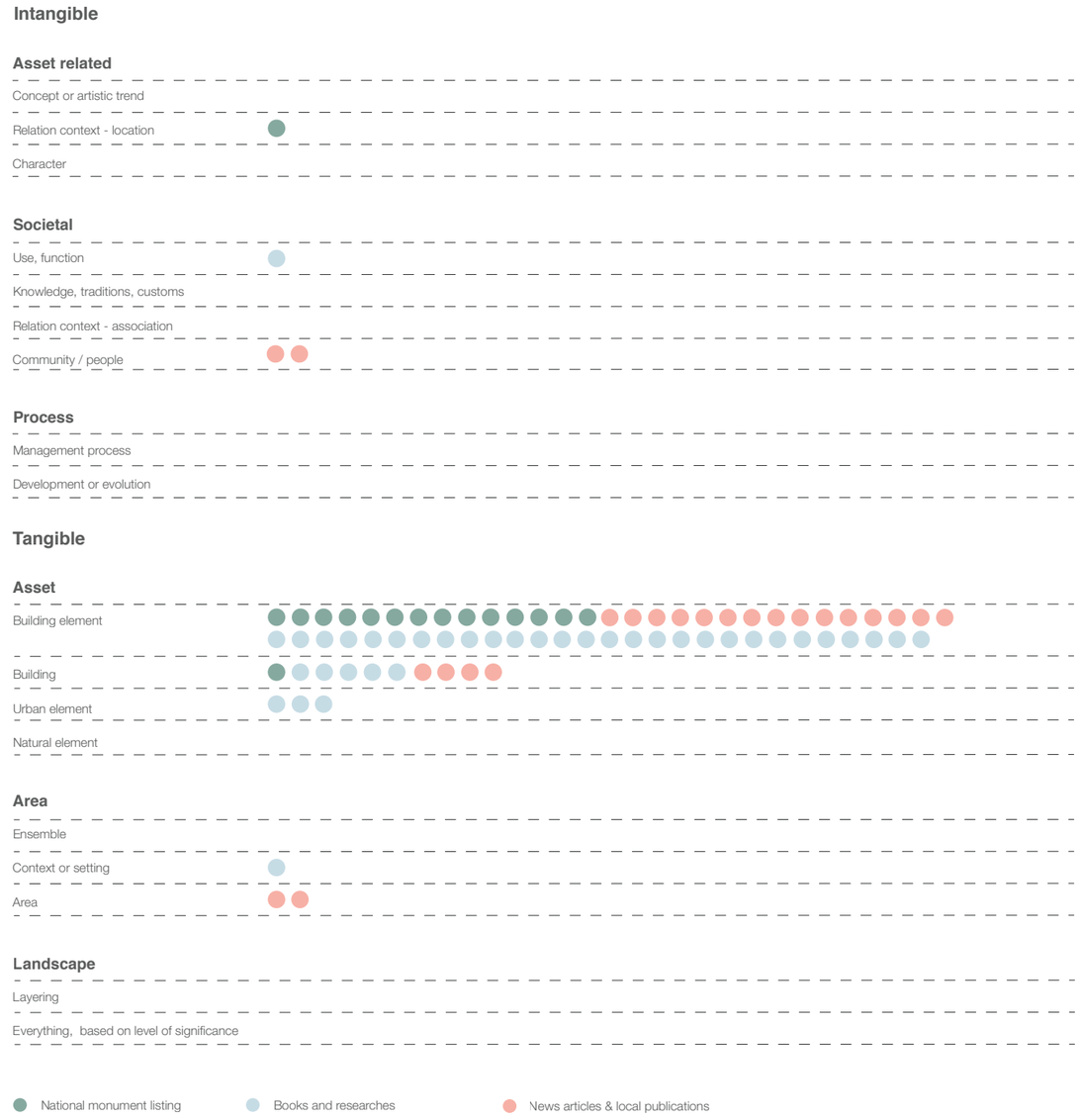
Context or setting

Area

Landscape

Layering

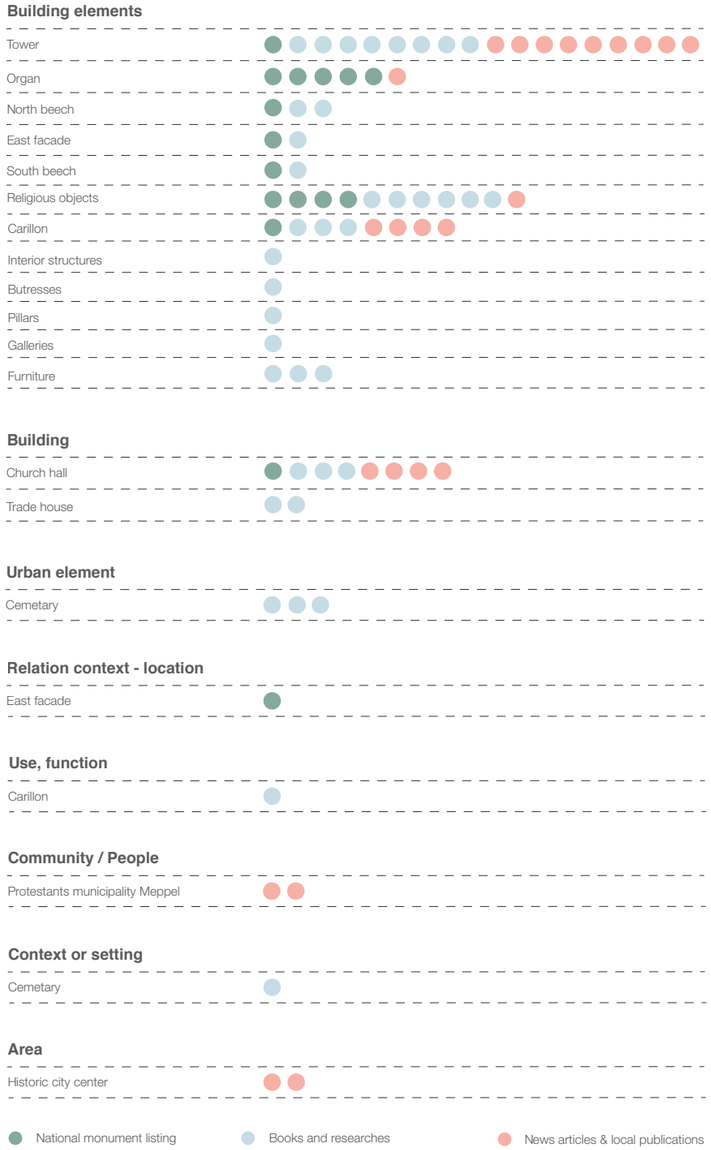
Everything, based on level of significance



Types of attributes of the Grote- of Mariakerk

After the evaluation of the assets, we zoomed into the specific assigned attributes, to get a better understanding of the elements that are considered most significant. This inventory shows that the church tower is mentioned most, from which we can take away that this is one of the most important elements. Aside from the church tower, the religious objects, the carillon, the organ, and the church building are mentioned multiple times as well. It is also interesting, that the ‘News articles & local publications’ only mentioned ‘protestants municipality Meppel’ and ‘historic city center’. From the number of times that the specific elements were mentioned, we can conclude that the physical building components are regarded as the most significant, especially the church tower.

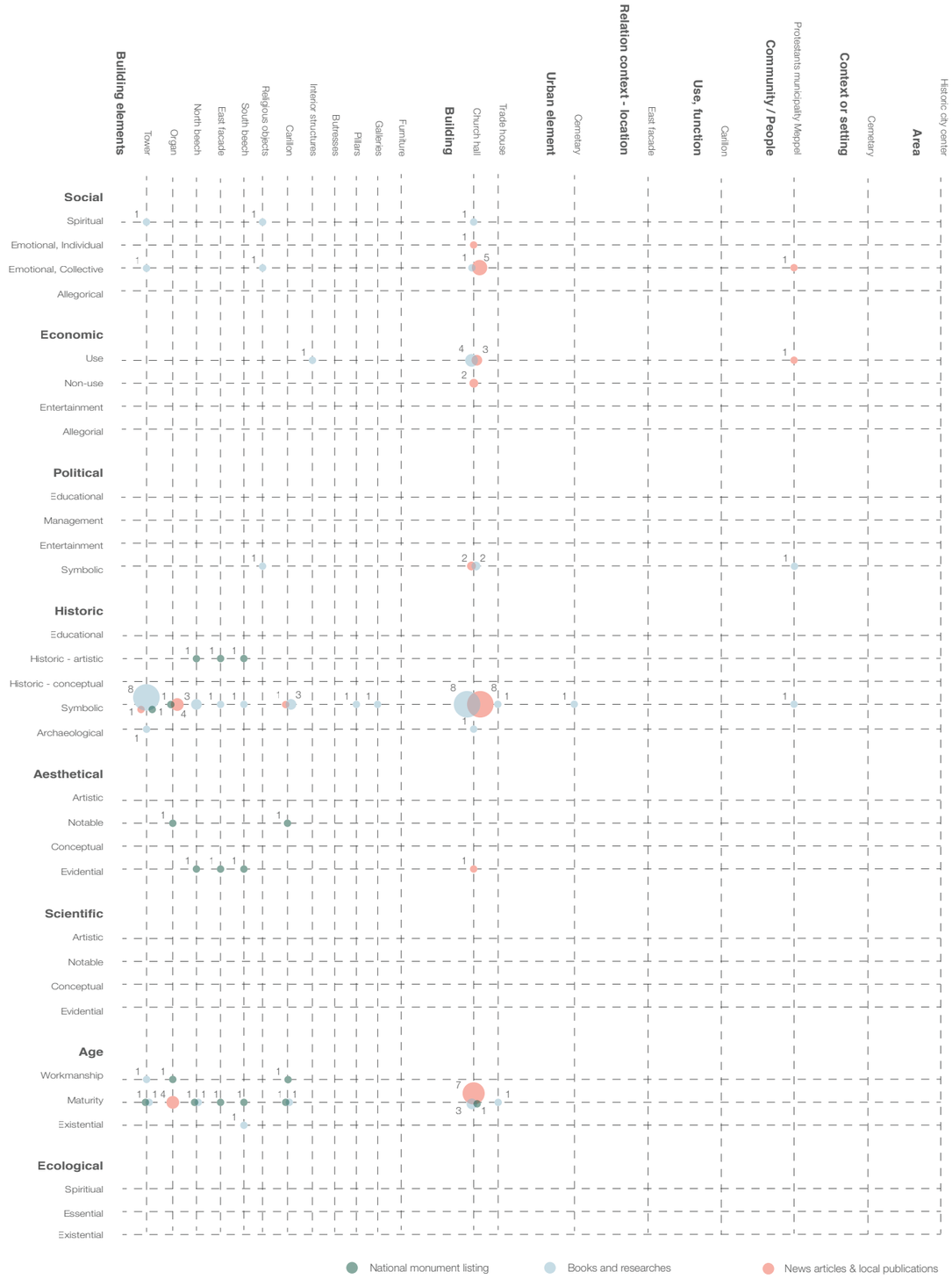
TYPES OF ATTRIBUTES



Values and attributes of the Grote- of Mariakerk

To get a better understanding of which of the specific attributes carry certain values, we investigated which attributes were present in the values assigned previously, as not all attributes necessarily carry values. This investigation shows that the church tower and church hall strongly carry the ‘historic-symbolic’ value. Furthermore, it is important to note that the church tower is valued as ‘historic-symbolic’ and ‘age-maturity’ by the ‘national monument listing’ document type, which is regarded as the most significant valuation. The church hall also strongly represents the ‘age-maturity’ value, which is also assigned by the ‘national monument listing’ document type. In addition, the church hall strongly represents the ‘emotional-collective’ value, which is almost solely assigned by the ‘News articles & local publications’. The main takeaway from this investigation is that the church tower and church hall are regarded as the most valuable building elements, assigned by all three document types. Furthermore, it shows that, again, ‘News articles & local publications’ evaluation of the ‘emotional-collective’ value is represented in the building elements, as they assign the value to the church hall.

VALUES + ATTRIBUTES



Valuation of the Grote- of Mariakerk

Based on the A.R. Roders valuation and the entirety of the ABC-analysis the final value assessment of the Grote- of Mariakerk was conducted. The main takeaways from this assessment are that the church tower, organ, trade house, and gothic and classic style elements must be preserved at all costs. Furthermore, the structural integrity, the preacher's chair, and the finishing of both the pillars and the outside of the facade are highly valuable. The preacher's house and the buttresses are considered medium value. Finally, the inside finishing of the facades, the galleries, and the inner sides of the double-gabled roof are considered low value.

Renvoy church structure:

Tower:

1	Foundations
2	Ground floor structure
3	Wooden beam structure first floor
4	Wooden finishing first floor
5	First floor structure
6	Wooden beam structure second floor
7	Wooden finishing second floor
8	Second floor structure
9	Railings and church bells
10	Wooden beam structure third floor
11	Wooden roof structure
12	Roof decking and roof tiles
13	Railings
14	Steeple
15	Wooden dome structure
16	Copper roofing dome

Church hall:

17	Foundations
18	Ground floor structure
19	East gallery
20	West gallery
21	Wooden beam structure
22	Wooden arch ceilings
23	Wooden roof trusses and stability features
24	Roof decking and roof tiles

Trade house:

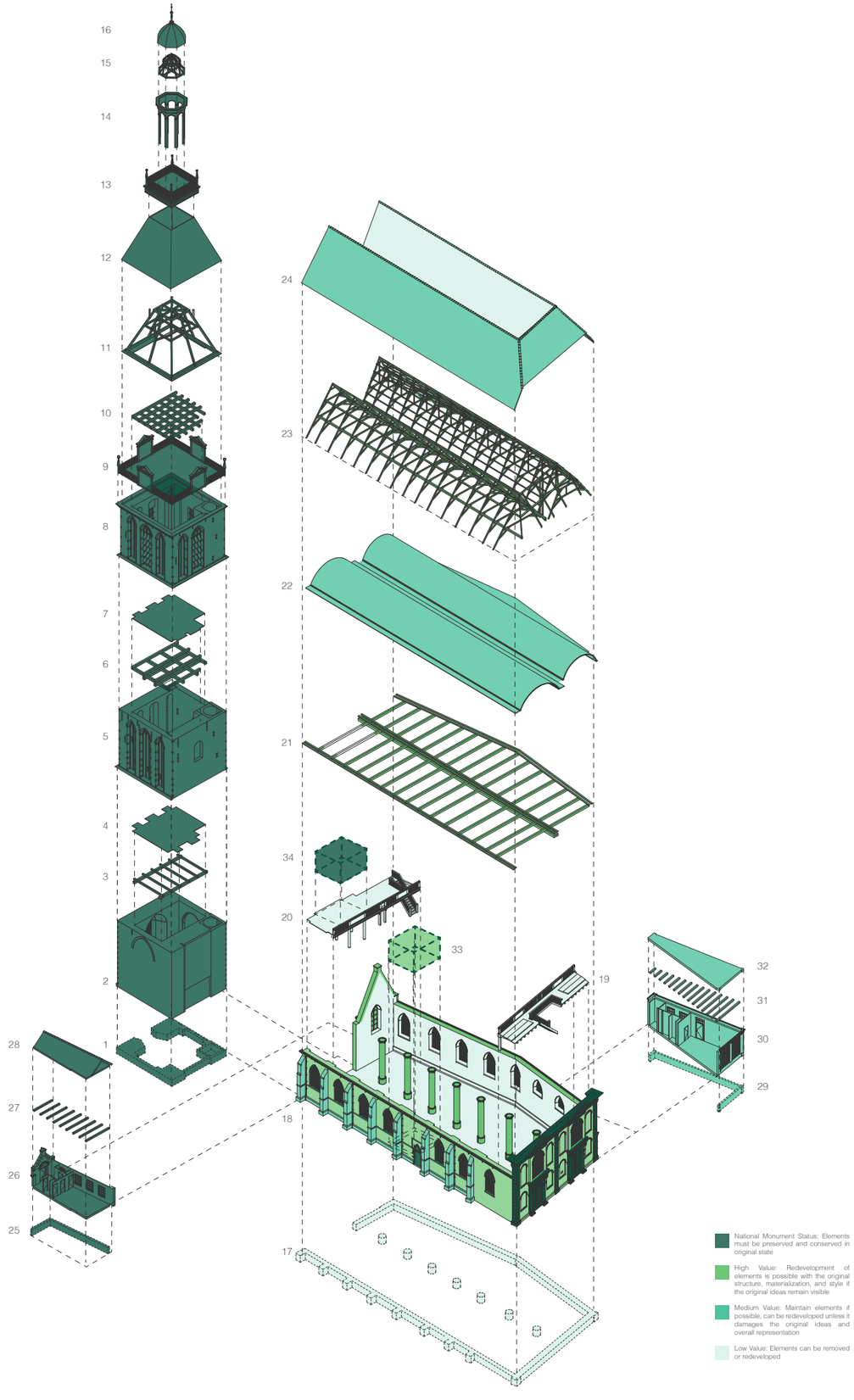
25	Foundations
26	Ground floor structure
27	Wooden beam structure roof
28	Roof decking and roof tiles

Pastor's house:

29	Foundations
30	Ground floor structure
31	Wooden beam structure roof
32	Roof decking

Interior elements

33	Preacher's chair
34	Organ



BUILDING VS ELEMENTS

Building vs Elements

Aside from the ABC-analysis, the Zero-Waste portion of the graduation assignment requires us to inventorize the Grote- of Mariakerk on a deeper level than just pinpointing the different materials. How many building elements are there, in what quantity are certain materials or components present, and which elements are dimensionally stable? Why is this important? You might ask, well in the event of a Zero-Waste redesign, you are required to use all the materials that you remove and are present within the original building. This is, of course, an impossible task, if it is not clear how much material or elements there are in the first place. To get a grasp of the existing material and element stock, the Grote- of Mariakerk is split into the most significant and image defining elements, such as the separate facades, roof, church hall interior, church tower, side buildings, etc.

After defining these elements, they are each dissected to get an idea of what materials or smaller elements the building elements are composed of. It is of significance to split the building into these components, as, in the event of removing a facade, for example, you need to know how much material becomes free. So, to facilitate the Zero-Waste design, the Grote- of Mariakerk is dissected into several elements.

North facade church hall

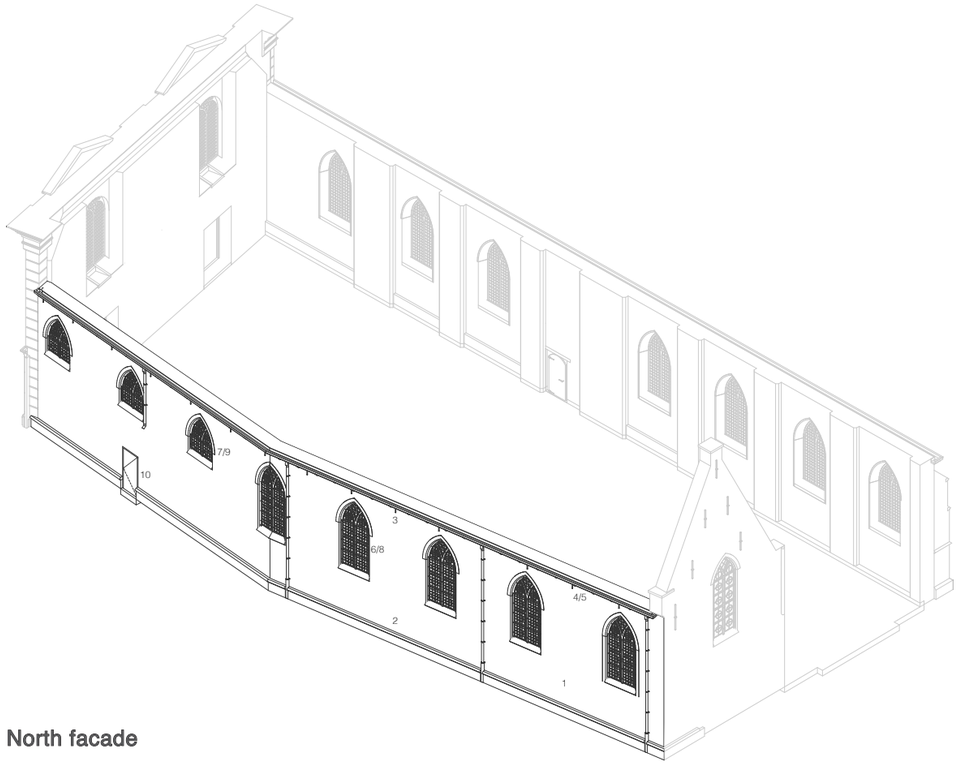
Materials	Number	Amount	Unit	Measurements	Remarks
Brick + Mortar	N.A.	203,1	m3	N.A.	N.A.
Natural stone strip	N.A.	N.A.	m1	150 x 110 mm	N.A.
Iron wall anchors	8	N.A.	pcs	350 x 25 mm	N.A.
Gutter	N.A.	37,03	m1	N.A.	N.A.
Gutter supports	37	N.A.	pcs	N.A.	N.A.
Iron window grids	5	N.A.	pcs	1550 x 3550 mm	N.A.
Iron window grids	3	N.A.	pcs	1550 x 2000 mm	N.A.
Windows	5	N.A.	pcs	1550 x 3550 mm	N.A.
Windows	3	N.A.	pcs	1550 x 2000 mm	N.A.
Rainwater drainage	N.A.	22,65	m1	= 140mm , = 120mm inside	N.A.
Door	1	N.A.	pcs	1050 x 2200 mm	N.A.

West facade church hall

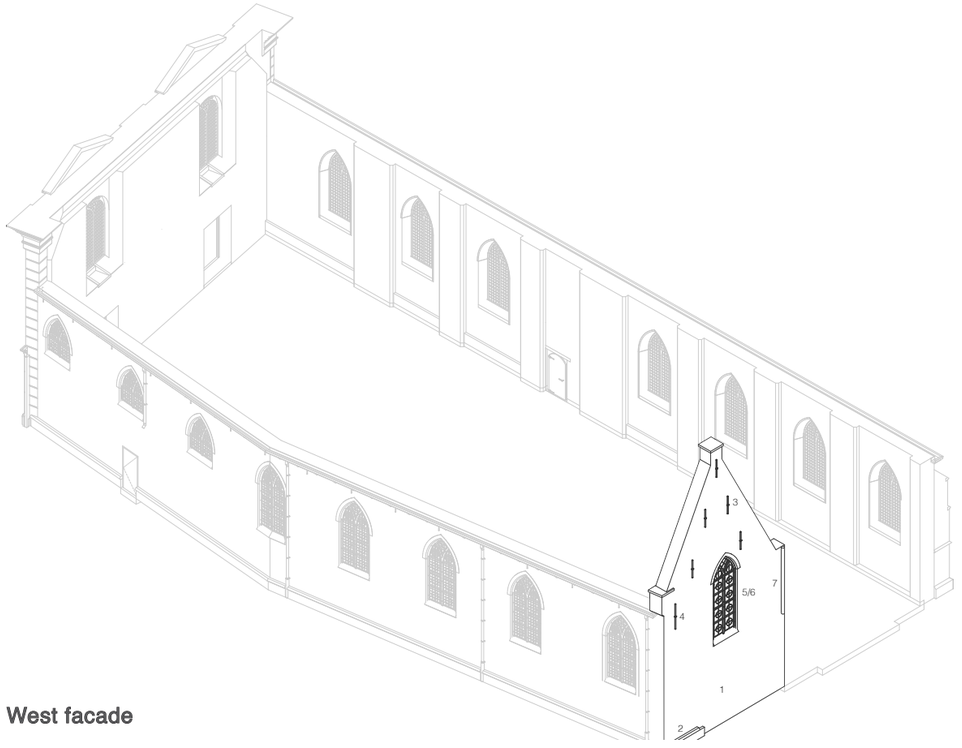
Materials	Number	Amount	Unit	Measurements	Remarks
Brick + Mortar	N.A.	51,3	m3	N.A.	N.A.
Natural stone strip	N.A.	2,2	m1	150 x 110 mm	N.A.
Iron wall anchors	5	N.A.	pcs	900 x 50 mm	N.A.
Iron wall anchors	1	N.A.	pcs	1300 x 50 mm	N.A.
Iron window grids	1	N.A.	pcs	1411 x 4083 mm	N.A.
Windows	1	N.A.	pcs	1411 x 4083 mm	N.A.
Rainwater drainage	N.A.	5,5	m1	= 140mm , = 120mm inside	N.A.

Elements in North facade + West facade

As indicated within the ‘Skin’ and ‘Structure’ analysis, the facades are mostly composed of brick. Which is by far the most present material with a total amount of 20,1 and 51,3 m3. Nevertheless, the facades carry several other components such as the decorative and structural Iron wall anchors, water drainage and gutter, and the windows with matching iron window grids. Apart from the amount of brick, the most notable material is the amount and variety of nature stone and the craftsmanship that the decorative natural stone elements show within the facades. In the case of a redesign, it is mostly the brick that can provide a substantial amount of reusable material. The brick would, however, have to be removed in larger segments, as removing single stones would be too labor-intensive. Of course, nature stones can be reused too, yet this would take a substantial amount of labor and due to the decorative nature of the stones, it could be questioned if the reuse of the nature stone is advisable. The windows can be removed and reused, yet, they should be reused as whole elements, as there is close to no gain in dissembling the windows. The other facade elements can easily be removed and reused if necessary.



North facade



West facade

South facade church hall

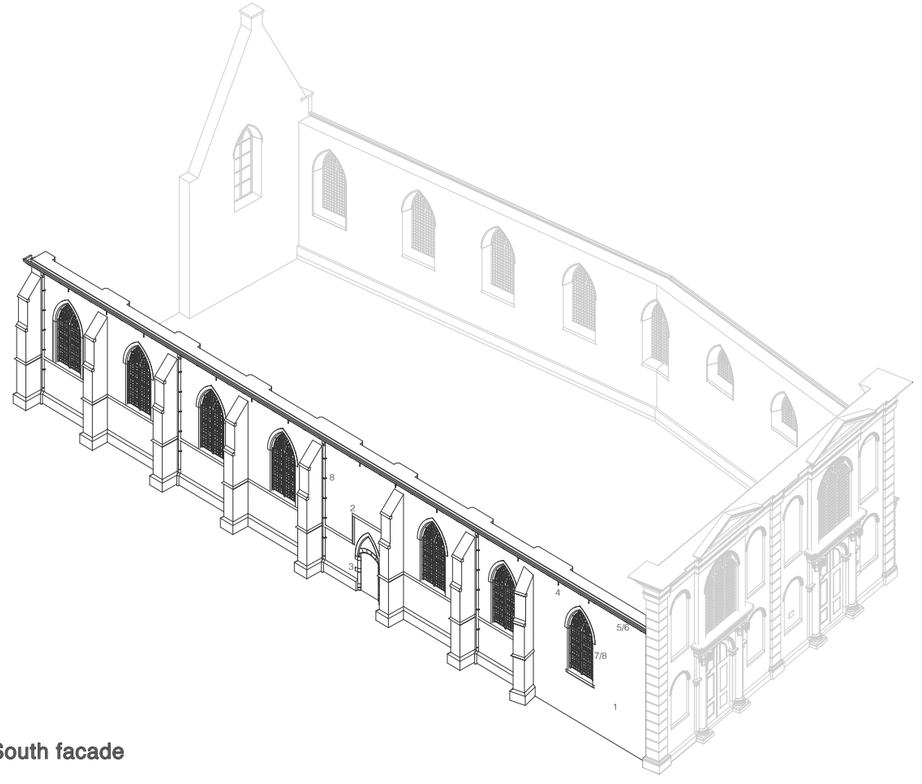
Materials	Number	Amount	Unit	Measurements	Remarks
Brick + Mortar	N.A.	217	m3	N.A.	N.A.
Natural stone strip	N.A.	60,5	m1	150 x 110 mm	N.A.
Natural stone blocks	9	0,414	m3	N.A.	N.A.
Iron wall anchors	8	N.A.	pcs	350 x 25 mm	N.A.
Gutter	N.A.	40,4	m1	N.A.	N.A.
Gutter supports	40	N.A.	pcs	N.A.	N.A.
Iron window grids	7	N.A.	pcs	1550 x 3550 mm	N.A.
Windows	7	N.A.	pcs	1550 x 3550 mm	N.A.
Rainwater drainage	N.A.	31,02	m1	= 140mm , = 120mm inside	N.A.
Door	1	N.A.	pcs	1050 x 2200 mm	N.A.

East facade church hall

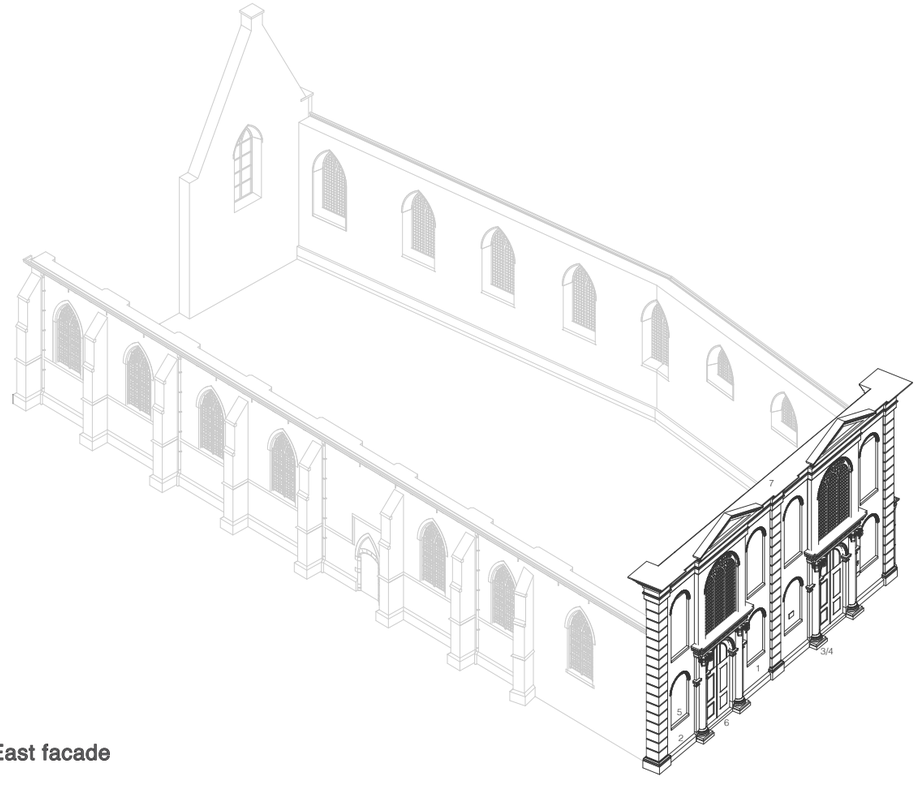
Materials	Number	Amount	Unit	Measurements	Remarks
Brick + Mortar	N.A.	157,9	m3	N.A.	N.A.
Natural stone strip	N.A.	60,5	m1	150 x 110 mm	N.A.
Natural stone blocks	8	0,34	m3	800 x 400 x 150 mm	N.A.
Natural stone blocks	8	0,2625	m3	150 x 110 mm	N.A.
Concrete slabs	8	0,1456	m3	1400 x 130 x 110 mm	N.A.
Classicistic wooden entrace	2	N.A.	pcs	N.A.	N.A.
Classicistic wooden eaves	1	N.A.	pcs	N.A.	N.A.

Elements in South facade + East facade

For the South and East facades, mostly the same points count as for the North and West facades. As indicated within the ‘Skin’ and ‘Structure’ analysis, the facades are mostly composed of brick. Which is by far the most present material with a total amount of 217 and 157,9 m3. Nevertheless, the facades carry several other components such as the decorative and structural Iron wall anchors, water drainage and gutter, and the windows with matching iron window grids. Apart from the amount of brick, the most notable material is the amount and variety of nature stone and the craftsmanship that the decorative natural stone elements show within the facades. In contrast to the other facades, however, the east facade is completely different due to the large wooden classic facade elements. The removal of the brick is, again, possible and the largest stock of material. This should, however, be done in the manner described earlier. The same goes for the window, nature stone, and other elements. Most notable in the case of removal, are the classic facade elements, to a certain extent wood can be salvaged from the elements. Yet, it can be questioned how much and whether the amount of wood extracted outweighs the character assassination that is committed when the iconic classical elements are removed.



South facade



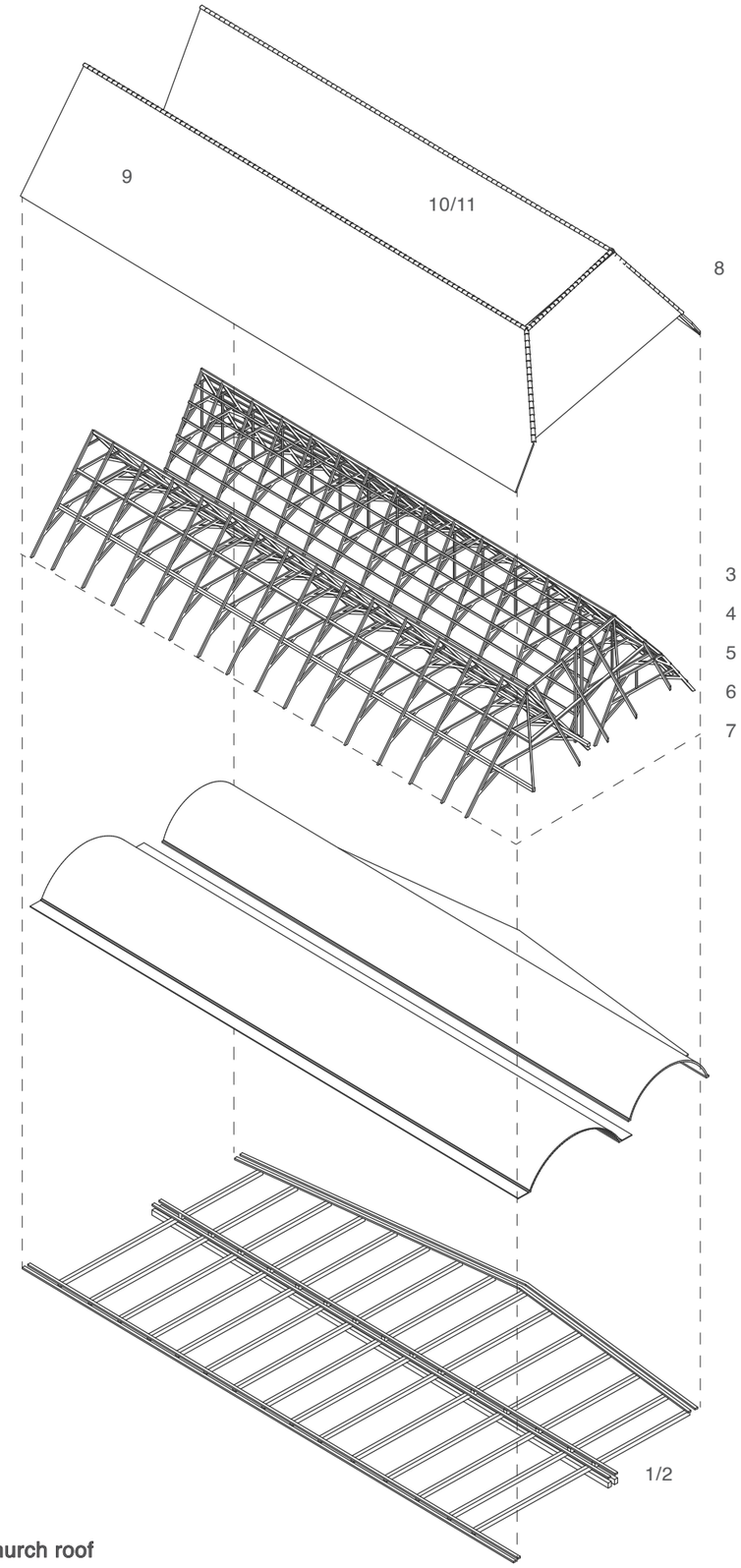
East facade

Roof church hall

Materials	Number	Amount	Unit	Measurements	Remarks
Wooden beam	N.A.	75,066	m3	350 x 250 mm	Horizontal wooden beam
Wooden beam	N.A.	239,805	m1	300 x 250 mm	Horizontal wooden beam
Wooden beam	N.A.	75,066	pcs	200 x 200 mm	Horizontal wooden beam
Wooden beam	N.A.	579,66	pcs	200 x 100 mm	Truss bone/Ridge beam/Wall Plate/ Horizontal wooden beam
Wooden beam	N.A.	406,8	pcs	150 x 100 mm	Collar beam
Wooden beam	N.A.	540,285	pcs	70 x 100 mm	Batten / King post
Wooden planks	N.A.	4149,36	m1	200 x 100 mm	Wooden ceiling
Roof decking	N.A.	1244,1	m2	N.A.	N.A.
Ceramic roof tiles orange	N.A.	676,66	m2	N.A.	N.A.
Ceramic roof tiles black	N.A.	567,44	m	N.A.	N.A.
Middle gutter	N.A.	34,424	m1	N.A.	N.A.

Elements in Church hall roof

Probably the largest facade or piece of the skin is the church hall roof. The roof is mostly composed of large quantities of ceramic roof tiles, split into 676,66 m3 of orange tiles and 567,44 black tiles. Underneath the rooftiles, there is a huge amount of roof decking. Aside from the roof tiles, the only notable components are the extremely large amount of wood that is present in the hidden roof structure. Not to forget, the middle gutter that is present in between the gable roofs. The large number of ceramic roof tiles are easily removed and can be reused as facade elements or can be recycled for new use. The most amount of material can be won from the wooden roof structure. The large number of wooden beams and planks can be repurposed towards new structural elements, facade pieces, or recut into new elements, the possibilities are endless. However, in case of removal, the roof structure should of course be replaced.



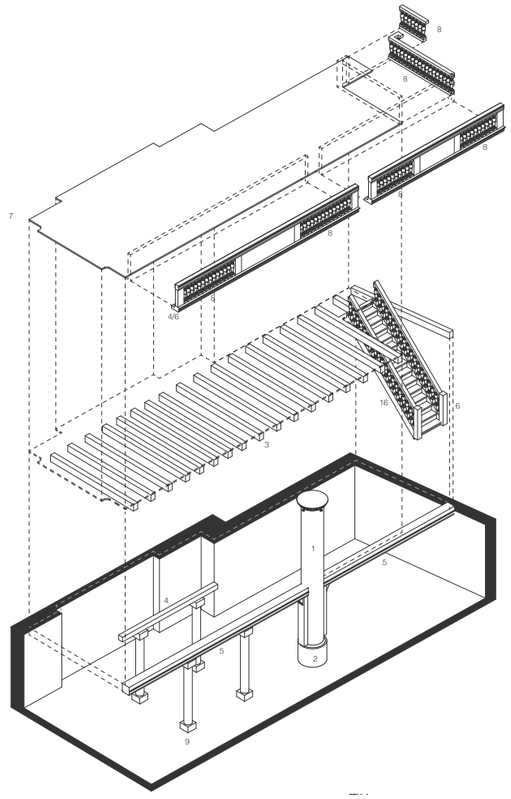
Church roof

Church interior hall

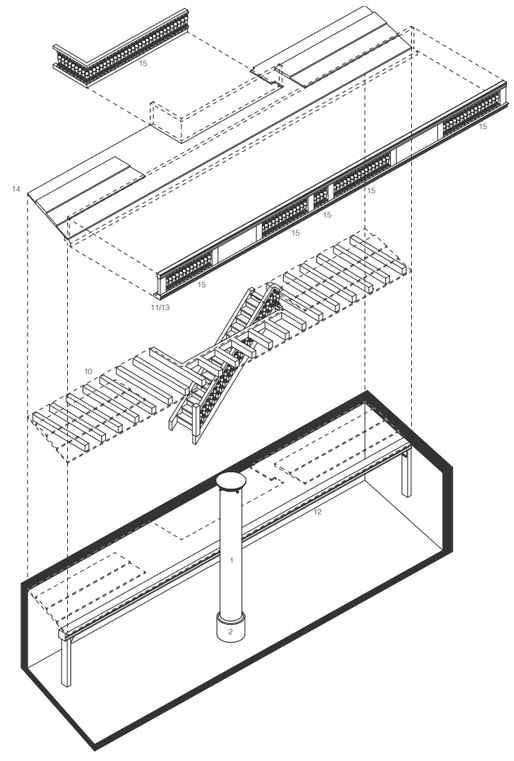
Materials	Number	Amount	Unit	Measurements	Remarks
Bricks column	N.A.	3,03	m3	= 800mm	Middle part of column
Nature stone column	N.A.	0,72	m3	= 1020mm	Lower part of column
Wooden beam	N.A.	76,6122	m1	275 x 200 mm	Gallery 1, Horizontal wooden beam
Wooden beam	N.A.	19,925	m1	200 x 200mm	Gallery 1, Horizontal wooden beam rand + Beam rand
Wooden beam	N.A.	15,25	m1	350 x 250 mm	Gallery 1, Horizontal wooden beam rand
Wooden beam	N.A.	30,5	m1	150 x 100 mm	Gallery 1, Horizontal wooden beam rand
Floor gallery 1	N.A.	67,014	m2	50 mm thickness	Gallery 1, Floor gallery 1
Wooden bars balustrade	75	N.A.	pcs	N.A.	Gallery 1, Wooden bars balustrade
Wooden column	4	N.A.	pcs	3000 x 300 x 300 mm	Gallery 1, Wooden column
Wooden beam	N.A.	42,815	m1	275 x 200 mm	Gallery 2, Horizontal wooden beam rand
Wooden beam	N.A.	17,658	m1	200 x 200mm	Gallery 2, Horizontal wooden beam rand + Beam rand
Wooden beam	N.A.	17,658	m1	350 x 250 mm	Gallery 2, Horizontal wooden beam rand
Wooden beam	N.A.	35,316	m1	150 x 100 mm	Gallery 2, Horizontal wooden beam rand
Floor gallery 2	N.A.	45,356	m2	50 mm thickness	Gallery 2, Floor gallery 2
Wooden bars balustrade	102	N.A.	pcs	N.A.	Gallery 2, Wooden bars balustrade
Wooden stairs	2	N.A.	pcs	N.A.	N.A.
Tour portal	3	N.A.	pcs	N.A.	N.A.
Kitchen	1	N.A.	pcs	N.A.	N.A.
Chairs	650	N.A.	pcs	N.A.	N.A.
Preacher's chair	1	N.A.	pcs	N.A.	N.A.

Elements in Church hall interior

The largest elements that can be counted as interiors are the west and east galleries. These galleries consist of wooden beams and planks, the most common beam size being 275 x 200mm. These wooden beams are of good quality and are very easy to reuse if these galleries were to be removed. There are also a total of 650 chairs in the church, yielding a large quantity of wood in total. It should be borne in mind that dismantling these chairs for reuse is very labor-intensive. The preacher's chair brings a lot of identity to the church and because of its ecclesiastical value, this object should be handled with care. If one reuses it, dismantling this object is not recommended. However, it could be moved in its entirety and reused by putting it on display.



West gallery



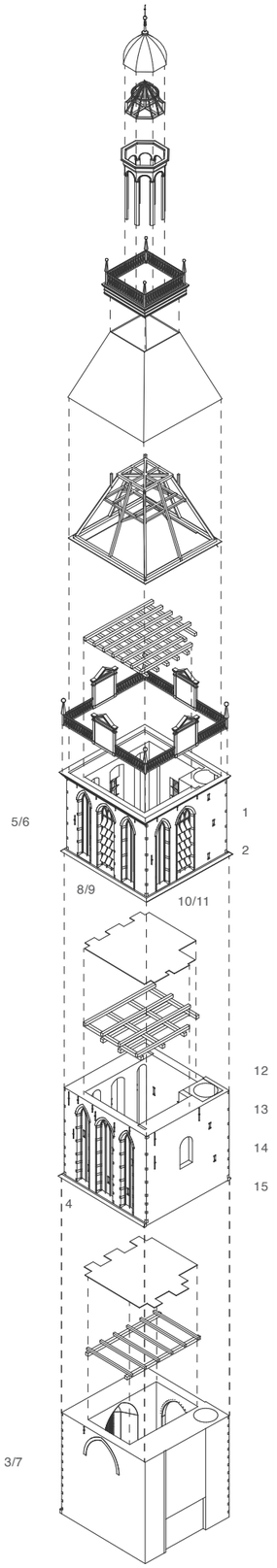
East gallery

Church tower

Materials	Number	Amount	Unit	Measurements	Remarks
Brick + Mortar	N.A.	990,135	m3	N.A.	N.A.
Natural stone strip	N.A.	71,23	m1	325 x 250 mm	N.A.
Natural stone strip	N.A.	6,87	m1	220 x 150 mm	N.A.
Natural stone sill stones	50	N.A.	pcs	N.A.	N.A.
Natural stone cornerstones	112	0,504	m3	150 x 150 x 200 mm	N.A.
Natural stone cornerstones	5	0,06	m3	200 x 200 x 300 mm	N.A.
Natural stone cornerstones	4	0,07	m3	220 x 220 x 350 mm	N.A.
Natural stone window decoration wide 1st	3	N.A.	pcs	N.A.	N.A.
Natural stone window decoration thin 1st	5	N.A.	pcs	N.A.	N.A.
Natural stone window decoration wide 2nd	4	N.A.	pcs	N.A.	N.A.
Natural stone window decoration thin 2nd	7	N.A.	pcs	N.A.	N.A.
Iron wall anchors 1325	15	N.A.	pcs	1325 x 50 mm	N.A.
Iron wall anchors 950	11	N.A.	pcs	950 x 50 mm	N.A.
Iron wall anchors 750	10	N.A.	pcs	750 x 50 mm	N.A.
Iron wall anchors 375	14	N.A.	pcs	375 x 50 mm	N.A.
Wooden eaves	N.A.	38,34	m1	325 x 300 mm	N.A.
Wooden planks	N.A.	169,72	m2	50 mm thickness	Story floor
Wooden beam floor tower	N.A.	17,68	m1	330 x 330 mm	N.A.
Wooden beam floor tower	N.A.	27,6	m1	330 x 290 mm	N.A.
Wooden beam floor tower	N.A.	17,6	m1	300 x 300 mm	N.A.
Wooden beam floor tower	N.A.	31,54	m1	290 x 270 mm	N.A.
Wooden beam floor tower	N.A.	104,7	m1	280 x 260 mm	N.A.
Wooden beam floor tower	N.A.	33,48	m1	200 x 200 mm	N.A.
Wooden beam floor tower	N.A.	52,84	m1	70 x 100 mm	N.A.
Wooden beam roof tower	N.A.	34,14	m1	280 x 250 mm	N.A.
Wooden beam roof tower	N.A.	70,98	m1	220 x 170 mm	N.A.
Wooden beam roof tower	N.A.	43,47	m1	200 x 150 mm	N.A.
Roof decking	N.A.	240,52	m2	N.A.	N.A.
Ceramic roof tiles grey	N.A.	240,52	m2	N.A.	N.A.
Wooden cuplar	1	N.A.	pcs	N.A.	N.A.

Elements in the Church tower

The tower consists mostly of brick and mortar. This totals 990.14 m3. In addition, a common material is natural stone; which can be seen in the keystones, strips and decoration. The brick and mortar has a load-bearing function and the identity of the tower is mostly determined by the combination of brick and the natural stone elements. The walls of the tower also feature many wall anchors. Finally, the upper floors of the tower are made of wooden beam structures topped with wooden planks as a finish. Provided these floors are removed, a lot of timber will be extracted. If this is the case, however, the installation of a new stability provision in the tower is recommended. In total, 285.44 m1 of wooden beams consisting of many different beam sizes ranging from 70 x 100 mm to 330 x 300 mm are involved. It should also be considered that these floors currently support the carillon and large church bells. A new solution will also have to be found for this when the floors are removed.



Church tower

Trader’s house

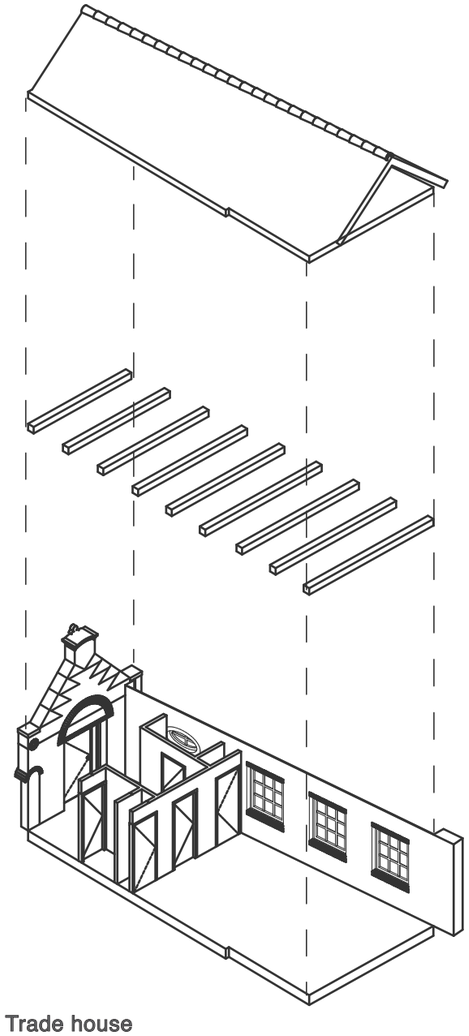
Materials	Number	Amount	Unit	Measurements	Remarks
Brick + Mortar	N.A.	9,34	m3	N.A.	N.A.
Inner walls	N.A.	2,18	m3	100 mm thickness	N.A.
Window opening rectangle	3	N.A.	pcs	N.A.	N.A.
Window opening oval	1	N.A.	pcs	N.A.	N.A.
Door opening	1	N.A.	pcs	1487 x 2100 mm	N.A.
Rejuvenation in wall	N.A.	0,675	m2	N.A.	N.A.
Ceramic roof tiles orange	N.A.	51,57	m2	N.A.	N.A.
Roof decking flat roof	N.A.	5,45	m2	N.A.	N.A.
Roof decking	N.A.	51,57	m2	N.A.	N.A.
Horizontal wooden beam	N.A.	34,99	m1	200 x 200 mm	N.A.

Pastor’s house

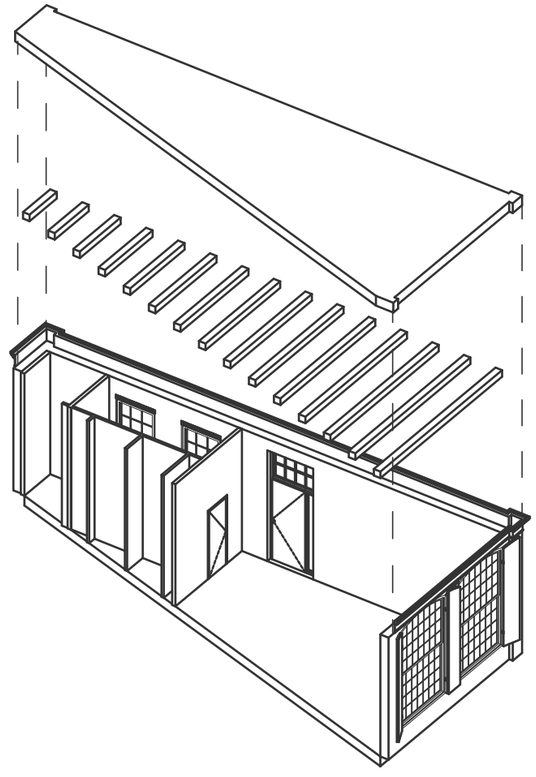
Materials	Number	Amount	Unit	Measurements	Remarks
Brick + Mortar	N.A.	6,67	m3	N.A.	N.A.
Inner walls bricks	N.A.	0,88	m3	100 mm thickness	N.A.
Inner walls bricks	N.A.	1,27	m3	70 mm thickness	N.A.
Window opening arched	2	N.A.	pcs	N.A.	N.A.
Window opening rectangle	2	N.A.	pcs	N.A.	N.A.
Door	1	N.A.	pcs	1487 x 2100 mm	N.A.
Wooden eaves	N.A.	38,34	m1	N.A.	N.A.
Roof decking	N.A.	50,27	m2	N.A.	N.A.
Horizontal wooden beam	N.A.	49,27	m1	200 x 200 mm	N.A.

Elements in the Pastor’s- and Trader’s house

Both the Pastor’s- and the Trader’s house have the same construction. The outer and inner walls of the buildings consist of bricks and mortar. Provided only the inner walls of both buildings will be removed, this will yield a total of a small amount of 4.33 m3 of bricks. In addition, both buildings contain wooden beams with dimensions of 200 x 200 mm, making a total of 84.26 m1 of wooden beams. In addition, both roofs contain orange ceramic tiles yielding a total of 101.84 m2 of roof tiles.



Trade house

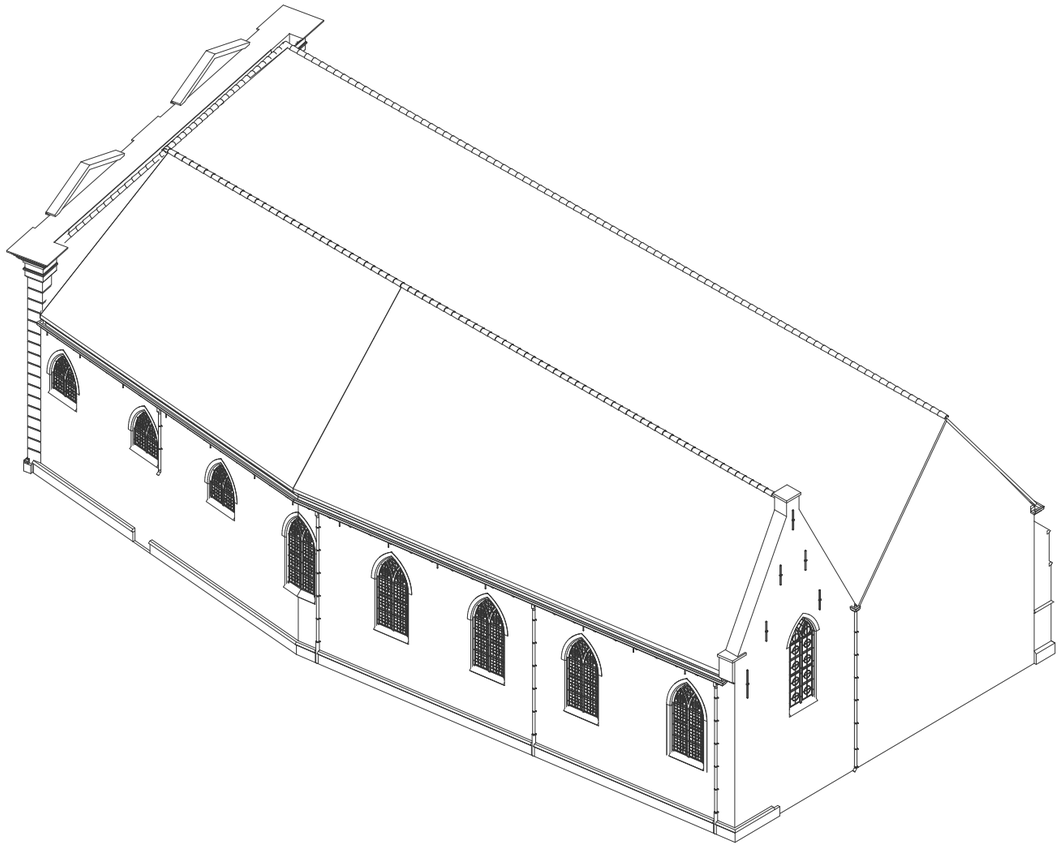


Preachers house

ELEMENTS VS BUILDING

Elements vs Building

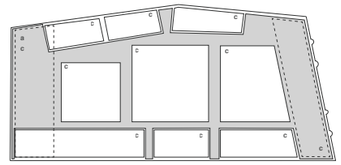
Next to defining the present and accessible stock of materials in the Grote- of Mariakerk, there is also a second part of the Zero-Waste design, which is defining the impact of removing certain materials or elements. What happens to the experience, spatial relations, -organization, and circulation of the church when certain elements are removed, or doesn't it impact the building at all? To determine the impact of the building elements and how they define the Grote- of Mariakerk as it is today. The elements are analyzed on different aspects, such as their impact on the experience of the church, spatial relations, spatial organization, elements that define the space, circulation, and building section. The elements that are analyzed are the building elements with the greatest influence on the character and experience of the building, such as the church tower, side buildings, roof, and associated structure, galleries, and pillars. By measuring the impact of these elements, the first step is taken toward the eventual development of a Zero-Waste redesign of the Grote or Mariakerk.



Removal of the Church tower and Side buildings

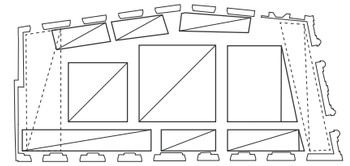
The removal of the church tower and side buildings has an immense impact on many aspects of the building. The whole identity of the church changes, as the church tower is the element by which the church is recognised. The impact of the removal of the side buildings is less relevant than the removal of the tower. Nevertheless, the church loses its identity when the outbuildings are removed, as the combination of building elements together form a unity that is then lost. A lot also happens in the perception of the building on the inside when the church tower and side buildings are removed. Thus, the church loses its main entrance and the circulation is also affected by the removal of the adjacent spaces.

Spacial relations



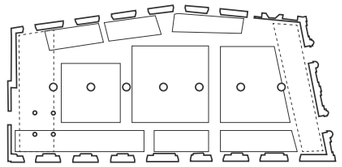
Spaces linked by a Common space (a) + Adjacent Spaces (b) + Space within a Space (c)

Spacial organisation



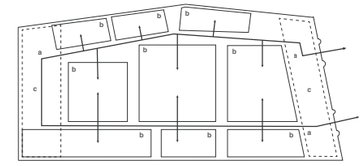
Clustered organisation (Spaces organized by geometry)

Elements defining space



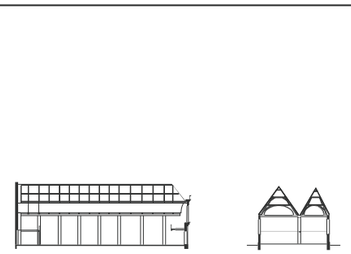
Elements defining space (four planes): Closure

Circulation



Pass by spaces (a) + Terminate in spaces (b) + Pass through spaces (c)

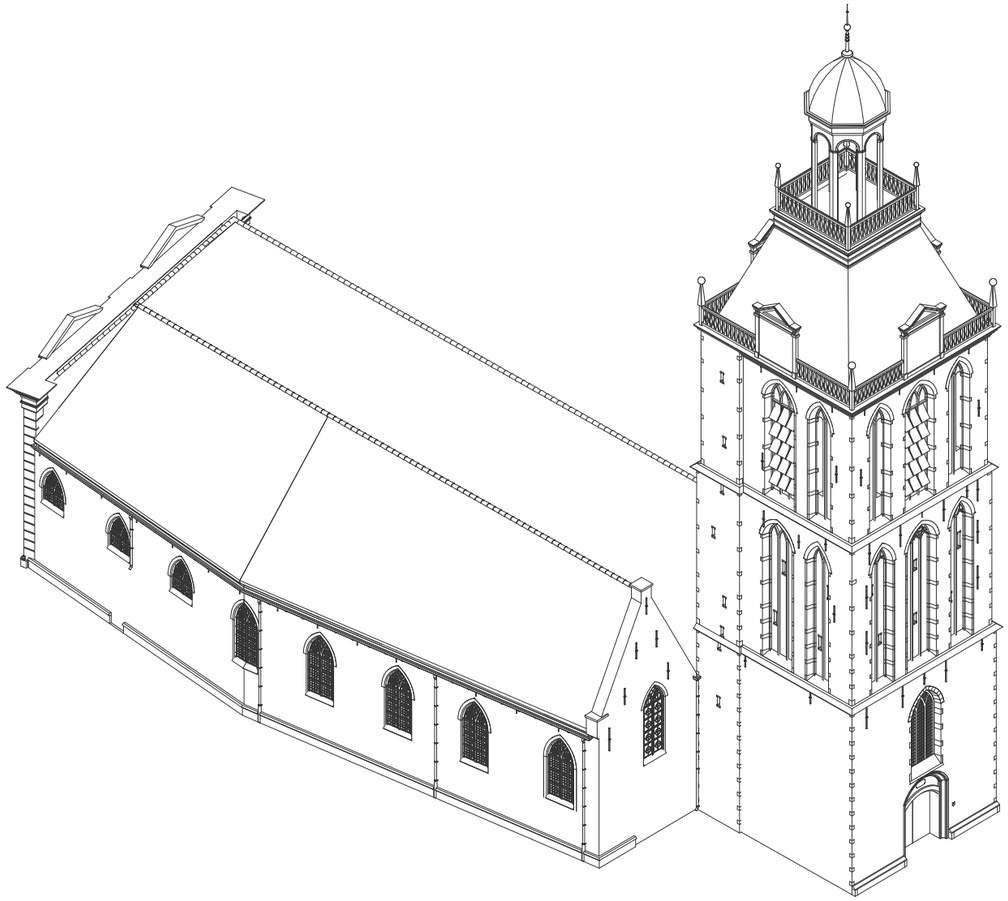
Section



Section

Circulation

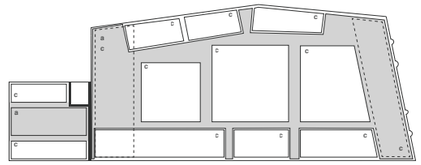
Configuration of the path



Removal of the Side buildings

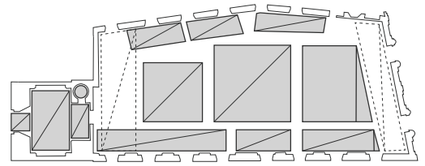
The church loses its identity when the side buildings are removed, as the combination of building elements together form a unity that is then lost. The perception of the building on the inside also changes when the side buildings are removed. The circulation is affected by the removal of the adjacent spaces.

Spacial relations



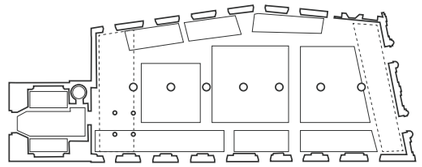
Spaces linked by a Common space (a) + Adjacent Spaces (b) + Space within a Space (c)

Spacial organisation



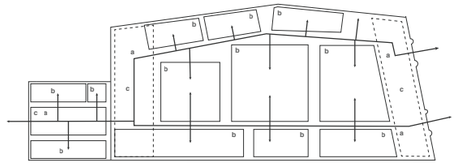
Clustered organisation (Spaces organized by geometry)

Elements defining space



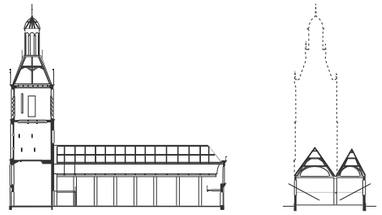
Elements defining space (four planes): Closure

Circulation



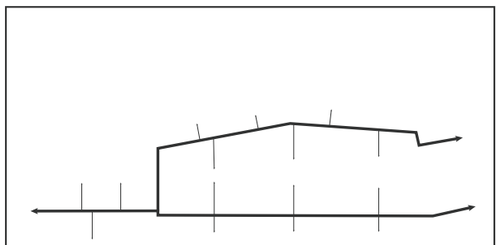
Pass by spaces (a) + Terminate in spaces (b) + Pass through spaces (c)

Section



Section

Circulation

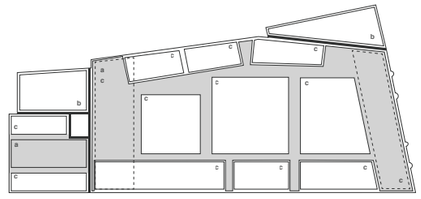


Configuration of the path

Removal of the Church Roof structure and Ceiling

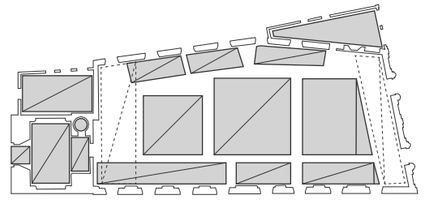
By removing the church roof structure and ceiling, the height of the space is altered. The dichotomy is greatly reinforced by the fact that division is already present at two-thirds of the space, instead of at the top of the space. The wooden beam construction and the ceiling are both examples of craftsmanship that contribute to the identity of the church hall. The removal of these components results in a great loss of identity in the interior of the church.

Spacial relations



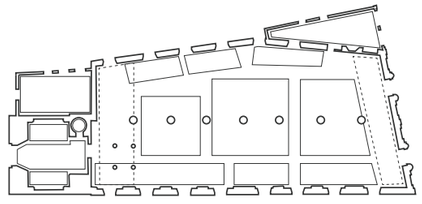
Spaces linked by a Common space (a) + Adjacent Spaces (b) + Space within a Space (c)

Spacial organisation



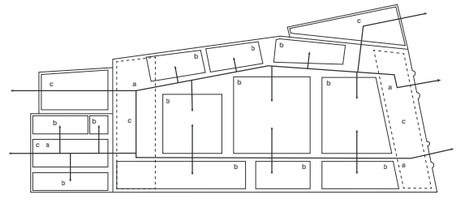
Clustered organisation (Spaces organized by geometry)

Elements defining space



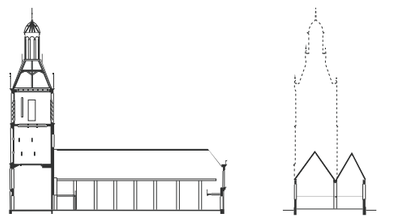
Elements defining space (four planes): Closure

Circulation



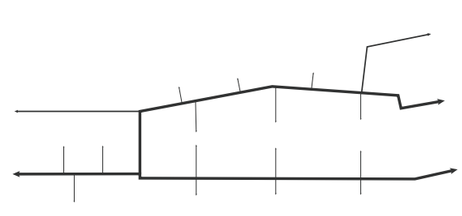
Pass by spaces (a) + Terminate in spaces (b) + Pass through spaces (c)

Section



Section

Circulation

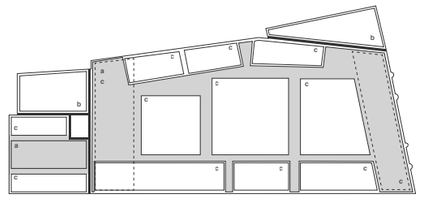


Configuration of the path

Removal of the Church hall roof and ceiling

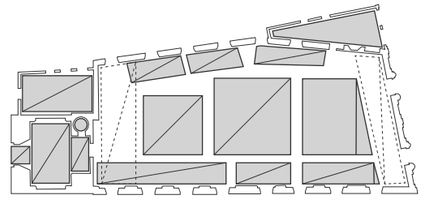
By removing the roof and ceiling of the church, the roof structure jumps into view and creates a link with the exterior context by showing the trees and sky. As a result, the focus of the space is no longer solely on the pillars, but shifts more towards the top of the building. Nothing changes in the relationships, organization and routing within the building. It mainly creates a spatially larger-looking space in the church hall.

Spacial relations



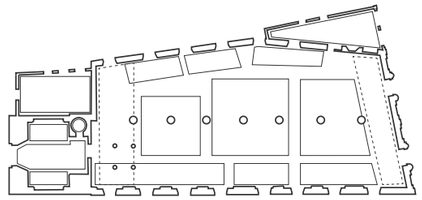
Spaces linked by a Common space (a) + Adjacent Spaces (b) + Space within a Space (c)

Spacial organisation



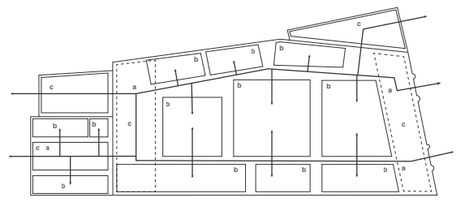
Clustered organisation (Spaces organized by geometry)

Elements defining space



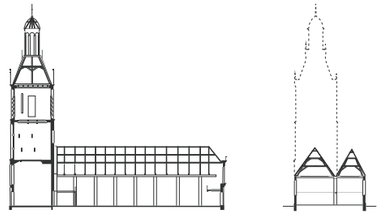
Elements defining space (four planes): Closure

Circulation



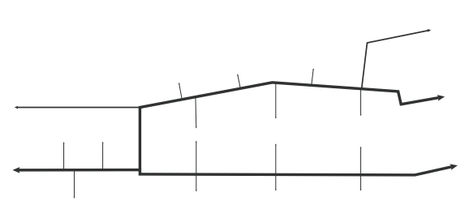
Pass by spaces (a) + Terminate in spaces (b) + Pass through spaces (c)

Section



Section

Circulation

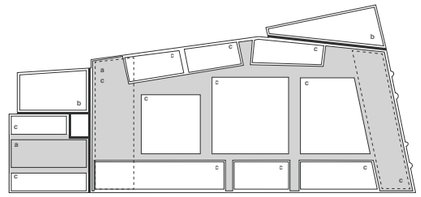


Configuration of the path

Removal of the Church hall ceiling

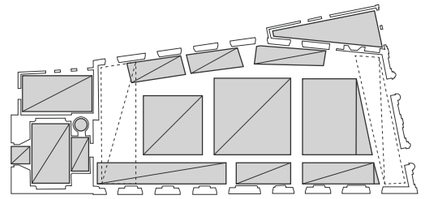
The removal of the church’s ceiling removes an iconic element in the church. These semicircular wooden ceilings are an example of craftsmanship and they give identity to the church. On the other hand, this makes the roof construction, which was not visible before, visible and this also gives identity back to the building. Nothing changes in the relationships, organization and routing within the building. It mainly creates a spatially larger-looking space in the church hall in which the focus is no longer solely on the pillars.

Spacial relations



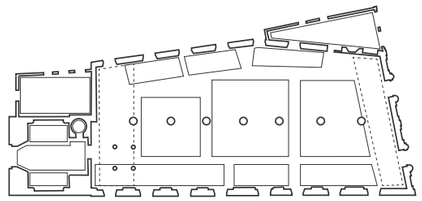
Spaces linked by a Common space (a) + Adjacent Spaces (b) + Space within a Space (c)

Spacial organisation



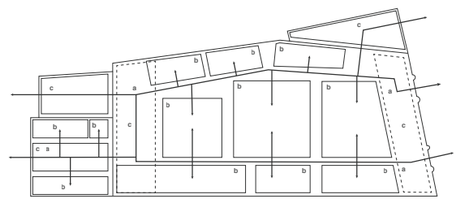
Clustered organisation (Spaces organized by geometry)

Elements defining space



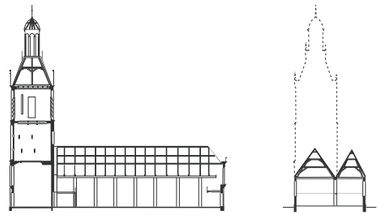
Elements defining space (four planes): Closure

Circulation



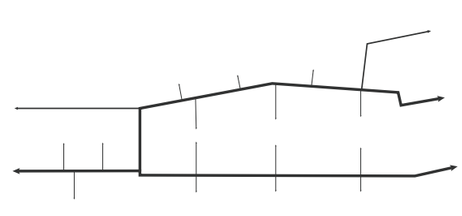
Pass by spaces (a) + Terminate in spaces (b) + Pass through spaces (c)

Section

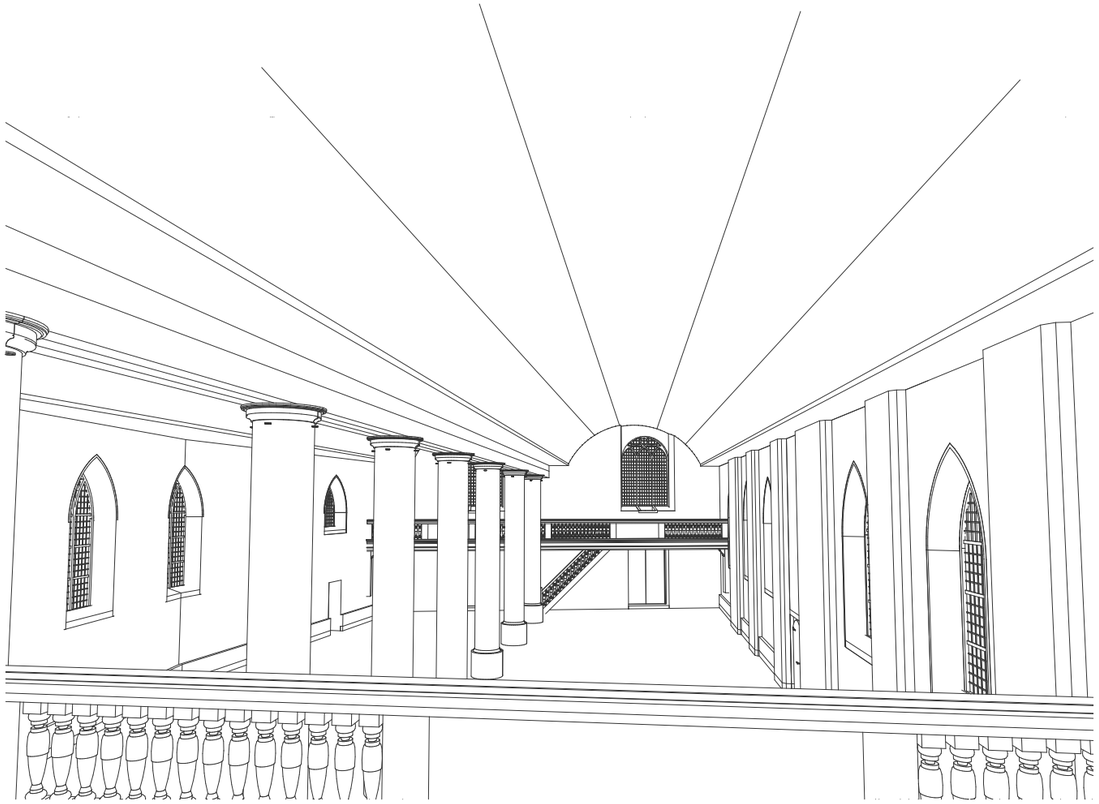


Section

Circulation



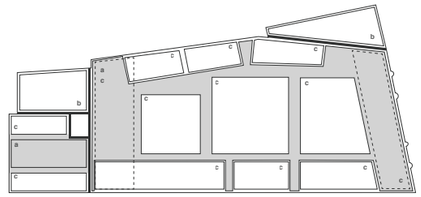
Configuration of the path



Removal of the Church hall wooden beam layer

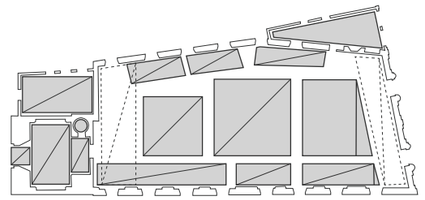
Removing the wooden beam makes the space look larger and brings the focus of the church hall to the semicircular ceilings, whereas these ceilings were previously in the background. The dichotomy is greatly enhanced by the fact that the partition is already at three-quarters of the space, rather than at the top of the room. Nothing changes about the proportions, organization and routing within the building. Mostly, it creates a spatially larger-looking space in the church hall in which the focus is no longer solely on the pillars.

Spacial relations



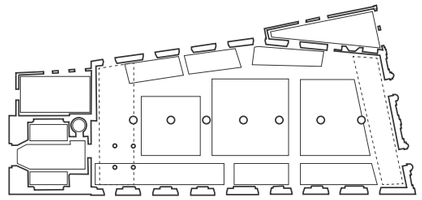
Spaces linked by a Common space (a) + Adjacent Spaces (b) + Space within a Space (c)

Spacial organisation



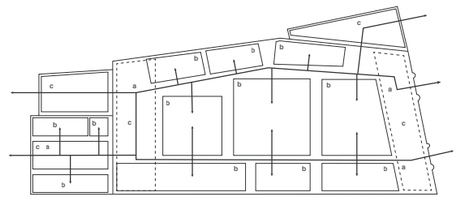
Clustered organisation (Spaces organized by geometry)

Elements defining space



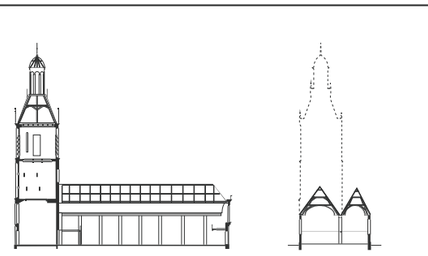
Elements defining space (four planes): Closure

Circulation



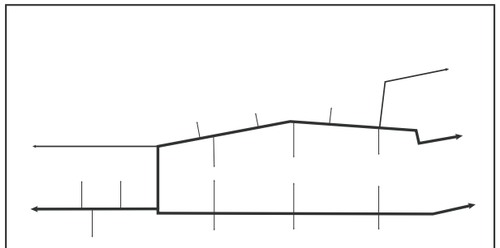
Pass by spaces (a) + Terminate in spaces (b) + Pass through spaces (c)

Section



Section

Circulation

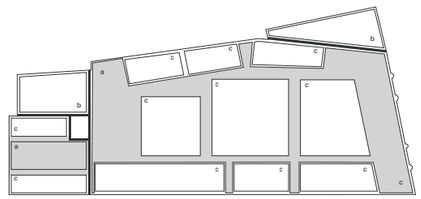


Configuration of the path

Removal of the Church hall galleries

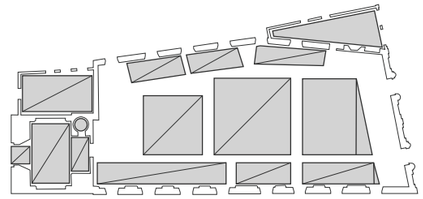
Removing the galleries changes the church hall from a multi-storey space to a single-level space. It also changes the routing as a result, given there are no more routes up. The perception of the space does change, but the difference is manageable. This is because the essence of the space is not in the galleries, as they are in the background in relation to the pillars. However, interesting vantage points from the galleries do disappear into the space when the galleries are removed.

Spacial relations



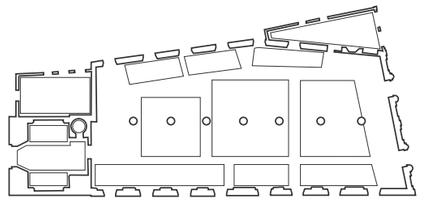
Spaces linked by a Common space (a) + Adjacent Spaces (b) + Space within a Space (c)

Spacial organisation



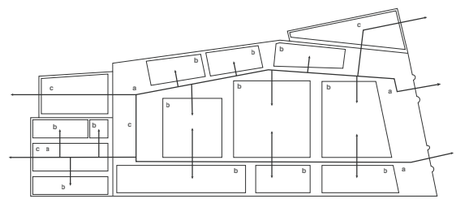
Clustered organisation (Spaces organized by geometry)

Elements defining space



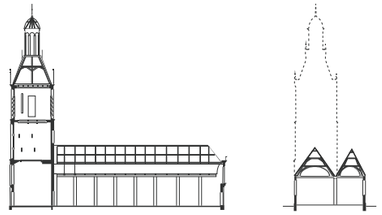
Elements defining space (four planes): Closure

Circulation



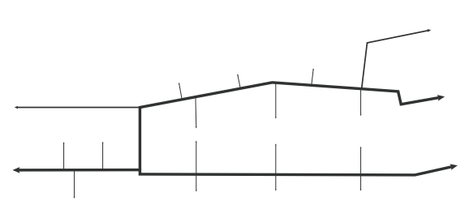
Pass by spaces (a) + Terminate in spaces (b) + Pass through spaces (c)

Section



Section

Circulation

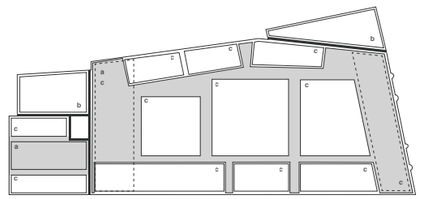


Configuration of the path

Removal of the Church hall pillars

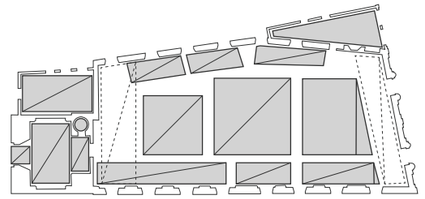
By removing the pillars in the church hall, the division disappears and one large space is created. The creation of this large open space offers many possibilities when choosing new functions for the church. However, the division of the church hall by means of the row of pillars represents the historical growth the building has experienced and this is part of the building's identity.

Spacial relations



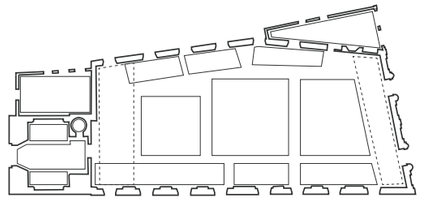
Spaces linked by a Common space (a) + Adjacent Spaces (b) + Space within a Space (c)

Spacial organisation



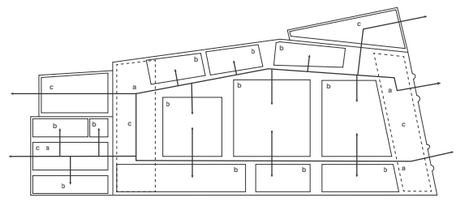
Clustered organisation (Spaces organized by geometry)

Elements defining space



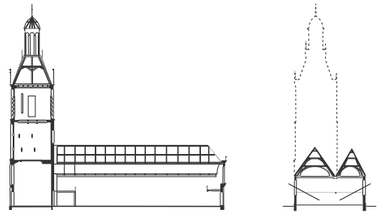
Elements defining space (four planes): Closure

Circulation



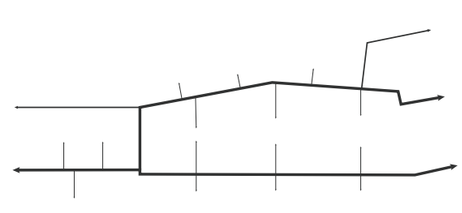
Pass by spaces (a) + Terminate in spaces (b) + Pass through spaces (c)

Section



Section

Circulation



Configuration of the path

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