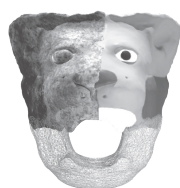


# **The digital 3D reconstruction of the 18<sup>th</sup> c. Bloemstraat and Eerste Bloemdwarsstraat**

Tijm Lanjouw



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## Abstract

A 3D reconstruction of the 18<sup>th</sup> century situation in the Bloemstraat and Eerste Bloemdwarsstraat, two narrow streets in the Amsterdam Jordaan neighbourhood, was made as a virtual space for visualisation and analysis of social patterns in historic street life. This report discusses the creation of the digital 3D model.

## *Project datasheet*

<b>Name project</b>	Freedom of the Streets – The digital 3D reconstruction of the 18th c. Bloemstraat and Eerste Bloemdwarsstraat.
<b>Date (from – to)</b>	05/02/2020 – 26/11/2020
<b>Author of report</b>	Tijm Lanjouw, 4D Research Lab
<b>Project initiators</b>	Dr. Danielle van den Heuvel, project director Freedom of the Streets, Historical studies, University of Amsterdam  Dr. Gamze Saygi, post-doc researcher Freedom of the Streets, Historical studies, University of Amsterdam
<b>Execution</b>	Tijm Lanjouw, 4D Research Lab: research, LiDAR, 3D modelling  Mattia Lucca, student assistant, 4D Research Lab: 3D modelling  Maroesjka Verhagen, research assistant, Freedom of the Streets: archival research  Jitte Waagen, 4D Research Lab: coordination and LiDAR
<b>Scientific advice</b>	Prof. Dr. Gabri van Tussenbroek, Art History, University of Amsterdam and department of monument care, Municipality of Amsterdam.
<b>Delivered product</b>	3D model in Blender of the reconstructed houses of a part of the 18th century Bloemstraat and Eerste Bloemdwarsstraat.
<b>Where to access main outcomes/product</b>	Available on request at the 4D Research Lab or Freedom of the Streets. Contact Tijm Lanjouw (t.j.r.lanjouw@uva.nl).
<b>Location and accessibility of project files</b>	4D Research Lab archive, cloud storage. Available on request at the 4D Research Lab. Contact Tijm Lanjouw (t.j.r.lanjouw@uva.nl).
<b>Related publications</b>	Heuvel, D. van den, Noordegraaf, J., <i>in press</i> . Unpacking Urban Life in the Past. Time Machine as a Method for Research on the Urban Flow of the Amsterdam Bloemstraat.  Saygi, G., 2020. <i>Towards a digital 3D narration of the premodern street life in Amsterdam</i> . Blogpost. <a href="https://www.freedomofthestreets.org/blog/3d-street-life">https://www.freedomofthestreets.org/blog/3d-street-life</a>  Saygi, G., 2020. <i>Employing digital tools in historical research: Bloemstraat goes 3D</i> . Blogpost. <a href="https://www.freedomofthestreets.org/blog/whybloemstraat">https://www.freedomofthestreets.org/blog/whybloemstraat</a>



*Figure 1. 18<sup>th</sup> century drawing of a street scene at the beginning of the Bloemstraat looking towards the Westerkerk (Drawing: H.P. Schouten, 1772/Stadsarchief Amsterdam).*

## Introduction

This modelling project is part of Freedom of the Streets (<https://www.freedomofthestreets.org/>), a research project ran by the department of History at the University of Amsterdam. The project aims to investigate the gendering of urban space in early modern cities, with the specific focus on the visibility of women in public spaces. It involves a cross-cultural comparison of three different cities: Amsterdam, Berlin and Edo (currently named Tokyo). In the period of investigation, 1600 to 1850, women gradually withdrew from the public sphere. Freedom of the streets proposes that this general narrative obscures the details of actual daily life, and sets out to create a more varied and detailed picture of social use of urban space. One of the case studies is 18<sup>th</sup> century Jordaan, specifically, the Bloemstraat.





Figure 2. Location of Bloemstraat and Eerste bloemdwardsstraat in their urban context. Map on the background is satellite imagery from Google maps. Coloured overlay are the streets and waterways as mapped for the cadastral registration in 1832.

### *Historical background*

The Jordaan is a neighbourhood in Amsterdam with its origins in the early 17<sup>th</sup> century, constructed during the ‘Derde Uitleg’ (‘Third Expansion’) of the city and its military defence system. It was created in a former ‘polder’, an area cut by many narrow ditches and smaller canals that drained into the Prinsengracht. The structure of this drainage system is still visible today in the general orientation of its streets and canals, which differs from the adjoining canal ring. This is the main cause of the odd angles that the streets in the Jordaan make with the Prinsengracht, Lijnbaansgracht, and Brouwersgracht, which together enclose the neighbourhood.

The Bloemstraat is one of these streets (Figure 1, Figure 2). Positioned in between two main canals, the Bloemgracht and former Rozengracht (now a street), the Bloemstraat is a secondary street, not located on one of the main communication routes. It is crossed by two shorter streets, the Eerste and Tweede Bloemdwardsstraat, that form the connection between the Bloemgracht and the Rozengracht. The Bloemstraat lines up exactly with the Westerkerk across the Prinsengracht. As a result, this church visually dominates the views out of the street.

An interesting historic feature is that within the ambit of the chosen street segments (see below) a Mennonite church was located until 1728 (Bloemstraat 49-51), and depicted on two 18<sup>th</sup> century drawings. The buildings were (partly) demolished and replaced by regular houses after 1728.

The aim is to construct a 3D model of part of the Bloemstraat and Tweede Bloemdwarsstraat in the 18<sup>th</sup> century, to form the basis for a socio-spatial analysis and visualization by Gamze Saygi, post-doctoral researcher in the Freedom of the Streets project (*Subproject 3: Visualising gendered movement*). The reason for choosing this street was not due to some particular research interest in the Bloemstraat, but because the street is considered to be a good representation of an average Jordaan street.

In this subproject, the research questions focus on the relation between the social (gendering, interaction) and material (urban structure, architectural elements), spatial (configuration, movement), and visual (visibility, privacy) properties of urban space. Therefore, a virtual 3D model is considered an effective platform for analysis as well as visualisation of research results.

## Research design and data collection

### *Demarcation of research area*

Since not the entire Bloemstraat could be reconstructed within the project's timeframe and budget, a certain segment had to be selected. The choice of project members fell on the segments of street surrounding the cross-section with the Eerste Bloemdwarsstraat. Cross-sections have always been interesting foci of urban activity, and a relatively large number of original buildings from the 17<sup>th</sup> and 18<sup>th</sup> century still survive here. Besides, it was expected to find here an interesting mix of people, as generally, the wealthier people lived near the Prinsengracht, and the poorer people further down the streets into the Jordaan. The presence of the former Mennonite church also played a role in the choice of this area.

In terms of chronological specification, we aimed at a reconstruction of the street in the middle of the 18<sup>th</sup> century.

### *Methodology*

Since part of the buildings still exist, it was decided to make a 3D LiDAR scan of the street to form an accurate basis for the 3D reconstruction. This was amended with a historical cartographic and pictographic study in order to fill in missing information, and to discern potential historical architectural modifications.

These kinds of reconstructions rely for a large part on the researcher's ability to recognize particular architectural features and classify them chronologically. Although the main researcher and author of this report is experienced in this type of work, for certain specific problems and questions, advice was sought of prof. dr. Gabri van Tussenbroek, building and urban historian specialised in historical Amsterdam architecture.





Figure 3. The reconstructed segments of the Bloemstraat and Eerste Bloemdwarsstraat (image based on GIS mapping in QGIS).

### Historical data collection

The image data was collected by Maroesjka Verhagen, student assistant to the Freedom of the Streets project. The most important source in this case is the *beeldbank*, the digital image resource of the Amsterdam archives (<https://archief.amsterdam/beeldbank/>). The images were downloaded from this resource, and were renamed formatted in the following way: {date\_address\_image Id on the beeldbank.jpg}. A separate copy of an image was made for each house that is represented on the image. The specific houses are indicated on the image with lines or arrows. The available pictographic data for each house was summarised in a spreadsheet. In the same spreadsheet an assessment was made of the viability of an 18<sup>th</sup> century reconstruction based on the available data.

The historical cartographic data was collected by the author of the report and a GIS document was made in which this data is combined. The most important historical cartographic source is the 1832 cadastral mapping, which formed the base for the modelling.

### Selection of houses

Based on an initial assessment of the historical data, a selection of houses was made that could be reconstructed to an 18<sup>th</sup> century phase with some degree of reliability (Figure 3). In the figure, the red plots are houses constructed after the 18<sup>th</sup>

century and for which no good historical image data could be found. The green plots represent houses that currently still have a large number of original elements, or for which reliable historical evidence could be found. These are the houses that have been modelled in detail, while the other houses were modelled as generic volumes in order for the viewer to perceive a continuous urban structure.

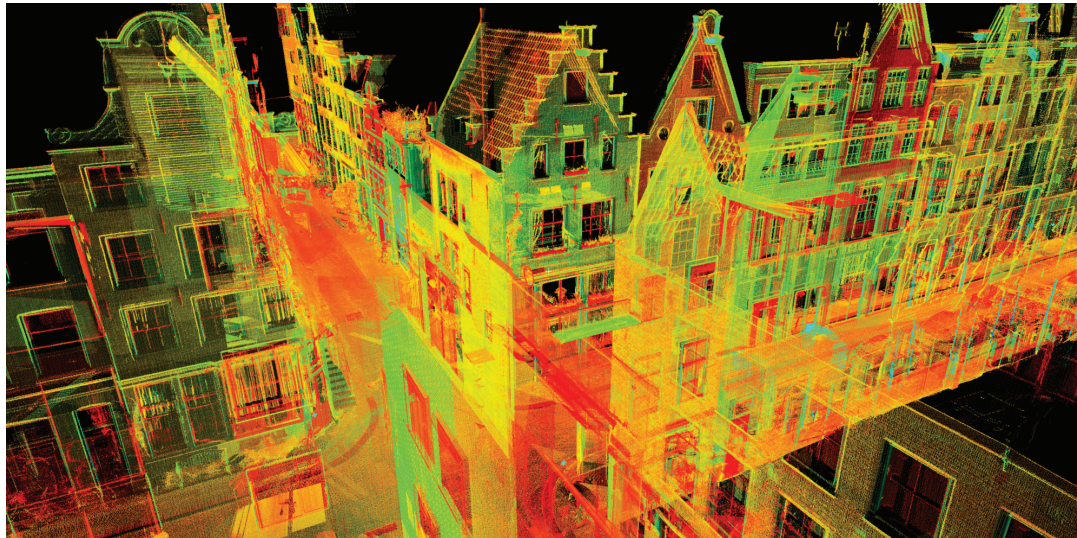


Figure 4. Screenshot of part of the scan data made in Leica's Cyclone software.

### *LiDAR scan*

On the 14<sup>th</sup> of April 2020 a LiDAR (laser) scan was made of the selected parts of the Bloemstraat and Eerste Bloemdwarsstraat. The 4DRL's Leica p30 was used. No colour data was captured. The required scan data was roughly cleaned up and cut out from the raw data. Two exports were made, one set with high resolution data (.p57 format, point distance 2-3mm), and a lower resolution dataset to be used as modelling base (.ply format, average point distance 1 cm).

## Reconstruction

### *Data review and interpretation*

Most of the collected images date to the 19<sup>th</sup> and 20<sup>th</sup> centuries, which means there is little direct historical evidence of how this segment of the Bloemstraat looked like in the 18<sup>th</sup> century. The only depicted building is the Mennonite church, which existed in the Bloemstraat from 1640 to 1728. Two versions of a very similar drawing exist, one dating to 1729 by Pronk<sup>1</sup> and one to 1780 by Verstegen & Phillips<sup>2</sup>. Since by 1780 the

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<sup>1</sup> <https://archieff.amsterdam/beeldbank/detail/142eb909-edf8-ddd9-7e84-02c8dcd97416>

<sup>2</sup> <https://archieff.amsterdam/beeldbank/detail/69b8f55b-b7a8-3d61-fe33-6e8ec33b9e82>

Bloemstraat - 3D scan datasheet	
Scanner model	Leica p30
Technique	LiDAR (laser)
Scan date	14/04/2020
Scan area	Bloemstraat 1-60, Eerste Bloemdwardsstraat 1-26
Scan resolution raw data	1mm on a distance of 10 m
Number of scans	22
Post-processing	Rough clean-up and sub selections of relevant data in Leica's Cyclone software, and CloudCompare
Exported scans	2 datasets:  .e57, average point distance 2.5mm  .ply, absolute point distance 1 cm

Table 1. Scanning datasheet

church had long ceased to exist, and the buildings were largely replaced or modified, the later drawing is a historicising image. The later drawing was probably based on the earlier one, and some details may have been imagined.

Before that date, the only other historical depiction of this segment of the Bloemstraat is on Balthasar Florisz. Berckenrode's map of Amsterdam, originally published in 1625 (Figure 5).<sup>3</sup> Although van Berckenrode's map saw several reprints, the last one being in 1657, the Bloemstraat area was never updated to a more recent situation. Although van Berckenrode generally depicts individualised buildings with reasonable accuracy, the Mennonite church building as seen on the 18<sup>th</sup> century drawings, and with a founding date of 1640, is not depicted on the 1657 map.

The 19<sup>th</sup> and 20<sup>th</sup> century images consist of photos and blueprints. In some of these 17<sup>th</sup> or 18<sup>th</sup> century houses could be recognized that do not exist today and could be used to amend the data from the laser scan.

Even though the laser scan of the current situation and the historic pictographic evidence show various 17<sup>th</sup> and 18<sup>th</sup> century elements, it is clear that very few houses are completely authentic. Even comparing early and middle 20<sup>th</sup> century photos of

<sup>3</sup> <https://archief.amsterdam/beeldbank/detail/efc4ec29-23b5-ce93-90f1-d5966b14b946>





Figure 5. Portion of Balthasar Florisz. van Berckenrode's map of Amsterdam zoomed onto the Bloemstraat and Eerste Bloemdwarsstraat. Outlined in white the later location of the Mennonite church. Outlined in dark grey Bloemstraat 44, with a different window division on the side than the current 18<sup>th</sup> century building (image: Stadsarchief Amsterdam).

the same house, can reveal considerable differences (Figure 6). Especially the ground floor facade, often a timber frame structure supporting the masonry of upper floors, was regularly replaced. The oldest lower facades still surviving today or on photographs are therefore dated in the 19<sup>th</sup> century on stylistic grounds. A possible exception is Bloemstraat 42, which may have an original 18<sup>th</sup> century lower facade frame.

However, generally we can assume that timber elements have a higher replacement rate than brick elements, and are therefore expected to be newer. This is valid for the window frames, and especially the panel division as indicated by the rods. In none of the cases the original 18<sup>th</sup> century window frame panel size is preserved (Figure 7).

### 3D modelling

All relevant data was combined in Blender, the 3D modelling software used for this purpose. A low-resolution version of the point cloud data (1cm) was used to improve handling speed in the viewport (Figure 8). The historical images were prepared in gimp (image editing software): the perspective was corrected, and the images were scaled in relation to an orthographic projection of the point cloud, after which they were loaded in Blender (Figure 9). As this is a manual process, this results in somewhat less accurate models than those based on the point cloud. Also, lens deformation affects the accuracy of the reconstructions to a small degree. Lens correction is not a solution here as the model of the camera and lens are unknown.





Figure 6. Example of modifications to a house (Bloemstraat 35). Original building with late 17th/early 18th century gable. To the left photo dating to 1930, with a lower facade timber frame probably dating the 19th century suffering from structural problems. To the right a photo from the 1950s, showing the replaced lower facade with a different window and door configuration (both images: Stadsarchief Amsterdam<sup>4</sup>).

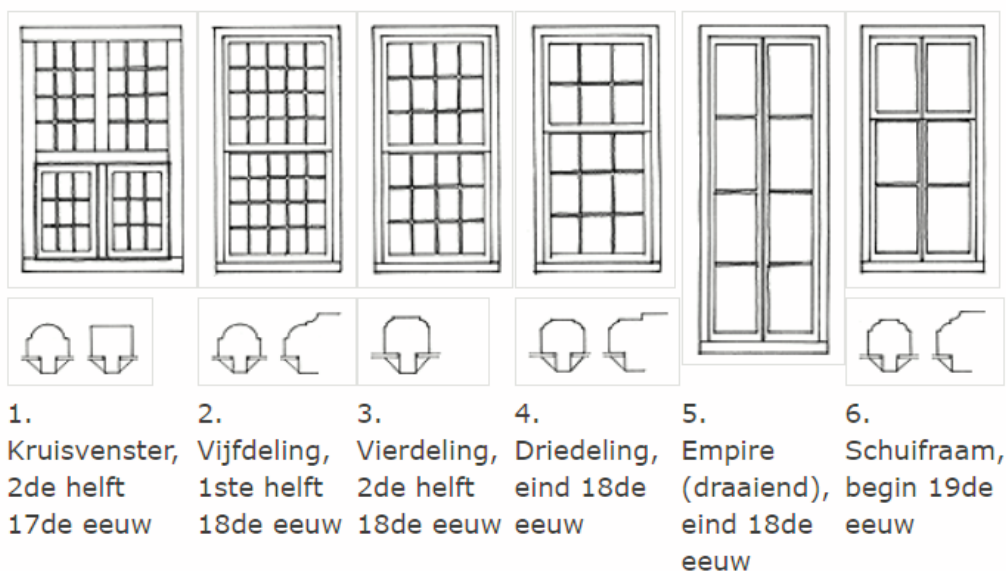


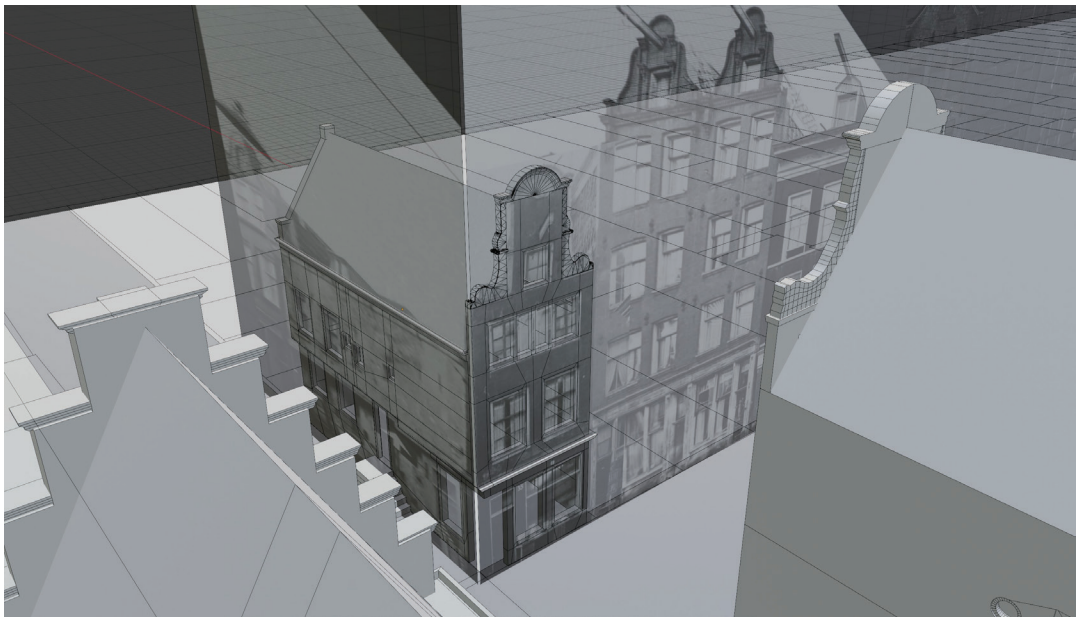
Figure 7. Window typology illustrating the chronological evolution of window panel size (illustration: Rouwhorst 2005).

<sup>4</sup>

<https://archief.amsterdam/beeldbank/detail/b6fcb840-4d2d-6883-061e-ba5611fc22ea>  
<https://archief.amsterdam/beeldbank/detail/703dfdf8-8527-11e4-bf84-cb7f6ae84d50>



*Figure 8. Example of modelling based on the point cloud data.*



*Figure 9. Example of modelling based on ortho corrected historical photography.*

### *Level of detail*

The houses were modelled in moderate to high level of detail, with most architectural elements represented (LOD 3 on a scale of 4).<sup>5</sup> Highly decorative elements with complex geometries such as gables were represented by generalised shapes, and relatively small parts such as anchor plates and hinges were not modelled. The choices result from the research questions which focus on the social presence and movement of people, and visibility in and outwards from houses to the streets. Higher degrees of detail would not be justified or necessary to meet the research goals.

### *Uncertainty, assumptions and choices*

Several assumptions and choices had to be made in order to reconstruct a mid-18<sup>th</sup> century state of the street. There are a certain number of uncertainties as result of lack of data and subsequent physical modifications to the architecture. This primarily relates to the placement, size and form of windows and doors, especially on ground level. For instance, the 1625 map of van Berckenrode gives us a clear view on the side of one of the corner houses, Bloemstraat 44, revealing a completely different window configuration than the current building. It also features a dormer, not present on the current building. On the other hand, the reliability of van Berckenrode, especially when it concerns regular houses, is always a question (Hameleers 2015: 35-38). If more certainty regarding the locations and changes to the dimensions of opening is required, a complete building-historical study on-site should be executed.

Few of the current windows, and those found on the historical photos, have a panel division and size typical for the 18<sup>th</sup> century. The only exception is perhaps Bloemstraat 19, which may have late 18<sup>th</sup> century windows. Since it is certain that the current window situation does not correctly represent the 18<sup>th</sup> century situation, all windows in the model were replaced by 18<sup>th</sup> century types.

Another uncertainty arises with the presence of window shutters. 17<sup>th</sup> century houses frequently feature window shutters, a typical element of the cross-frame window. The cross-frame window got replaced by sash windows in the late 17<sup>th</sup> century, which often do not feature shutters (Mooiman 2001). Nevertheless, as can be seen on H.P. Schoutens extensive visual documentation of 18<sup>th</sup> century Amsterdam, a sizable portion of the 18<sup>th</sup> century houses still had old style windows with shutters, primarily in their higher floors.<sup>6</sup>

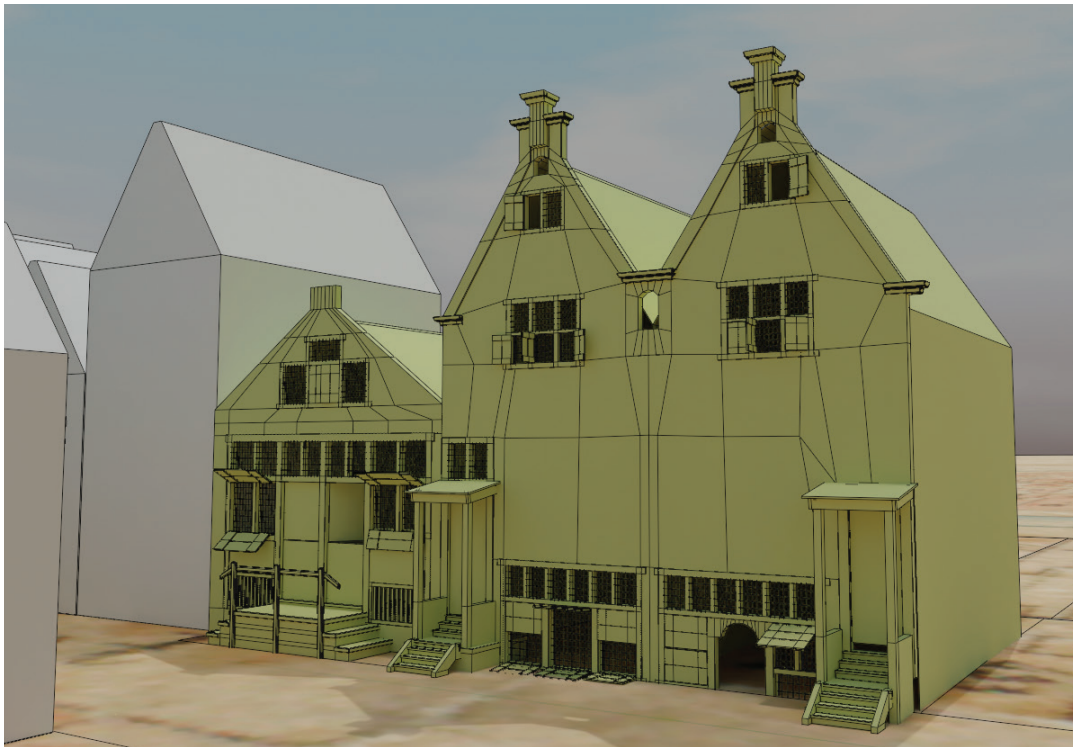
As with the windows, the lower facades evidently do not represent authentic 18<sup>th</sup> century frames. We can assume that generally, the height will have been constant from modification to modification (although this is not necessarily the case). However, the splitting of houses in multiple habitation units and the change of ground floor

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<sup>5</sup> See Lanjouw & Waagen (2021, p. 10) for the LOD classification the 4DRL uses.

<sup>6</sup> A search for H.P. Schouten on <https://archief.amsterdam/beeldbank/> produces 488 drawings and prints by this 18<sup>th</sup> century artist.





*Figure 10. Reconstruction of the Mennonite church building, and low timber house next to it dating to the period 1640-1728.*

functional use, will have impacted the lower facade structure. Front doors could have been added, or entire windows could have been replaced by garage or stable doors. Since it is assumed that most of the house splitting and addition occurred in the 19<sup>th</sup> century (Gabri van Tussenbroek, pers. comm.) due to the increased population pressure, many houses that have two front doors nowadays or in the early 20<sup>th</sup> century, may not have had them back in the 18<sup>th</sup> century. This issue can only be solved by more detailed archival-historical research. The same would be valid for the presence of stable doors.

In the model, some houses have been modelled as they are currently, with their 19<sup>th</sup> or 20<sup>th</sup> century facades. In other cases, which are generally the more basic facades, the windows are replaced by 18<sup>th</sup> century style windows. Also, clearly modern or 19<sup>th</sup> century garage doors were replaced by a regular window. The choices made for a particular house can be found annotated in the model, and described in detail in this document in the appendix of this report.

A last element that deserves our attention, although probably of less pertinence to the project's research questions, are the gable tops. These elements often suffered most from weathering and water intrusion, and were often repaired or replaced separately. In a few cases there is some evidence that this occurred, with the result that the gable top is not original. In cases of evidence, or suspicions, of such adaptations, they are listed in the exhaustive listing of houses (appendix I).

### *Chronological consistency*

Although a reconstruction of the street around 1750 was aimed for, it was not possible to create a unified picture of that moment specifically. That means there are some asynchronisms in the model. For instance, the Mennonite church and neighbouring timber house were added to the model by request of the Freedom of the Streets, whereas they were probably demolished and replaced around 1730. Most other houses, at least their facade, point at a construction period of the 2<sup>nd</sup>, 3<sup>rd</sup>, or 4<sup>th</sup> quarter of the 18<sup>th</sup> century.

### *Degree of certainty*

The model includes a classification of the degrees of certainty resulting from the variation in reliability of source data, and alternative ways of treating gaps in the data. Parts of the models were colour coded according to degree of certainty (Figure 10), following the scheme developed by the 4DRL (Table 2). An explanation and justification of this classification can be found in Lanjouw & Waagen (2021: 17-20).

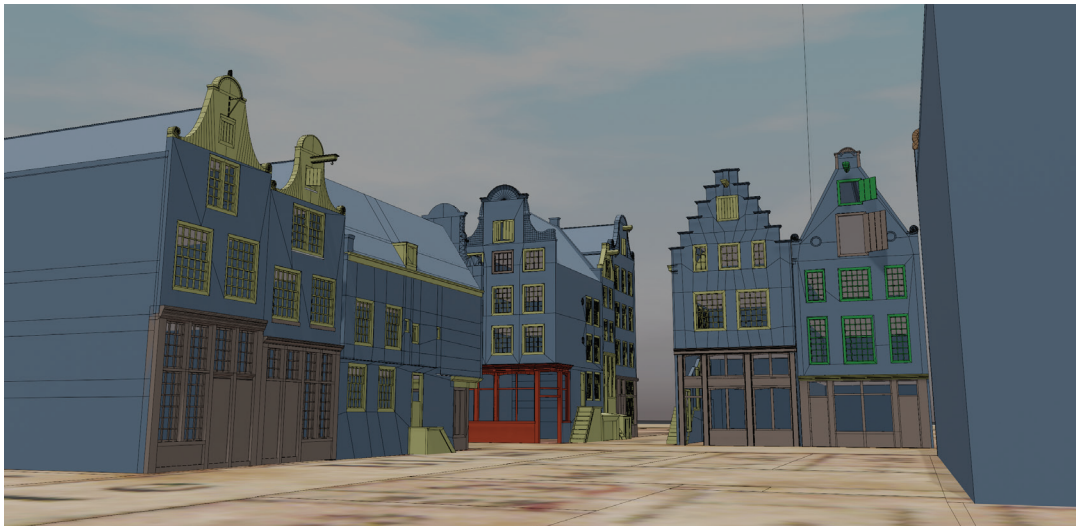


Figure 11. Visualisation of degrees of interpretative certainty.

Certainty Class	Evidence type	Variability	Example	Colour
Certain	Empirical	None	Scanned remains	6A8096
Quite certain	Logical extension	Low	Missing part of relatively complete object	3DAA4F
Moderately certain	Close parallel	Limited	Same type, direct relation	CCC87B
Not so certain	General parallel	Considerable	Same type, indirect relation	968175
Quite uncertain	Historic context	High	General stylistic traditions	A77E58
Very uncertain	Theoretical	Very high	Constructional argument	BA3F1D

Table 2. Certainty class definition.<sup>7</sup>

<sup>7</sup> This classification has been superseded by the one in Lanjouw & Waagen (2021: 19), but still applies to the Bloemstraat model.



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## Appendix I

The following is an exhaustive list of the houses that were reconstructed, including discussion of the related issues of interpretation and reliability.

### *Bloemstraat uneven numbers*

#### **Bloemstraat 19**

- Current house appears largely original, model is based on LiDAR data.
- Window glass panes of current house are late 18<sup>th</sup>/early 19<sup>th</sup> in style, replaced by early/mid-18<sup>th</sup> window glass panes (see general discussion on window frames in this report).
- Timber frame ground floor facade renovated several times.
- Current ground floor facade timber frame is post-war construction but 19<sup>th</sup> c. style as the photo from 1942 (<https://archief.amsterdam/beeldbank/detail/105ba9c7-c8e2-236c-2e26-95cb36ado5e1>) shows the facade with a different cross beam, and three front doors. At present time the facade has been renovated again, and works are still being conducted.
- The reconstruction was modelled after the current phase, as the laser scan provided better data for the measurement of the architectural elements. The crossbeam was however modelled after the less elaborately profiled beam as seen in the 1942 photos, which may be original. (<https://archief.amsterdam/beeldbank/detail/105ba9c7-c8e2-236c-2e26-95cb36ado5e1> & <https://archief.amsterdam/beeldbank/detail/577301cc-c55f-d5ca-c912-43b3718d4bc5>).

#### **Bloemstraat 23**

- According to monument registration house is 18<sup>th</sup> c. in date.
- Current cornice gable is 19<sup>th</sup> c. renovation, in model replaced by generic 18<sup>th</sup> c. style gable.
- Unclear whether top floor(s) was/were already present in 18<sup>th</sup> century, but no change in brickwork visible, so height probably original.

- Ground floor facade is 20th century, with garage doors.
- Ground floor facade timber frame reconstructed to generic 18<sup>th</sup> c. style. Construction drawing 1901 (<https://archieff.amsterdam/beeldbank/detail/5f618a23-56d9-36ab-d9e0-4ce883f9e8fo>) used for basic window/door proportions, but adjusted to accommodate for stylistic differences in 18<sup>th</sup> c.
- Middle window openings on 4th-5th floors are larger than side windows, therefore may have been doors originally, as was customary in 18<sup>th</sup> c. houses. Therefore, doors modelled.
- Top window also modelled with door. In depictions of the period, top opening in attic commonly has a door.

#### **Bloemstraat 25**

- Largely modelled after LiDAR data.
- Straight cornice gable probably last quarter of 18<sup>th</sup> c. Statement in monument register regards the consoles only, not the entire gable. The model thus represents a late 18<sup>th</sup> c. phase of the building, and is therefore not contemporary with most of the other buildings in the street which are modelled to a mid-18<sup>th</sup> c. phase.
- Window frame glass panels are correct size. Shutters top floors also correct. Unclear whether these are original, since these elements rarely survive that long. The building may thus have been renovated to match 18<sup>th</sup> c. original, which makes these elements a modern reconstruction.
- Ground floor facade timber frame reconstructed to generic 18<sup>th</sup> c. construction. Dual doors may however have been added later.

#### **Bloemstraat 27**

- 18th c. facade with two *oeil-de-boeuf*'s. The straight cornice gable is the result of 19th c. construction.
- In the 3D model we replaced the 19th c. gable with a 18th c. one, which was modelled after an illustration by H.P.Schouten of houses elsewhere in Amsterdam (<https://archieff.amsterdam/beeldbank/detail/b69c5816-3516-8dae-4815-20b264c61394>)
- The front doors were replaced with 19th c. doors found during restoration works, however for the 3D model we decided to model the lower facade in the style of the early 18th c., following the other houses.
- A narrow alley appears to be part of this house plot (still present). It is not drawn on map drawn for 1832 cadastral registration. It therefore likely is a private alley that may lead to the back house. However, no structural separation of front and back side is apparent. Houses must therefore have been structurally integrated.

### Bloemstraat 35

- Corner house on cross-section with Eerste Bloemdwarsstraat.
- Currently modern houses dating to 1980s/1990s.
- 1930s and 1950s photos show largely authentic 17<sup>th</sup>/18<sup>th</sup> c. house with neck gable and a first floor with an overhang on the side, typical of the period.
- Lower facade replaced during 20<sup>th</sup> c. Structural instability visible on 1930s photos. Compare 1930s and 1950s photos. Architrave wooden frame lowered. Doorway changed from corner doorway to front facing doorway. Window size changed.
- Reconstruction based on orthorectified and scaled photos.
- Reconstruction facade based on 1930s photos: <https://archief.amsterdam/beeldbank/detail/6a7b3359-658b-6fb9-72be-0e32f225b061>, <https://archief.amsterdam/beeldbank/detail/007ebab2-855e-34ee-0167-168fco3aab75>. Side of building modelled after 1950s photo: (<https://archief.amsterdam/beeldbank/detail/f2359c74-7d4e-c7f6-2c77-c3bee9f36dcd>).
- Windows and door on Eerste Bloemdwars side of house: imprecise placement and size. Orthorectification of photo not accurate due to strong perspective and lense distortion.
- Window on ground floor next to doorway, Eerste Bloemdwars, deviates somewhat from orthorectified photo. Position of doorway estimated based on minimum size of gap required for corner doorway (at least 90cm) and made the same size as windows on front side.

### Bloemstraat 47

- Current building 20<sup>th</sup> c. in historicising style.
- Two different previous phases of the house attested in the sources.
- Model based on 18<sup>th</sup> c. drawings of the Mennonite church, numbers 49-51, one dating to 1729 by Pronk (<https://archief.amsterdam/beeldbank/detail/142eb909-edf8-ddd9-7e84-02c8dcd97416>) and one to 1780 by Verstegen/Phillips (<https://archief.amsterdam/beeldbank/detail/69b8f55b-b7a8-3d61-fe33-6e8ec33b9e82>).
- At least until 1728 a single storey timber house, with ground floor and attic.
- On 1921 photograph (<https://archief.amsterdam/beeldbank/detail/dccb6247-8f28-392c-3867-0a77501coe3b>) a two-storey house with a mid-18<sup>th</sup> c. Baroque gable is shown
- House depicted on the drawings by Pronk and Verstegen/Philips is 17<sup>th</sup> c. timber house. As earliest drawing dates to 1728, the house got replaced sometime between 1728 and 1750/60s, the approximate time range for construction of the house with the baroc gable.
- By request of Gamze Saygi and Danielle van den Heuvel, the earliest version of the house was modelled. It is however likely that around 1750, this house did not exist anymore and was already replaced by the one with the baroc gable.
- In the original sketch of 1729 only half of the building is depicted, in the 1780 drawing based on this sketch, the entire building is depicted. It is uncertain whether this is based on reality, memory, another unknown sketch, or just conjecture for compositional/artistic reasons.

### **Bloemstraat 49-51**

- Currently two 20<sup>th</sup> c. houses in historicising style.
- Former Mennonite church, 1640-1728.
- Model based on 18<sup>th</sup> c. drawings of the Mennonite church, numbers 49-51, one dating to 1729 by Pronk (<https://archieff.amsterdam/beeldbank/detail/142eb909-edf8-ddd9-7e84-02c8dcd97416>) and one to 1780 by Verstegen/Phillips (<https://archieff.amsterdam/beeldbank/detail/69b8f55b-b7a8-3d61-fe33-6e8ec33b9e82>).
- These house numbers had at least two completely different phases in the 18th century, in terms of physical appearance and use. One phase covers the early part until 1728. After the Mennonite church merged with another one, the church building was turned into two regular houses. It is unknown how much was demolished and rebuild, but it seems that the internal structure and height remained largely the same.
- There is a sketch by C. Pronk dated to 1729 that depicts this building in its original state. In 1780, this sketch was used to make ink drawings or etchings by J. Verstegen and published by C. Phillips. However, by that time the building did not exist anymore.
- Evidence for the mid-18th c. houses that replaced the church building are found on the 1921 photographs (<https://archieff.amsterdam/beeldbank/detail/dccb6247-8f28-392c-3867-0a77501coe3b>). And on a technical drawing made in 1864 (<https://archieff.amsterdam/beeldbank/detail/ced8e498-d989-896e-9a46-72e04cecob24>).
- After the desire of Gamze Saygi & Danielle van den Heuvel, the model includes the early phase, so the church phase, of these buildings.
- Historically, this causes some discrepancy with the rest of the house models which can generally be dated to 1750-1775. The built environment contemporaneous with the church building would likely to have included many more single storey and stepped gable houses, typical of the 17th c. and still carried on in the early 18th century.

### *Bloemstraat even numbers*

#### **Bloemstraat 32**

- *Rijksmonument*, dated 1736
- Largely original (or restored?)
- Current window frame panels are correct for the period, but probably not original if house was restored.
- Modelled after LiDAR data
- Double doorways at ground level, indicates splitting in two habitation units. Date of separation unknown.

### **Bloemstraat 36**

- *Rijksmonument*, building largely in original state. Early 18<sup>th</sup> c. gable.
- Similar to Bloemstraat 40, but with an additional floor.
- Window frame panel size correct for period.
- The building was modelled after the LiDAR point cloud.
- Window at the top floor replaced with a simple door, as was customary in the 18<sup>th</sup> c.
- Original window and door situation ground floor unknown. Before at least 1973 ground floor had large garage doors but were turned into windows in 1970s or later.
- Two front doors indicating separation in two habitation units. Date of house separation unknown.

### **Bloemstraat 40**

- *Rijksmonument*, building largely in original state.
- 17<sup>th</sup> c. style facade. Gable top not original according to monument register.
- Typical tripartite window arrangement 2nd half of 17<sup>th</sup> c. (2 narrow, 1 wide in middle) and small round windows.
- Gable top possibly a 18<sup>th</sup> c. renovation/simplification of a more elaborate 17<sup>th</sup> c. gable.
- Until 1973 large double doors on ground floor, indicating presence of workplace or garage.
- Renovated in 1973, double doors turned into windows indicating regular habitation.
- Double front door situation indicates separation of houses, date of separation unknown
- Modelled largely after LiDAR with adjustments for windows and ground floor facade timber frame.
- Window frames reconstructed with pane sizes common of 18<sup>th</sup> c.
- Replaced window with door on lower attic opening, as is customary in 18<sup>th</sup> c. houses.

### **Bloemstraat 42**

- *Rijksmonument*, mid-17<sup>th</sup> c. house with stepped gable.
- Ground floor timber gable frame was modified during restoration 1968 (design drawings available): window frame style changed, but location and dimension of windows did not change.
- Door orientation changed: diagonal placement on corner changed to straight. Uncertain what original orientation of door was in 18<sup>th</sup>/17<sup>th</sup> c.
- The restored version of the house was used as a basis of the model (as documented by LiDAR scan and 1968 design drawings), assuming the restoration aimed to bring the house back to an historical state.
- Doubtful that large windows/doors on the ground floor on the Bloemdwardsstraat side of the house are original.
- Window frame pane size reconstructed to common 18<sup>th</sup> c. size.

#### **Bloemstraat 44**

- *Rijksmonument*, largely original building dating to earlier half of 18<sup>th</sup> c.
- Model based on LiDAR scan current state, stairs on the side of house based on 1931 photograph (<https://archief.amsterdam/beeldbank/detail/b9aeb657-940f-6310-e1a6-6c5338e6b17f>).
- Lower facade timber frame is 19<sup>th</sup> c. construction, so must have been different in 18<sup>th</sup> century.
- Middle window top row blocked. Date of blocking uncertain when. In model blocking replaced by another window.
- Stairs on the side 1950s and earlier: (appears to be) wooden stairs with 8 instead of 10 steps. Modelled wooden stairs.

#### **Bloemstraat 48**

- *Rijksmonument*, gable dating to third quarter of 18<sup>th</sup> c.
- Building largely original.
- Modelled after LiDAR data.
- Window frames replaced by ones with 18<sup>th</sup> c. panel sizes.

#### **Bloemstraat 50**

- *Rijksmonument*, 17<sup>th</sup> c. origin. Gable 19<sup>th</sup> c. renovation.
- Model based on LiDAR data, gable and timber frame lower facade based on general architectural trends.
- 19<sup>th</sup> c. renovation may have replaced original 17<sup>th</sup> c. gable, therefore opted for reconstruction of a stepped gable. Uncertain, since other 17<sup>th</sup> or 18<sup>th</sup> c. gable types are also possible.
- Ground floor facade is 19<sup>th</sup>/20<sup>th</sup> c. construction, replaced in model by default 17<sup>th</sup> c. one with small lead strip window panels in the upper windows. This is occasionally seen on 18<sup>th</sup> c. illustrations by JH Schouten.
- Currently 2 doorways for two habitation units, but uncertain when house was divided. Modelled one door instead.

#### *Eeste Bloemdwarsstraat*

##### **Eerste Bloemdwarsstraat 9**

- Currently a facade in neo-renaissance style, constructed in 1902, as shown on design drawings of that year (<https://archief.amsterdam/beeldbank/detail/e899713e-a533-2587-88d1-0a67a48f7c96>).
- Blueprint from 1902 (<https://archief.amsterdam/beeldbank/detail/e899713e-a533-2587-88d1-0a67a48f7c96>) records also the facade at the time of the works, possibly being the original facade of the 18<sup>th</sup> c. This recording served as a base for the model.
- Gable top of 18<sup>th</sup> c. facade on drawing seems modified and simplified, so not original.
- Blueprint of the ground floor plan also shows a backhouse. This was put in



the model as well. Building height uncertain. Current flat roof and height probably 20<sup>th</sup> c. modification.

- Window frame panels are modelled after the blueprint drawing. They are probably too large for mid-18<sup>th</sup> c. window types.

#### **Eerste Bloemdwarsstraat 11**

- Between 1974 and 1995 the building was replaced with a new one.
- The blueprints from 1974 (1974\_Eerste Bloemdwarsstraat\_11\_CTAD00005001237.jpg<sup>8</sup>) by Bureau Monumentenzorg possibly records the architecture before the current phase. The drawing shows a building similar to the one appearing on the 1955 and 1957 photos (<https://archieff.amsterdam/beeldbank/detail/7fd7ad2f-bd81-2a57-5e8c-76do84d65669>, <https://archieff.amsterdam/beeldbank/detail/dad4b67a-8994-2b54-6ec2-cc4389occb88>).
- The blueprint differs from the 1950s photos in respect to the decoration of the gable and the windows at the ground floor.
- The model is based on the 1974 blueprint.
- Detail of gable in model likely incorrect since 1950s photo shows different stylistic elements.

#### **Eerste Bloemdwarsstraat 10**

- The building was demolished in the first half of the 20<sup>th</sup> c. Does not exist anymore today.
- Original building depicted on 1894 blueprint drawn for renovation works, which also documented the facade (18<sup>th</sup> c.) at the time before the beginning of the works (<https://archieff.amsterdam/beeldbank/detail/1a466062-c80a-59fo-6025-ca102d52e5ed>).
- Model based on blueprint 1894.
- The window panels displayed in the blueprint are the larger kind. In the model we substituted those with smaller panels (20x25cm), more common in the first half of the 18<sup>th</sup> c.

#### **Eerste Bloemdwarsstraat 12**

- House demolished in 1960s or 1970s and never rebuild.
- 1955 photo appears to show a relatively untouched 17/18<sup>th</sup> c. facade (<https://archieff.amsterdam/beeldbank/detail/1a9fbe75-6648-990c-c85a-5f567325a257>).
- Gable top may have been modified. Simple type, hard to tell.
- Model based on 1955 picture, which was corrected using as a reference the 3D model and point cloud of the corner building (Bloemstraat 44).

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<sup>8</sup> Has been removed by city archive from online database.

### Eerste Bloemdwarsstraat 14

- House demolished in second half of 20<sup>th</sup> c. Replaced by new building in 1980s or 1990s.
- The dimensions of the model were based on the pictures from 1891 (1891\_Eerste Bloemdwarsstraat\_14\_10019A000621.jpg) and 1955 (<https://archief.amsterdam/beeldbank/detail/920d4478-78f1-dc3e-ffa6-8a3c4183262b>).
- In respect to the 1891 photo, the 1955 photo shows an extra window in the gable and a different location of the hoist beam, indicating gable modifications in the first half of the 20<sup>th</sup> c.
- The 1891 photo offers a side view into the frontal facade of the building. The photo was scaled using the building at Bloemstraat 35 as a reference. The scaled picture gave reliable information about the height and existence of the architectural elements (windows and gable). However, it could not provide accurate information on the width of the elements.
- This lack of information was supplemented by the picture from 1955, which was corrected and referenced using the information of building at Bloemstraat 35.
- It is important to note that in the first half of the 20th c. the facade was modified, but the width of the windows seems to have been maintained the same as in the previous century.

### Eerste Bloemdwarsstraat 16

- House still exists. But gable and possibly windows have been (partly) replaced in the first half of the 20<sup>th</sup> c., based on the differences between an 1891 photo (<https://archief.amsterdam/beeldbank/detail/52cco474-1f25-6ode-2cd9-3196d956c1f6>) and a 1955 photo (<https://archief.amsterdam/beeldbank/detail/920d4478-78f1-dc3e-ffa6-8a3c4183262b>).
- Modifications of gable are slight: curvature of the sides, profile shape of support blocks below volutes, and possibly volutes themselves have been replaced. Also hoist iron has been replaced by hoist beam.
- The 1955 state matches the current state of the building.
- Model based on photos, but should still be checked with LiDAR data.
- The dimensions of the model were based on the blueprint of the lower facade from 1886 (<https://archief.amsterdam/beeldbank/detail/d9e4f24a-f6ef-8da7-3f63-44869bbfc124>) and the picture from 1891 (<https://archief.amsterdam/beeldbank/detail/52cco474-1f25-6ode-2cd9-3196d956c1f6>).