Introduction

Many buildings lose their function overtime, due to changing needs. This leaves a lot of buildings vacant and unused, in need for a new function. The chair of RMIT does tries to find possibilities for transforming the existing building stock and giving it a new future. This graduation RMIT studio focuses on a selection of these building in The Hague and Delft. The case study building for my graduation studio is the Armamentarium in Delft.

Motivation

The approach of RMIT appeals to me. I think it is very interesting to develop an existing building and to give a building a new life. The development of a building over the years give it an history, which causes it to have an additional layer not present in newly built projects.

The Armamentarium is a very special building for me. Almost daily I pass by the building, but I never really get an idea what happens inside. The size, strong appearance and isolated situation, on this very visible spot in the centre of Delft, give the building something mysterious. It is very exciting right now to be able to fully explore the building and to be given the opportunity to develop my graduation project with this building.

Structure P1 report

The P1 report is a collection document of the first quarter of the studio. This quarter has focussed on analysis on the different scales, related to the Armamentarium. In this document, a selection of my analysis done in the scale of the city (urban), the building (architecture) and the technology (building technology) are displayed.

The theme for the urban analysis has been the programmatic- and infra-structures in Delft.

For the architecture I have focussed on the character of the spaces inside the Armamentarium.

In the building technology analysis the focus is on the used materials.

At the end of the report, the value assessment does describe the important values derived from these analysis.

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To get an idea of linkages in the city, it is interesting to research the infra- and programmatic structure. In this case it is also interesting how the Armamentarium is linked in these structures. Hereby I will get a good understanding of the way the city functions, on which I can react on in the design process.

Research questions

"What is the main infra- and programmatic structure in Delft?"

"What are the programmatic statistics compared to some benchmarks?"

"How do different visitors of Delft use the city?"

Infra structure

Map 1 shows the main traffic-routes through Delft, the main parking-garages and the main stops of public transportation. Here can be noticed that the Armamentarium is very well linked in the infra structure. Public transportation is close by. The ring road is also very close by and in good connection with the arterial roads and the highway.

Map 2 shows how the current situation will change, when the construction of the station will be finished. The ring road is moved to the back-side of the station. The Westvest will become a boulevard, designed for pedestrians and in close contact with the inner city (see fig. 1 & 2).

Map 3 shows a hierarchy of the types of roads through the city. It is visible that the Armamentarium is located in the area in between the car-free inner city and the car-friendly ring road.

Map 4 shows the perpendicular distance from some important hubs in Delft. Research has shown that people are willing to walk up to 500 meters to their destination. Above this figure, people feel obstructed. From the station and the closest parking garage, people can reach the Armamentarium within the 500 meter limit. From the drop-off spot for touring cars (next to the market square), the Armamentarium is located just outside the 500 meter limit.

Conclusion

From this infrastructure analysis can be seen that the Armamentarium is very well linked in the infrastructure of Delft. The location is easy to reach by public transportation. Since the Armamentarium is located in the edge of the inner city, the reachability by car over the ring road is very good. A parking garage is also close by. 

The development of the Spoorzone, including the realisation of the boulevard, will induce a better connection between the station and the inner city. The Armamentarium is located in between both and will profit from this development.

Programmatic structure

On map 5 you can see a selection of the public program existing in Delft. This information has been partly obtained via an interactive map online, partly through the tourist information of Delft and partly by self exploration of the city. There is a gradation of density in public program visible, from the car free centre of the inner city to the outskirts. The area around the Armamentarium is not very much used for public program.

Map 6 is an abstraction of map 5 and shows the important catering places. Most of the catering program in Delft is located in the car-free area in Delft. A lot of restaurants and cafés can be found around the bigger public spaces, like the market square and the Beestenmarkt.

In map 7 it is been shown the cultural and touristic program in pink. The black bubbles show the amount of visitors the most important tourist program of Delft receives. The cultural program is quite spread throughout Delft, with two mayor hot-spots outside of the city centre: Delft Pottery ‘De Delftse Pauw’ and De Koninklijke Porceleyne Fles/Royal Delft. These two hot-spot do however receive relatively a lot of visitors.

Map 8 shows the shops and souvenir shops in Delft. Visible is that most of the shops are located in a line from the market square to the Bas-tiaansplein, in the car free zone. Souvenir shops can be found around the market square.

Map 9 shows the locations of large offices in Delft. They are all located in the periphery of the inner city of Delft, close to the ring road. Most of them can be found on the Oude Delft or the Phoenixstraat, in the west of the inner city.

Map 10 shows the currently vacant commercial spaces in Delft. The Armamentarium is, with 11.000 m², one of the bigger vacant buildings. Close by is a yet to develop project for sale, with 1.700 m² of space available. A lot of smaller vacant buildings can be found in the centre of the inner city.

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In figure 3 several statistics of Delft are compared to some benchmarks. The benchmarks are Gouda, Alkmaar and Amsterdam. Gouda and Alkmaar are in terms of size quite comparable. Amsterdam is approximately eight times bigger, but still relevant for this comparison, since the program of Amsterdam has been regarded very developed.

When looking at the density figures, one can see that the inner city of Delft is very densely inhabited, even compared to Amsterdam. In the amount of visits of Dutch tourists, Delft can not compete with Amsterdam or Alkmaar in absolute figures. In relation to its size, it is noticeable that Alkmaar still has more than double the amount. Gouda on the other hand, has approximately 25% less visits (relative). Unfortunately, there are no figure known about international tourists.

Delft provide a quite extensive cultural program. The figures can almost compete with Amsterdam and do overcome the figures of Alkmaar and Gouda. This extensive cultural program might be related to the density of Delft.

The statistics for the catering program of the given cities do not vary much. It is remarkable that the figures of Gouda are this high, since the touristic and the density figures of Gouda are less than the other benchmarks.

The figures of retail in Delft stay behind, compared to the considered cities. The settlement of business services on the other hand are fairly high, Delft can even compete with Amsterdam.

The percentage of vacant commercial space in Delft overall is at the high end, where the figures of the inner city of Delft are not bad at all.

Conclusion

The Armamentarium is not very well linked in the structure of public program in Delft. This program is mostly located in the car free centre of the inner city, where as the Armamentarium is located on the edge of the inner city. The offices of Delft are located in the periphery, in which the Armamentarium is also located. At last, around the location are some of the bigger vacant commercial buildings Delft.

The statistics show that Delft is densely inhabited. The further figures show that the programmatic structure of Delft is solid, the only part where it does stay behind, is the amount of offered retail.

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Fig. 3 Statistics Delft, Gouda, Alkmaar, Amsterdam (own illustration)

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**Programmatic structure (continuation)**

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Synthesis users of city

Synthesis tourists [11]
For tourists, it is important that their intended program is in a walkable distance. A lot of the tourists enter the city from the drop-off spot for touring cars, next to the market square. Much of the program for tourists is in a walkable distance from this spot. However, the Armamentarium is located on a slightly remote spot for the tourists and is outside the 500 meter limit.
Two of the main touristic attractions in Delft are located outside the inner city. Still they receive a great amount of the tourists of Delft. If the Armament gets a touristic function, it should also become a distinct attraction, where people go to intentional.

Synthesis students [12]
The Technical University is a very important part of Delft. The Armamentarium is located next to the main route from the station to the TU district.

Synthesis inhabitants [13]
For inhabitants the public program of the city is important, for which a similar conclusion can be derived as for the tourists. On a daily base, not all the public program of the city is needed. An easy access to daily-shops, public services or public transportation is important. An easy access to the inner city by bike is therefore desirable, which is present by the several accesses designed for bikes/peDESTrians.

Synthesis employees [14]
For employees, a good connection to public transportation and arterial roads is important. Besides this, enough and close by parking lots are desirable. The edge of the inner city, in which right now most of the offices are located, is good accessible by public transportation. The distance from the station and the several parking garages to the offices is very reasonable. The location of the Armamentarium fits in the aforementioned profile: the distance to the station, a parking garage or the arterial road is very small.

Conclusion
The Armamentarium is quite separated from the public and touristic program of Delft. If the building will house a public or touristic function, it should have a distinct attraction. People have to go there on purpose. An integration of the building in the office program of Delft is very easy, since the building is located in the periphery of the inner city, close to public transportation and the ring road.
The Armamentarium could easily form a relation with the TU, since the building is situated on a visible spot next to the route from the station to the TU district.
ARCHITECTURE | Character of space

The spaces inside the Armamentarium have a special character, which is quite specific. This character is formed by its history of a warehouse. My intentions are to capture this character and try to preserve it in the intervention.

Research question

‘What is the character of the spaces inside the Armamentarium?’

‘Which parameters do define the character of a space?’

‘How have case studies dealt with the existing character of the building in the intervention?’

How we experience a space, is dependent of our sense: sight, hearing, taste, touch, smell. In this research is mainly looked at the visual experience of a space (sight).

Peter Zumthor describes in his book Atmospheres which element for him define the atmosphere in a space. This book has helped me defining which parameters define the visual character of spaces for me. For this research, I have focussed on:

- light
- scale
- contact with surrounding
- contact internal (physical and visual)
- materials (grade of finishing)
- detailing/ornamentation

In this matrix is notable that the spaces of the 1692 building, connecting building 1660 and the ground floor of 1602 building have a shared character. They are very isolated spaces (internal as well as to surrounding), are quite dark, have a rough unfinished material use and a focused detailing without ornamentation. The spaces are big and you can not experience the whole space at once. However do the height of spaces and the row of columns reflect to the human scale.

The first floor of the 1602 building is a interesting exception. This space is much lighter and has more contact with surrounding, because of the bigger window openings. The space is a lot higher. Furthermore are the surfaces much more finished and detailed with ornamentation.

The entrance building and internal interventions of van Velsen do form a relation with the original character, in its focused appearance and finishing, as well as in the isolation of the spaces. The intervention is however still readable as a new insertion.

The entrance building of Thewessen forms less a relation with the existing building. The material use is more finished. The transparency of the facade is much higher, by which the spaces are lighter and in closer contact with the surrounding.

On the next pages, two visually dominant spaces are examined more deeply.

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The ground floor of the 1692 building of the Armamentarium is a recognisable space for more spaces in the complex.

The facade is very closed, whereby the internal space is dark. The contact with the surrounding is minimal, since the small window openings are located too high to be able to look out of. Using the existing doors as window will improve both mentioned. Visual internal contact is very poor, since the floor is very closed (no atrium) and the vertical circulation is designed very closed. Physical contact is however pretty good, since there are five vertical circulation elements available in this part of the complex.

The used materials are all very pure and rough applied. All the surfaces are unfinished, the materials are not treated. The used materials are very elementary, like natural stone, timber and brick.

**Conclusion**

- **Light**
  - Ratio openness facade/floor surface: 3.03%
  - 26.2m² window surface facade
  - 15.2m² window surface courtyard
  - 1365m² floor surface

- **Contact surroundings**
  - Ratio openness facade/ surface facade: 4.02%
  - 26.2m² window surface
  - 46.4m² door surface
  - 651.5m² facade surface

- **Contact internal**
  - 1st floor
  - ground floor

- **Materials**
  - 1 brick flooring, anthracite, unfinished
  - 2 bear brick walls, red, painted
  - 3 wooden door, painted green, painted
  - 4 wooden ceiling, no treatment, unfinished
  - 5 wooden structure, no treatment
  - 6 steel WC/elevator box, grey, powder coated

- **Detailing**

Fig. 5 photo ground floor 1692 Armamentarium (own photo)
The first floor of the 1602 building is a major exception in the complex. The facade is much more transparent, by which the interior is very light. The contact with the surrounding is also much bigger, since the larger window openings are located on a height related to the human scale. Visual internal contact is still poor, however one stair is designed quite open. Physical contact is pretty good, with four vertical circulation elements available in this part of the complex. Visual internal contact is still poor, however one stair is designed quite open. Physical contact is pretty good, with four vertical circulation elements available in this part of the complex.

The materials in this space are all finished and treated applied. The walls are plastered, the wood is painted. The detailing in this part of the building is treated with more care and is enriched by some additional ornamentation. The appearance is more representative, instead of focussed.

**Light**

<table>
<thead>
<tr>
<th>Ratio openness facade/floor surface</th>
<th>17.11%</th>
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<tbody>
<tr>
<td>82.6m² window surface facade</td>
<td></td>
</tr>
<tr>
<td>41.3m² window surface courtyard</td>
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<tr>
<td>724m² floor surface</td>
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**Scale**

<table>
<thead>
<tr>
<th>Ratio openness facade/ surface facade</th>
<th>13.11%</th>
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<tbody>
<tr>
<td>82.6m² window surface</td>
<td></td>
</tr>
<tr>
<td>0m² door surface</td>
<td></td>
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<tr>
<td>630m² facade surface</td>
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**Contact surroundings**

<table>
<thead>
<tr>
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<td></td>
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<tr>
<td>630m² facade surface</td>
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**Contact internal**

**Materials**

1. plastered walls, painted white
2. wooden structure, painted green
3. wooden ceiling, painted green
4. wooden floor, clear varnish
   [5 steel walk-around, grey powder coated]

**Detailing**
1. bombed part of building reconstructed in new way, but with respect to original dimensions, transparency
2. when possible, parts have been restored, no new intervention visible
3. new element are clearly new, but with in relation with existing (dimensions, color)
4. original lay-out/partitions has remained interventions are largely a reconstruction

**Precedent | Neues Museum Berlin**

Architect (original) Friedrich August Stüler
Architect (transformation) David Chipperfield
Year of construction 1841
Year of transformation 2009
Size 20.500m²
Monument status national monument
Old function museum
New function museum
Owner -

**Transformation**

1. bombed part of building reconstructed in new way, but with respect to original dimensions, transparency
2. when possible, parts have been restored, no new intervention visible
3. new element are clearly new, but with in relation with existing (dimensions, color)
4. original lay-out/partitions has remained interventions are largely a reconstruction

**Value intervention related to character**

<table>
<thead>
<tr>
<th>Value intervention related to character</th>
<th>before intervention</th>
<th>after intervention</th>
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<tbody>
<tr>
<td>Light</td>
<td></td>
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<tr>
<td>Scale</td>
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<tr>
<td>Contact surrounding</td>
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<tr>
<td>Contact internal</td>
<td></td>
<td></td>
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<tr>
<td>Finishing materials</td>
<td></td>
<td></td>
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<tr>
<td>Detailing/ornaments</td>
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these character-related parameters has stayed roughly the same before and after the intervention

**Conclusion**

The character of the original building has remained and gained very good in this intervention. If possible, bombed parts have been restored to their original appearance. In these parts, no intervention is visible. Completely new additions are clearly new, but have been highly influenced by the original: for example hte dimensions, colour, transparency of facade and light are based on the original. Also the spatial character has not been changed.

This attitude towards interventions does appeal to me very much. The intervention is honest (clearly new), but is in great dialogue with the existing/original building. In this way, the character of the space does remain.
The intervention for the Hermitage is somewhat less modest. The visible interventions to the exterior are minimal: the new entrance to the courtyard is well resolved in the original facade. In the interior some specific, recognisable elements have stayed, like the organ. Other interventions are more radical. Floors have been opened up to create atria, with more visible connections between the floors. New stairs have been added, in a completely new execution without relation with the existing. The layout has changed, whereby the spatial character has changed. At last, all the surfaces are newly finished, which has removed the aesthetic character. Inside you feel like being in a new building, the character of the history of the building is for a great amount lost.

This attitude in interventions does not appeal to me. The original character is being lost too much.

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**Precedent | Hermitage Amsterdam**

- **Architect (original)**: Hans Petersom
- **Architect (transformation)**: Hans van Heeswijk architecten
- **Year of construction**: 1681
- **Year of transformation**: 2009
- **Size**: 15,000m²
- **Monument status**: national monument
- **Old function**: retirement home
- **New function**: museum
- **Owner**: Stichting Hermitage aan de Amstel

**Transformation**

1. appearance exterior has not changed much
2. specific elements in interior have stayed
3. new elements are clearly new
4. finishing of interior all new
5. existing lay-out/partitions completely changed
6. floor have been removed -stairs added- to improve vertical contact
7. added sky-lights improve light, but are not visible from exterior

Interventions are not easily reversible

**Value intervention related to character**

- **Light**
  - before intervention
  - after intervention
- **Scale**
  - before intervention
  - after intervention
- **Contact surrounding**
  - before intervention
  - after intervention
- **Contact internal**
  - before intervention
  - after intervention
- **Finishing materials**
  - before intervention
  - after intervention
- **Detailing/ornaments**

These character-related parameters has changed quite a lot before and after the intervention.

**Conclusion**

The intervention for the Hermitage is somewhat less modest. The visible interventions to the exterior are minimal; the new entrance to the courtyard is well resolved in the original facade. In the interior some specific, recognisable element have stayed, like the organ. Other interventions are more radically. Floors have been opened up to create atria, with more visible connections between the floors. New stairs have been added, in a completely new execution without relation with the existing. The layout has changed, whereby the spatial character has changed. At last, all the surfaces are newly finished, which has removed the aesthetic character. Inside you feel like being in a new building, the character of the history of the building is for a great amount lost.

This attitude in interventions does not appeal to me. The original character is being lost too much.
The Armamentarium is an historical building, constructed with basic and simple materials. For the design process of the intervention, it is good to know which materials are present, what their quality is and how authentic they are. In this way, I can adapt my design on this.

Research question
‘Which materials are present in the Armamentarium and how are they processed?’
‘What is the state of the present materials?’
‘How authentic are the present materials?’

The results for this research has been combined in a material report. This report addresses all the separate buildings of the complex, internal and external. In this P1 report, the materials of the 1602 building is being displayed.

BUILDING TECHNOLOGY Materials

Door
- Material: fir wood (26mm), steel plate (3mm), triplex with sawn grooves (6mm)
- Colour: painted dark green
- Transom window with radial grill
- Additional glass door
- Very good
- Doors replaced in 1981 (Walraad)
- Glass doors added in 1989 (Velzen)
- Transom window added during construction in 1692 or 1754

External walls
- Material: plastered
- Colour: painted white
- Other: dummy joint in block motif
- State: very good
- Wall originally bear brickwork with natural stone
- Current plaster is from 1981

Roofing
- Material: ceramic roof tiles
- Colour: red
- Other: old dutch roof tiles
- State: generally good
- Valley gutter does create leakages
- Authenticity: 1751

Sill
- Material: natural stone
- Colour: anthracite
- State: very good
- Authenticity: added in 1985 (Walraad)

Pilaster
- Material: bentheimer natural stone
- Colour: painted off white
- Keystone (sluitsteen) with lion head
- Very good
- Pilaster added during construction in 1692 or 1754 (incl. transom window)

Walls courtyard
- Material: brickwork with bentheimer natural stone
- Colour: red brickwork, painted natural stone
- Cross bond brickwork
- Size 215-225*100-110*40-45
- Relieving arch above windows
- Radial transom window with grill
- Very good
- Mostly original
- Window openings changed during construction in 1754
Flooring
material: brickwork, stretching bond
colour: dark anthracite
other: size (yet to measure)
state: placed directly on the sand
very good
authenticity: mostly original 1602

Footing
material: natural stone; type unknown
colour: dark anthracite
other: to prevent rising moisture in structure
state: very good
authenticity: original from 1602

Windowframe
material: bentheimer natural stone
colour: anthracite
other: cross frame (kruisraam)
state: good, only aesthetic improvement possible
authenticity: original cross frame from 1602

Ceiling
material: pine
colour: untreated
other: sleeper (moerbalk) 395*320 mm
state: beams laid on timber corbel (sleutelstuk)
very good;
beam ends mostly replaced in 1981 (Walraad)
others original 1602

Walls
material: platered
colour: painted light green and white
other: plinth of one layer of white tiles
state: very good
authenticity: no information

Pilaster
material: bentheimer natural stone
colour: brickwork
other: anthracite
state: keystone (sluitsteen) with lion head
very good
authenticity: pilaster added during construction in 1692 or 1754 (incl. transom window)

Stairs
material: steel with wooden steps
colour: steel: grey powder coating
other: wood: clear varnish
state: landing stairs
very good
authenticity: added during construction in 1989 (C. van Velzen)

Structure
material: pine
colour: untreated
other: size 320*360mm
state: knee brace structure (standvink)
very good;
double pen and tenon connection
partly added (1751)
partly original (1602)
The used materials in the Armamentarium are very elementary in nature and mostly unfinished in application. The different kinds of used materials is little: natural stone, brick, timber, plaster, glass and ceramic roof tiles. In more recent interventions the material steel has been introduced and glass has become more important.

The state of all the materials is very good. In most of the materials is no improvement necessary. Sometimes an aesthetical improvement is possible, but the technical state of the material is still good.

The building has been modified and renovated several times over the centuries. Lots of materials are therefore not authentic anymore (from the year of construction). Despite this: since the used materials in the modification and renovations have followed the existing materials, the not authentic materials are not directly apparent. Materials of recent interventions are not always in harmony with the existing, whereby they are apparent as recently added.

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**Conclusion**

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**Urban analysis**

- National context
- City context
- Location
- Ensemble

- Remote situation in programmatic structure, outside of main public program
- Good reachability from station and via ring road
- Location in area between car free centre and ring road
- Historical significance for 'de Staten van Holland' and 'West-Friesland'

**Architectural analysis**

- Isolated situation of complex on peninsula
- Visible development of building in the current appearance
- Interventions van Velsen: clearly new, but in relation with original characteristics
- Neues Museum Berlin; way of intervention: intervention in dialogue with existing building
- Several characteristics are adopted in intervention design

**Building technology analysis**

- Isolated interior spaces: little contact with surrounding and little internal contact
- Emptiness in floor surface: big floor surfaces without walls
- Functional detailing: little ornamentation
- Focused material use: elementary in nature and unfinished application

**Value assessment**

- High value
- Indifferent value
In this first design idea, the Armamentarium is transformed into a Wellness centre for Delft. The isolation of the plot and the variety of closeness of internal spaces, in combination with the several courtyards, the idea of isolation and revelation could form an interesting starting point for the intervention design.