

*Vaade Oven  
Tyverende*

*Palat*

*0 22  
16*

*Lövehovederne*

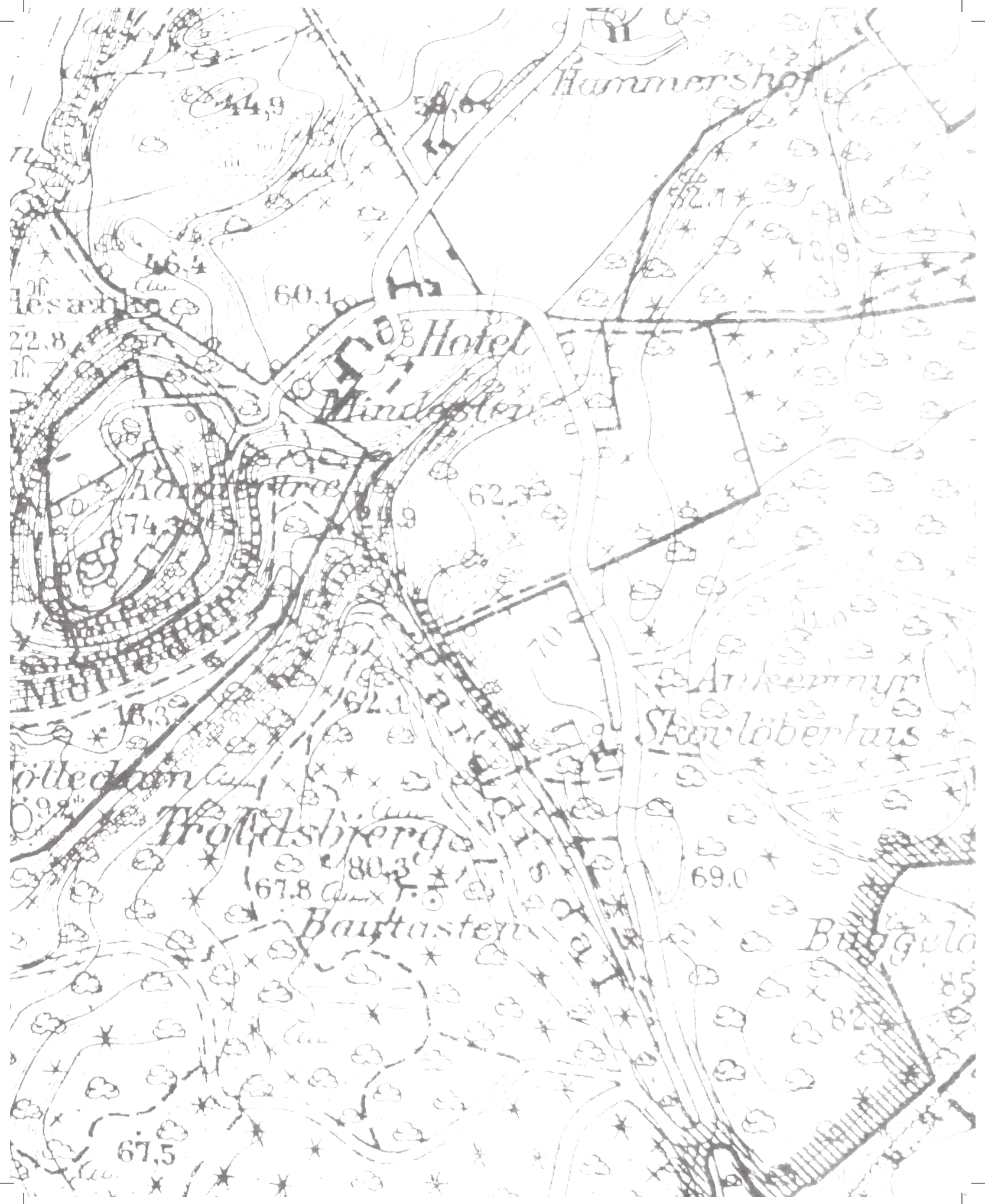
*Galgerende*

# Hammershus Ruin

*Torre Oven*

*Möllevig*





Hammershøj

Hotel

Mindesten

Ankermyr  
Skovløberhus

Troldsbjerge

Bagtasten

Bælgelø

67.5

67.8

69.0

80.3

85.5

82.5

62.3

60.1

46.4

44.9

59.6

72.1

72.9

74.3

18.3

22.8

16.7

7.2

---

Charlotte Biørn Nielsen

Hammershus  
Thesis project, MSc4, ARK  
Architecture and Design  
spring 2013

Supervisor: Claus Bonderup  
Technical supervisor: Poul Henning Kirkegaard  
Copies: 6  
pages: 45

## ABSTRACT

*The project takes its basis in the ruin of Hammershus there currently is having a competition of a new Visitor Centre. One of the main ideas for the project is to understand the life there was at the ruin in the past. This project is though focusing on how to recreate life in the centre of Hammerhus by adding a new structure.*

*The focus has been how to create a new structure with respect on the existing buildings and how to make these interact with each other.*



# CONTENTS

|              |                                       |    |
|--------------|---------------------------------------|----|
| PROGRAMME    | Location                              | 8  |
|              | Hammershus ruin                       | 10 |
|              | Tourismn at Hammershus                | 11 |
|              | Topography                            | 14 |
|              | Atmosphere                            | 16 |
| PRESENTATION | Concept                               | 17 |
|              | Flexible space                        | 19 |
|              | Connection landscape and architecture | 23 |
|              | Structural design                     | 25 |
|              | Roof structure                        | 27 |
|              | Shadow studies                        | 29 |
|              | Matrerials                            | 30 |
|              | Arrival                               | 31 |
|              | Detailing                             | 33 |
|              | Flooring in surrounding rooms         | 35 |
| EPILOGUE     | The old church wing                   | 37 |
|              | Conclusion                            | 40 |
|              | Illustration and literature list      | 42 |
|              | Appendix                              | 43 |



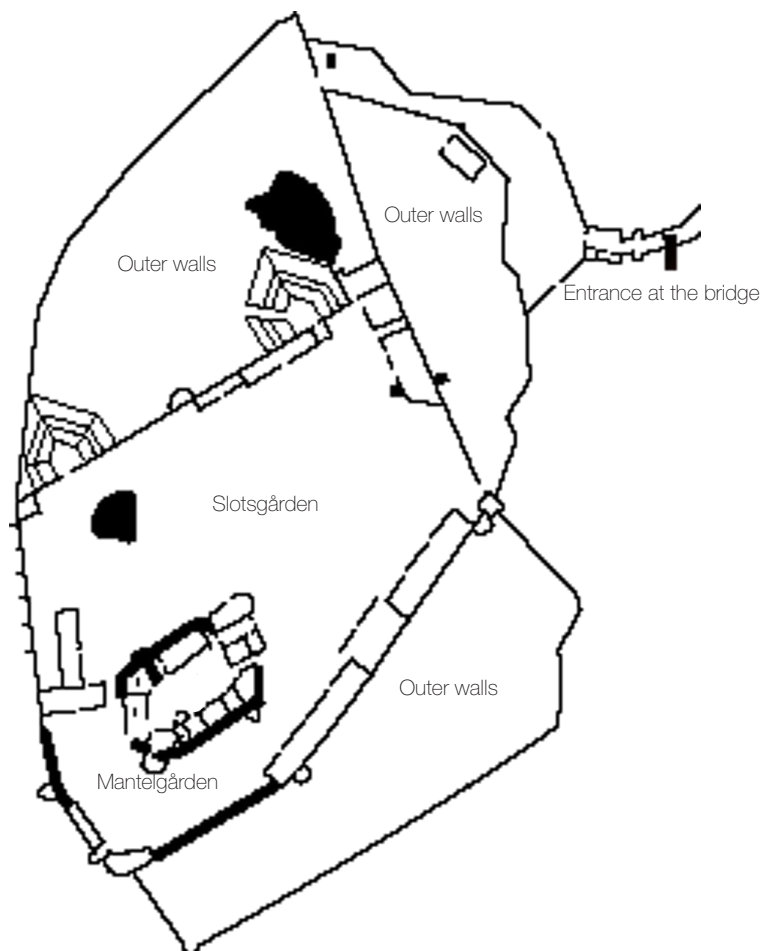
## LOCATION

Bornholm is located in the middle of the Baltic Sea in the outer area of Denmark and differs in many ways from the rest of the country. Culture, nature and even language has its own characteristics, which gives the island its special charm.

The island has from the 20th century been a popular holiday destination; known as the sunny island. It attracts today over half a million tourists every year (Kommuneplan 2009).







## HAMMERSHUS

Hammershus did in the past act as centre of the administration of the island. Today it is the island pride and the greatest castle ruin in the northern Europe with over 300.000 visitors every year.

The Archbishop of Lund built Hammershus in the beginning of the 13th century. But over the next 400 years was it under various dominions, first by the Lubecks and later the Danish king until it in 1743 was abandoned.

Under the different periods did the ruin changes and extended according to the current needs.

In 1822 under the Romanticism in Europe was the ruin rediscovered as tourist attraction. The idea of the greatness from the past and the beauty of the nature were in the zeitgeist and influenced the way in which the ruin was seen. From this perspective was the visitors reduced to observers, and the ruin was protected for the future.

Today almost two centuries later is the experience the same, though our understanding of the world has changes.

## TOURISM AT HAMMERSHUS

Hammershus is at the arrival towering over the landscape next to the Baltic Sea. The secluded site is taking the visitors back to the stories of a great castle from where the fate of Bornholm were decided.

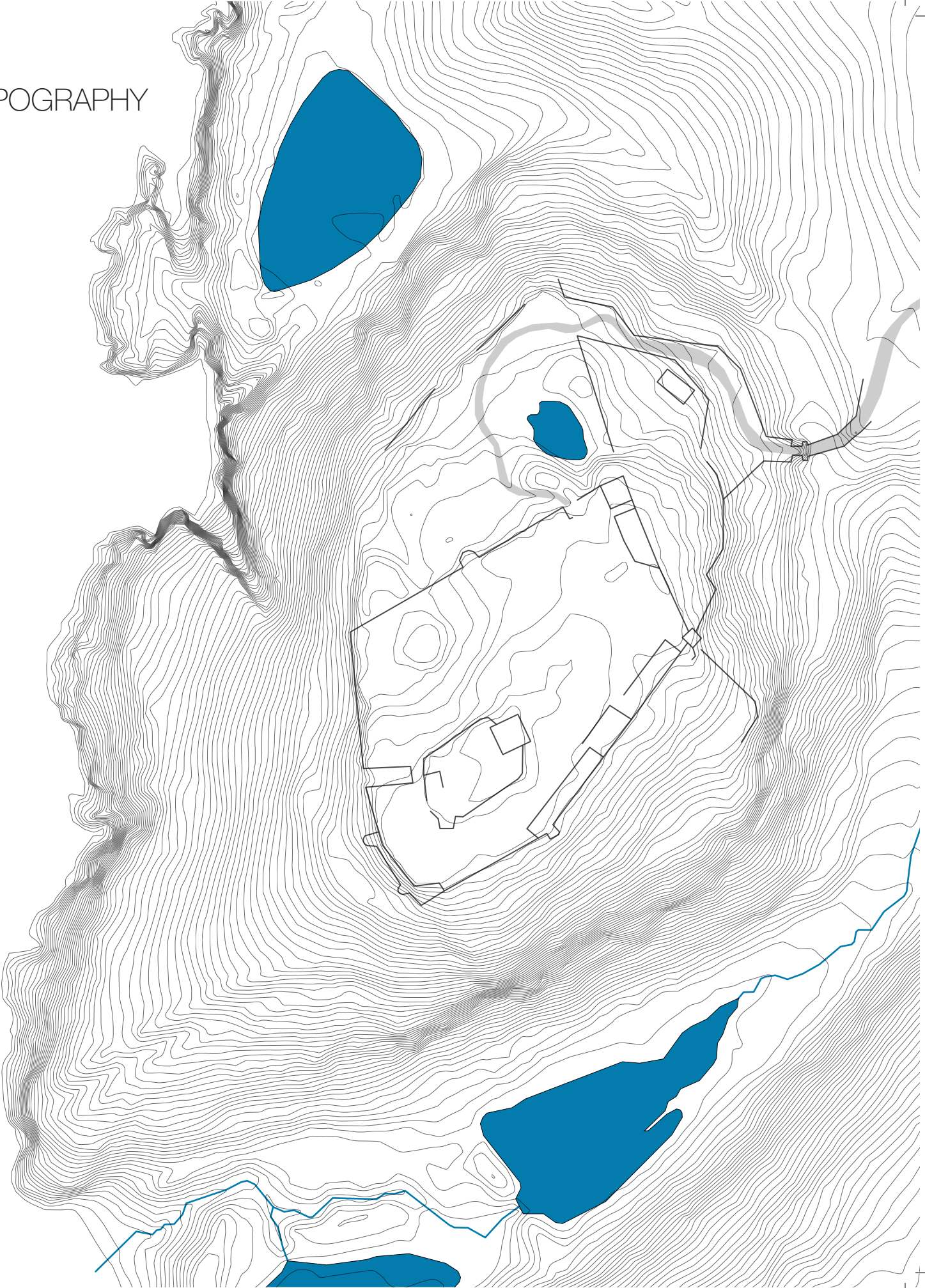
Today the visitors can experience the remains of the castle and the great nature surrounding the site. It is possible to experience the ruin from different perspectives and the tourists can decide to take a guided tour, experience it on their own or visit the exhibition at visitor centre.

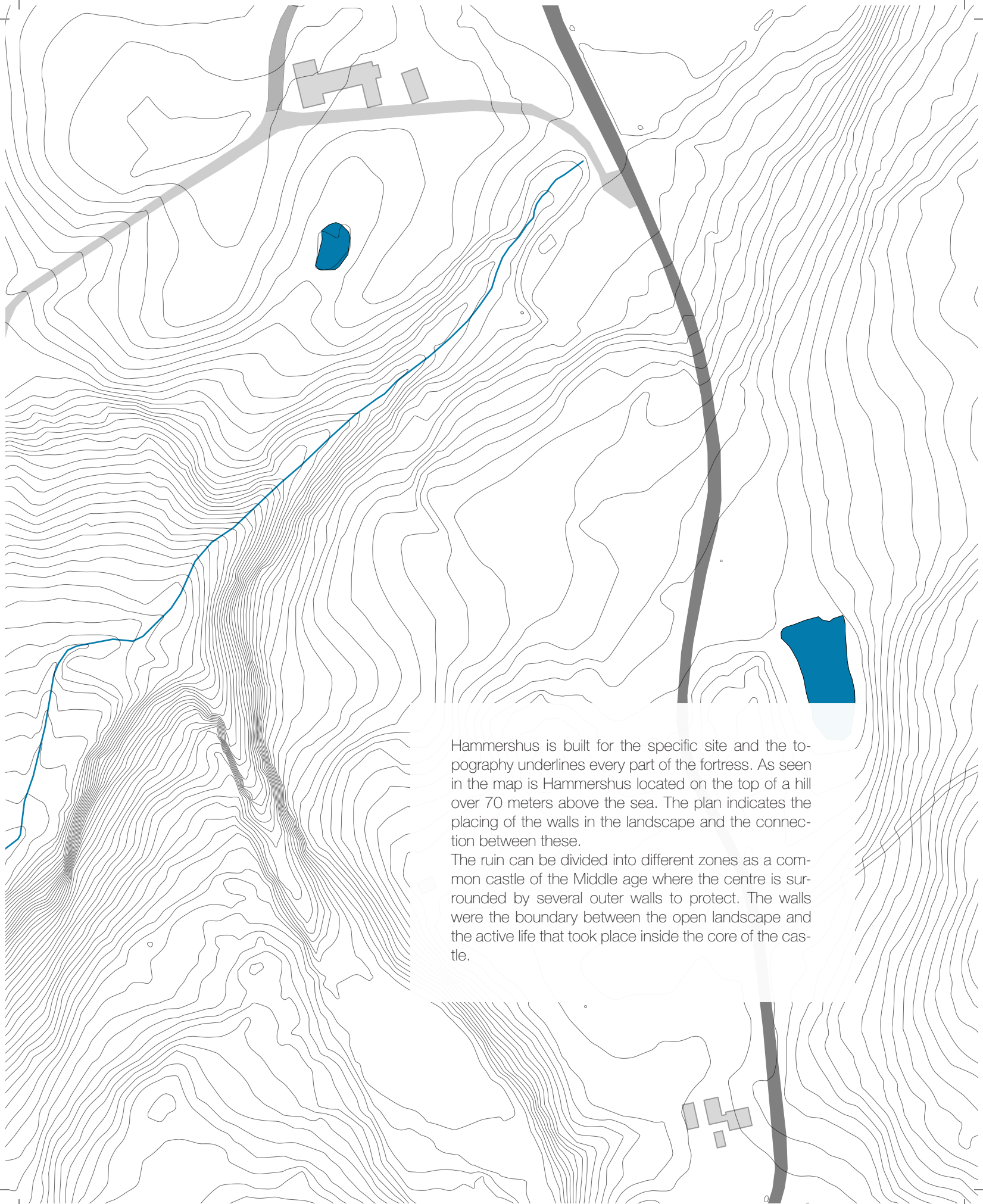
The visitor centre is located in an old farmhouse on a smaller hill in front of Hammershus. Further does the farmhouse contain functions as cafe and shop. For this reason many of the activity concentrated in front of the actually ruin.

Although Hammershus is the focal point for many activities is most to find outside the walls.



TOPOGRAPHY





Hammershus is built for the specific site and the topography underlines every part of the fortress. As seen in the map is Hammershus located on the top of a hill over 70 meters above the sea. The plan indicates the placing of the walls in the landscape and the connection between these.

The ruin can be divided into different zones as a common castle of the Middle age where the centre is surrounded by several outer walls to protect. The walls were the boundary between the open landscape and the active life that took place inside the core of the castle.





## ATMOSPHERE

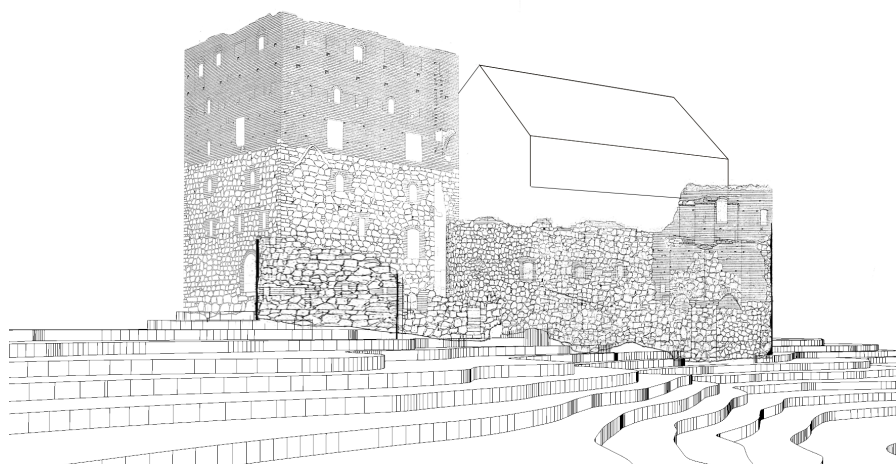
Every year is more than half of the tourists at Bornholm visiting the old ruin. Though Hammershus is the main attraction is the nature and vegetation just as an important part of the experience.

When climbing the hill to reach the core of the ruin is the visitors taken around the edge from where there is an amazing view to the Baltic Sea.

The feeling of the wild nature and the fact the attraction can be visited for free gives it an informal character where the experiences back in history can appeal to all generations.

Compared to many other museums are it possible to be in direct contact with the attraction, which mostly children is enjoying when climbing around at the remains of the castle.

The quality of the place it the close connection between the ruin and the nature, which will both be experienced through the architecture and weather. This connection is essential to keep the spirit of the place.



## CONCEPT

Over centuries has the ruin changed in order to adapt to the existing needs. The result is Hammershus as it is experienced today. We see the ruin as a historical relic of the past to be preserved, though the changes that has been made over time gives the place its story and identity.

The idea is to pass this tradition by bringing a new element into the heart of Hammershus and create a space from where the life can be brought back to the ruin.



## FLEXIBLE SPACE

### Utilize the existing potentials of the ruin

Hammershus ruin has in the past been active centre for essential functions of the island. To bring back the activity and understanding to Mantelgården the potentials of the remains of the castle have to be exploited. The ruin today stands as a backdrop for an empty stage. The lack of use of the different spaces in Mantelgården may impede the understanding of the original structure. The spaces appear without identity and can rather be considered as one mass than separate units.

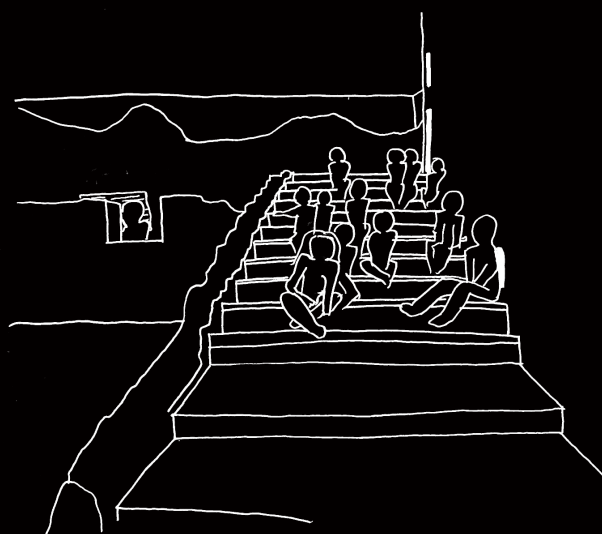
### Outdoor attraction

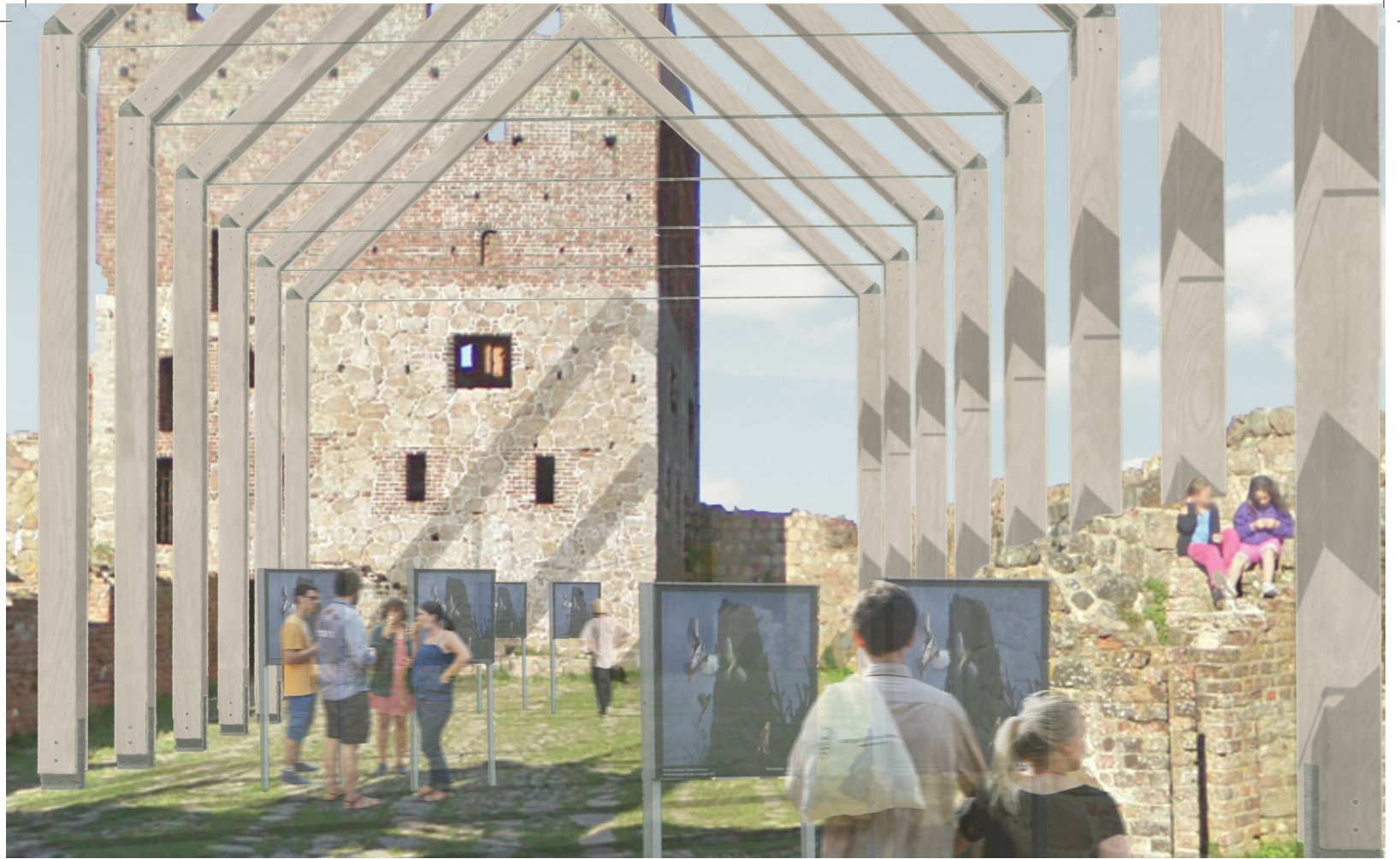
Hammershus ruin is a great tourist attraction and provides an insight in the history of Bornholm in a more informal way than regular museums. The quality of keeping the ruin as an outdoor attraction ensures that the visitors will have access to the place independent of opening hours. It allows them to explore the ruin either on their own or on a guided tour and will thereby be understood on different levels. A similar idea is used for the new elements added to Mantelgården. This has to add a new perspective to Hammershus whether it is experienced in relation to an event in the tourist season or alone on a day in the fall.

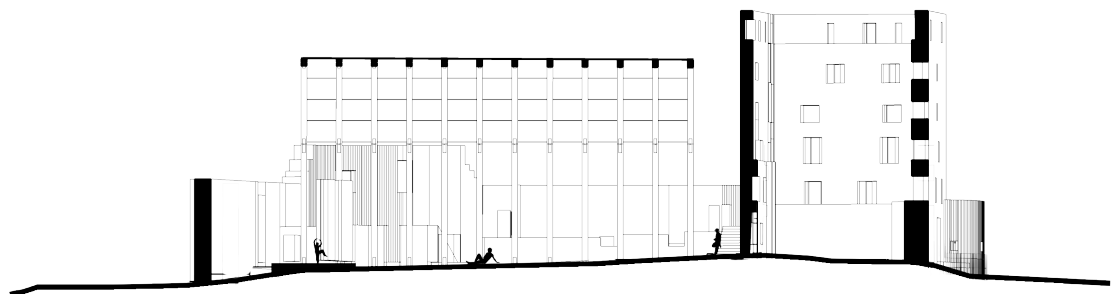


## Fleksibility

The flexible space will be centre for a number of different scenarios using the ruin as backdrop and caters to a wide range of visitors. The events can be in connection to outdoor activities as well as cultural experiences. Further can the space be used in collaboration with existing events at the island and thereby create an interaction between events as the jazz festival of Allinge and the island pride and greatest tourist attraction Hammershus. By using the heart of the ruin for these events is it possible to recreate an active space rather than a passive relation between ruin and visitors.





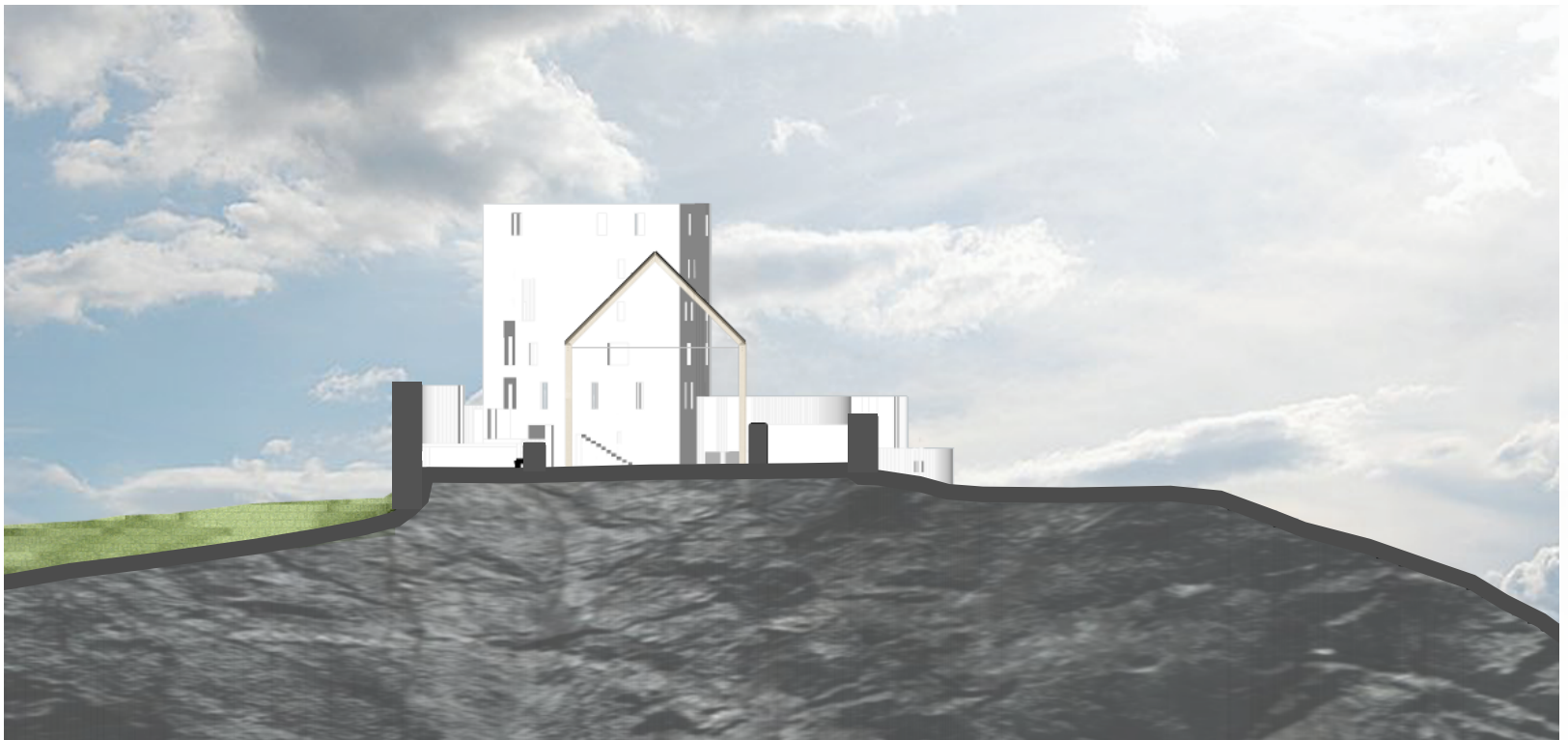


Current page:  
Sloping terrain is utilized for performance  
Opposite page:  
Photo exhibition  
Concert in connection with Allinge Jazz festival

## CONNECTING LANDSCAPE AND ARCHITECTURE

The new structure is placed in the centre of Mantelgården and follows the initial idea of using the contours in the landscape as basis for the placement of the different structures. It thereby underlines the connection between the landscape and architecture.

Mantelgården can be considered as the heart of the ruin and is thereby placed at the top of the hill. The structure itself emphasizes the vertical expression and reaching, with its high columns, for the sky.





0 m    5 m    10 m



1:500

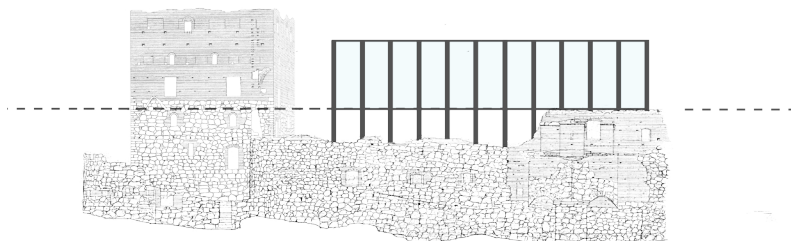
## STRUCTURAL DESIGN

The new structure is related to existing and former lines in the ruin. Thus do the pitched roofs that originally were to find in the structures in Mantelgården inspired the new structure.

This is emphasized by choice of construction and materials and differs from the old ruin.

Though the project differs by structure and material do both the ruin and the new structure symbolize a robustness that through history has been part of the place. The ruin has over time has been translated according to the certain need and thereby appear more complex.





Relation between proportions

## ROOF STRUCTURE

As seen in the picture on the previous page will the new structure appear as an independent element in the centre of Mantelgården. When arriving to Slotsgården in which Mantelgården is placed will the roof of the new structure serve as a teaser to the visitors. The roof is defining a space from where a different experience is to take place and appear as a foreign element there by creating a curiosity will attract the visitors directly to the core of the ruin.

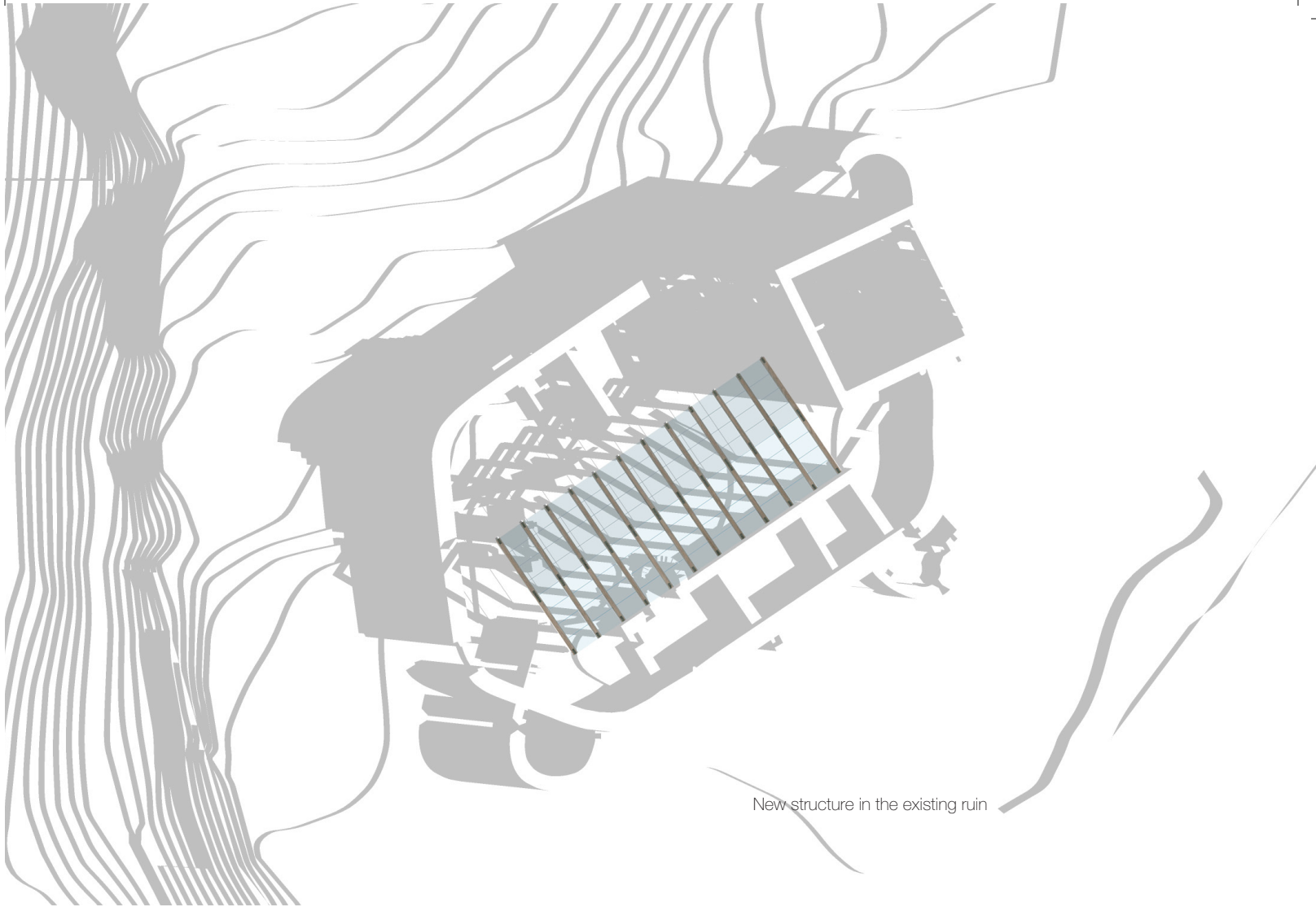
The overall idea of the project is to create a flexible space in the old courtyard. Though the two structures appear as independent elements can the relation between these be seen in the proportions of the building. The structure is built as a traditional construction with columns, beams and discs that gives it a simple and understandable expression compared to the complexity of Hammershus. It respects and relates to the old building by following the existing lines of the ruin. The columns follow the highest point at the outer wall while the pitched roof reaches against the tower.

Caused the rising terrain on arrival at Mantelgården will the ruin appear more spectacular. Also this perspective ensures that only the roof will be visible at the arrival. The glass panels covering the roof are reflecting the sky and create a connection between the architecture and nature.

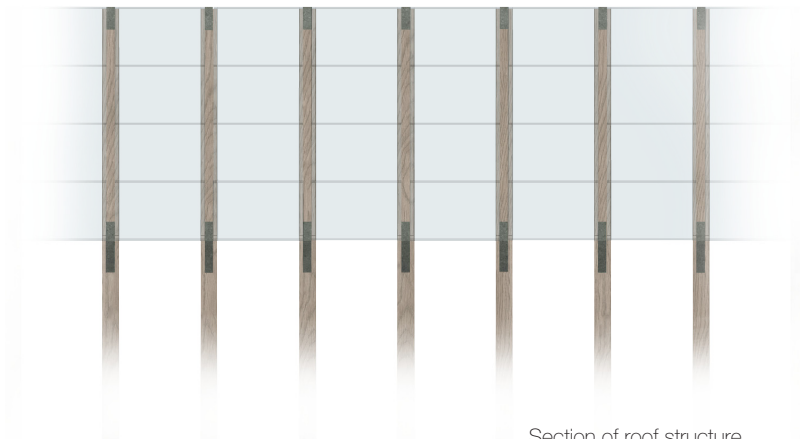
The structure underlines the verticality of the landscape while keeping the tower as an essential part of Mantelgården.

To maintain the simple profile of the frames the glass panels are lowered into the sides of the beam. This ensures the structure will appear as one unit and that the beams will still be visible when the glass is reflecting.

The columns are placed with in a unique and with a distance to that the glass panels can function as discs between the beams.



New structure in the existing ruin

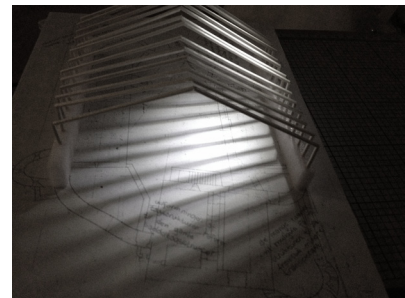
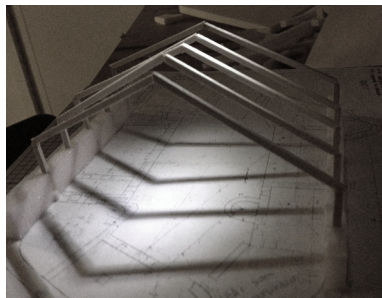


Section of roof structure

## SHADOW STUDIES

In the north is the weather often changeable and every opportunity to stay in the sun will draw people outside. However a sunny day may not be equal to warmer weather. The changes in the Nordic weather though is thought to be emphasized by the new structure and used to create a connection to the nature there is an essential part of the experience at Hammershus.

The frames there define the construction is further used for creating a shadow play in the courtyard under the structure and on the surrounding remains of the castle. As known from a number of different situations can a pattern of funny shape in the shadow invite to play. By making a shorter distance between the frames will the shading underneath appear as a pattern that change over day and season.



## MATERIALS

Hammershus is do to its former function as fortress made as a massive structure. The ruin served as protection for enemies but did also form a shelter to the weather as Hammershus is located in an exposed place next to the Baltic sea. The robustness that represents the ruin is reproduced in the thickness of the frames.

Inspired by local materials and the oak trees in Slotsgården is the new timber structure growing of the courtyard. A wooden structure is a natural material as the existing used for the ruin.

In time will the timber be affected by the weather and appear as a natural element in its context. The joints in the structure is made by steel to emphasize the transition between the structural elements.



Oak



Patinated oak



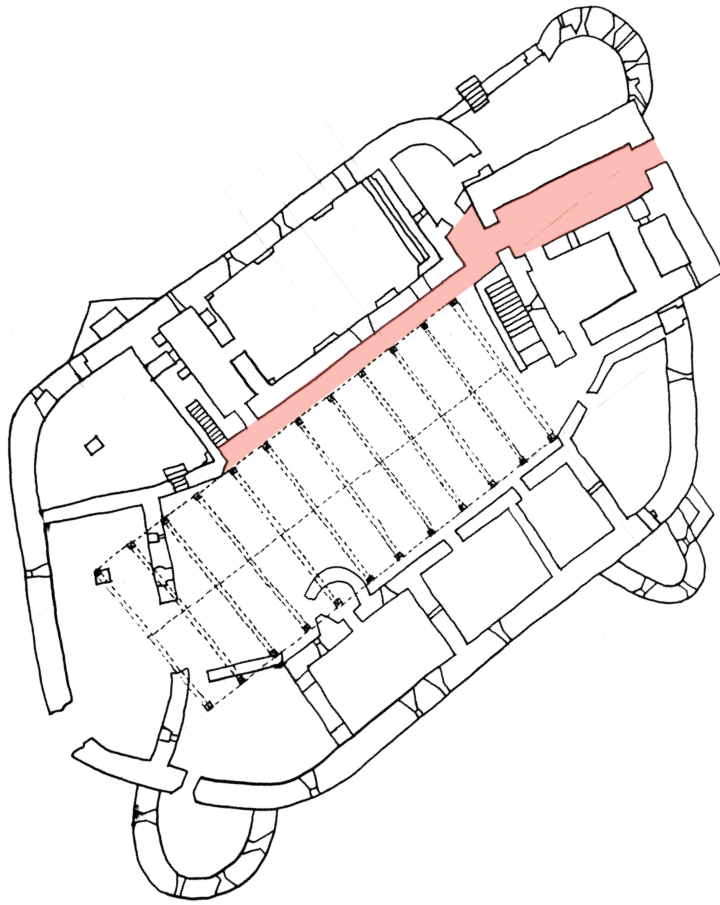
Steel



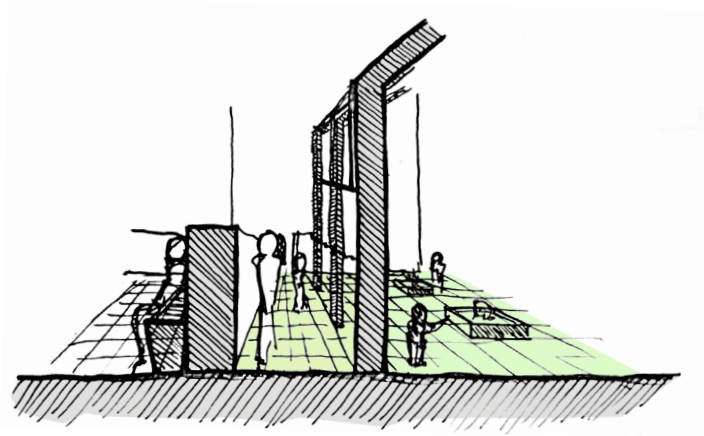
## ARRIVAL

When arriving at Mantelgården the visitors will be met by the old tower there served as original entrance for the core of Hammershus. The movement through the narrow entrance will create a contrast to the open space under the new structure. The columns in the northern part of the structure serve

as entrance to the flexible space and the colonnade define a transition between the two spaces. As the columns is pulled back from the wall of the ruin in north does it further creates a hierarchy between the surrounding spaces in the north and south wing.



Arrival area through the originale entrance



Transition between arrival area and the new strucutre



Detail of roof structure; new oak

## DETAILING

“...the recognition that details themselves can impose order on the whole through their own order.” is how Marco Frascari describes the essence of the detail.

In the new structure for the flexible space the detailing is contributed to the story of the architecture.

The idea of keeping the structure simple and understandable to the visitors requires that the individual elements will appear clear.

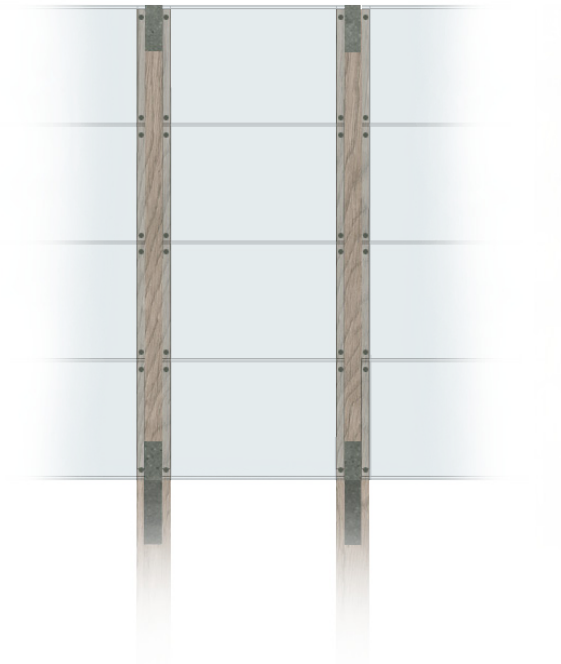
By changing the materials in the joints will the transition be emphasized and the division between beam and column.

The connection between structure and joints is visible from the inside the as they are pushed into the beams so that the profile of the structure will appear intact.

To avoid torque between beam and column is used a thin line connecting the columns.



Detail of assembly of structure



Section of roof;  
detail of with screws

## FLOORING IN SURROUNDING ROOMS

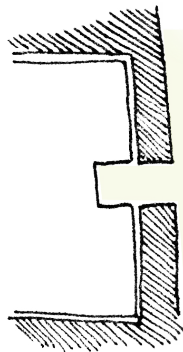
As the courtyard in the centre of Mantelgården represents the flexible space with a continuous flow of people are the special units surrounding the courtyard thought to be spaces for a lower level of activity. These rooms in the heart of the ruin did in the past represent several functions there were essential parts of the castle. Today is these rooms left as empty shells without specific identity there define the difference between former indoor and outdoor spaces.

To recreate the feeling and understanding of the difference between spaces is added a new flooring to the former rooms their surround the courtyard. The flooring is considered not to imitate the expression of the past but rather appear as an element in itself in the same way as the roof structure.

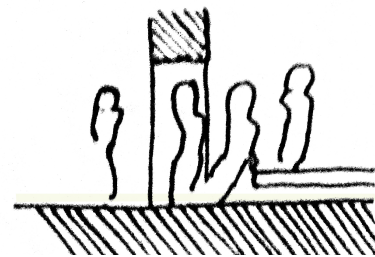
The transition to the smaller units is marked by a retreat in the flooring. This ensures a relation between the two areas as well as it provides good access through the low door opening.



existing coating from courtyard is connecting the inner and outer parts of Mantelgården

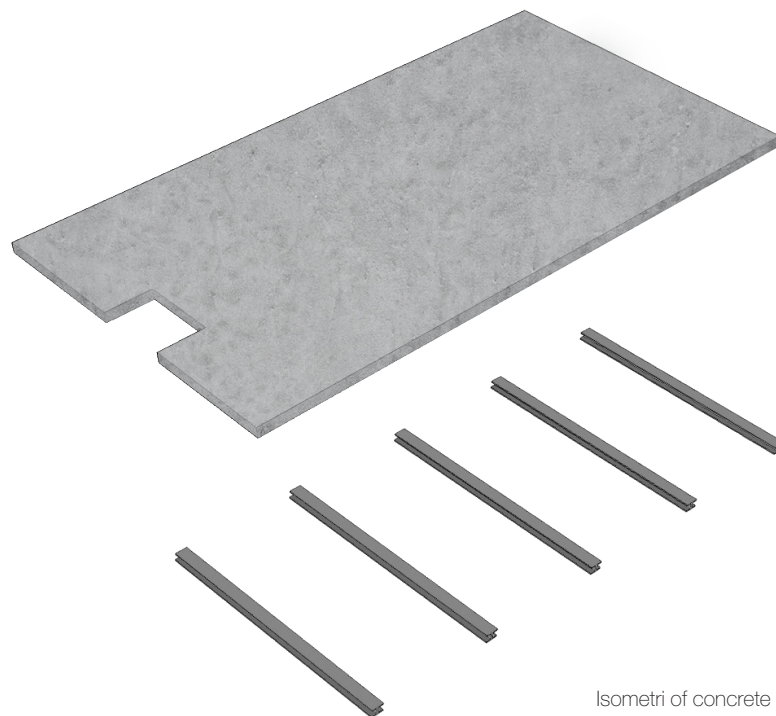
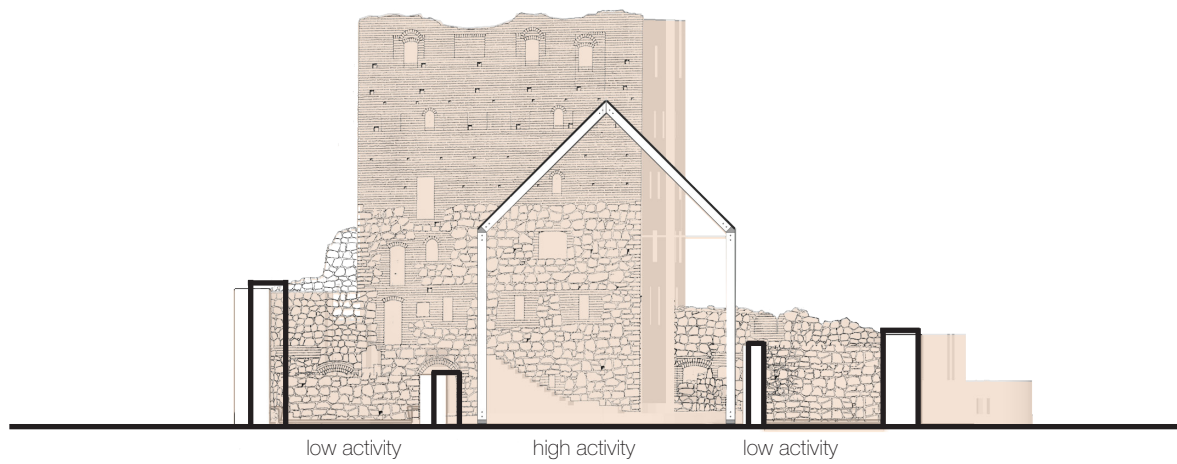


plan of the relation between dept of existing wall and coating



retracted level ensure good accessibility through the low entrance



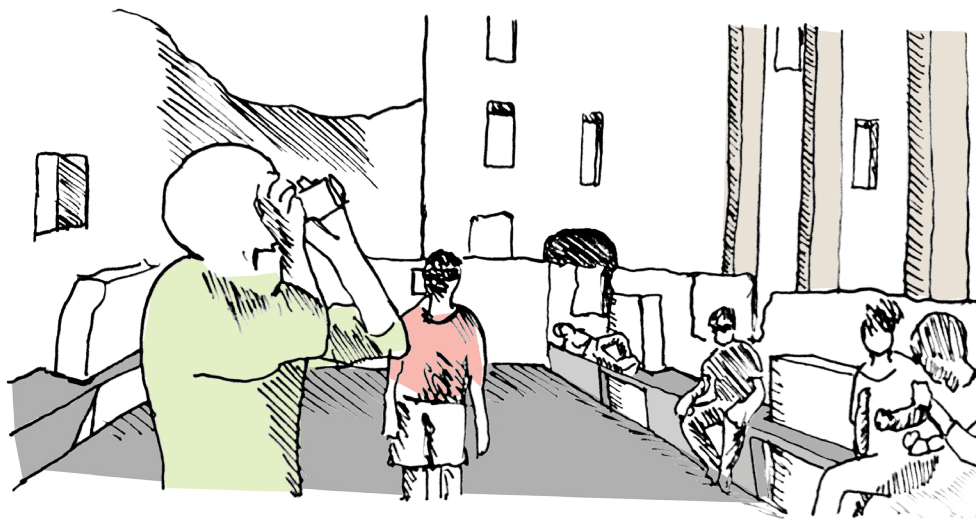


Isometri of concrete coating, raised from ground by using I-beams

The areas with the new flooring are more intimate spaces where the visitors can relax and enjoy music from possible concerts from a more withdrawn position. The material used for the flooring is concrete as this during the summer season gains the sun heat. This ensures that the spaces will provide comfortable sitting areas for the guest, which in the North is important to consider, as the weather conditions often can be changeable with lower degrees.



Child using the warm of the stone for sitting



## THE OLD CHURCH WING

An essential room there differs from the remaining is the church wing. This area is placed in the northern part of Mantelgården. In order to emphasize this room is there along the northern and southern wall added sitting elements that furnish the space and underlines the depth of the chapel.

The sitting places are a reinterpretation of the low brick benches from the past, though the material and design

relates to the new coating elements.

The benches are attached to the coating and thereby avoiding a direct interaction with the ruin.

To emphasize and respect the old remains in the church wing is the connection between the bench and coating partly opened. This ensures that the remains will be framed and highlighted to the visitors. The contrast between the two materials emphasizes both elements.





## CONCLUSION

Placed in the heart of one of Denmark's national treasures is the new structure questioning the idea of how the historic place can be experienced.

The idea of preserving doesn't have to exclude a thought of how a certain place can be used in the future. In connection with the current exhibition of Hammershus is one of the focal points to understand the life that took place at the castle in the past. At that time was the courtyard an active space for further activities to take place.

The focus of this project has therefore been how to create an architectural space from where different activities can contribute to re-establish the courtyard as an active centre.

As the roof catches the reflection of the sky outside and inside creates a play of shadows that almost is like a sundial to the visitors, is the new structure in constant contact with the nature. The expression changes over time and season.

By adding the new flooring to the surrounding rooms does the understanding of inner and outer places become clear to the visitors. As the concrete floor underlines the previous spatiality's does the existing coating in the courtyard indicates a more active space.

The project is not competing with the existing structures but the contrast between them is rather emphasizing both elements in a harmonious unit.

The project is an example of how a simple transformation can create new life to a place. It has a critical approach of how to experience historic places in the future and if it is possible to increase the interacting to the visitors.

# ILLUSTRATIONS

page 8:

<http://www.bornholm.info/sites/default/files/Svaneke8.jpg>

page 10:

[http://www.bornholm.info/sites/default/files/styles/slide\\_688x337/public/Hammershus-paa-Bornholm\\_0.jpg](http://www.bornholm.info/sites/default/files/styles/slide_688x337/public/Hammershus-paa-Bornholm_0.jpg)

page 11:

Hammershusguide s. 4

page 16:

[http://www.visitdenmark.dk/sites/default/files/styles/galleries\\_ratio/public/vdk\\_images/Attractions-Activities-interest-accommodation-people-geo/Nature/bornholm-klipper.jpg?itok=FWH\\_zLAA](http://www.visitdenmark.dk/sites/default/files/styles/galleries_ratio/public/vdk_images/Attractions-Activities-interest-accommodation-people-geo/Nature/bornholm-klipper.jpg?itok=FWH_zLAA)

page 31:

<http://klimateksikon.dk/sites/klimateksikon.dk/files/imagecache/800/Egeved.JPG>

page 39:

[http://www.baadstad-strand.dk/media/Bornholm\\_11-stor.jpg](http://www.baadstad-strand.dk/media/Bornholm_11-stor.jpg)

# APPENDIX

Resultat fra Robot Structural Analysis

RESULTS - Code - EN 1995-1:2004/A1:2008

Bar: 1 Timber Column\_1  
Point / Coordinate: 3 / x = 1.00 L = 5.50 m  
Load case: 7 ULS SN1 1\*1.00+3\*0.45+4\*1.50

Section OK

RECT\_1

Auto

Simplified results | Displacements | Detailed results

CALCULATION STRESSES

$\text{Sig}_{c,0,d} = 55.56/1600.00 = 0.35 \text{ MPa}$   
 $\text{Sig}_{m,y,d} = 66.36/10666.67 = 6.22 \text{ MPa}$   
 $\text{Tau}_{z,d} = 1.5 \cdot 12.07/1600.00 = -0.11 \text{ MPa}$

ALLOWABLE STRESSES

$f_{c,0,d} = 8.31 \text{ MPa}$   
 $f_{m,y,d} = 8.31 \text{ MPa}$   
 $f_{v,d} = 1.57 \text{ MPa}$

FACTORS AND ADDITIONAL PARAMETERS

$k_h = 1.00$   $k_{h,y} = 1.00$   $k_{mod} = 0.60$   $K_{sys} = 1.00$

LATERAL BUCKLING

BUCKLING Y

$L_Y = 5.50 \text{ m}$   $\text{Lambda}_{rel Y} = 0.83$   
 $LF_Y = 5.50 \text{ m}$   $k_y = 0.90$   
 $\text{Lambda}_Y = 47.63$   $k_{cy} = 0.81$

BUCKLING Z

$L_Z = 5.50 \text{ m}$   $\text{Lambda}_{rel Z} = 0.83$   
 $LF_Z = 5.50 \text{ m}$   $k_z = 0.90$   
 $\text{Lambda}_Z = 47.63$   $k_{cz} = 0.81$

RESULTS

$\text{Sig}_{c,0,d}/(k_{c,y} \cdot f_{c,0,d}) + \text{Sig}_{m,y,d}/f_{m,y,d} = 0.35/(0.81 \cdot 8.31) + 6.22/8.31 = 0.80 < 1.00 \text{ (6.23)}$   
 $\text{Tau}_{z,d}/f_{v,d} = 0.11/1.57 = 0.07 < 1.00 \text{ (6.13)}$

OK

Change

Forces

Detailed

Calc. Note

Help