CIRCULAR CONSTRUCTS: An architectural investigation into the possibilities of re-centring places of gathering, in cylindrical form, within the margins of a Sussex town

Design Portfolio Mats Borgen AD 671



The first term project revolved around the exploration of the circular form, and how the circle could form complex architecture. It experimented with how negative and positive spaces could work within different gridded systems. The project itself aimed to create spaces that encouraged interaction between people, where political discussion was at the heart of it. Furthermore, it sought to work with light and darkness as a central element, where the light came from above, through unique apertures formed by tapered circular shapes.

THE INITIAL PROJECT (FIRST TERM)



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PROJECT DEVELOPMENT (FIRST TERM)

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POTENTIAL NET



First term revolved around twelve circular shaped chambers organized in a four by four rectangular grid. These chambers had passages varying from chamber to chamber, although all chambers were accessible by journeying through the building. However, how can the building become a more cohesive and interesting space? By expanding the grid, new spaces in-between appears that will otherwise not have been accessible, which forms passageways for the inhabitants from one chamber to another.



EXPANDING THE GRID



How could these spaces in-between not just be mere corridors from one chamber to another, but become interesting elements in and of themselves? By exploring different forms, shapes and orientations, these spaces can become fundamental parts of the complex. These diagrams explore both rectangular and circular shapes within different layouts, and how each one forms unique spaces in-between. While some solutions enhances the experience of moving around the chambers, others diminish it. Furthermore, some offer more space in-between, that can be utilized for additional purposes, while others resemble more of a traditional corridor.

SPATIAL EXPLORATION



Through the spatial diagrams, an interest in how each layout might create different and unique atmospheres and experiences arose. How would the inhabitants move differently throughout these spaces? Consequentiality, this sparked the idea of how a journey through the building might be. This concept was intriguing, and I therefore began to research the concept of a journey in terms of architecture.

The Jewish Museum by Daniel Libeskind's offered a captivating perspective of how one might journey through, and how he altered and played with the idea of traveling from one point to another. Thinking about the linear perspective of how people might move through the spaces between these two points. This gave a new and interesting insight into how a journey might be incorporated as an architectural elements within the project.





A JOURNEY



Plan drawing of Daniel Libeskind's Jewish Museum



These diagrams explore the movement one might take within the boundaries of certain layouts, and present the places of encounters between the inhabitants. Moreover, by adapting Daniel Libeskind's idea of vaulted spaces- where the inhabitants might not be able to enter nor experience, only move around or look past, the journey one might partake in could be altered to encourage interaction or movements between spaces. Vaulted spaces could guide the inhabitants in certain directions and thereby maximize the possibility of unique experiences and enhance the likelihood of dialogue occurring.

MOVEMENT EXPLORATION 1









MOVEMENT EXPLORATION 2



Will the experience of the in-between spaces become an endless journey through light and dark spaces that are overflown with warm steam descending from the chambers along the path? Or rather a defined corridor the inhabitants travel through in order to reach a predetermined destination?





A CORRIDOR/ JOURNEY?



How might the relationship between the in-between spaces and the chambers be like? Will each space be a vital element of the building, or will one be overshadowed by another? A harmonious marriage between these elements is vital for the building to achieve a place of human interaction and dialogue between the inhabitants.

The image is combining two of the spatial layouts, in order to illustrate that a combination of these layout might add more complexity to the project. By adapting several layouts, it enhances the experience as there will be more elements to discover and brings with it the advantages certain layouts might have.



A MARRIAGE OF SPACES



How might the chambers be used? While the small chambers form intimate spaces where poltical dialogue might likely occur, larger spaces might be inhabited differently. The chambers will encourage the inhabitants to adapt the spaces as they see fit, and some might want to journey through the chambers just to feel the warmth or to heat themselves up, while others might rather want to practice yoga or dancing. Ultimately, the project will encourage people to come together in different ways, and through steam, light and darkness estalish a sancury for dialouge and interactions.

SCALE/ OCCUPANCY

Map of Lewes, Sussex, England

Lewes Train Station Car Park

Lewes Castle Car Park

Bonfire Site

Convent Field

LOCATING THE PROPOSAL

The access of water will be of vital importance for the building, in order to be able to generate steam. Lewes, which is located in Southern England in Sussex, has mainly three sources of water that can be tapped into, which is made up of the River Ouse, Winterbourne and Cockshut. However, Winterbourne is only active during the winter months, in contrast to the Cockshut and River Ouse. Three of the potential sites will have access to minimum one of the rivers, and thereby be able to produce steam, while one will need an alternative ways of accessing water.

BONFIRE SITE

CONVENT FIELD

LEWES CASTLE CAR PARK

Bonfire Site

Convent Field

Lewes Castle Car Park

TESTING FORM/ SPACE/ LIGHT

DEVELOPMENT SKETCHES

By working with irregular, angled and organic grid systems, alternative ways of organizing the chambers develop, which presents a more complex and cohesive layout in comparison to the regular grid system.

How might the journey and the experience through these spaces be for the inhabitants? Could light and darkness be an elements that provoke human interaction? By controlling the darkness and light of the spaces, they might become interesting elements of themselves, that might evoke certain senses. Moreover, by working with different apertures, the amount of light penetrating will vary throughout the complex, and thereby result in a cohesive environment of uniquely lit spaces.

By breaking up and fragmenting the circular grid, a more advanced complex of forms emerges, that offers a richer experience for the inhabitants to move around the inbetween spaces of the building. These spaces forge many different journeys that one might partake in, and opens up the possibility for the inhabitants to choice for themselves where to roam. Conclusively, it creates several spaces where the inhabitants will encounter one another, and thereby encourage dialogue.

CONVERSATIONS/ POLITICAL?

The proposal works with different sized chambers and an unique grid system in order to maximize the spaces within the building. The chambers offer a wide spectrum of possibilities in terms of occupancy, from intimate small spaces to larger more open ones. Furthermore, due to the uniqueness of the grid system, the in-between spaces vary in scale, and thereby contribute with additional spaces for the inhabitants to occupy. Moreover, by removing ceilings from certain chambers, open spaces emerges, that could furthermore be enriched by incorporating the concept of nature from first term, by adding trees and vegetations into these open spaces.

PROPOSAL S1: A TEMPLE OF STEAM/ GATHERING

Peter Zumthor's Therme Vals, was a building that truly sparked my interest, like how the building was separated into different elements, and instead of looking at the building as one unit, the Therme Vals was split into many smaller ones, which was something I wanted to incorporate into my own design. However, in contrast to Therme Vals, the project would not have clear gaps in-between each element, but instead the different elements would overlap one another. Thereby creating small vertical gaps between the roofs, forming several unique light slits where light could enter through.

FORM EXPLORATION/ ASSEMBLY

Peter Zumthor's sketch of Therme Vals

By repeating these three elements in many different orientations, a new concept appears.

PROGRESS DEVELOPMENT

The Bonfire Site is located near the river Ouse with the cockshut river running through it. Moreover, it is characterized by a large open field with a few trees scattered around, and is in general a mostly abandoned and forgotten site, that once a year is used for the Lewes bonfire. Consequently, the site is therefore a great location for the project, which can bring new life to the site

THE BONFIRE SITE

By following the restraints of the three different elements, an interesting space appeared in-between the many chamber rooms, that could become a garden or maybe a outdoor pool. The area might become a space where people could travel to after having had political talks within the steamy chambers to cool down, and maybe have a cold bath.

PROPOSAL S2: AXOMETRIC DRAWING

How might the experience of journeying through the in-between spaces be? Will it be characterized by the light penetrating through small slits in the roofs and open air spaces, or rather the sound of trickling water in the distance? Alternatively all elements might harmonize with one another, creating a symphony of unique experiences for the user to encounter.

A JOURNEY/ PATH OF LIGHT

The first concept had in many ways lost some of the interesting elements the circular shape had added to the building. The chambers were therefore pushed beyond the restraints of the walls, which then bough some of the lost complexity back. Furthermore, the Cockshut river could be tapped into in order to provide the water needed to create steam.

PROPOSAL S3: AXOMETRIC DRAWING

By the natural restrains of the three elements some areas of the complex would not be covered by any roofs, and thereby interesting spaces would occurs where the inside and outside seamlessly coexists. Furthermore, the floor of these spaces leave a gap like with the roofs, which could become an additional pool for people to enjoy.

While the medium and the large elements only go into one another when they connect, the small and the large elements overlap one another, and leave a gap in-between the two roofs, where light could enter. This forms a controlled environment where only certain areas of the roof will contain gaps for light to enter, and a harmony between the light and dark spaces is obtained. How might the experienced'

How might the experience of this space centred around the pool be experienced? Will it be an area of passage, where the inhabitants pass through to cool themselves, while traveling from one steam chamber to another? Or will it be an element of warmth, where the inhabitants might stay and occupy, or furthermore, where families might gather around.

A SANCTUARY OF STEAM

PROPOSAL S4: AXOMETRIC DRAWING

First Concept

Issues: by putting facilities such as toilets and showers within the chamber spaces, some complexity of these spaces are lost.

Second Concept

Issues: the sequence of different facilities like the changing rooms, toilets and showers, are not optimal, and requires a more thorough plan.

Third Concept

Issues: The building doesn't have a proper entrance or lobby space. Additionally, it will require a reception and offices for the employees.

PLAN DEVELOPMENT/ CRITICAL ANALYSIS

Entrance Proposal One

Entrance Proposal Two

Entrance Proposal Three

Entrance Proposal Four

How will the building be perceived from afar? Will the building encourage people to come inside or will it rather spark an interesting in people of what that is, and what is occurring inside those walls? The entrance will be an important element of the project that will bring people inside of the building, and encourage people to interact.

ENTRANCE

ENTRANCE PROPOSAL

RATIONALISING THE PROJECT

By removing several entryways within the chambers, the movement pattern of the building changes. Instead of having the possibility to walk through all chambers, a more restricted pattern is implemented, were the user have to move between both the chamber spaces and the in-between spaces, resulting in a more cohesive movement pattern.

1 STEAM CHAMBER 1 EDHINGAL ROOM 1 EDHINGAL ROOM 1 HANGING ROOM 1 HONG 1 DLF1 1 PROC

COLLECTION OF JOURNEYS

ENVIRONMENT STRATEGIES

Cross ventilation can ensure for natural ventilation throughout the building.

SUMMER SOLAR REDUCTION

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Overhang

The stack effect can be used within the building due to the height difference. It will ensure that fresh cold air comes into the building in the summer.

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In the summer, it will be important for the building not to overheat. To prevent this, the building can adapt solutions such as overhangs and blinds.

Blinds

The effect can be increased by adding a roof with vents on both sides. A winged roof, will create a low pressure, which will bring in even more air into the building. In the winter months, most of the vents can shut, so that the building only let in the minimum amount of air, in order to keep the building warm.

In the summer, the ground is cooler than the air. Underground cooling can therefore be adapted for the building, which will direct warm air through a network of pipes underground, which will enter the building as cool air.

VENTILATION

It will be important to incorporate to adapt sufficient ways for the steam to exit the Building. The first alternative might not provide enough room for the steam to exit, in contrast to the second one. Rowever, rain could still penetrate the first two solutions. Therefore, the third solutions will be the best for the building, which consist of a ventilation box, which lead the steam downwards before it can exit the build, and therefore preventing any outside hazards from damaging the building.

HEAT PUMP

Air source heat pump It is cheap to install, but will be noisy. The external fan box will need to be located preferably south for the sun, and in a well ventilated area. Is less efficient than ground source.

A blueroof can also be adapted to both collect water, but also assist in heat retention in the winter monthe

It is three times more expensive to install, compared to air source. Moreover, it requires good ground conditions. This option will be a great alternative for the building to cool in the summer.

Both the ground source and the air source can ensure for a constant flow of fresh air for the building, and that the air is swapped out regularly.

Another alternative will be to locate the pipes on the outside, which will then make it a lot easier to clean, and not create any issues with damp within the inner walls of the building. Therefore this solutions will be the best alternative for the building. Furthermore, it will ensure for a sustainable way of providing water within the

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The vacuum tubes doesn't need to be located horizontally, but can also be located vertically on the side of the chambers in order to provide additional tubes if that is needed be heated up

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Underground heating In the winter, the ground is warmer than the air, and the pipes can instead be used for underground heating, by having cold air enter through the pipe network, the air will be warmed up.

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Trombe wall

A trombe wall is a natural way of heating the building in the winter. The sunlight will pass through a glass facade, and heat up an inner wall, which will radiate heat to the air in-between, which will then flow through the building.

The trombe wall is a good alternative for winter heating, however it will need to face south in order for it to be sufficient, and therefore there are only some wall within the building that can be used for the purpose.

Outside drainage

building.

A combination be generate steam

RAINWATER HARVESTING SYSTEM

WINTER HEATING STRATEGY

Inside drainage

The building will consume a large quantity of water in order for it to stay operational, and it will require water for different facilities such as toilets, sinks and showers, but also in order to create steam. It will therefore be important to adapt smart solutions such as rainwater harvestin systems, which will be good both for the building itself, but also for the environment.

One solutions is to have a network of pipes that will collect the rainwater from the many different roofs. The pipes that will gather the water will be located within the walls. This solutions will however not be the best alternative, as it might result in damages to the inner wall due to damp, in addition to being hard to access and difficult clean regularly.

STEAM

Steam can be generated by having warm oil of at least 100 degrees heat up water, which will generate steam

MIN WOTE. TANK

The vacuum tubes will face A combination between vacuum tubes with oil The vac and rainwater tanks can be adapted in order to south

COMPOST ENGINE

The steam generated with the vacuum tubes might not be enough sometimes, and a compost engine can therefore be an extra source to be used for generating steam and electricity. Furthermore, there is a great access to compost at site, since the neighbouring building is the Lewes household wast recycling site.

The tubes will need to have insulation in order to prevent heat loss

STRUCTURES

FLOOD RISK IN LEWES

CLT STRUCTURE

A CLT or gluelamminated timber structure is an sustainable option for building. It will both be structurally strong and flexible, which will be great for the building. However, the thermal mass of a timber structure will not be very high, and as the building will need good thermal mass, this alternative might not be the best solution.

CONCRETE SLAB FOUNDATION

A concrete based foundation will both be durable and strong, but will not be reusable and difficult to deconstruct. However, within the marshy land of the site it will be a good and reliable alternative, and as the building is built with the intention of standing for more than 150 years, it can be a good alternative.

BRICK STRUCTURE

Flint is a well used material throughout Lewes, and there are many different alternatives for flint construction. However, only a structure with flint as a facade and brick as the structural bearing element will be structurally strong enough to be used for the building. Therefore a combination between flint and bricks will need to be adapted.

STRUCTURAL GLASS

CONCRETE PILES WITH CONCRETE BASE

A concrete slab might not be enough for the structure within the site. The site is within the flooding zone, and the building can therefore be flooded, and it will need a solid connection to the ground so that it doesn't move like with concrete piles connected to the bedrock.

The smallest diameter of the roof windows will be 3 metres. It will be very difficult, if not impossible, to create windows of those dimensions. Alternative solutions can instead be to use structural glass which will be a lot stronger and be able to cope with the structure. Structural glass can also offer many different alternatives to how to divide the glass panels.

The Apple store at Fifth Avenue in New York is a great example of how to us structural glass

an insight into how to construct a cone shaped building

CONCRETE STRUCTURE

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BRICK FOUNDATION

CONTROL IL SINULIUNE Concrete is a great material for the form and shape of the building, and will provide a high level of thermal mass. However, the materials will have a high carbon footprint, and will not be a sustainable alternative. Although, the building will stand for a long period of time, the use of concrete can still be kept to a minimum.

Brick foundation is a lower carbon material compared to concrete, and a good structural material. It can also be reusable if lime based mortar is used.

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A combination between concrete and timber might be the best alternative for the building, as it will need a strong base and also well connected to the ground if a flood occurs.

EXPLODED AXO OF THE STRUCTURE

TIMBER PILES WITH CONCRETE BASE

CONSTRUCTION AND MATERIALS

An alternative structure can be to use gluelaminated timber.

Illustration of how the connection between the two roofs might work, as well as how the structure can work with gluelaminated timber.

OUTSIDE CLADDING

W003SWRES is a sustainable material to use, which can be locally sourced. Wood such as larch or pine is good alternatives for cladding. However, it has a low durability, and will need a lot of maintenance. Moreover, it is a costly material, and has a low level of fire resistance.

CANTLES can also be locally sourced, but is less sustainable. It has a high durability, and will require some maintenance. The cost of the material is moderate, and it has a high level of fire resistance.

INSIDE CLADDING

The roof system might be difficult to achieve, and an alternative can instead be to use the same solutions as Peter Zumthor's Therme Vals.

RNM will need to be mined from areas such as Norfolk, but with lime mortar it will be good alternative that can be reused. Moreover, it will not require a lot of maintenance, and will cope well with a steamy environment.

BROX can be locally sourced, and with lime mortar it can be reused. It will not require a lot of maintenance, and will be able to cope well with steamy environments.

TMREP can be locally sourced, and is a sustainable solution for an inside material. However, it will require a lot of maintenance and will not cope well under steamy environments and might get damages from damp.

CIRCULAR CONSTRUCTS: Further architectural investigations - the possibilities of a library

This sequence further investigate the cylindrical form and explore how it could develop for another purpose. Could these cylindrical forms become a place for books, where the space of gathering is reinvented as a space containing books? How might the cylindrical forms work differently with a more complex structure separated by several floors, will the inhabitants gather differently within these forms, or will it remain a constant? While the steam house revolved around a horizontal structure, the library will work with both a vertical and a horizontal axis. The library will explore how people might move from different cylindrical forms while descending and ascending within them.

Site Map

Site Photographies

Development Sketches

LOCATING THE LIBRARY

The car park near Lewes station, might be another site that is largely forgotten and looked past. Could the library work with the location in a way that both could coexist harmoniously? One alternative might be to lift the building off the ground, so that the car park is still functional. By lifting the building up, another space emerges which could be adapted as a marked place for the people of Lewes to gather.

The concept for the library continued with the ideas of working with the cylindrical forms as different elements, separated into three unique ones. How might these new cylindrical elements be oriented and organised within the boundaries of a traditional library? Will it continue with the gridded structures of the bath house, or will it instead have a less restrained layout? Moreover, how might the experience of one of these small libraries within the cylinders be? Will it be characterized by books upon boos as far as the eye can see, or will it rather have a more elegant approach where the books are neatly organised into different section. How could the library encourage the people of Lewes to gather within its boundaries, and might the building evolve around political discussions at its core?

ELEMENT THREE

Could the roof of the library enhance the experience for the inhabitants? How could the change in apertures change how the building might be perceived? Could the light be manipulated into creating different atmospheres?

ROOF EXPLORATION

How might the experience of the building be outside of these cylindrical libraries? Will it be characterized by massive straight or organic walls stacked with books? Or perhaps just pure white ones, which creates a contrast between the inside of the cylinders and the in-between spaces. By exploring the possibilities of working with double height spaces, a new concept of a path emerges, where the inhabitants might transit through a tall and narrow space stacked with books. A path of enlightenment, which might guide the inhabitants somewhere.

PATH OF ENLIGHTENMENT

PROPOSAL L1

PROPOSAL L2

PROPOSAL L4

A PLACE OF GATHERING

CIRCULAR CONSTRUCTS: Further architectural investigations - the possibilities of a meeting house

A condensation of thoughts, ideas and discoveries. Looking at the possibilities of bringing people together simply for meetings, but on a smaller scale, with a more modest practical approach.

Site Map

Site Photographies

LOCATING THE MEETING HOUSE

The car park near Lewes Castle, is another site largely looked past. The site is situated at the centre of Lewes, and could become a great location for people to gather and socialize.

DEVELOPMENT SKETCHES

CASTLE LIAE LIGHT SUITS

PROPOSAL M1

CIRCULAR CONSTRUCTS: An architectural investigation the possibilities of places for gathering, in cylindrical form, at the margins of Lewes, a Sussex town: steam house, library and meeting house.