Versions of Brutalism

A Comparison of Marcel Breuer´s St.John´s Abbey and Van den Broek & Bakema's Aula Conference Centre.

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ABSTRACT

During the post-war period in the 1950s, brutalist architecture originated in Great-Britain as a reaction to previous architectural movements. It derived from an architectural style of building with exposed concrete called ‘béton brut’. It later became more popular when a new generation of modernist architects started using this exposed concrete in their designs. Brutalist architecture expressed itself using distinctive materials such as excessively exposed concrete and it has generic properties which can be clearly identified too. Though, architects tended to incorporate own unique features into their designs. Brutalism was a movement that thrived up until the 1970s, inspiring many architects. Among which the architects Marcel Lajos Breuer with his St. John’s Abbey in 1961, and Jo van den Broek and Jaap Bakema with their University Auditorium in 1966.

The research is intended to detect which brutalist design characteristics have a relevance for contemporary building culture. This is done by investigating and comparing design characteristics of the two brutalist buildings; the University Aula and the Saint John’s Abbey. Both buildings have been selected for this research because of their clear referencing to brutalist architecture. The comparison of these buildings is made because the function of both buildings demand space for large groups of visitors.

An objective architectural analysis of design characteristics is executed with drawings retrieved from the Marcel Breuer Digital Archive (n.d.), Het Nieuwe Instituut in Rotterdam and the TU Delft Academic Heritage archive. This analysis will be held on both brutalist buildings to discover which parts of each design specifically are more valuable and which parts are less well developed. Subsequently, in case of overlapping proper design characteristics, statements can be made regarding which architectural or compositional decisions that have been made are tied to a particular effect on the sensory and spatial experience. These statements made in the comparison will lead to a grounded conclusion on characteristics of brutalist architecture that are potentially instructive for contemporary building culture.

INDEX

Fig. 4: St. John's University Abbey.

INTRODUCTION & METHODOLOGY

In architecture, periods can be recognized in which designs of buildings adopt certain characteristic design features. The collective name of the designs that are made with, and the architects that have used roughly the same features or motifs is called an architectural movement. Brutalism is a architectural movement that is recognized between the 1950's and 1970's. In most continents, brutalist buildings have resurrected in different typologies. In the United States, the architect Marcel Breuer built an abbey for the St. John's University in Minnesota (Figure 4) with complete creative freedom. In The Netherlands, the architects Jo van den Broek and Jaap Bakema designed a conference auditorium for the University of Delft (Figure 5). They did this with complete creative freedom too. Though, both having obvious brutalist characteristics, these buildings hardly share any appearances. And even when these projects are being compared to the first official version of brutalism, namely the Hunstanton School by Alison and Peter Smithson (Figure 6), it would be almost impossible to recognize that they are in the same architectural movement. Architects have taken the core elements of the brutalist style and made them their own, even to the extreme. Although the movement has never been to everybody's interest, it has left a vast legacy to the world.

Brutalist buildings have been moving people for a long time, among them users, passers-by and artists (Asto, 2022). The emotional and sensory impact that the voluminous structures have on humans are incomparable to any other existing built project (Brockington & Cicmil, 2016, para. 6). The architectural movement has spread itself among fascinated architects and developers on different continents in a short period. With that many forms of brutalism can be seen in various compositions (Editors, 2018). Although the many forms of brutalist buildings may operate in different environments, their characteristic features appear the same.

Brutalism could have been typified under modernist architecture, a movement that was facing its expiration. Some claim that brutalism was rather a reaction to the modernist movement. At the same time, another countercurrent began to develop that

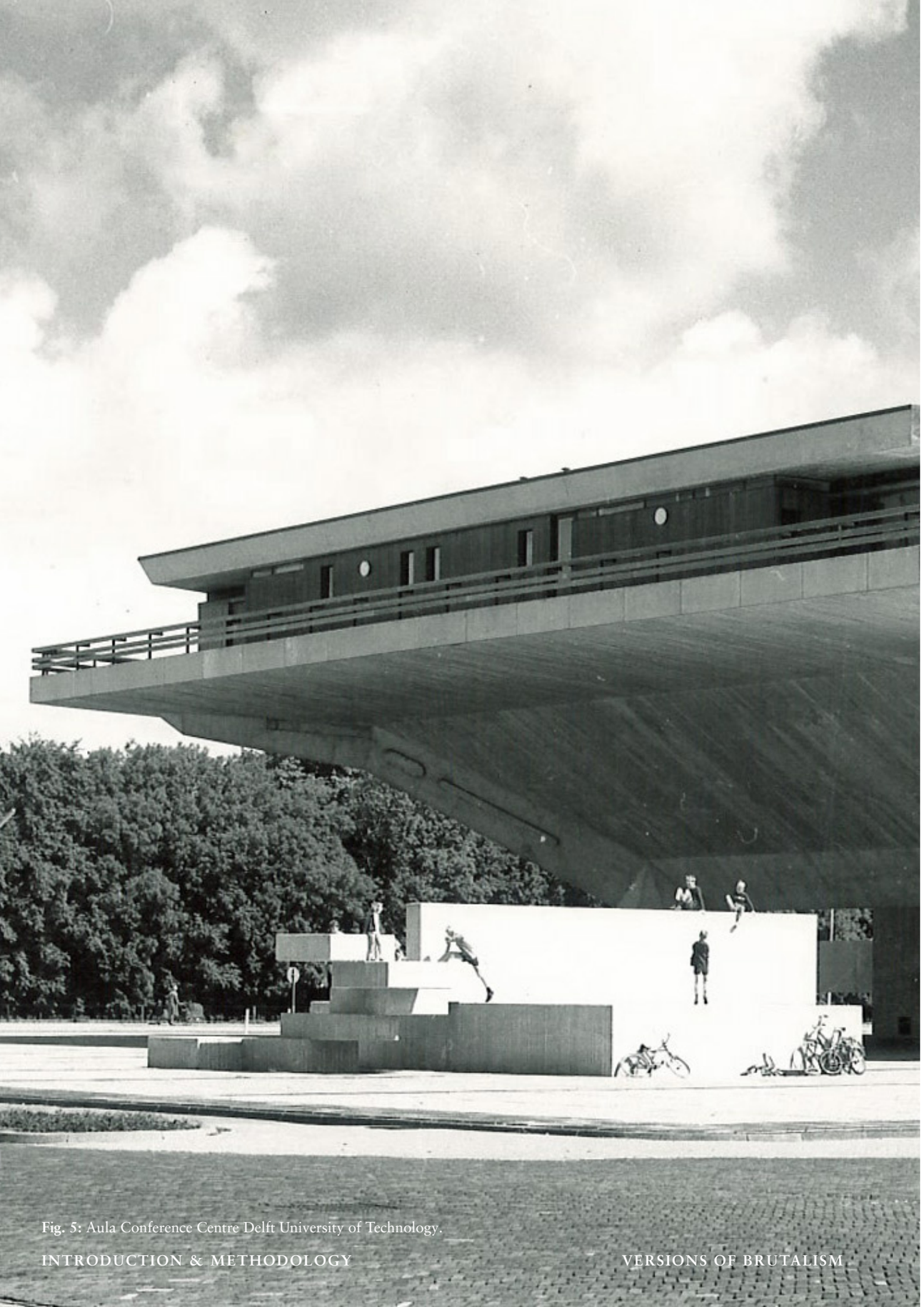


Fig. 5: Aula Conference Centre Delft University of Technology.

did survive the following decades; postmodernism. It can be argued why brutalism should not also fall under the postmodernist movement, but in essence postmodernism desires to be skeptical about reality (Holtz, 2020, p. 2). Brutalism, on the contrary, tends to make reality visually demonstrable.

Due to the growth of science and the tendency to build more sustainably, brutalism as an architectural art and thus an architectural movement has been seen disappearing since the late 1970s. Because brutalism has faded under postmodernism and afterwards almost been forced to a halt by studies on emissions from certain building materials, namely concrete a founding element in brutalist designs. The world can still relish the often illogical and challenging structures that exist today and in many instances are still in use. It has been passed to wonder which advantages these architectural giants brought the building environment, to which extend the contemporary building society is able to adopt elements or characteristics features of typical brutalist architecture or which can be instructive for modern thinking.

To find out how contemporary architecture can acquire inspiration or useful knowledge from brutalist architecture, a comparison will be made between two clearly brutalist buildings, made by different design companies with different origins in different places in the world. In case that well-functioning elements in both designs correspond from the comparison, and these elements can be significantly linked to its brutalist character, a statement can be made about the possible valuable characteristic of brutalist architecture.

In the first part of this thesis, the term brutalism is defined and determined by supporting literature studies from architectural historical contexts. Defining brutalism is necessary for the continuation of the research. In the second part, an architectural analysis is made of the earlier mentioned conference auditorium by architects Jo van den Broek and Jaap Bakema. The third part is set up in the same way as the previous

Fig. 6: Hunstanton School in Norfolk, England.

part, but the analysis is carried out over the St. John's Abbey by Marcel Breuer, also earlier mentioned,. These two buildings were chosen for the fact that they both have clear references to brutalist architecture, are both employed to receive many people at once and because they still are in daily use.

The analyses consists of a decomposition of the building in question from construction drawings, such as plans, sections and elevations. This provides insight into information such as the rhythm between elements, scale, dimensions and proportions. The ornamentation of the buildings will as well be examined. The functional layout of the spaces, the routing though the buildings, the typographical layout in its surrounding landscape, common areas and accessibility. Structural properties such as lighting, materialization and climate control will be included in the analysis. Finally, the intention of the designer is explained. Their social and cultural background is hereby taken in account. Subsequently, the aspects of both projects, discussed in the explanation of the analysis, are compared to each other.

Fig. 7: Pavilion Suisse.

1 | DEFINING BRUTALISM

The terminology demands an appropriate explanation before an analysis can be initiated. The history behind the emergence of the architecture movement is presented to form the basis. Subsequently, a description is given of the way in which general aesthetics are perceived and thereby the link is made to brutalism. From this a conclusion is formulated how brutalism can be considered according to the described requirements.

1.1 | Origins and emergence

The Franco-Swiss Le Corbusier was one of the first modernist architects to experiment with the use of concrete in architectural arrangements. In the Pavilion Suisse in Paris which he realized in 1930 (figure 7) visible concrete was integrated into the design. As well as in the Gustavo Capanema Palace, realized in 1945 (figure 8). This application of the material was called ‘béton brut’. (Bacon, 2015, p.17) Le Corbusier was also deeply inspired by architecture with honest construction, architecture in which the power transfer of the construction could be clearly traced (Cowan, 1992, p. 97). This was also referred to as ‘fair architecture’.

After the Second World War, many countries in Europe lay in ruins. In the period immediately after the war, much attention was paid to rebuilding cities, political systems and social security. Unfortunately, there was little money for this, so people continue to be confronted with the emotional trauma they suffered. An art movement responded to this social trend of sadness: post-war art, or avant-garde. This art movement focused on arousing emotional feelings to soften the traumas. The art was a search for the sense of recognition of the defeated feeling that the countries were struggling with. The idea behind avant-garde art was the redevelopment of identity through originality and honesty. That principle has inspired architects in said countries (Niebrzydowski, 2021, p. 10-11), among which Peter and Alison Smithson. Together with a group of European architects, including Jaap Bakema, they were part of a team of architects called Team 10. This was a club detached from the recognized congress

Fig. 8: Gustavo Capanema Palace.

for international modern architecture, also known as CIAM. Their main focus on the identity and flexibility of a design while unfolding association in users for a sense of social connection (Smithson, 1963, p. 353-354). When designing the Huntington school, the Smithson duo took the meaning of fair architecture completely out of context. It started visualizing pipes and conduits, making the architectural design game even more about the positioning of spaces. Basic floorplans with logical axis made it possible to exhibit the structure and its materials.

According to Reyner Banham (1955, p. 22) the use of fair construction with relatively new materials started an architectural movement which he described to be 'New Brutalism'. Banham recognized how concepts in brutalism as an architectural movement are very similar to imaging and that the image of a design evokes emotion (Banham, 1955, p. 25). To distinguish the movement he listed the following characteristics for a brutalist building: "1. Memorability as an image 2. Clear exhibition of structure 3. Valuation of materials for their inherent qualities as found" (Banham, 1955, p. 19). As so with imaging, something has to be visually appealing without conforming to generic aesthetics. The human senses tend to like to be stimulated, which is also possible when provoked by form and composition. Brutalist buildings continued to evoke emotion through honesty and rough materialization (Niebrzydowski, 2019, p. 3).

1.2 | Aesthetics

The generic form of aesthetics is the supreme beauty of the things in reality. This includes the beauty of everyday things, such as the beauty of human behavior and interaction. The art of generic aesthetics is to translate these commodities into something understandable and communicable. The new aesthetics, introduced by Böhme (1993, p. 114), overflows the generic shape with feeling. The subject of perception, the reality of imaging, is the atmosphere. The new form of aesthetics describes how human perception is initially developed through the experienced

Fig. 9: Brasilia National Congress, designed by architect Oscar Niemeyer.

atmosphere of a space (Böhme, 1993, p. 125). The new aesthetic can therefore be experienced through the sensory feelings in a space.

This study has been presented because of the earlier notion of imaging regarding the principles of brutalism. Böhme (1993) argues that imaging is the basis for the atmosphere and the new aesthetics can be achieved through the experience of an atmosphere. The idea of Banham (1955) is to let the buildings be a memory or an image of a moment, a reflection of a zeitgeist. In the case of the brutalist movement, it seeks radiate the feeling of the post-war freedom and honesty, but also the rawness of its era. The experience of space in brutalist buildings is therefore substantially critical.

1.3 | A brutalist building

In Serbia, many building blocks have been made completely out of raw concrete. However, it is not proven that brutalism as an architectural movement has inspired this East-European area, since brutalist buildings have a precise architectural theory included. Many buildings in this area simply are made of concrete because it was a profitable and economical way of building. During the late 20th century, this was a major advantage (Alfirević & Alfirević, 2017, p. 330). This example is applicable to many more concrete buildings that people tend to define as brutalist, solely because of the material that was used. Indeed, brutalist buildings consist of aggressively exposed materials, but the main idea of the architectural movement as it is recognized goes beyond materialization (Clement, 2011).

In addition to the three points given by Banham (1955), Niebrzydowski has written a more extensive list of definitions about what exactly signifies brutalism in architecture (2021). It is a logical distillate from the history behind the architects who initiated the movement. The main ideas according to him were: seeing and using the materials as they are, namely raw and ordinary. The same applies to the structural elements and technical installations. Other notions were: to reflect the realities of life, to articulate

Fig. 10: Aula Conference Centre backside.

internal functions in the form of the design, to simplify forms, to repetitive elements with high attention to order, to disturb rhythms and to integrate careful circulation and communication in the design. The aesthetics pleasure of a building arises from the sincere interest in the properties of the materials and the attention that goes into the process. It ignores influences from previous architectural movements, so that a brutalist building cannot be compared (Niebrzydowski, 2021, p. 28).

Fig. 11: Aula entrance side.

2 | AULA CONFERENCE CENTRE

While approaching the aula, the first impression of a concrete colossal construction which slowly reveals itself behind the trees is enigmatic. The box is the calling card, but it soon becomes clear that there is more to be processed behind the impressive gray whole. Although it all looks enormously and massive, it disappears somewhat due to its horizontal positioning alongside a densely wooded park. As a passerby, you are drawn in by the natural attraction of the placement of the main entrance, which is situated below the focal point of the box shaped front. The concealment of the entrance only leads the visitor to speculate more about what is happening in the large mysterious spaceship-shaped building. Entering with this curiosity, the building welcomes guests with an enormously spacious and functional interior. The open floor plan, which is made possible by the widely spaced concrete columns, does not create any confusion for the visitor as to where he should move. The void that is embraced by the immense stairwells helps with the feeling of spaciousness. Ceilings and columns made out of exposed concrete make the experience industrial and robust, but the wood used in the design gives some warmth to the interior. The building is clearly designed for human scale and functions purely for what it has to function for, receiving people.

2.1 | Context

The background behind the creation and continuation of the design and the frameworks in which the building was designed are necessary for the analysis. This gives the building a story and allows it to be placed in certain perspectives. The context of a building indicates something about the reason behind design choices and it is provides a small retrospective of how people in society thought at the time.

2.1.1 | The architect

The architects of the conference center are Johannes Hendrik (Jo) van den Broek and Jacob Berend (Jaap) Bakema, of the eponymous architectural firm Van den Broek & Bakema. This architectural firm has its origins in Rotterdam. Prior to the current name that the agency bears, previous contributors continued the agency under their

Fig. 12: Van Nelle Factory.

names from its foundation in 1910. In 1951 the architecture firm turned its name to Van den Broek & Bakema. The firm seems to have been strongly inspired by Bauhaus in the first half of the 20th century. Bauhaus was a school founded in 1919 for architects and visual artists (Droste, 2002, p. 18). The type of architecture that has developed from this school is based on the function of a building with many linear motifs. Until the name change in 1951, the firm already had a vast reputation for creating architecture with references to Bauhaus, such as the Van Nelle Factory (figure 12). After the transfer in 1951, the firm presented itself further throughout the Netherlands as a capable architectural firm through its oeuvre consisting mainly of large public buildings and large-scale housing projects. The firm's projects became more experimental over the years and borrowed brutalist influences from other European architects, including Alison and Peter Smithson, with whom Jaap Bakema was in the architectural assembly Team X (Brown, 1967, p. 49).

2.1.2 | The Site

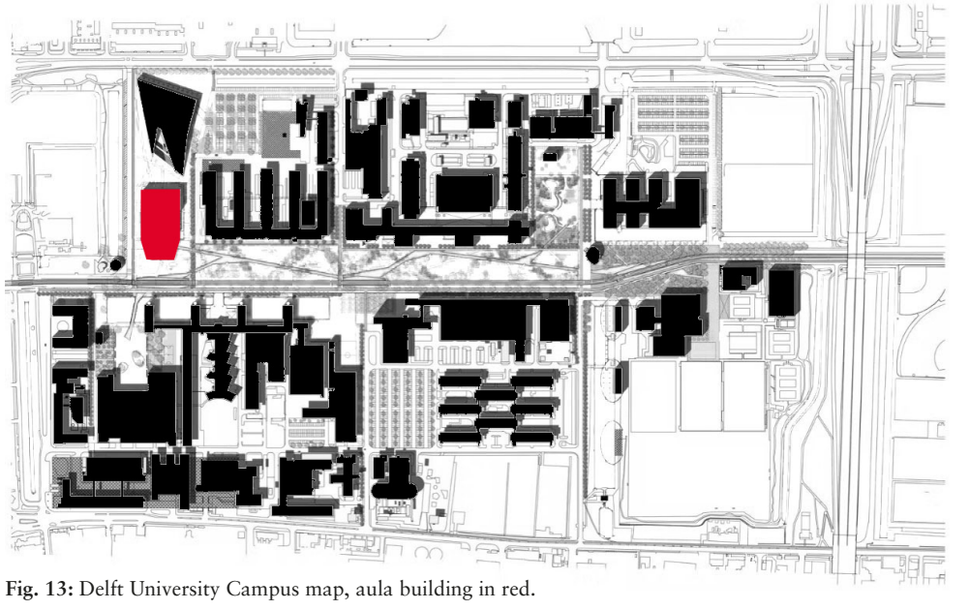


Fig. 13: Delft University Campus map, aula building in red.

The auditorium is located in the Dutch city of Delft. This city is located in the west of the country where the climate changes with the seasons throughout the year, cold and

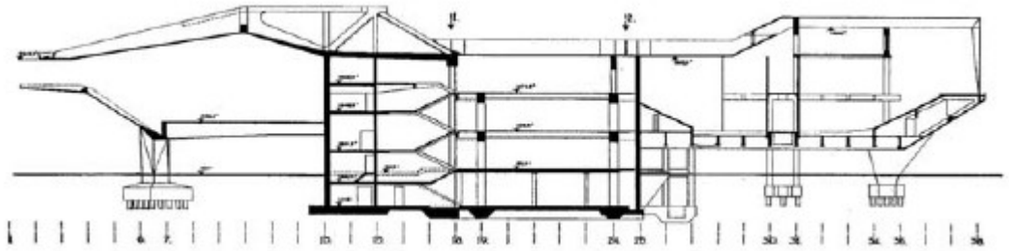


Fig. 14a: Preliminary design 1.

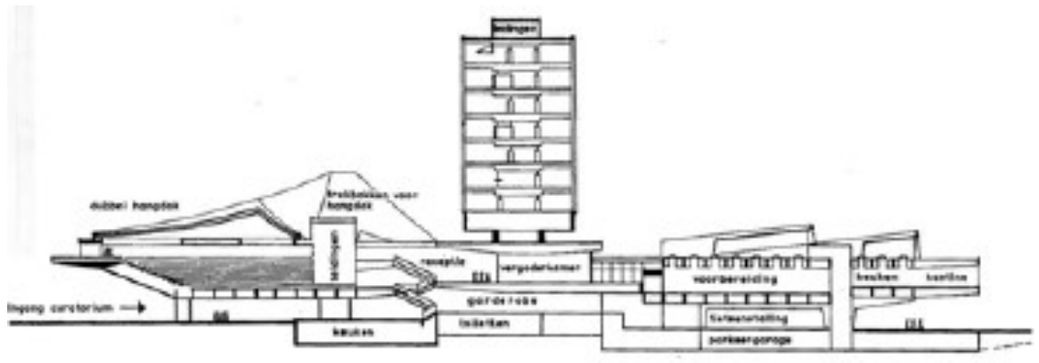


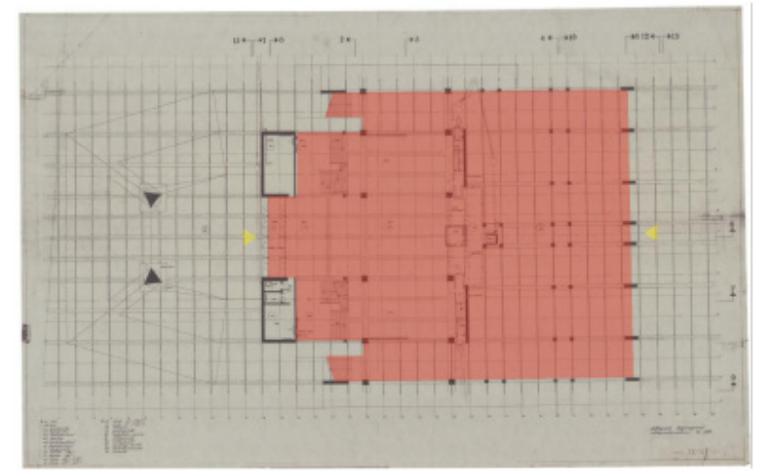
Fig. 14b: Preliminary design 2.

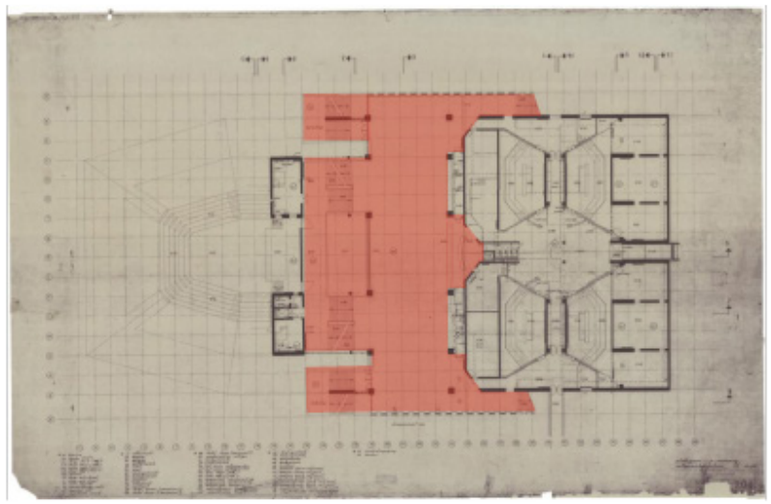
snowy in winter and warm in summer. The soil on which the building is built consists mainly of peat, clay and sand and is mainly flat (Van de Giessen, 2017, p. 179). The location of the auditorium is well thought out. The campus of Delft University of Technology consists of faculty buildings along one long axis called the Mekelweg. In figure 13 a plan of the university campus is shown, with the aula marked in red. Due to the brutalist character of the design, it is contrasting and striking to the passer-by. By locating the conference center at the very beginning of the axis, making it the first building on the avenue, it gains prestige. It does not have a monumental location, but it does have a prominent spot.

2.1.3 | History

With regard to the centenary of the Technical University, an Auditorium was planned to be realized on its campus. Its location had hardly been discussed, as mentioned earlier this was thought out far in advance. It derived on the beginning of the long axis of the university campus. Van de Broek & Bakema was approached for the design of the auditorium because of their involvement in the development of the design assignment. Jo van den Broek also had close ties with the Executive Board of the Technical University, where he played an advisory role in the development of the University Campus area and real estates (Máčel & Wegner, 1994, p. 115). The auditorium was designed in 1958 and realized in 1966. After the office had already made a first version of the design, which is very similar to the realized design, the client started speculating to add administrative functions to the building. A design was made for this in 1959, see figure 14b.

This design has nevertheless been withdrawn for budget reasons (Máčel & Wegner, 1994, p. 115). For the design as a whole it seems better now that the tower in the nave is not built, in terms of circulation it seems more efficient that the auditorium only has one purposeful function. It is striking that the previous versions and the current versions each have integrated brutalist ideas.





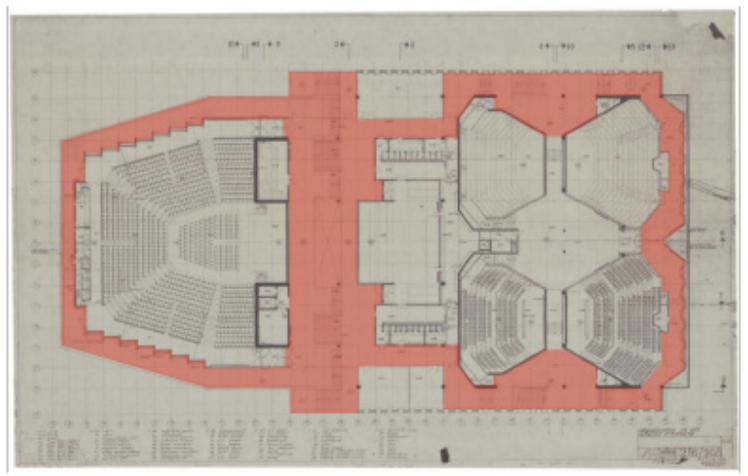


Fig. 15: Aula floorplan analysis.

2.2 | Building design analysis

In order to get a good overview on how the auditorium is set up and functions, the building characteristics will be examined in this paragraph. This is divided into four themes that approach the Aula at different scales and perspectives: 1. Functions and routing 2. Scale, rhythm and proportions 3. Ornamentation 4. Materials and construction. Within this analysis, the extent and influence of brutalism will be assayed.

2.2.1 | Functions and routing

The building can be divided into three compartments. The front part houses the largest main hall of the auditorium. The rear part contains four lecture halls, two conference rooms and a restaurant. These two building parts are connected by the middle compartment where the circulation is arranged. Here are the main stairwells, the origins of the building's traffic arteries and the toilet areas. Only the central part of the building is fully connected to the ground level, the front part rests on two multifaceted columns and the rooms in the back part are raised above the glass-enclosed restaurant. As a result, visitors to the auditorium, excluding catering guests, are forced to use the stairwell in the traffic area in the middle of the building. In figures 15 the floorplans of the ground, the second and third floor are presented. The entrances to the building are visible in yellow and the distribution space between the functions in the building in red . It is clear how the visitor's route from the entrance to the chair has been given a lot of attention. This attention fits in positively with the ideas of functionalism, in which the function of a building is leading for how a building form develops.

2.2.2 | Scale, rhythm and proportions

The hallmark of the auditorium, which immediately catches the eye, is the gigantic concrete overhang that spews out 14 meters from the central entrance. Because the functions in front of the entrance are lifted, a large entrance area is created and an

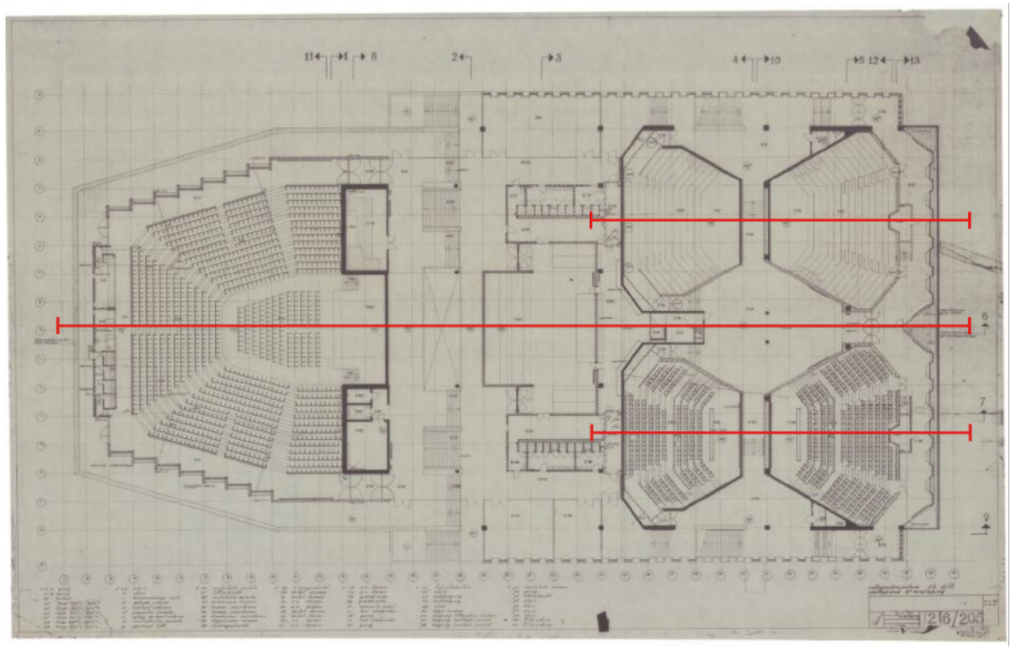


Fig. 16: Aula symmetry analysis.

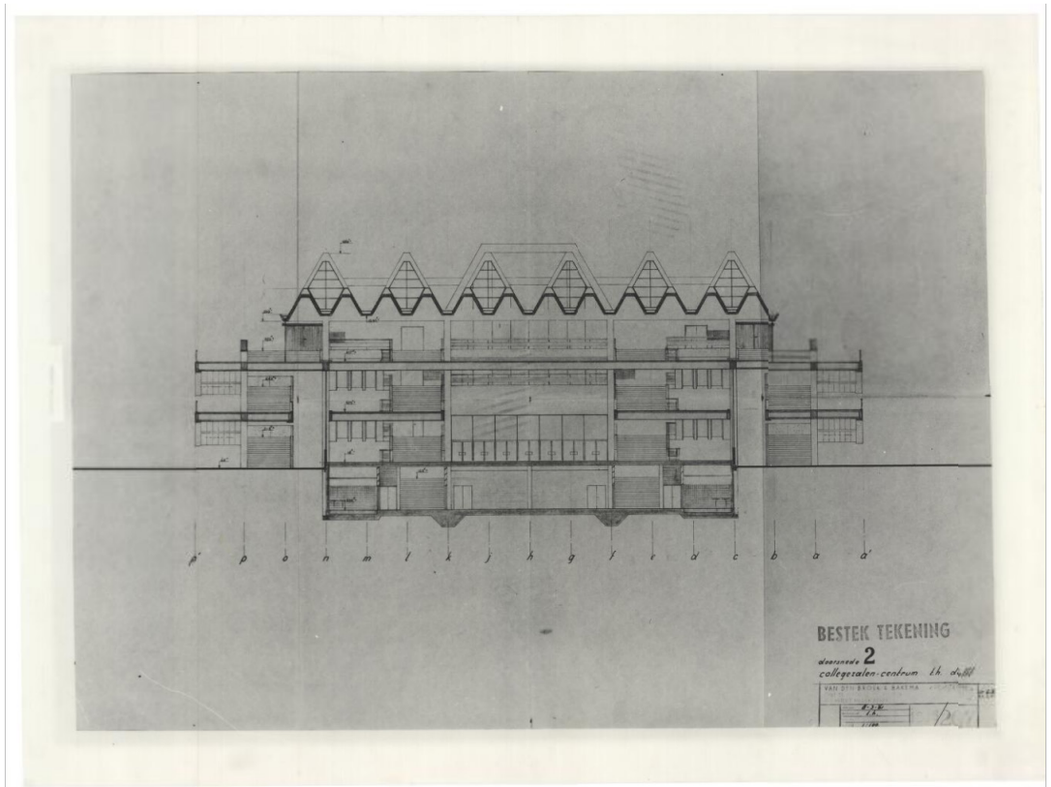


Fig. 17: Aula section.

unobstructed view of the university campus is maintained. The scale of the building is reflected in its appearance, its interior atmosphere breathes massive. A clear symmetry pattern can be recognized along the length of the building. The first runs the entire length of the building and splits the main hall in two. In addition, the two lecture halls found in the rear part of the building are also placed symmetrically opposite from each other in length, see figure 16. In the facades a window section is consistently placed along the length of the building with strips of vertical frames that stretch from floor to ceiling. Another recognizable recurring rhythm is the use of geometric shapes. Vertically, the majority is arranged orthogonally, except for the stairwells and the slope of the halls. Horizontally, more use has been made of triangular and hexagonal shapes, which can be clearly seen in the cross-sections in figure 17.

2.2.3 | Ornamentation

The omission of ornaments creates a minimalist artful impression. The concrete construct, is a unique edifice itself, without having generic shapes. The volume of the construction consists of elements that have also been realized in an unique way. By applying béton brut, wood grains remain visible in the unfinished concrete. This gives the auditorium a raw presence, which provides a unique appearance.

2.2.4 | Materials and construction

In addition to the obvious use of concrete, the design uses a light steel construction for support (Den Hollander, 1964, p. 45). A variety of wood and glass is used for the finishing of facades and interior walls. Closed walls are covered with vertically placed, varnished hardwood slats. Balustrades are made in the same type of wood. These have a horizontal design and a firm grip. The balustrades are implemented identically throughout the building, both in the interior and exterior spaces (see figure 34). The construction of the conference center is very advanced for the period in which it was built. The auditorium box was initially supposed to be prefabricated, but because of concerns about its availability, the contractor opted for a solution poured in situ (Den

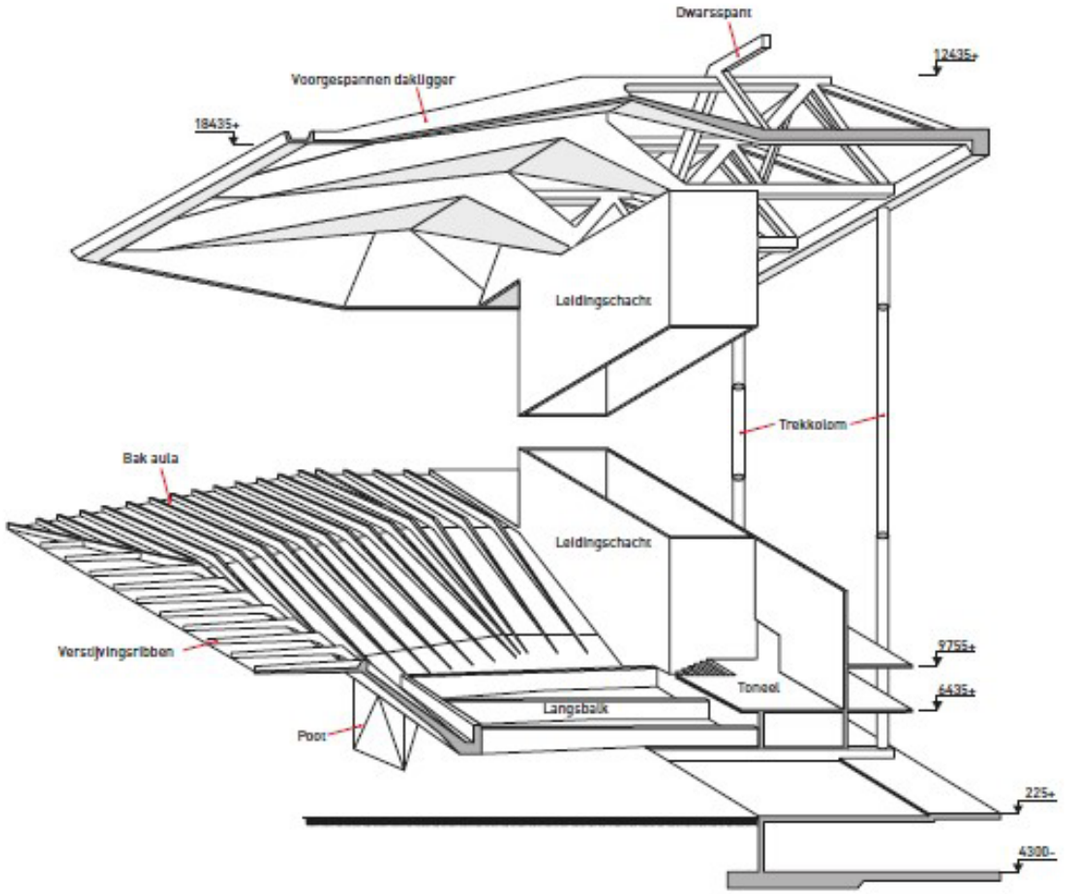


Fig. 18: Axonomic drawing of the construction skeleton.

Hollander, 1964, p. 45). The box of the large auditorium hall is constructed of pre-stressed concrete, which is stretched towards the center of the hall. The two columns and the duct behind the stage bear these forces, as visualised in figure 18.

The roof of the auditorium consists of several triangular horizontal prestressed beams that also rest on two connection points, one for the transfer of compressive force and one for the tensile force (figure 19). This principle of triangular folded plates as a roof construction was not new in the Netherlands during the 1960s. This construction principle can be found in various buildings, including brutalist ones. Incidentally, the application in the auditorium is the most advanced of its time (García, 2006, p. 1199). Hence it is not surprising that 60% of the total costs of the construction of the auditorium were spent entirely on the construction (Máčel & Wegner, 1994, p. 117).

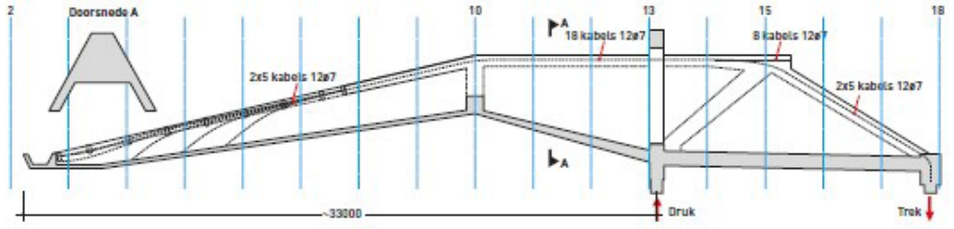


Fig. 19: Construction of the room beams.

Fig. 20: Breakthrough light in roof.

3 | ST. JOHN'S ABBEY

Over to America, where the next building is set in the state of Minnesota. Driving on St. John's Road, rounding the bend towards Abbey Road, the bell tower of St. John's University Abbey comes into view at the end of the long approach and gets bigger and bigger. The boulevard ends in a park that lays centralized on the campus. The Abbey has a present location here. The concrete bell tower is impressive in shape, uniform in color and material and has a brutal appearance that makes it look like a macho looking over de area. Due to the openness of the area, the road to the entrance is easily accessible. The compressed entrance is continued in the interior space, which arouses a sense of curiosity. In the building past the raised platform, a revelation of the hugeness of the grandstand hall derives. The visible vaults along the sides, which continuous in the ceiling, draw the attention to the center of the room, where the light from the roof striking the hexagonal facade creates a dreamlike indoor climate. The abundance of concrete feels like a hidden, undiscovered cavern where beams of light illuminate the darkness. This experience of the building seems to be achieved the same from every perspective inside.

3.1 | Context

As with the Aula the creation and continuation of the design framework will be summarized. The chapter is arranged in the same order as the previous to maintain consistency and to describe the link to brutalism or to what extend brutalism has had any influence on the design will be addressed.

3.1.1 | Architect

"I have the feeling that, and this is not a very clear-cut program or idea, that any space which is larger than necessary and higher than necessary, and in which the structure and the whole building of the space is visible as it is in all churches and this type of architecture, that this space created is simply automatically religious." Said by Marcel breuer in an interview on religious buildings (Howarth, 1979, p. 260). Marcel Breuer is the architect of the Abbey. Breuer owns a rich portfolio before he was asked to

Fig. 21: Interior space.

create a master plan for St. John's University. He originated from Europe, where he started his career at the Bauhaus school making modernist furniture. Years later he moved to America to teach the Bauhaus style at Harvard Graduate School of Design with another influential architect, named Walter Gropius (Gatje, 2000, p. 23).

3.1.2 | Site

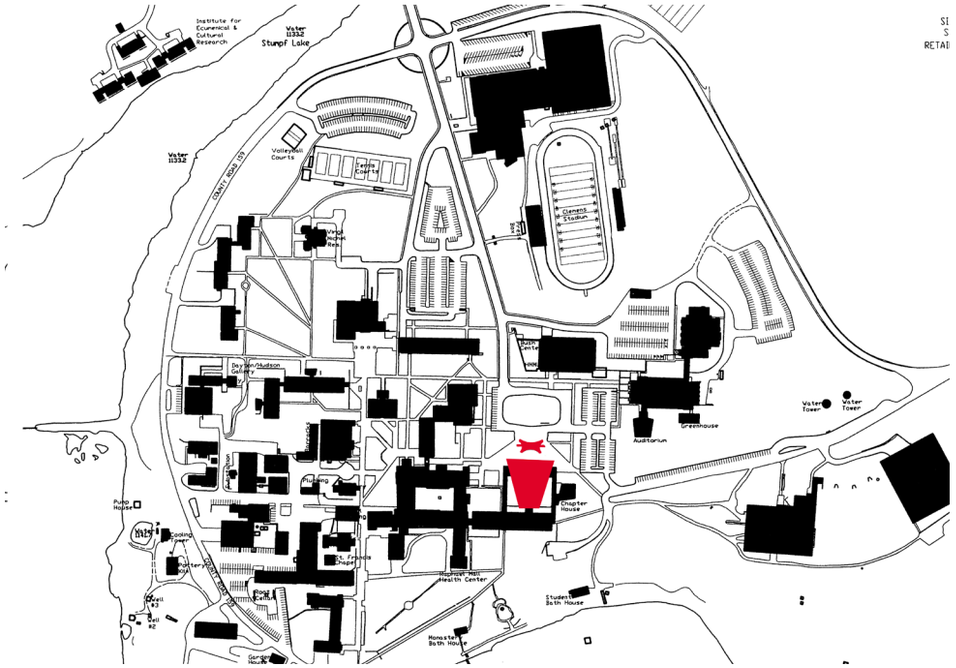


Fig. 22: Saint John´s University Campus map.

In the North American state of Minnesota, which is one of the coldest states in the United States on average (Temperature - US Monthly Average, 2023), the Saint John's University is located in a forested area. The university campus is shown in Figure 22, with the Abbey in red. The campus can be reached from a circular ring road and an access road in the north. The central axis in the campus area leads directly to the central area where the Abbey is situated. It is a clear monumental place on campus, with a central and striking shape.

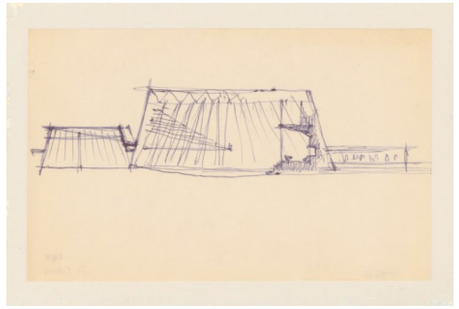


Fig. 23: Sketch section.

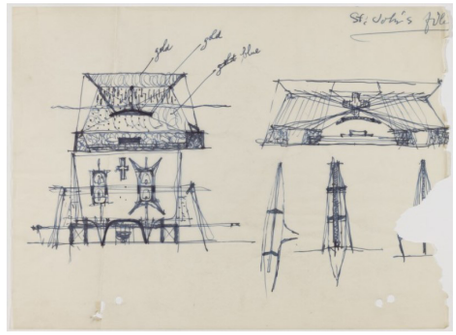


Fig. 24: Sketches.

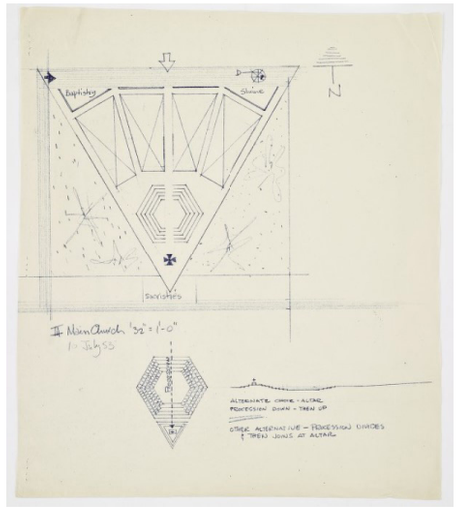


Fig. 25: Preliminary floorplan study 1.

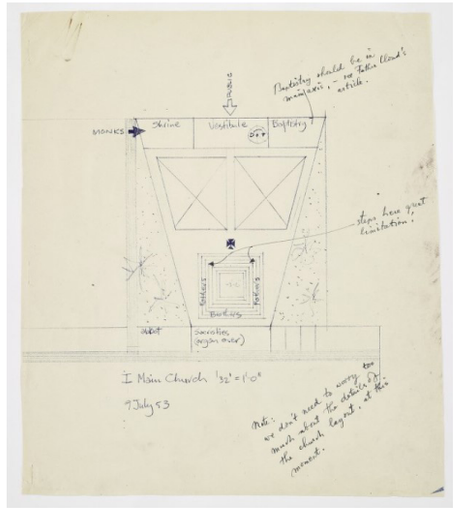


Fig. 26: Preliminary floorplan study 2.

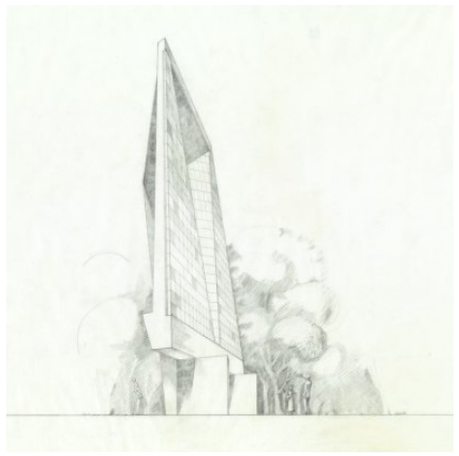


Fig. 27: Perspective sketch.

Fig. 28: Preliminary facade drawing.

3.1.3 | History

The master plan for the expansion of the university campus included student housing, a library and an abbey (Breuer & Smith, 1961, p. 7). In the first sketches made by Breuer the building can already be reasonably recognized as it is eventually built. Breuer had a clear preference for trapezoidal shapes in the design, which can be seen in both figures 23 and 24. It is noticeable that the bell tower was included from the beginning of the design process. His associates have speculated that the design of this bell tower was inspired by churches Breuer had seen in Greece, where the bells were also placed in an opening in the facades (Gatje, 2000, p. 48).

In the more elaborate designs it can be seen that sharp corners were a goal (figures 25 & 26). Triangular and hexagonal shapes in the floor plan are dominant, while right angles are absent. Breuer chose a distinctive form after a number of studies and stuck to it. A clearly larger facade on the entrance side slopes down in the two-dimensional plane like a trapezium towards the altar, this even takes into account the proportions of the golden section. The dimensions of the front façade in relation to the back façade are in perfect proportion of each other within the Fibonacci sequence (Gatje, 2000, p. 49). The Fibonacci sequence is a mathematical composition of numbers that can be recognized in nature in various sizes (Sinha, 2017, p. 7). Everything within this proportion and size is therefore considered inherent aesthetically pleasing. Several studies have been carried out for the elaboration of the facade of the building, as can be seen in figures 27 and 28. The first proposals consisted of a majority of rectangular surfaces with various symmetrical window styles incorporated. At the time, Breuer's architectural firm was also doing work for the Dutch company Bijenkorf, which is literally translated to beehive. One associate made a design for a hexagonal patterned façade for the building of the Bijenkorf in Rotterdam, which at its turn inspired Breuer to change to front façade of the Abbey (Gatje, 2000, p. 49).

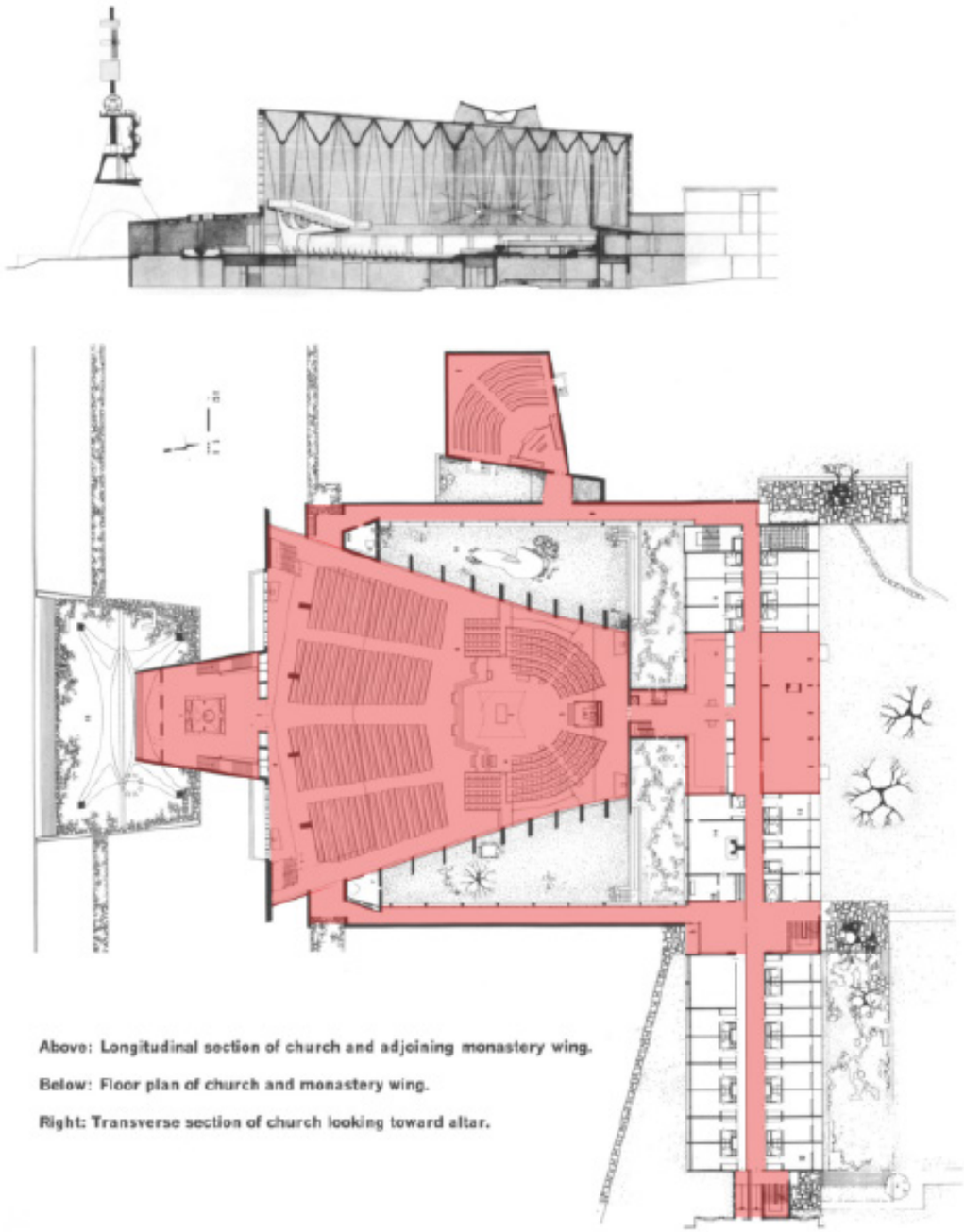


Fig. 29: Floorplan analysis.

3.2 | Building design analysis

The architectural characteristics of St. Johns Abbey are explored in the same way as the auditorium building is. The analysis will reveal which parts are characteristically brutalist and how the designer designed the building. As mentioned earlier, the university complex consists of various parts; the Abbey, a chapter house and a monastery. Because the buildings are connected, they are included in the function and routing analysis. For the architectural analysis, only the Abbey has been taken into consideration, because of its highly brutalist value. The monastery and the chapter house have been left out because each building functions independently.

3.2.1 | Functions and routing

The building is very simple in terms of the floor plan. First of all, a distinction must be made between the three different types of buildings that are connected by the galleries, as shown in figure 29. The Abbey has the shape of a funnel, a monastery that is incorporated in a strip behind the Abbey and a chapter house in the shape of a diamond at the top. In figure 29 the freely walkable area is marked in red. The large hall where the services are held can be reached by visitors from the main entrance. From the monasteries it is accessible from the back, they step directly onto the podium with pulpit. The whole is therefore quite well functionally designed.

3.2.2 | Scale, rhythm and proportions

The symmetry's in the form has already been devised in the first sketches, these run in the length of the design, both in the horizontal and in the vertical section. The space in the building is dramatically high and slopes down from the entrance towards the rear of the design, which is clearly visible in figure 30 . The volume of the Abbey can be seen as a three-dimensional trapezoid lying on its side. From the ground to the roof a triangular column forms which gets bigger as it rises and it continues across the width of the roof to go down again mirrored on the other side. This concrete band repeats throughout the volume and decreases with each repetition to the rear of the building.

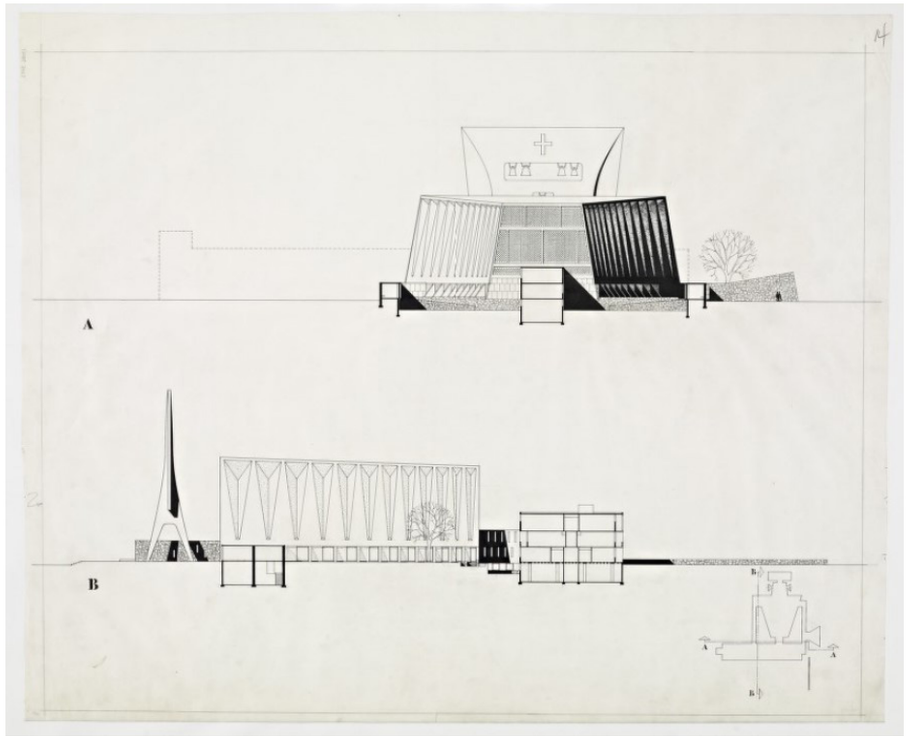


Fig. 30a: Sections and elevations 1954.

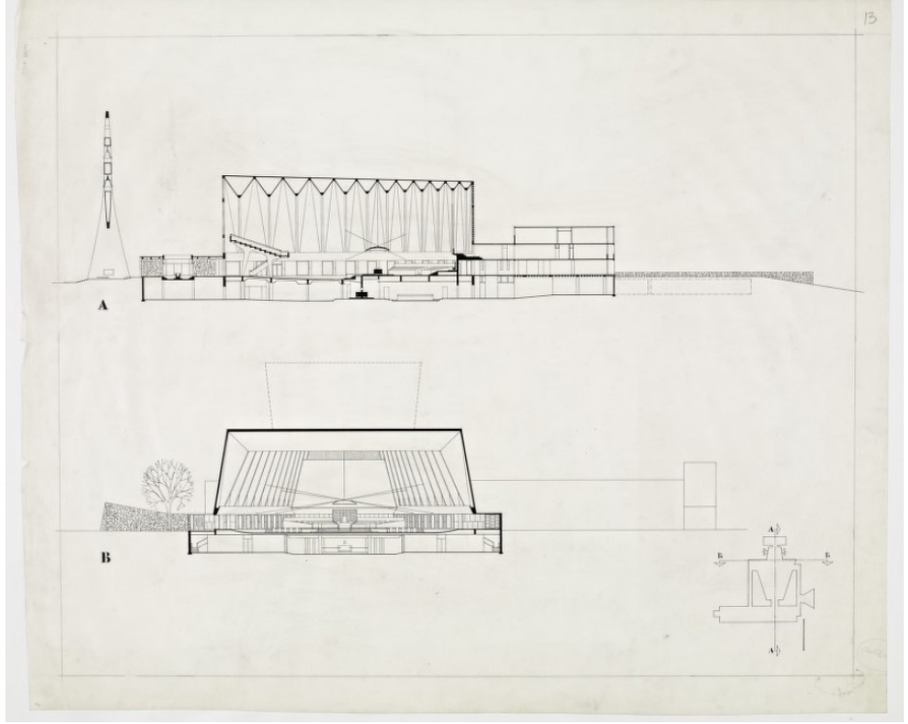


Fig. 30b: Sections and elevations 1954.

The rhythm and proportion of the triangular elements have a brutalist character, it has an honest appearance and it strengthens the spatial sensation.

3.2.3 | Ornamentation

No loose ornaments have been incorporated in the Abbey either. Each façade, however, is uniquely designed and can be seen as a work of art. In many places, especially in the interior, the concrete has been left unfinished, so that the wooden grain of the formwork is still visible. The entire front facade consists of a hexagonal grid of exposed concrete with stained glass incorporated in between (figure 31), this stimulates an exclusive appearance and adds an inviting character to all the heavy, visible concrete. In front of the building is the pronounced bell tower (figure 33). The tower rests on a plinth with 4 legs that tapers upwards. This foundation continues the triangular compositions from the side façades of the main building by which it forms a clear connection. A huge concrete slab rises from the base with a carved Christian cross in the center and space for the carved out chimes below.

3.2.4 | Materials and construction

Due to bureaucratic reasons construction started in 1958, years after the design was ready. The building consists of a prefabricated foundation with a cooperation of cast-in-place columns on top and a cast-in-place roof construction. For the front façade prefabricated elements have been applied (Millette, 1961, p. 83). In the process of pouring the concrete, vibrating instruments have been used to prevent air bubbles from remaining in the grout during the hardening (Millette, 1961, p. 86). This technique, called ‘Schokbeton’, originated from a Dutch concrete company founded in 1932 (Quist, 2021, p.540). A granite facing has been placed on the outside of the building, which is attached like tiles to the folded triangular columns (Gatje, 2000, p. 50).

Fig. 31: Interior space.

4 | COMPARISON

To begin with, it is interesting to highlight that the research concerns two university buildings that were tendered with the same intention. They both included a plan for a meeting space that had to be realized by a renowned architect and the design would be free of limitations. In Contreras's thesis (2013, p 11) it is described how buildings of universities lend themselves perfectly to the desire to radiate institutional splendor, there is a natural purity through simple functionality. In the run-up, the building's appearance share a similar experience for the user, who is overwhelmed by the greatness of the structures. The fact that they both have brutalist features contributes enormously to this greatness, thereby this use of certain types of material has greatly influenced the experience of the user (Wastiels & Wouters, 2012, p.589).

4.1 | Context comparison

For the design of both buildings, the clients chose well-known architectural firms with experience in working with modernist style architecture. Breuer was educated at the functionalist, modernist architecture school Bauhaus. The same of which the office of Van de Broek and Bakema is strongly inspired. Van de Broek and Bakema also have been influenced by the architectural group team X, which developed into functionalist and brutalist architecture in Europe. In short, brutalism was not so much a one-time experimental trial for both design parties. The designers have directly participated in the emergence of this architectural movement.

For both designers the desire for a land-marking design was clearly taken in. At the Abbey this was created by situating the design at the end of a monumental axis, at the Auditorium this was achieved by providing a prominent location between other faculty buildings. Both buildings know how to draw attention to the position they have obtained. The contrast that the buildings have with the architecture of surrounding real estate naturally contributes to this. Breuer's sketch ideas show that several studies have been done into the design of the facade, which ultimately derived from inspiration from the Dutch department store Bijenkorf. In its developing period,

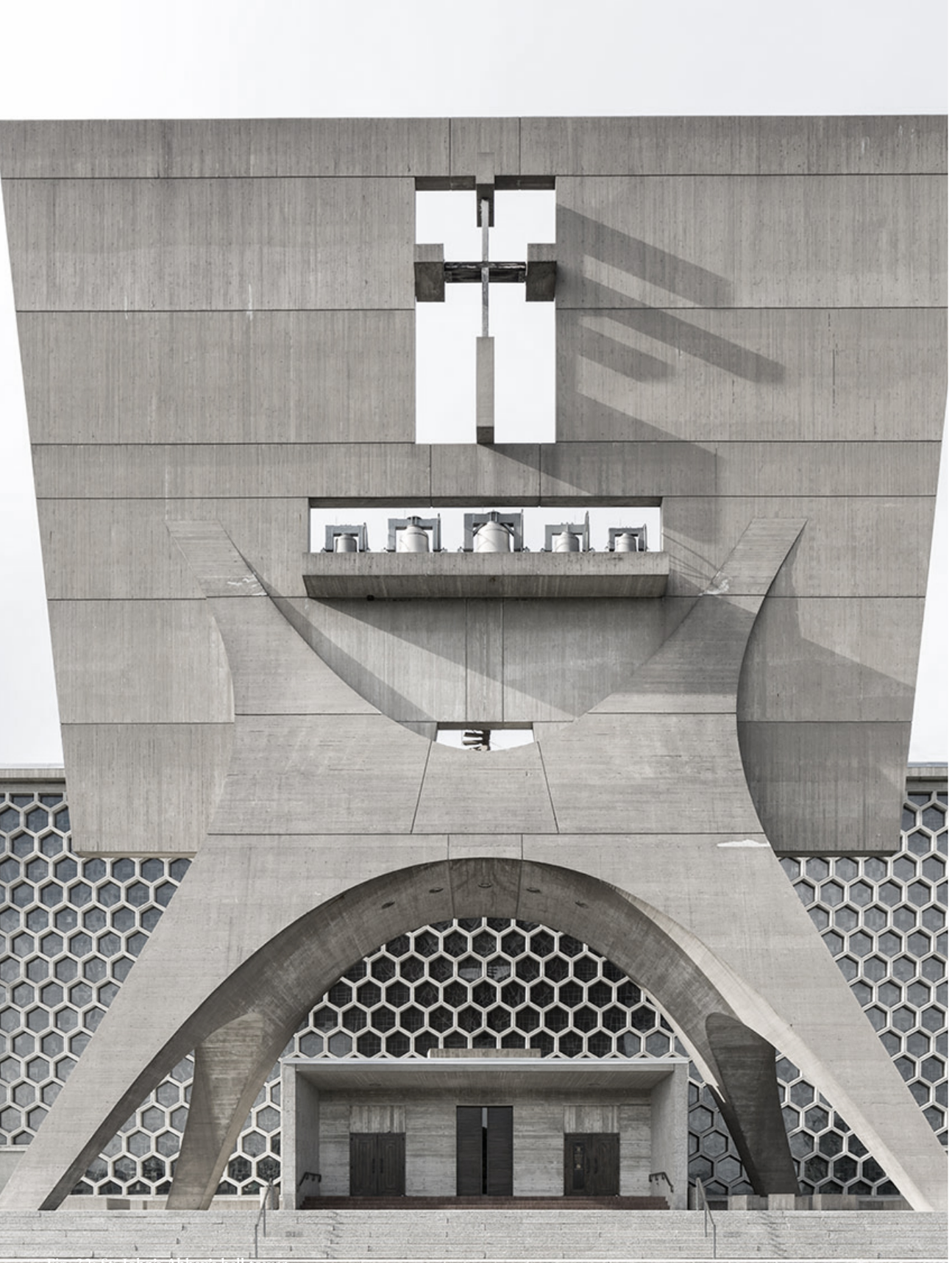


Fig. 32: St. John's Abbey's bell tower.

both buildings experienced a postponement of construction from the moment the design was finished. This can not directly be linked to a brutalist character, it is merely an indication of how the priorities of the construction world were organized at the time. Saving money was and is evidently part of the construction and design process.

4.2 | Building design comparison

Functionalism, in other words allowing the design to be guided by the function of the building, plays an significant role in both designs. In the examined buildings the shape has been subjected to the function it is intended to serve. This also ensures that both buildings have logical wayfinding and comfortably gives the user's experience a high priority. The Auditorium has focused more on the circulation of the users and has no ornaments that decorate the building. The Abbey also omitted ornaments, although there has been implemented a certain form of decoration in the design. The stained glass in the facade serves purely for decoration and although the bell tower has a distinctive function, it also serves a decorative function and as a landmark for the environment. There is a higher rate of symbolism at the Abbey, due to the fact that it is a religious building. The Auditorium belongs to a non-religious institution so it has exuded neutrality and innovation.

What is clearly recognizable in both buildings is the abundant use of symmetry. This is not surprising, since Bakema and Breuer were supporters of the Bauhaus school, the school where attention was drawn to semiotic meaning (Nikos, 2020, p. 234). The use of hard symmetry has a natural attractiveness in it, which evokes aesthetic appreciation. Breuer himself indicated that the reason for the extraordinary proportion of the building was a conscious action to give a religious feeling to it. In the case of the auditorium, the scale of the building has been adapted to its human use, which has been a typical brutalist action. This fits Mould's statement that brutalist architecture demands human interaction (2016, p. 17).

Fig. 33: **Aula** backside

Triangular and hexagonal shapes are often used in the designs. Both designers used them for the roof construction. Breuer also included these shapes in the structural walls. It is noticeable that in addition to the constructive aspect, it is unclear whether this has a symbolic meaning. Structurally, these forms work excellently. The use of materials in both designs is completely in accordance with the established rules of honesty and purity of the brutalist movement, with visible formwork remains and discernible construction mechanisms.

The buildings are clearly designed and constructed within the same ideology. The biggest difference between the buildings is that Breuer paid more attention to the decoration and ornamentation of the Abbey. The experience Breuer has tried to accomplish is built on celestial practicality and glorified divine feelings of honesty. The auditorium, on the other hand, is more focused on quickly receiving and processing groups of people, without distracting building elements. The Van de Broek & Bakema building exudes grandeur and serves as a distinctive island within the established order of faculty buildings.

Fig. 34: Aula interior space.

CONCLUSION

What is remarkable about the studied buildings is that the architects were free from building limitations while developing their creations. They have used this freedom to express the post-war zeitgeist in architecture. Just as avant-garde art wanted to move people's emotions, the architects in the analysis did so by considering architecture as an experience in space. The use of explosive exposed concrete has contributed to the experience of the buildings. It is due to the significant use of concrete that these buildings are so unique in their form. One could wonder about whether it was the architects' intention to create something brutalist or whether they simply wanted to create something innovative in a period full of raw and post-war trauma. In any case, the use of concrete was ideally suitable for this. Despite the fact that the architects themselves were perhaps unaware that they could call this brutalist features, they were undoubtedly familiar with the ideas of the architectural movement that was active at the time. Brutalist features have made the buildings impressive. They are leading designs, they are heavy, strong and impressive. For this type of institution, a choice for brutalism in architecture is therefore seemingly fitting. Brutalist buildings attract attention. In means of attraction by esthetic appreciation, the studied buildings both have been designed with the idea of imaging in mind, which was a common characteristic in the brutalist movement.

Architects do not need to be directly replicating features of brutalist buildings to achieve the same sensory sensation. Architects at the time did not even do that even when they were heavily inspired. That is why so many different types of brutalism have appeared. The concept of adding awareness to a spatial experience is the most important lesson that the architectural movement can teach contemporary architects. Taking high-profile elements to express a feeling in the physical experience is something that people can appreciate. As long as this is also balanced with some kind of visual aesthetic, which can be in the simplest things like symmetry or logical construction, people will probably experience the building as pleasant, even though they may not like it at all.

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