

The Idea of the Primary Stage in Alvar Aalto's Drawings Through the Analysis of the Design Process of "Vuoksenniska Church (1955– 1958)"

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This paper aims to clarify the design process of “Church in Vuoksenniska” by Alvar Aalto.

The following is the analysis of the design process.

1. The design process can be divided into four terms: the first term, the second term, the third term and the fourth term.
2. The architectural form in the first term was consistent with the form in the fourth term.
3. The first term can be divided into four forms: the trapezoid, the three fan-shaped forms, the rough arc and the arc.
4. The design process has a relation with his past works, such as ‘Seinäjoki church’ and ‘bent wood’.

Throughout this paper the word term is used to refer to the phases that each plan undergoes.

Keywords: *Alvar Aalto, Imatra, Vuoksenniska, Church, Design Process, Drawing*

1. Introduction

Alvar Aalto (1898-1976) is one of the most principled architects of the 20th century. He developed various designs for urban environment, architecture, furniture, and other living environmental aspects.

The ideas of his architectural works have been investigated by many researchers. Researches have consistently shown the necessity of clarifying the design process of his work, in order to observe his architectural ideas.

These main observations are as follows.

Ogawa¹ (2004) analyzed the design process of ‘Villa Mairea (1938)’. She investigated morphological analyses, dividing the changing forms of the plan. In her study, she dealt with all drawings related to the house except the sketches, taking special notice of the characteristics and changes made to the plan regarding individual spaces and forms of element. She analyzed Aalto’s methodology concerning the morphological designs, such as the court, inside spaces and outside. She concluded his organic forms in his methodology appeared in the final term in this house. Maeda² (2001) analyzed the plan of his houses using his drawings and his writings. He explored Aalto’s methodological concept, through the analysis of the processes of form modifications in Aalto’s fifteen houses, such as ‘Villa Mairea (1938)’, ‘Aalto’s own house (1935)’, ‘experimental house (1952)’. He explored the thematic explanation of both the internal system of the form of houses and the connection between the house and nature. He concluded that the form of an enclosure of his houses is at the key of our understanding of Aalto’s architectural form. Observations by Pallasmaa³ (1977) described Aalto’s ideas using both the drawings of ‘Vuoksenniska Church’ and his writings, in order to investigate his entire design process. He explained one of the drawings of this Church and pointed out Aalto’s ideas, such as the form of the lamp, the windows, the handrail, and the plan. He analyzed that these appeared in one of his drawings altogether at the same time.

Ogawa's study is limited only to the study of 'Villa Mairea' and did not describe Aalto's ideas of the design process. Maeda's study was restricted to his houses. Although Pallasmaa extensively studied Aalto's design process by examining the drawings taken from a wide range of Aalto's works, he did not analyze the entire design process of Vuoksenniska Church in detail.

These studies further serve our purpose. However, there are no existing studies focusing on his drawings of 'Vuoksenniska Church' and analysis of the design process.

In order to clarify Aalto's architectural idea of the design process, we explore Aalto's drawings, particularly focusing on the early stages of his drawings. It is desirable to investigate his ideas in the design process, so as to lead to new possibilities in creating harmony between nature, architecture and furniture.

1-1. Purpose

This paper aims to clarify the design process of Vuoksenniska Church by Alvar Aalto. This study explores the architectural form of the ideas that are embodied in Aalto's primary sketches.

We, in particular, focus on the drawings concerning the plan of the church. Through the analysis of his architectural idea in the primary stages of his drawings, this study aims to investigate the fundamental elements of his concept, such as form and space.

1-2. Subject

He constructed seven churches during his life. 'Muurame Church (1926) is the first church designed by Aalto. The second church is 'Vuoksenniska Church', however the official name is 'KOLMEN RISTIN KIRKKO (Church of the three crosses)', which is a Lutheran church. At that time, the church was a place not only for religious activities but also for regional activities, such as town meetings. This church is located in Imatra, Eastern Finland. Imatra, which is an industrialized city replaced Viipuri city after World War II.

According to the analysis by the Alvar Aalto Museum staff, Aalto started working on his plans for this church in 1955 as an offshoot of the master plan of Imatra. The construction of the church was completed in 1958¹⁾. He designed the church, the vicarage, bell tower and the interior of these buildings, including furniture such as chairs and lamps.

1-3. Method

Although, the drawings of Aalto's early works have been published⁴, the drawings of 'Vuoksenniska Church' are not published yet. All the materials related to this church, such as drawings, letters and pictures, are maintained by the Alvar Aalto Foundation in Finland. The drawings are catalogued according to type, whether rough sketches, drawings or detailed drawings²⁾.

In order to reconstruct the design process of Vuoksenniska Church, approximately 800 drawings were analyzed in this paper. From these drawings, 280 morphological forms related to the church were further analyzed. The number of each section is as follows (Table 1). As shown in Table1, Aalto created the most drawings and sketches for the section plan, suggesting he regarded this as the most important element of the church design.

	Site plan	Plan	Elevation plan	Section plan	Others	total
Drawings	17	36	34	49	13	149
Sketches	4	42	13	56	12	131

Table1. The details of the account

The analysis of 'Vuoksenniska Church' will be in four sections. In section 2, we clarify the overview of the entire design process, to elaborate the methodology of Aalto's design processes through the analysis of the drawings of 'Vuoksenniska Church'. Section 3 clarifies the concept of the plan, by focusing on the morphological changes in the 19 pieces of drawings in the primary stage, and expounds the fundamental ideas in his design process. Finally, in section 4, this study considers and integrates the above analysis and inquiry into the background.

2. Design Process

After that the church was drawn by hard line, the main outward form of the church was almost unchanged. All types of drawings³⁾ were completed on September 22, 1955 (The second term). The design process can be divided into four terms: the first term, the second term, the third term and the fourth term. In the first term (approximately May 13, 1955), the main outward form of the church was almost completed. In the second term (from September 22, 1955), the sketches of the first term were reviewed by using hard lines. In the third term (from October 12, 1955), the process was carried out by adding more details to second term. Final drawings were created during the fourth term.

- The first term: approximately May 13, 1955

The total number of drawings was 17. The first term can be divided into four forms considering the form of the plan: the trapezoid, the three fan-shaped forms, the rough arc, and the arc (Fig.2).

In the trapezoid, the outward form of the church and partitions were mainly studied. The external approach and the pulpit were analyzed.

In the three fan-shaped forms, in the process of the approach to the church, the environment was conceived, such as installing three crosses, the path to the church and vegetation.

In the rough arc, interior elements were added by putting the internal elements, such as the altar, the pulpit, and chairs. The entrance and some approaches to the church were added.

In the arc, the west side was opened outward. The arc was given more detailed examination, such as the approach to the entrance, circulation, and movable partitions.

In this term, these forms consisted of the three spaces. The trapezoid and the three fan-shaped forms were almost symmetrical, the rough arc and the arc were asymmetrical.

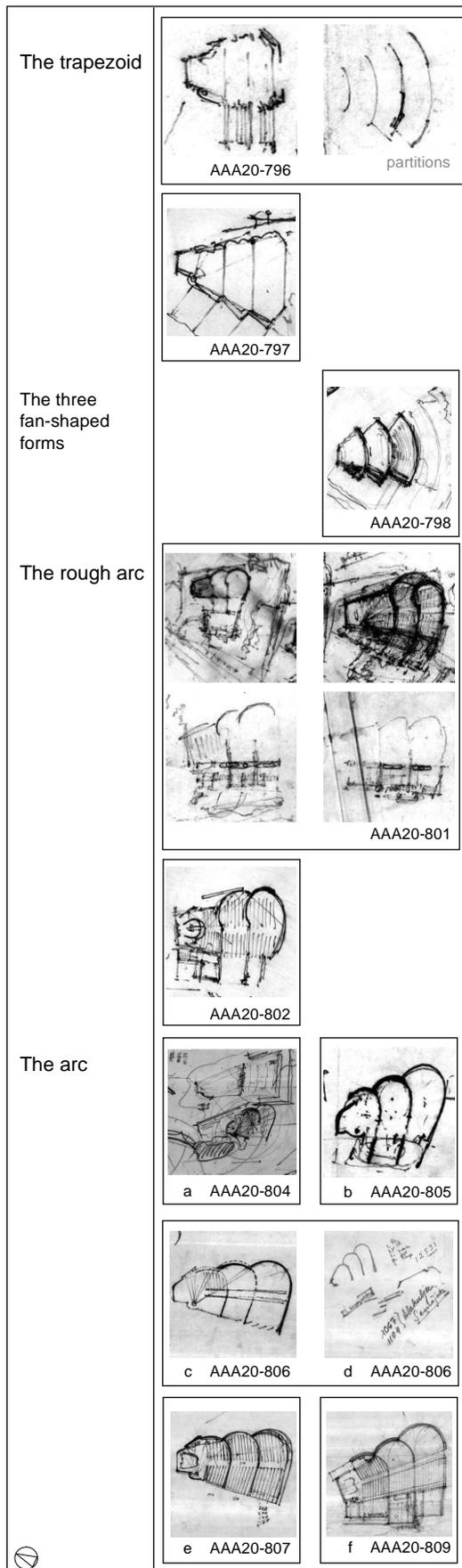


Fig2. The plan in the first Term

- The second term: from September 22, 1955

The total number of drawings was 36.

On September 22, 1955, all types of drawings were completed (Fig.3 b). Exterior elements were added by analyzing the site plan, including the approach, the vicarage and the parking. The partitions were drawn by using dotted lines. After that, the south entrance, the basement in the east side of the church and the second floor were analyzed.

The form of the east side wall, part B⁴⁾ and part C (Fig 4), were like the anchor form. In part B, this modification appeared on the inside wall, however, in part C, this modification appeared on the outward wall.

In this term, regarding the form in the east side, the church consisted of a range of three circles. All circles were united.

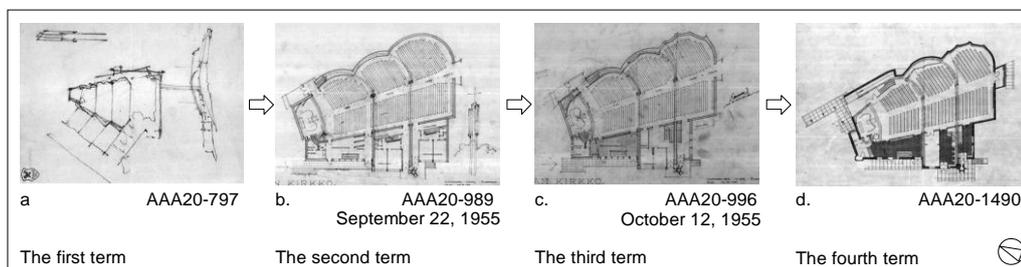


Fig3. The plan of Vuoksenniska Church

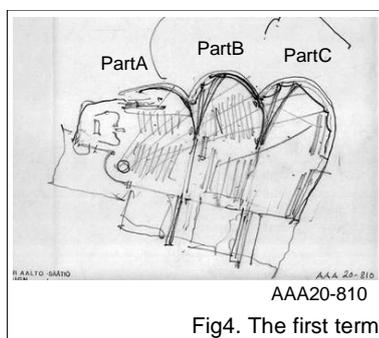


Fig4. The first term

- The third term: from October 12, 1955

The total number of drawings was 78.

On October 12, 1955, the basement plan was analyzed. At first, the basement plan was carried out under the altar of the first floor. Next, this plan was moved to under the west side wall of part A. As a result of this change, the entrance in the north side was analyzed (Fig.3 c).

On January 31, 1956, all types of drawings were completed. The outward form of the church was decided, and after that no further changes were made.

On February 9, 1956, approach to the basement, the north entrance to part A and approach to the north entrance were analyzed.

On February 21, 1956, the basement and the second floor were analyzed partially.

In this term, the form of the east side wall, part C, was changed from the arc to the organic form (Fig.3 c).

- The fourth term

Final drawings were as follows: first floor plan (after July 3, 1956), basement plan (on July 20, 1956), second floor plan (on September 13, 1956), site plan (after September 17, 1957), elevation plan (on October 3, 1956), section plan (after November 5, 1957).

3. Detail of the first term

During the first term, the total number of drawings was 17. Among these, two drawings had a date, which is the site plan⁵. The starting date of the first sketch cannot be defined. In the first term, the plan was definitely modified.

This term can be divided into four forms. We clarified the four forms in the spatial composition of the plan in the first term: the trapezoid, the three fan-shaped forms, the rough arc, and the arc (Fig 2). The architectural form in the first term was consistent to the form in the fourth term (Fig 3). It was shown that the visions of Aalto clearly pointed to the final form in the first term.

- The trapezoid: two plans in the two drawings

The two trapezoids were planned in the two drawings. In the first drawing, the trapezoid was drawn in the bottom right-hand corner of the drawing (Fig5 a). The outward form was divided into three by the soft lines of the three partitions. The partition was studied on the curve of the sector. He studied the opening and shutting of these partitions. The partition separated the spaces and roughly distinguished

the spaces. In the next drawing, the pulpit, the bell tower, external spaces, vegetation and perspective were analyzed. He drew the line toward the direction of the acoustic based on acoustical explanation.

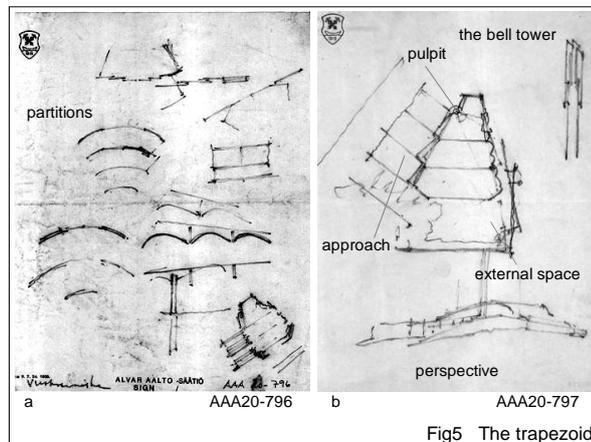


Fig5 The trapezoid

The trapezoid and the partition were almost symmetrical. In this term, the main outward form of the church was almost formed already. The small triangle was drawn to the final position of the pulpit before the pulpit was added and the acoustical direction was analyzed. The outward form on the west side was drawn by using double lines. The outward form on the east side was drawn by using wavy lines. In short, he regarded that the acoustics

were one of the important aspect when he designed the form of this church⁶⁾. The trapezoid form was similar to 'Seinäjoki church (1958-1960)'. It can be shown that the plan form of 'Vuoksenniska church' was based on the plan form of 'Seinäjoki church' from the 1951 competition⁷⁾.

• The three fan-shaped forms: one plan in one drawing

The three fan-shaped forms were planned in one drawing. The forms were a plan to combine the fan-shaped (Fig 6 c). In the approach to the church, the crosses were added. The approach was added by using pale lines. The entrance was planned to be in the back side of the church. Form (b) is drawn at the left-hand side of this drawing. Form (b) was similar to form (c). Next, we can see form (a) at the right-hand side of this drawing. Form (a) consisted of three forms. It was drawn in a square form with soft edges. Among these, two forms were trapezoidal: one was something like an oval. These three forms had a black circle in the center. These forms were added to the fan-shaped forms by using pale lines.

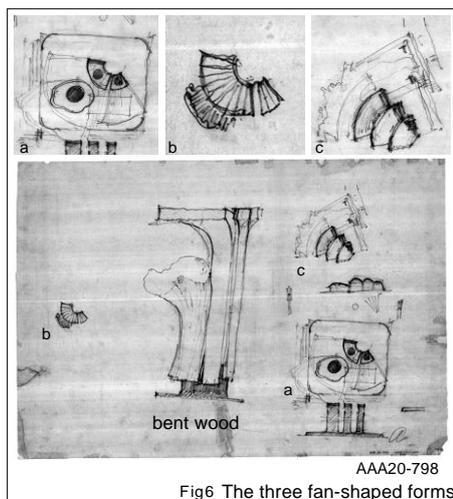


Fig6 The three fan-shaped forms

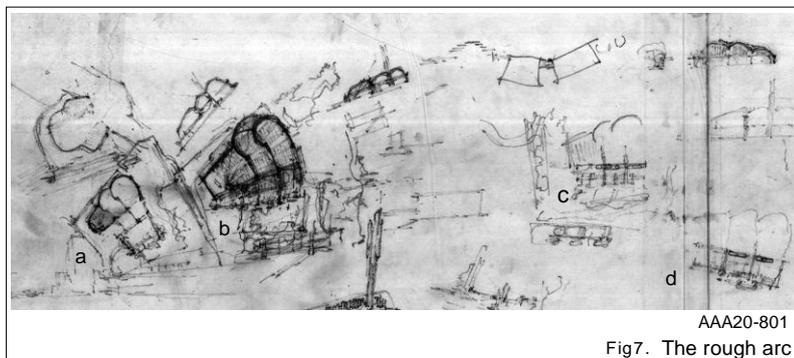
The sketch of 'bent wood' was drawn at the center of this drawing. The bent wood was developed as part of the furniture which was one of Aalto's original products. This bent wood was used for a relief. From the position of the bent wood in this drawing, it can be assumed that he started to draw the bent wood at the center of this drawing earlier, then he drew form (b) and form (c) next.

This form (c) has a connection with the sketch of bent wood⁸⁾, which comes from experiments in furniture. From the analysis of these design processes, the section of 'bent wood' (a) varied in the three fan-shaped forms (c) through one form (b). In short, Aalto evolved the section of 'bent wood' into the church's form.

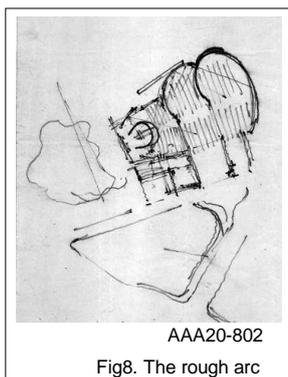
- The rough arc: five plans in two drawings

Aalto drew five plans in two drawings (Fig 2).

In the first drawing, the first one (Fig 7 a) was formed in the actual site plan. It was shown that he merged the church and the vicarage in one form. The second one (b) was added by putting internal elements, such as, the altar, the pulpit and chairs. Acoustical exploration appeared in the architectural form in the east side. Entrance and some approaches to the church were added. Third one (c) was added by putting the internal elements, such as, the space in the west side and the doors. The last one (d) was considered the circulation of this plan. The line of the form in the east side was very pale. From the analysis of the design process in four plans, it can be assumed that this plan was drawn by turns from (a) to (d) in this drawing (Fig 7). Among them, the second one (b) was the most intense form.



In the next drawing (Fig 8), the altar, the chairs and the room on the west side were analyzed. These interior elements determined most of the interrelations existing in this form.



In this term, all plans had three independent spaces. The wall on the west side was straight. Acoustical exploration appeared in the architectural form in the east side, this longitudinal wall was formed in three curves. The form in the east side was changed from a range of circles to the arc. The required rooms, such as the space in the west side, were added after the rough arc was drawn.

• The arc: six plans in five drawings

Aalto drew six plans in five drawings (Fig 2). The arc consisted of three forms. The arc was given more detailed examination, such as, the approach to the entrance, circulation, and movable partitions.

The first plan (Fig 2 a) was compared to 'Seinäjoki Church'. Aalto considered the space and the form of this plan against his past works. The plan (b) was considered the circulation in the west side. The plan (c) was designed by adding two partitions. These partitions were created by using dotted lines. In the plan (d), a line was drawn only as the outward form. The altar and chairs were added to the plan (e) by using free hand lines. The altar, chairs, the space in the west side and the aisle in the church were added in the plan (f). The circle was drawn by using a compass. It was shown that these forms are final plans in the first term.

In these six plans, the form in the east side was like the arc and the form in the west side was a straight line. The three spaces in the church were not connected to each other to be used as one space. The internal elements, such as, details of the space in the west side, were added into the plan after the form of the church was decided. After analyzing the circulation, he planned the location and the space of rooms according to the circulation. In this term, the form of 'Seinäjoki Church' was drawn again. It was shown that he acquired a plan of the Lutheran church as his original plan.

Through the analysis of the design process in the first term, by orienting the position of altar, the space of the plan had central position and direction. From the analysis of the form of the plan, it can be assumed that the rough arc was analyzed earlier than the arc. The first form in the first term can either be the trapezoid form or the three fan-shaped forms. However, in the first term, it cannot be judged which form was drawn first.

4. Conclusion

Aalto's design process for Vuoksenniska Church can be divided into four terms: the first term, the second term, the third term and the fourth term. The architectural form in the first term was consistent with the form in the fourth term. In the second term, the sketches of the first term were reviewed by using hard lines. In the third term, the process was carried out by adding more details to the second term. The first term can be divided into four forms: the trapezoid, the three fan-shaped forms, the rough arc, and the arc. Acoustical exploration appeared in the architectural form in the east side.

In conclusion, the design process has a relation with his past works, such as 'Seinäjoki Church' and 'bent wood'. Although Aalto did not make any reference to this particular aspect of the project in his writings, the fundamental idea of this project is represented in his primary sketches in the first term. In summary, the ideas of the architectural form are based on his past works considering the requirements of historical conditions, such as a Lutheran Church.

- 1) The inauguration was on September 28, 1958. (ALVAR AALTO KOLMEN RISTIN KIRKKO: CHURCH OF THE THREE CROSSES IMATRA/ ALVAR AALTO –MUSEO,2001)
- 2) From the interviews of the Alvar Aalto Museum staff, a system of archiving was created in Museum of the Finnish Architecture. The Alvar Aalto Archive staff (AAA) attached a number in every drawing in the cataloguing. Nowadays the source of the drawings and photos is the Alvar Aalto Museum (AAM). They are organized using control numbers. The control number of the drawings is included after the caption.
- 3) All types of drawings: site plan, plan, elevation plan and section plan. Others (table1): the drawings of the vicarage, the bell tower and furniture, detailed drawings. The drawings were determined based on the types of line used. Sketches were drawn using free hand lines while drawings were drawn using soft lines. Incomprehensible drawings are exceptions to this analysis.
- 4) In the third term, the name of space was marked in the plan. The first space, including the altar, was PartA (kirkko-osaA), the middle space was PartB (kirkko-osaB), final space was PartC (kirkko-osaC).
- 5) From the interviews of the Alvaro Aalto Museum staff, the first sketches of the site plan were dated on May 13, 1955. The last interior drawings were dated on November 1958.
- 6) Considering that the audibility of the sermon is the most important and most difficult problem in a Lutheran church.
- 7) Aalto won Seinäjoki Church competition in 1951. Part of the church was completed in 1960. (ALVAR AALTO Seinäjoki church and administrative center 1951-1987/ ALVAR AALTO –MUSEO, 2011)
- 8) Aalto developed the furniture in the 1930s.

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*In this paper, the construction year of Aalto's work refers to date provided by Alvar Aalto Museum staff.

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