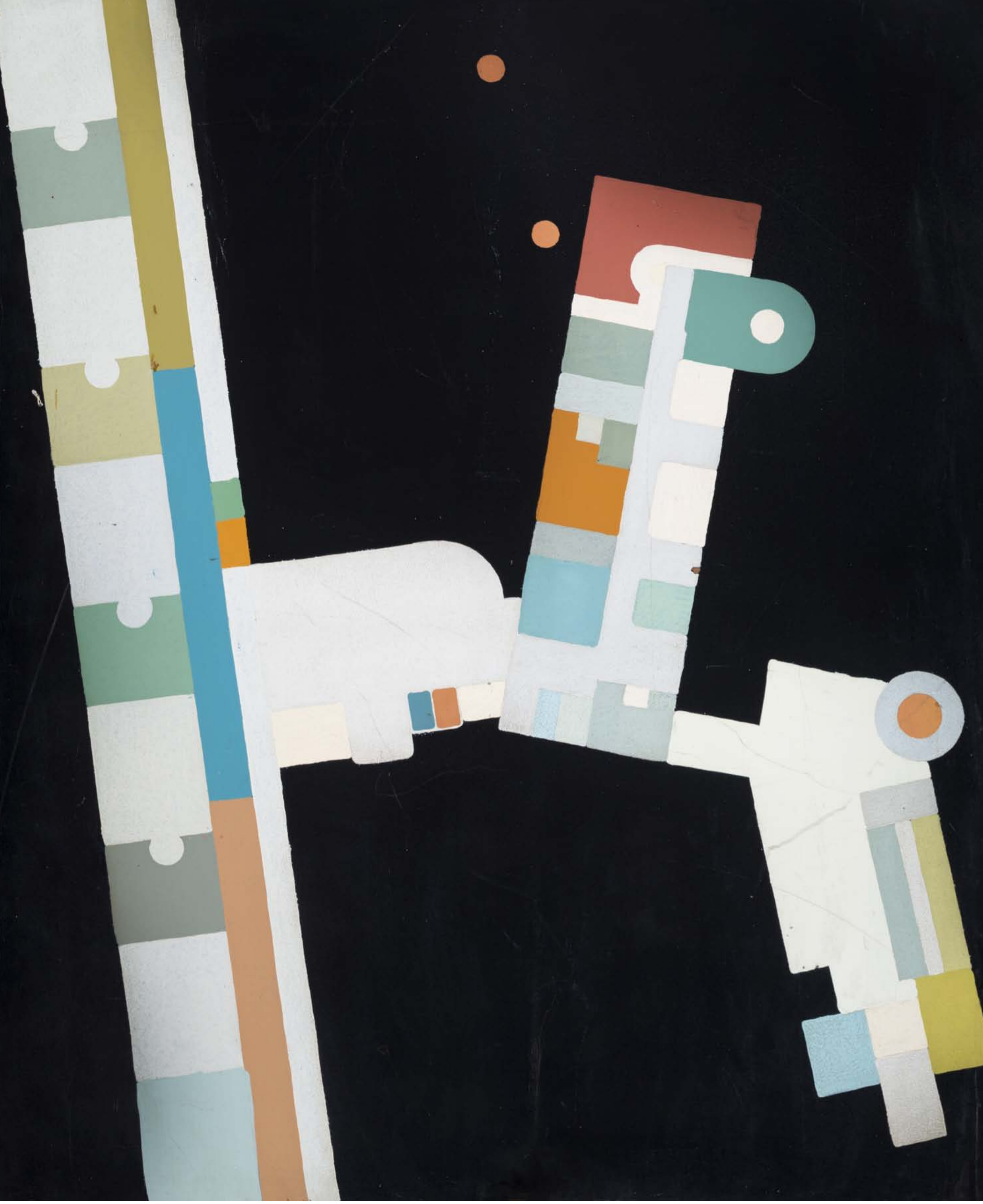

PAIMIO SANATORIUM CONSERVATION MANAGEMENT PLAN 2016

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AAM 50-003-233 1930s

The overall goal of the CMP is to guide the future use, care and conservation of the Paimio Sanatorium. The objective in preparing of this CMP has been to produce documents that bring together already existing historical records of the building, including defining of architectural features, physical analysis and the knowledge of the buildings performance over time to create a long-term strategy for decision-makers, contractors and users regarding conservation and maintenance.

AAM 50-003-277 Aino Aalto 1930s

INTRODUCTION

KEEPING IT MODERN

Tommi Lindh

This Conservation Management Plan (henceforth CMP) has been made possible by the grant awarded by the Getty Foundation in Los Angeles, USA, in 2014, and the restoration grant awarded by the National Board of Antiquities in Finland. There were three main objectives for the CMP. The first was to define the prerequisites for future uses of the spaces in the Paimio Sanatorium's main building. The second was to prepare the best possible repair and maintenance principles and practices for the buildings and site. And finally, the third objective was to prepare Paimio Sanatorium for nomination to the World Heritage List. All three objectives have been achieved.

The owner now has a new understanding of the property and is not as eager to get rid of it as before. On the contrary, the Hospital District of South-Western Finland has actively taken part in the CMP project and has taken a dynamic approach to the future development of the site. The building's current main tenant, the Mannerheim League for Child Welfare, is well suited for the site and gives new hope for the future uses of the Sanatorium.

The second objective (to prepare the repair and maintenance principles and practices for the site) has consumed most of the time we had for the project. The better part of the archive and field work has been linked to this objective. Through 10 well chosen examples, we have been able to deepen the understanding of the problematics concerning the preservation and use of the Sanatorium. It's no coincidence that we have used similar approaches as determined in the Burra Charter of ICOMOS Australia.

The third objective (preparing Paimio Sanatorium for inclusion in the World Heritage List) is connected to the two previous objectives. The use has to cope with the increasing number of visitors at the site and the state of preservation has to be on the level determined by the CMP. There is a great need for a Visitor Centre and even the possibility to provide accommodation for visitors since the Sanatorium is so far from other similar sites (i.e. other masterpieces from the Modernist era).

THE GETTY FOUNDATION

The Getty Foundation fulfills the philanthropic mission of the Getty Trust by supporting individuals and institutions committed to advancing the greater understanding and preservation of the visual arts in Los Angeles and throughout the world. Through strategic grant initiatives, it strengthens art history as a global discipline, promotes the interdisciplinary practice of conservation, increases access to museum and archival collections, and develops current and future leaders in the visual arts. It carries out its work in collaboration with the other Getty Programs to ensure that they individually and collectively achieve maximum effect.

The Getty Foundation (initially called the Getty Grant Program) was established in 1984 in the belief that philanthropy is a key component in carrying out the mission of the J. Paul Getty Trust. The Getty Trust is an international cultural organization that includes the Getty Conservation Institute, Getty Foundation, Getty Research Institute, and J. Paul Getty Museum. Drawing on its unique position as a grant-making entity within the larger Getty Trust, the Foundation utilizes the expertise of all the Getty programs--as well as colleagues in our field--to identify areas where grants can make a difference.

One such program is Keeping It Modern, an international grant initiative launched in 2014 that is devoted to the conservation of significant 20th century architecture around the world. Keeping It Modern supports projects of outstanding architectural significance that promise to advance conservation practices. Grants focus on the creation of conservation management plans that guide long-term maintenance and conservation policies, the thorough investigation of building conditions, and the testing and analysis of modern materials. The Paimio Sanatorium was among the first ten buildings to receive the Getty's support through a $180,000 grant awarded in 2014 to the Alvar Aalto Foundation. The Getty Foundation created Keeping It Modern to complement the Getty Conservation Institute's Conserving Modern Architecture Initiative (CMAI).

THE ALVAR AALTO FOUNDATION

Le Fondation Le Corbusier was founded in 1968, and it was followed that same year by the Alvar Aalto Foundation. In 1969 the Alvar Aalto Museum, first founded in 1966, started its actual operations in Jyväskylä in Central Finland. For thirty years the two organizations were independent entities, though with close links. By the time of the huge efforts to celebrate the centenary anniversary of Aalto's birth in 1998, the Alvar Aalto Museum had grown to become a specialist museum for architecture and design, which had been the goal of its director, Markku Lahti, from the beginning. The museum had started as an exhibition space for the City of Jyväskylä's art collection, and run by the Alvar Aalto Society. The museum building intended to house the art collections was completed in 1973. It was designed by Alvar Aalto himself, who took part in its inauguration, though wishing it could be used as a living space for creativity rather than as a museum devoted to him as a person.

The Society ran the Alvar Aalto Museum until 1979, when the City of Jyväskylä took responsibility for the museum in which its art collections were exhibited. That same year, Jyväskylä hosted the world's first International Alvar Aalto Symposium. Since then, the symposia have become a steady triennial institution, directed at a wide audience interested in discussion about modern architecture, and is ranked among the most appreciated cultural events in Finland. Alvar Aalto's architecture provides the surroundings for the events, but the content has entailed a wider approach to questions relating to the cultural environment.

For the first decade of its existence, the Alvar Aalto Foundation existed almost solely on paper, but become more active in 1981 when the rights to Aalto's serially produced design objects came into its possession. Since 1990 the Studio Aalto building in Helsinki (designed by Alvar Aalto in 1955) and the archives have been the property of the Foundation. In 1998, the Foundation purchased the home and first studio building (designed by Aino and Alvar Aalto in 1936) from the Aalto family. That same year, the Alvar Aalto Museum finally became part of the Foundation.

Built heritage has been part of the scope of the Foundation since Aalto's architectural office closed in 1994 (18 years after his death). Restoration projects regarding Aalto sites provided a natural continuation from the office to the Foundation. Some of the Aalto office staff continued as voluntary advisors for the repairs on Aalto sites. Later, the Foundation hired a full-time employed architect to take charge of the consultation work. Today, the work on Aalto's built heritage is a major part of the Foundation's activities, and it provides free advisory services, statements of significance, building-historical surveys and site documentation for building owners and authorities.

The Ministry of Education founded the Alvar Aalto Academy in 1999, and for it to be a part of the Foundation. The Academy provides an international forum for discussions on Modern architecture and organizes events and training programmes together with partners working in the field. Among the activities of the Academy are the Alvar Aalto Symposia, design seminars, conferences and lectures. International courses on the conservation of Modern architecture have been organized by the Academy together with the International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM) and other partners.

Besides taking care of the huge Aalto collections (including more than 100,000 drawings, which make it the largest collection from a single architect in the world), the Museum provides a wide range of exhibitions, publications and education services around the world. A permanent Alvar Aalto exhibition was created in the Aalto Museum building in 1998. In 45 years the Alvar Aalto Foundation has grown from the good idea of a few friends into a multifaceted organization with links to all cities with Aalto buildings as well as Aalto societies established in individual countries around the world. The Foundation and its partners manage five museums open to the public (in addition to the ones already mentioned, there are the Muuratsalo Experimental House in Jyväskylä and the Maison Louis Carré in France), organize international events of global interest, and preserve Alvar Aalto's material and spiritual heritage. All these activities prove that even today there is a wide international audience interested in Alvar Aalto's work.

CONSERVATION MANAGEMENT PLAN (CMP)

Nina Heikkonen

This CMP has been prepared in order to provide long-term guidelines for the use and maintenance of the buildings and surroundings of the Paimio Sanatorium. The contents of the CMP address the issues usually dealt with separately in a historical survey, conservation plan and management plan. The objective of this document is to present what is required on the site by focusing on both its architectural and cultural-historic significance, as well as the key management issues related to the care, maintenance and development of the site.

The process of preparing the CMP has proceeded in two stages: 1. Research, analysis and understanding the site, and 2. Establishing the conservation policy and producing the implementation strategy. While a lot of research and analyses have already been done pointing out the building's significance and history, a large part of the cultural significance of the Paimio Sanatorium still remains to be explored. The preparation of the CMP has provided an excellent opportunity to gather together the existing information as well as to further it with new research.

New information has been produced by carrying out a comprehensive colour research, thus outlining the appearance of the original colour scheme, and to help to perceive the state of preservation of the interiors. The research was conducted with the guidance and financial assistance of the National Board of Antiquities. Other notable sources of new information have been an extended building-historical survey, and a study of the original technical installations in a much more detailed level than previously.

The CMP will be made available in electronic format at the website of the Alvar Aalto Foundation: <www. alvaraalto.fi>. An exhibition of the Paimio Sanatorium CMP project has been on display at the Alvar Aalto Museum in Jyväskylä in February-March 2016. Also the permanent exhibition "Alvar Aalto Architect" in the Alvar Aalto Museum has been modified in regard to the exhibition's model room about the Paimio Sanatorium.

The process and findings of the CMP, as well as the Paimio Sanatorium site, were presented during an excursion organized for the participants of the international "Monumental Treasures - Preservation and Conservation XX NKF Congress" held in Helsinki 21–23 October 2015. Jonas Malmberg and Elina

Riksman were the guides of the tour organized by the Alvar Aalto Foundation.

The project will have a continuation with a new project undertaken by the Alvar Aalto Foundation: a publication about the process of preparing a CMP will be produced in Finnish, aimed at both experts and the general public. The project will be partly financed by the Finnish Ministry of Education and Culture.

The interest in the restoration of 20th century architecture has risen significantly in Finland in recent years. This is naturally due to the large number of buildings in the country dating from that era. A large part of these properties have already reached, or will soon reach, the age and condition where comprehensive and inevitable repairs are needed. Also the functions of the properties are changing due to the changes in the societal environment in general. In these situations a guiding CMP can be an excellent tool for all parties involved. The CMP for the Paimio Sanatorium could provide an encouraging example for other similar buildings and sites.

This document is divided into six parts, each focusing on a certain area of the CMP, from general policies to specific guidelines and recommendations. It includes the following: a description and history of the property, together with an analysis of the physical and documentary evidence; a conservation policy describing the principles of restoration and use; and an implementation strategy, with guidelines and recommendations for the conservation and maintenance works on the site. It also takes a look into the future, and considers any new development prospects for the property or surrounding area.

PART I INTRODUCTION

Part I introduces the reader to the Paimio Sanatorium site and the purpose of the document.

PART II DESCRIPTION

Part II describes the property and its history, bringing together previously collected historical records regarding the site, including physical and documentary evidence, with the new information explored and collated during the CMP preparing process.

PART III CONSERVATION POLICY

Part III presents the protection designation and principles for the restoration and use of the site. Also the assessment of values is analysed in accordance with three different values: 1. Architectural value, 2. Cultural-historical value, and 3. Use value.

PART V IMPLEMENTATION STRATEGY

Part IV presents the guidelines and recommendations for the restoration and conservation of the site. The research has addressed the landscape, the interiors of the main building, the furniture and lighting, and the maintenance and housekeeping issues. The prerequisites for the feasible and compatible uses have been studied from different perspectives during the CMP project and the results and case studies regarding various interiors are also presented. Part IV also takes a peek at the possible future of the site.

PART V APPENDICES

Part V includes the listing and a short description of the appendices of the CMP. The actual documents will be available in separate files.

PART II DESCRIPTION

AAM 109669 Piero Berengo Gardin 1970s

DESCRIPTION OF THE PROPERTY

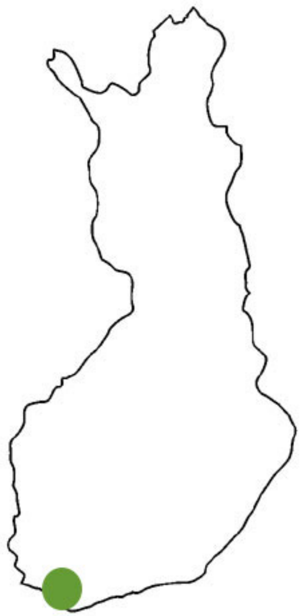
Nina Heikkonen

Paimio Sanatorium is situated in the town of Paimio in southwest Finland. The sanatorium was built in 1930-1933. An architectural competition for its design was held in 1928-1929, which was won by architect Alvar Aalto. The prize-winning proposal was among the first in Finland to employ the principles of Functionalism.

The hospital area is surrounded by a forest zone of natural beauty that includes some scattered dwellings and fields. The site is a sandy terrain in the middle of a pine forest, which was considered exceptionally well-suited for the building complex's original function as a tuberculosis sanatorium with its specific medical requirements. The location still offers its current users a peaceful environment surrounded by natural beauty. The hospital plays an important role in the territorial structure of modern-day Paimio as a significant functional, cultural and spiritual centre of the municipality.

The hospital complex includes the following: the main sanatorium building, the chief physician's residence (nowadays a kindergarten), the junior physicians' row house, the staff housing (nowadays offices), the hospital morgue (the so-called Rose Cellar), the boiler and machine room and garages, all completed in 1933; the nurses' row house (the so-called Kyykartano or Adder Manor) and garage built in the 1960s; and the heating plant built in the 1980s.

Furthermore, the area includes various utility buildings of different ages. Outside the hospital area, though still part of the sanatorium complex, are a water pumping station, together with its dam structures, and a biological wastewater purification plant. Aalto also designed a serpentine path for the hospital grounds, in an area south of the main building, linking a series of water fountains, and where patients could take walks. Some of the water fountains have been preserved as flowerbeds. The path network itself is presently overgrown.



Geographical coordinates to the nearest second
60° 27' 54"
22° 44' 9"

01 The main sanatorium building (1933, operating theatre wing 1958, underground extension 1980s)

02/03 The boiler and machine room and garages (1933)

04 Storehouse, original wood shelter (1930s)

05 Housing building (anonymous design 1950s)

06/07 The heating plant (1980, 1982 and 1988)

08 The staff housing, called Mäntylä (designed by L. Sipilä, 1949)

09 The staff housing (1933, offices since 1981)

10 The junior physicians' row house (1933)

11/12/13 The nurses' row house (the so-called Kyykartano or

Adder Manor) and garage (1962)

14 The chief physician's residence (nowadays a kindergarten)

(1933)

15 Kindergarten's garage (1962) (on the site of the chief physician's

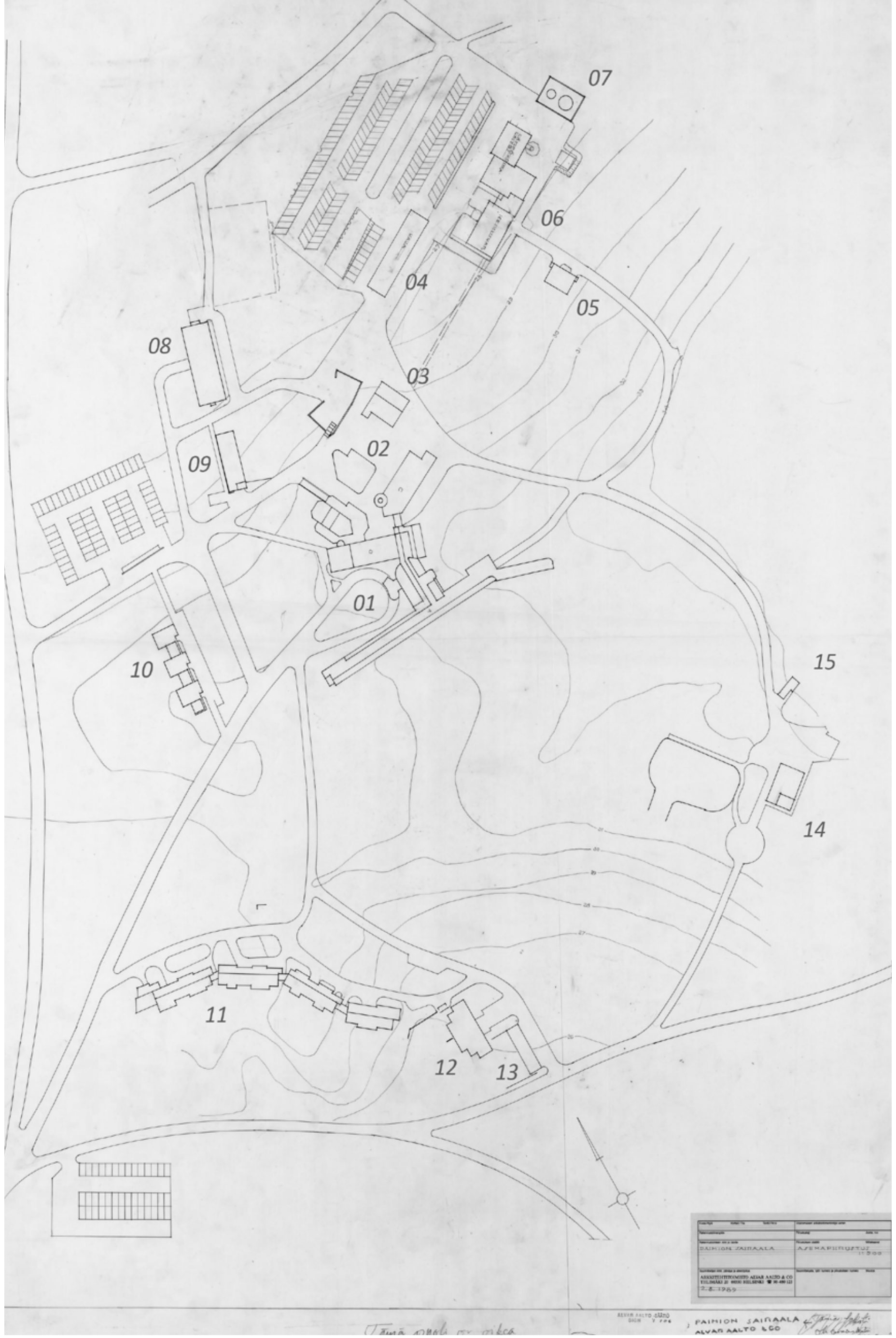
sauna 1933, demolished)

16 Rose Cellar (formerly the sanatorium morgue) (1933)

(outside the map area, in the southeast) a water pumping station and its dam structures (1933)

(outside the map area, in the south) a greenhouse (1933)

(outside the map area, in the north) a biological waste water purification plant (1933).



AAM 50-003-096 1930s

The main building of the sanatorium was placed on the highest point of the area, and oriented in a north-south direction. The layout was organised into five independent entries, connected with the main functions – the patient rooms, communal rooms, operating theatre, kitchen services and technical spaces. Each was placed in its own wing and oriented in the most favourable direction with regard to the light. The various wings meet at a central connecting node, where the most important internal circulation routes – the main staircase and lifts – are located. The central entrance porch, with an amoeba-shaped canopy, is also situated in this central core. The glazed lift shaft of the narrow west facade is a reflection of the Aaltos' admiration at that time for the machine age and modernity. This planning principle has produced a unique building offering a dynamic whole with varying views outwards into the landscape, as well as embodying the ideas of the new Functionalist architecture.

The other buildings of the hospital complex; the doctors' and nurses' residences, heating plant, garages and other utility buildings dating from different construction periods, are freely laid out within the picturesque grounds of the sanatorium. The mainly two-storey residential buildings are organised hierarchically, and in their time represented a progressive type of housing. The hospital morgue (Rose Cellar), the water-pumping station and the biological water purification plant are placed at the edge of the sanatorium grounds, which originally extended much further than it does today as an agricultural landscape with fields and greenhouses providing provisions for the sanatorium.

THEMATIC HISTORY

Eva Eylers, Jonas Malmberg & Jukka Sainio

PAIMIO SANATORIUM HISTORY

The following chapter briefly describes the background to the Paimio Sanatorium, the history of its buildings and use, as well as the major changes and its legal protection. The authors of this chapter are Jonas Malmberg and Eva Eylers, while the specialist contributor writing about the technical installations has been Jukka Sainio.

INTRODUCTION

A child of industrialization, the tuberculosis sanatorium emerged as a distinct medical institution in Europe during the 1850s and by the time of its decline, barely a century later, had inspired modernist architecture like probably no other building type.

Until the sanatorium treatment became obsolete with the introduction of a pharmaceutical cure, the sanatorium was a realization of the essence of modernist visions and demands. What made the specialized institution a model for hygienic architecture were the strict separation of functions, planning on a “tabula rasa” site, southward orientation, balconies, sun terraces and large windows that would ensure the maximum amount of light and fresh air entering the building, together with an interior design based on a demand for smooth, unornamented and thus washable surfaces.

It was the lack of a promising alternative curative approach that kept alive the sanatorium movement, despite the unsatisfactory healing rates. Conflicting statistics and a rather vague and tangible framework of medical demands left room for interpretation and thus created opportunities for innovation and the development of new architectural ideas. The sanatorium should therefore not be regarded as the mute response of specific medical demands. On the contrary, the sanatorium was not only a space for medical research but also came to be an important space for technical, architectural and even urban experimentation and innovation. Each sanatorium has its own specific history and deserves to be read within the respective socio-political, medical and architectural context in which it was created. Irrespective, however, of specific national variations, the sanatorium deserves to be seen as a success. It constitutes a milestone in the collegial collaboration between medicine and architecture, despite the fact that the institutional aim, the long-term cure of TB, could not be obtained. The sanatorium speaks of the heroic belief in architecture’s capacity to contribute to the betterment of society.

One of the major architectural manifestations within the field of tuberculosis sanatoria was Paimio

Sanatorium, completed in 1933. It was a relatively late example in the European context of tuberculosis sanatoria, but was one of the most advanced in architectural expression. The architectural competition in 1928–29 was the first in Finland in which all the awarded entries followed functionalistic architectural expression and the building itself became a key work in the early career of its architect, Alvar Aalto, and who was paving his way to become one of the most celebrated modernist architects. Raija-Liisa Heinonen summarized the importance of Paimio as follows:

In Paimio the foreign influence which Aalto had absorbed is visible – particularly his journey to France and the Netherlands briefly before the architectural competition. On the other hand, Paimio represents the coherent development in Aalto's architecture, both spatially and in its detailing. Paimio is in a way the culmination and endpoint of a process and synthesis of new features which had over previous decades developed in various situations. Simultaneously, it can be regarded as a starting point, as an example of a contemporary architectural site that bears in the purest way everything that functionalism included. In addition to Aalto's whole artistic intuition.[1]

TUBERCULOSIS

We know today that tuberculosis is an infectious disease caused by a bacterium, "Mycobacterium Tuberculosis". The disease can affect not only various parts of the human body – the bones, intestines and also the skin – but ultimately all organs and bodily systems. It should be noted here that whenever tuberculosis, "TB" or "consumption" is mentioned, the text refers to the most widespread form of the disease, the form to be predominantly treated within the sanatorium, namely pulmonary tuberculosis.

Known by its present name only since the 19th century, "tuberculosis" has existed probably since ancient times. "Phthisis", "scrofula", "tabes", "inflammation of the lungs", hectic or gastric fever and – commonly used in the 19th and 20th centuries – "consumption", are different names for what was most probably caused by the same agent discovered in Egyptian mummies dating from 2400 B.C.

THE ROMANTIC NOTION

In Europe during the late 18th and early 19th century little was known about TB, and it occurred relatively seldom. At that time the disease came to be associated with literary and artistic circles and developed something of a romantic aura. That it was often the very young whose bodies were slowly fading away, consumed by the disease, added a further dramatic dimension. Alexandre Dumas' *Lady of*

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1 Heinonen 1986, 177. Translation by Jonas Malmberg.

the Camellias (1848), later also the subject of Verdi's *La Traviata*, mirrored and at the same time strengthened the tragic yet romantic notion of the disease.

With the mass dissemination of TB in wide parts of Europe, which went hand in hand with industrialisation and population growth in cities, this conception gradually changed. In Germany, for example, more than 100,000 people were estimated to have fallen victim to the disease each year during the second half of the 19th century. Such numbers left little space for any romantic fantasy and the disease came to be feared for what it was, that is, an unpredictable and ultimately fatal disease which affected all levels of society.

TRANSMISSION

What exactly caused tuberculosis, be it hereditary or infectious, remained a mystery until the discovery of the tubercle bacillus in 1882. After receiving the Nobel Prize for his discovery in 1905, Robert Koch explained in his audience address what by the turn of the century had become widely accepted: Tuberculosis was an airborne disease. Therefore, "even the smallest drops of mucus expelled into the air by the patient when he coughs, clears his throat, and even speaks, contain bacilli and can cause infection."

The overcrowded living conditions caused by industrialisation and subsequent population growth in many European cities constituted, therefore, favourable conditions for the spread of TB.

With the knowledge that the disease was contagious, came also the insight that it was avoidable through cleanliness and isolation. Before the discovery of a pharmaceutical cure, cleanliness (obtained through fumigation, disinfection, the avoidance of dust and the encouragement of airflow) and isolation (separation of the infected from the un-infected) were indeed the only effective measures to diminish the spread of the disease. It was a prophylactic, a preventative strategy, aiming at the protection of the un-infected.

THERAPEUTIC MEASURES

Despite the discovery of the bacterium and the better understanding of its transmission and avoidance, the solution for how best to treat the already infected patients, a therapeutic strategy, remained less obvious.

Before the development of the pharmaceutical cure, the course of the disease depended on the robustness and resistance of the infected body. Since the body's self-defence mechanism had to be strengthened, the cure changed according to what was believed to be beneficial to the body's overall health. And since the aim to strengthen the body as an entity could trigger, then as it does now, the most wide-ranging speculation, the therapeutic approach to TB operated in a distinct grey-zone.

Dr. Brehmer's sanatorium in Görbersdorf, with the neo-gothic "Neue Kurhaus" (1875-78) designed by architect Edwin Oppler. The early newspaper advertisement (circa. 1880) notes that 42 Marks had to be paid per week by the patient. (Eva Eylers' archive)

Despite claiming scientific accountability, the therapy for TB was influenced not only by medical observation. Also medical fashions as well as political and cultural currents formed and determined the therapy, making it a fairly tangible and ideology-driven set of treatments.

EUROPEAN SANATORIA

In this chapter some European examples of sanatoria built prior to Paimio are discussed as examples of the development. They are only a few representative examples of a large number of sanatoria built in Western Europe (many interesting examples are also found in Eastern Europe, for example in the present-day Czech Republic and Slovakia) during the late 19th and early 20th centuries.

Due to their often remote location, the inspiring brief and often generous funds, architects were faced with the rare opportunity not only to experiment with new materials and technologies but also to develop and express their visions for a new communal life. The sanatorium thus allows us to read and understand the political and social currents of their time probably better than any other building type.

HERMANN BREHMER'S GÖRBERSDORF, 1854

Dr. Hermann Brehmer (1826-1889) introduced in 1854 the "dietetic-hygienic treatment" in the first TB sanatorium in the Silesian village of Görbersdorf (today Sokolowsko in Poland). The treatment consisted of a combination of the so-called "Freiluft-Liegekur" (a rest cure in fresh air), water applications, walks and light open-air exercise together with a rich, strengthening diet, organised within a disciplined daily routine. It was developed and amended by doctors during the following years, but remained the basis for the standard therapy during the last quarter of the 19th and the first half of the 20th century.

With its castle-like appearance, Brehmer's sanatorium expressed a romantic belief in the possibility to finally heal and conquer tuberculosis. The neo-gothic employed for Görbersdorf would be the perfect style to express its remoteness and the immunity of the place and at the same time indicate the romantic belief or hope in betterment.

Unfortunately, probably due to the complicated history of the Görbersdorf site, there are very few photographs or plans giving testimony to the time of its operation as a sanatorium. However, a five-minute mute advertisement film, made by DRB[2] and probably meant to be shown at cinemas before the actual film, is an interesting document from the early days of Görbersdorf. It shows the village (depicting Dr. Brehmer's sanatorium while not directly referring to it) as a holiday resort where skiing, even ski-jumping is a favourite leisure activity. In the accompanying captions, tuberculosis is not mentioned at all, while promising that the "verhetzte Großstadtmensch", the haunted city dweller, would find peace and relaxation in this sanctuary surrounded by mountains. The captions accompanying the film by Dr. Herbert Brieger reads:

Enclosed by mountains, Görbersdorf is a sanctuary for the haunted city dweller. Here he finds peace and relaxation. /Numerous slopes and comfortable forest paths offer an ideal sports terrain. / Those journeys through the lonely winter forest are splendid. / It is full of life and bustle during the sports day events. / Silesian youth cross-country skiing. / At the ski jump – Oops, that was in the rough! / And next time, come yourself! /Good skiing![3]

After 1945 the complex would still be used as the Grunewald sanatorium. After some decades it was abandoned and became successively derelict. In the 1990s the main building, the "Neue Kurhaus" by Edwin Oppler, was partly restored and for a while operated as a hotel, before a fire destroyed most of the complex in 2005.

After 1945 the complex would still be used as the Grunewald sanatorium. After some decades it was abandoned and became successively derelict. In the 1990s the main building, the "Neue Kurhaus" by Edwin Oppler, was partly restored and for a while operated as a hotel, before a fire destroyed most of the complex in 2005.

THE ALPINE RESORT

Görbersdorf had been the first in a tradition of privately run (more or less luxurious) institutions that sprang up in the Alps in the following years. One of the most successful of all the sanatorium locations was, as Paul Overy explains, Davos. The Swiss mountain resort became known as "'the tuberculosis

2 Dr. Herbert Brieger, Görbersdorf film: http://www.youtube.com/watch?v=uovPrB7Wvas [accessed 16.7.2010].

3 The original German captions: Von Bergen rings umschlossen liegt Görbersdorf - eine Zufluchtsstätte für den gehetzten Großstadtmenschen. Hier findet er Ruhe und Erholung. / Zahlreiche Hänge und bequeme Waldwege bieten ein ideales Sportgelände. / Herrlich sind solche Fahrten durch den einsamen Winterwald. / Reges Leben und Treiben herrscht an den Tagen sportlicher Veranstaltungen. / Schlesische Jugend im Langlauf. / An der Sprungschanze – Hoppla! Das war ins Unreine! / Und beim nächsten Mal: Kommt selbst! / Ski-heil!

capital of Europe'. A local practitioner, Dr. Walter Spengler, opened the first sanatorium in Davos in 1862, and he was soon followed by other doctors who opened their own establishments. The village, in an isolated valley, was transformed into a prosperous and extremely fashionable small town whose main industry was the treatment of tuberculosis and other respiratory ailments, attracting patients from Britain, Germany, The Netherlands, Russia and the United States."[4]

Many of the Davos sanatoria would become very influential for the architecture of future sanatoria. Overy calls Otto Pfleghard and Max Haefeli's Queen Alexandra Sanatorium from 1907, "one of the most spectacular of early 20th century sanatoria".[5] The Swiss structural engineer Robert Maillart was the engineer in charge and Hennebique, the French specialists in reinforced concrete construction, the contractor. The building is illustrated in Sigfried Giedion's *Befreites Wohnen* as well as in Richard Döcker's *Terrassentyp* (both 1929).

Both the Queen Alexandra Sanatorium and the earlier Berghof Schatzalp (1900) inspired Thomas Mann's description in his 1928 novel *The Magic Mountain*: Upon Hans Castorp's arrival from Hamburg "before them [Hans and his cousin, Joachim] rose a low, projecting, meadow-like plateau, on which, facing south-west, stood a long building, with a cupola and so many balconies that from a distance it looked porous, like a sponge."[6]

Also the collaboration between Dr. Karl Turban (who was an influential practitioner in Davos) and the architect Jacques Gros in an architectural competition in 1902 led to a most advanced and visionary project. The plan for an 'ideal sanatorium' where "the south-facing wall of each patient's room was constructed entirely of movable panes of glass divided by thin metal frames, (was) very similar to the types of window adopted in modernist buildings",[7] such as Zonnestraal or Paimio which followed more than 25 years later.

With few exceptions, most Alpine sanatoria were private endeavours and only admitted private patients. In parallel to the development in the Alps, we see, however, especially in Germany, a growing demand to offer sanatorium treatment on a large scale – especially for the working class.

Schatzalp at Davos by Pfleghard and Haefeli (Eva Eylers).

4 Overy 2007, 24.
5 Overy 2007, 24
6 Mann 1999, 8.
7 Overy 2007, 25.

FROM PRIVATE RESORT TO PUBLIC SANATORIUM

During the last decade of the 19th century a growing number of institutions sought to provide sanatorium treatment for everyone, in order to increase social justice. These sanatoria were founded and supported by a combination of public and private organisations acting as responsible bodies.[8]

At the turn of the 20th century, when the (financial) interest in the recovery of invalid TB patients increased, a large number of sanatoria emerged within the German Heilstätten movement to enable adequate medical treatment for low-income members of society.[9] It was at this time that three sanatoria, Beelitz, Belzig and Hohenlychen, were built in the Märkische Tiefebene, the flat lands in the centre of the state of Brandenburg, in order to take on patients from Berlin and thus lessen the devastating effects tuberculosis exercised over the capital.

THE BEELITZ HEILSTÄTTEN

When the Heilstätten programme in Germany peaked in 1928, the then 30-year old Beelitz Heilstätten was still the largest institution of its kind and had proved to be a paradigmatic figure within the movement. The vast complex, planned to host more than 1200 patients, had been realised within an area of 200 ha of woodland close to Berlin. Providing its own infrastructure – from a central heating and electricity plant to facilities for growing its own food – Beelitz became almost independent from the outside world.

Immediately after the completion of the first building phase in 1904, the complex had been documented and published in several editions of Deutsche Bauzeitung. The introductory article justified the focus on the Beelitz Heilstätten in stressing the model character of the complex. The journalist celebrated the realisation of this "vornehme sozialpolitische Aufgabe", "noble socio-political task", as the "most complete, possibly the most important Heilstätten, where both building/layout [Anlage], interior furnishings [Einrichtung] as well as equipment [Ausstattung] are concerned."[10]

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8 For instance, in 1885 the Berlin-Brandenburger Heilstättenverein, under the patronage of the empress Auguste Viktoria, used private funds to create Heilstätte Belzig; in 1886, the Red Cross founded Grabowsee, not far from Berlin (Honourable president: Fürstin Hohenlohe; direction: Prof. Gerhardt, Dr. Pannwitz, Dr. Schultzen); in 1887 the Hanseatische Versicherungsanstalt für Invaliditäts- und Altersversicherung (Hanseatic insurance company for invalidity and old age), founded Andreasberg in the Harz mountains.

9 For a more detailed description of the German sanatorium movement and the Beelitz Heilstätten see: Eylers 2014, 667–692.

10 "...sind die Arbeiterheilstätten bei Beelitz vielleicht die bedeutendsten und umfangreichsten [...] und nach Anlage, wie nach Einrichtung und Ausstattung ohne Einschränkung als eine Musteranlage zu bezeichnen." Deutsche Bauzeitung 38. Jahrgang, Nr. 11-13, Berlin, 6, 10, 13. Feb. 1904, 61, 80.

Hohenlychen sanatorium in 2007
(Eva Eylers).

DEUTSCHE BAUZEITUNG
XXXVIII. JAHRG. № 11. BERLIN, DEN 6. FEBR. 1904

DEUTSCHE BAUZEITUNG
XXXVIII. JAHRG. № 12. BERLIN, DEN 10. FEBR. 1904

DEUTSCHE BAUZEITUNG
XXXVIII. JAHRG. № 13. BERLIN, DEN 13. FEBR. 1904

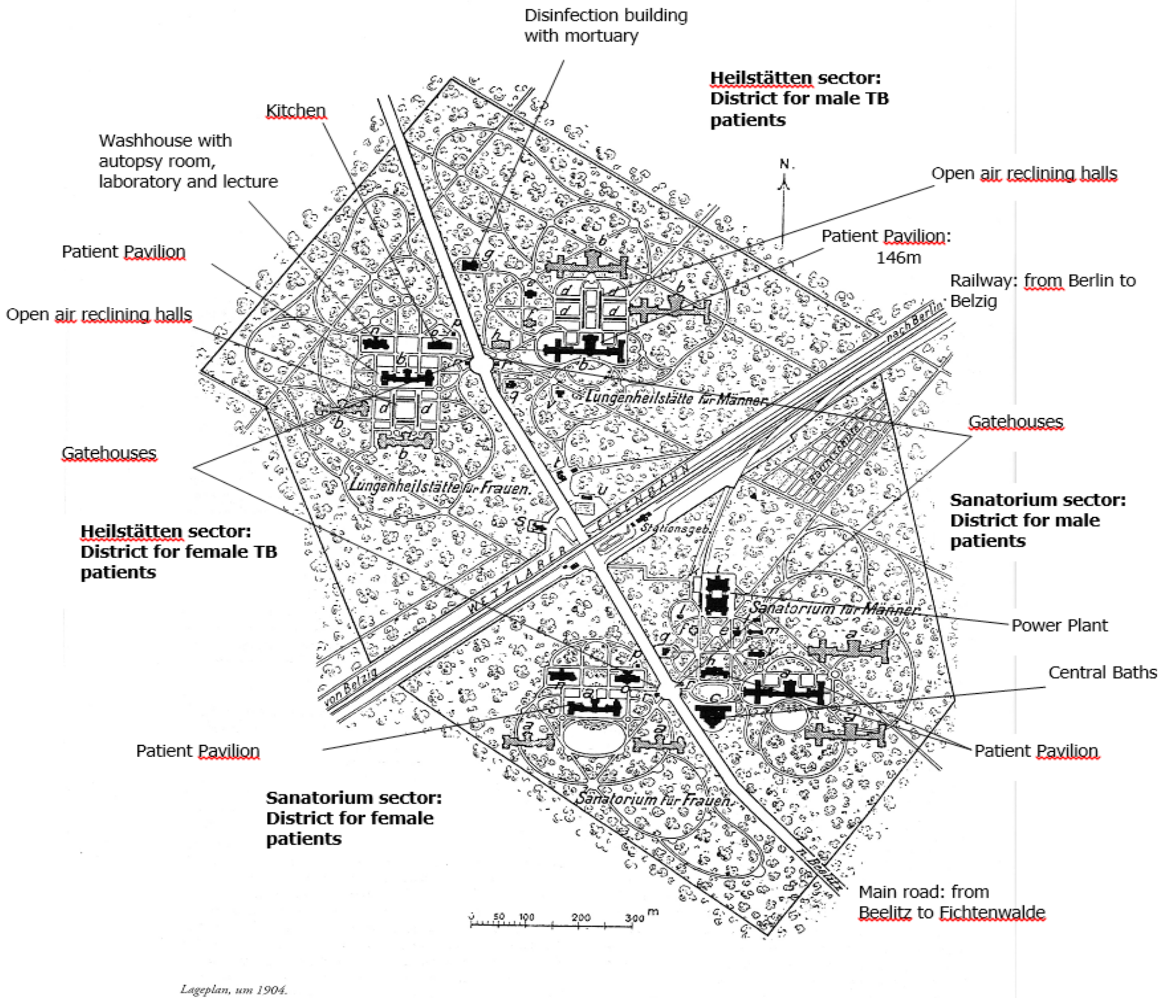
The Beelitz gate house on the cover of no. 11 of Deutsche Bauzeitung, 6 Feb. 1904. The Beelitz workshop building and skittle-alley on the cover of no. 12, 10 Feb. 1904. The cover of no. 13, in which is featured an article on Beelitz, 13 Feb. 1904 (Eva Eylers' archive).

"One feature of the site selected [...] is that the building site was divided into four parts by a railroad [cutting through the territory from east to west] and by a highway [connecting Beelitz with Fichtenwalde, from north to south]."[11] This "natural" division of the site worked well for the envisaged segregation between TB (contagious), and other- (non-contagious) forms of disease, but also between male and female patients.

The Beelitz Heilstätten was realised in four different building phases: the first phase (1898–1904) was supervised by Baurat Heino Schmieden[12] (1835–1913) and Regierungsbaumeister Julius Boethke (1865–1917). During those six years, four patient pavilions, the central bath, kitchen and laundry buildings were realised. Also built during that period were the surrounding fence, gatehouses, landscape garden with the walkways and open-air reclining halls, as well as the technical infrastructure with the central power plant.

11 Gerhard 1914, 2.

12 Schmieden had been working together with Martin Gropius, until Gropius's death in 1880, in the Sozietät Fa. Gropius & Schmieden.



Site plan from 1904, with the buildings realised during the first building phase indicated in black, while the grey figures represent the projects to be executed in future years. To give an idea of the scale, the main pavilion of the TB sector for men had 180 beds and is 146 metres long. The overall site is roughly 1km x 2km. Beelitz site plan, 1904; (source: Brandenburgisches Landesamt für Denkmalpflege (Hrsg.): Die Beelitzer Heilstätten, p.12, amendment by authors).

Beelitz pavilion for male patients, “Männersanatorium” (Eva Eylers).

While the average German Heilstätte provided about 150 beds, with the completion of the second building phase (1905-1908) the Beelitz complex was planned to host more than 1200 patients.[13] Given the size of the project and Schmieden’s function in the DZK, the German Central Committee responsible for fighting tuberculosis, the Heilstätten acquired a distinctly model character, which was maintained during the following years as Fritz Schulz twice enlarged and added to the complex.

Although Paimio was operating on a smaller scale (40 ha and 300 patients) compared to Beelitz (200 ha and 1200 patients), the (relative) independence from the surroundings was an important aim common to both. Thus the provision of food, and especially of heat and water, as well as the subsequent waste (water) disposal, had to be carefully planned.[14]

Although at first sight the three-storey Beelitz pavilions, with their pitched roofs, colourful glazed brickwork and timber frame detailing, seem to be indicating a rather low-tech approach, the infrastructure was distinctly modern. A generous underground tunnel system was connecting all buildings and servicing them with heat, water and electricity. The 2 km sewer system led to a 5 ha irrigation field.

13 During the 1930s the number would increase temporarily to 5000 to 6000 patients and 500 members of staff.

14 As Ehrström notes: “The well-being of the patient started from acquiring clean water and ended in the hospital’s own separate purification plant.” Ehrström et.al., 2005, 33.

After 1945 the Beelitz Heilstätten became a military "Sperrgebiet" (prohibited area) hosting the Central Military Hospital for the Soviet troops. Until the withdrawal of the Soviet Army in 1994, when the area was given back to the Federal State of Brandenburg, the buildings were spared significant demolition or modernisation that would affect any structural change. After 1996 a renaissance of the site was planned, centred around medical and prophylactic institutions, a "medical park".

However, to date only one of the main pavilions has been renovated and put to use for rehabilitation purposes. because the investor, the property development company Roland Ernst, went insolvent in 2001. While the thermal power station was renovated in 2001 with support of EU funding and the Deutsche Stiftung Denkmalschutz, only a number of the smaller villas formally occupied by medical staff or serving as hotels or restaurants could be sold to private investors. The former disinfection building was subsequently turned into Landhaus Gustav, a restaurant and conference venue. Recently plans have been developed to renovate further pavilions and convert them to apartments.

ZONNESTAAL SANATORIUM

The Zonnestraal or "ray of sun" sanatorium received its name through the Koperen Stelen Fonds (the Zonnestraal Society) who needed a sanatorium for the Amsterdam diamond workers. The commission had been given in 1925 to Bernard Bijvoet[15] and Johannes Duiker.[16]

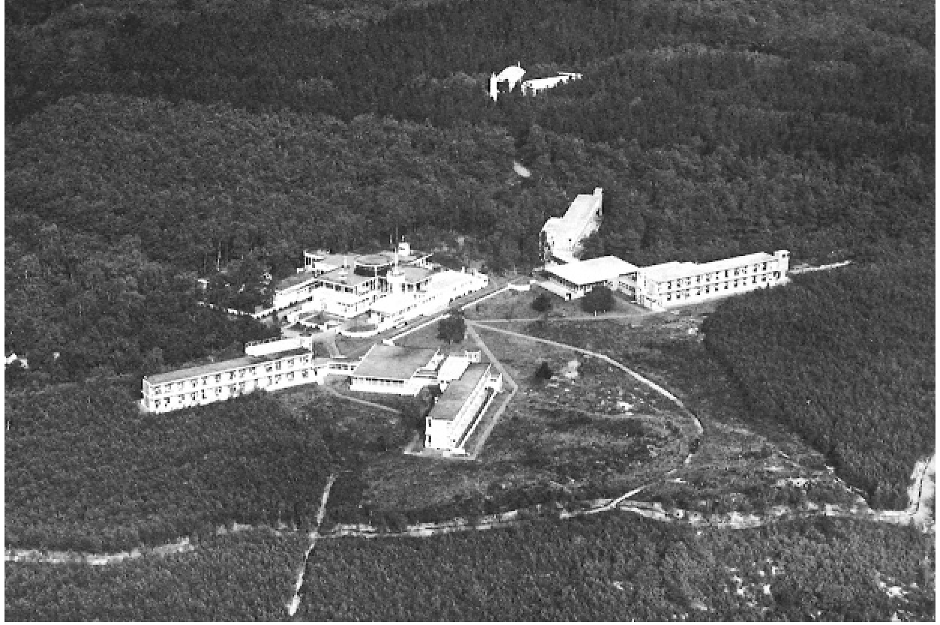
A "symbol of the belief in the healing power of the sun for the treatment of tuberculosis";[17] here again, the idea is represented through the plan of the building. There is, however, a further, functional explanation for the building's arrangement, since the patient pavilions meet at a 45-degree angle to allow for an undisrupted view and the admittance of the maximum amount of sunlight. But at the same time, the pavilions themselves become the beams or rays, together with the walk-ways which are visible in early aerial photographs of the complex.

The central services building was flanked by two residential wings, each able to accommodate 50 patients. Due to the lack of funds, the southern part of the plan was never realized and the total number of male patients would remain at 100. All the "rays" point towards the main building with its cross-shaped first-floor dining hall, which links together the strictly separated ground floors of the buildings of the complex and establishes the compositional centre.

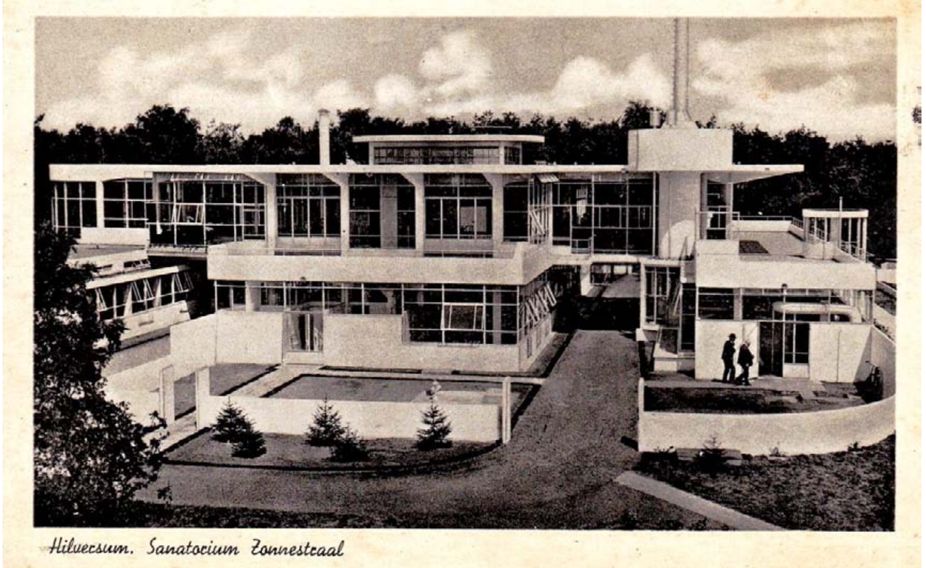
15 Bernard Bijvoet (1889–1979), although having collaborated on the initial planning for the commission, did not play a significant role in the realization of Zonnestraal. Bijvoet moved to Paris in 1925, where he would work with Pierre Chareau on another icon of the 1920s, Maison de Verre. The engineer J.G. Wiebenga was probably more influential in the implementation of Zonnestraal.

16 Johannes Duiker (1890-1935) had graduated from the Delft Polytechnic in 1913 as an "architectural engineer".

17 Overy 2007, 7.



Zonnestraal in 1931
(http://www.bdonline.co.uk).



A postcard of Zonnestraal
(http://prettyarchitecture.tumblr.com).

It has often been stated that Aalto developed various ideas from Zonnestraal in his own project. While Zonnestraal, which Aino and Alvar Aalto most probably visited on its inauguration in 1928, certainly served as an inspiration for Paimio, it is interesting and more fruitful to point out the differences between the two projects.

While Zonnestraal was planned as a pavilion-type hospital and divided into different units, Paimio would employ the so-called "block system" and accommodated all functions, although organising them into independent entities, under one single roof. With Paimio we find, possibly also due to the Finnish weather conditions which make walking in-between buildings rather unpractical, the attempt at a more integrating plan. The ground floor of the Zonnestraal main building, on the other hand, comprises three (unconnected) parallel wings indicating the separation of functions: the medical department with a six-bed intensive care unit on the northern side; the kitchen and dispensary[18] in the middle; and terraces, baths, showers and the boiler-house on the southern side. In-between the

18 Dedicated to diagnosis, the dispensary was rarely situated on the sanatorium grounds due to the danger of infection. But the Zonnestraal (probably due to the fact that less acute cases were treated there) was generally less strict on where the separation to the outside was concerned and also family members were admitted to the grounds.

The main building at Zonnestraal in 2015 (AAM Jonas Malmberg).

buildings run two streets belonging to the main thoroughfare, while the cross-shaped first floor links the strictly separated ground floors of the buildings of the complex. The upper floor dining hall took not only a central role in the plan, but also served recreational purposes and could be used as a space for events such as birthday celebrations or theatre plays.

In Zonnestraal it had been the declared (medical) aim not only to provide curative treatments but also occupational therapy in order to prepare the patients for their return to a normal work life. Thus Zonnestraal provided manifold opportunities for work, communal life and diversion.

The patients were to be housed in two pavilions on either side of the main building. The pavilions provided an individual room for each patient. An access corridor ran down the north side, while a long terrace was situated on the south side, whether the garden was situated. The beds could thus be moved back and forth from the rooms to the balconies and half of the patients had direct access to the grounds.

Aalto chose to situate the terraces for the patients' daybed cure either at the end of each corridor or on the top floor of the patient wing which, would lead to a very different movement pattern. Also direct access to the ground was not considered as important in Paimio as it was in Hilversum. Since Duiker believed that his two-storey buildings enabled a closer relation to nature, Zonnestraal almost vanishes within the high trees surrounding it, while Aalto's seven storey building[19] can be perceived from a distance as an "exclamation mark".

19 Aalto originally designed the sanatorium as a 4-storey building, as is explained later.

Zonnestraal expresses the attempt to radiate "health and hygiene" by means of a new architecture. Duiker was the first to call for the "hygienic style" and thus coined the term. The sanatorium commission gave him the opportunity to realize his theories and by using and openly displaying in abundance the "new" materials, such as glass, steel and concrete. Zonnestraal therefore exemplifies, in contrast to earlier institutions such as Beelitz, a very different approach towards industrialisation and the products it provided, while it would prepare the ground for future projects such as Paimio.

During WWII the sanatorium was used by the occupying German forces as a military hospital but returned to its original function after the war.[20] As had been predicted at the time of Zonnestraal's creation, when tuberculosis decreased in Europe also the Dutch sanatorium was no longer needed for its original purpose. In 1957 Zonnestraal was converted to general hospital use specialised in geriatrics. In the 1970s the buildings were successively abandoned and left to decay until the decision was taken in the 1990s to restore the complex.

Despite the fact that Duiker himself "was of the opinion that the building would no longer be needed when the original intention disappeared",[21] Zonnestraal is still partly in use today, following the restoration and partial reconstruction of the main building in the 1990s by Wessel de Jonge Architecten in cooperation with Hubert-Jan Henket Architects. The main building complex now functions as a new type of polyclinic health centre and provides rehabilitation and aftercare functions. Zonnestraal has since 1995 been on the tentative list of World Heritage sites.

TUBERCULOSIS IN FINLAND

In Finland the death rate due to tuberculosis was still high in the first decades of the 20th century, being up to 3 ‰ per year in the worst areas. The densely populated western parts of the country were the worst. It was estimated by Professor Woldemar Backman that more than 40 % of the deaths of people aged from 15 to 60 were caused by lung tuberculosis.[22]

The first Finnish government acts against tuberculosis date back to the late 19th century. In the parliament in 1891 the question of building a public sanatorium was raised, but it was only six years later that a committee to map actions was actually set up. The committee, led by Professor A. Palmgren, gave its memorandum on "Acts to prevent the spreading of tuberculosis" in 1900, paying particular attention to public health care and hygienic living conditions.[23]

20 For more details see Overy 2007, 20.
21 Ehrström et. al. 2005, 42.
22 Törrönen 1984, 24.
23 Törrönen 1984, 14.

Some ten years earlier many physicians had already held conversations in the meetings of the Medical Society about Robert Koch's findings regarding the bacteria causing tuberculosis. The Halila sanatorium in Uusikirkko in Karelia founded in 1889 was the first of its kind in Finland, but soon became the property of the Russian Empire, and after 1892 was used for the treatment of Russian soldiers.[24] The sanatorium in Hyvinkää designed by architect M. Schjerfbeck was completed in 1896 and was extended ten years later, having then as many as 150 patients.[25]

The need for public sanatoria was realized by the physicians, and the first public sanatorium in Finland was built in Punkaharju on the recommendations of the Finnish Medical Society Duodecim. The Takaharju sanatorium in Punkaharju was opened in 1903, and only a month later the treatments were started at the Nummela sanatorium. The building and its functions were partly funded by the State. In Helsinki there was no separate sanatorium, but the TB patients were treated in the city's Maria hospital among other patients. In 1904 a special office, a dispensary, was opened to give advice to tuberculosis sufferers. They were given a sputum cup and possibly even a bed with linen so that some separation from healthy family members was achieved.[26]

UNIQUE RESEARCH

Extensive research on the occurrence of tuberculosis in Finland during the period 1771–1929 was undertaken by Woldemar Backman and Severi Savonen. They stated that tuberculosis had first arrived to the cities of Finland, and by the late 18th century was already common in the bigger cities. It was also more common in the harbour cities and those cities with extensive trade, and thus extensive domestic and foreign connections. The result was that already by the late 18th century lung diseases were the cause of more deaths in the cities than in the countryside, even if the cities in Finland at that time were rather small compared to those in Central Europe. The research also showed that the death rate for lung diseases was at its highest in different areas in Finland from the early 19th century until the end of the century. The highest rate was in 1860–70.[27]

With the knowledge that the disease was contagious came also the insight that it was avoidable through cleanliness and isolation. Before the discovery of a pharmaceutical cure, cleanliness (obtained through fumigation, disinfection, the avoidance of dust and the encouragement of airflow) and isolation (separation of the infected from the un-infected) were indeed the only effective measures to

24 Forsius 1990.
25 Törrönen 1984, 15.
26 Törrönen 1984, 16.
27 Backman; Savonen 1934, 123–139.

diminish the spread of the disease. It was a prophylactic, that is, a preventative strategy, aiming at the protection of the un-infected.

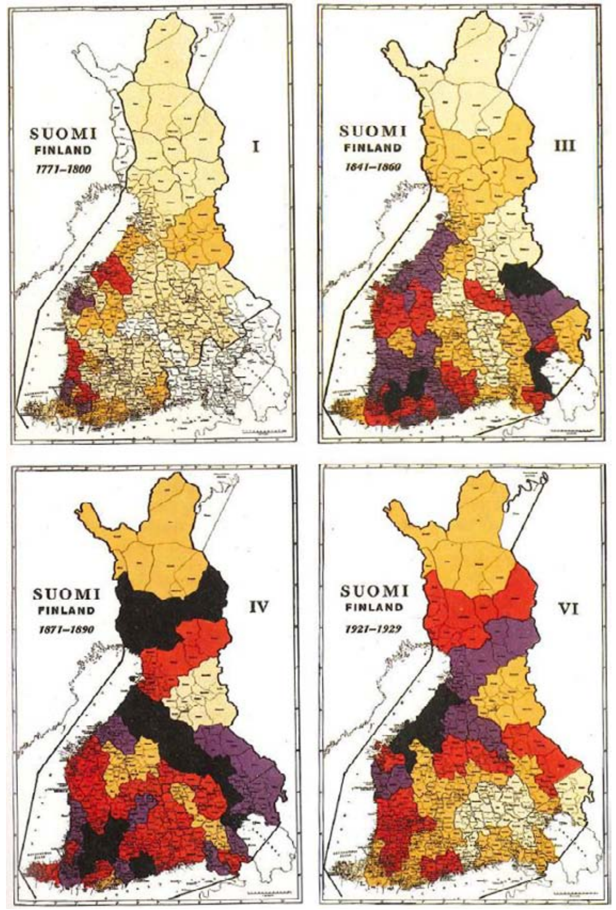
The amount of tuberculosis infections had started to diminish in Finland prior to any governmental actions. Backman and Savonen explain this decrease due to immunity, general health care, and better standards of living and nutrition. But tuberculosis remained an enormous question in Finland until the 1960s.[28]

LAW ON GOVERNMENTAL AID FOR TUBERCULOSIS SANATORIA

Finland gained its independence from Russia in 1917, resulting in the conversion of a Grand Duchy of the Russian empire into an independent state. This led the country in to a civil war in 1918, which was fought between the "Reds", led by the Social Democratic Party, and the "Whites", led by the non-socialist, conservative-led Senate. The "Whites" won, and the first time the Social Democrat party was allowed in the government was in 13.12.1926–17.12.1927. After that it was not until 1937 that they would again participate in the government.

Nevertheless, the conservative-led government took major actions in preventing tuberculosis, as it was a major threat to the labour force as well as potential soldiers. The first large communal sanatorium in Finland, Satalinna, was built in Harjavalta and opened on the March 1, 1925. The institution was urgently needed, as within its first ten months as many as 1300 patients applied for treatment in the sanatorium, though it had only 150 beds.[29] Satalinna sanatorium was designed by architect Onni Tarjanne. The realization of the project took a rather long time, as Tarjanne drew up the overall design as early as 1914. He developed the design over the years, yet it was completed in accordance with ideas that were eleven years old. The first extension, the children's sanatorium in Satalinna, was completed in 1927.[30]

Satalinna became a model for many of the later sanatoria in Finland, including Paimio, whose building committee visited it prior to the construction work at Paimio. In Satalinna large patients wards were no longer built, and instead there were rooms were just 2 to 3 patients. The rooms were also much shallower than in the earlier hospitals, being only approximately 3 meters deep, which resulted in major savings in building costs, while patients' wellbeing and privacy increased in small rooms.[31]



Deaths caused by tuberculosis in Finland according to the study by Backman and Savonen. Black being the worst, over 3‰. (Backman; Savonen 1934, appendix).

28 Backman; Savonen 1934, 138–139.
29 Härö 1992, 77–78.
30 Väänänen 2000, 15; 17.
31 Härö 1992, 78.

The Law on Governmental Aid for Tuberculosis Sanatoria was implemented on May 31, 1929, though the State had supported sanatoria also before then; e.g. the Satalinna sanatorium at Harjavalta had received in 1927 sums that were equivalent to those of the new law.[32] Yet the new legislation brought about a real building boom. According to it, the State would pay 3/4 of the building costs and 2/3 of the running expenses. The communal federations started building eight new sanatoria; the first to be completed was the Kinkomaa sanatorium and the last one was Paimio, which opened in 1933.[33] The eight new sanatoria were:[34]

1. Central Finland tuberculosis sanatorium at Kinkomaa, Muurame, 1930; architect Jussi Paatela.

2. North Karelia tuberculosis sanatorium at Kontioniemi, Kontiolahti, 1930; architect Eino Forsman.

3. Uusimaa/Mjölbollstad tuberculosis sanatorium at Karjaa, 1931; architect Bertel Jung.

4. Central Häme tuberculosis sanatorium at Kangasala, 1931; architect Eino Forsman.

5. North Savo tuberculosis sanatorium at Tarinaharju, Siilinjärvi, 1931; architect Eino Forsman.

6. North Pohjanmaa tuberculosis sanatorium at Päivärinne, Muhos, 1931; architects Toivo and Jussi Paatela.

7. Kanta-Häme tuberculosis sanatorium at Ahvenisto, Hämeenlinna, 1932; architects Jussi and Toivo Paatela.

8. Southwest Finland tuberculosis sanatorium at Paimio, 1933; architects Alvar and Aino Aalto.

In addition to these eight communal sanatoria, also a government established sanatorium was opened at Härmä in Kauhava in 1933, designed by architect Ilmari Launis.[35] The effect of the new legislation in 1929 was powerful, yet is should be mentioned that some communal federations had already before then built sanatoriums, at Oulainen (1914) and Harjavalta (1925). The sanatorium in Oulainen, dating from 1914, was enlarged in 1934.[36] In 1936 also the Satalinna sanatorium in Harjavalta was extended so that it had as many as 440 beds.[37]

By 1941 three more sanatoria were built by communal federations, and so the tuberculosis treatment

32 Väänänen 2000, 25
33 Törrönen 1984, 25.
34 Törrönen 1984, 127–131; Härö 1992, 99.
35 Törrönen 1984, 27.
36 Törrönen 1984, 126.
37 Väänänen 2000, 22

was arranged to cover the whole country. The task of completing the network in such a large but sparsely populated country as Finland was enormous and can be seen as a demonstration of how strongly the disease was being fought against.[38]

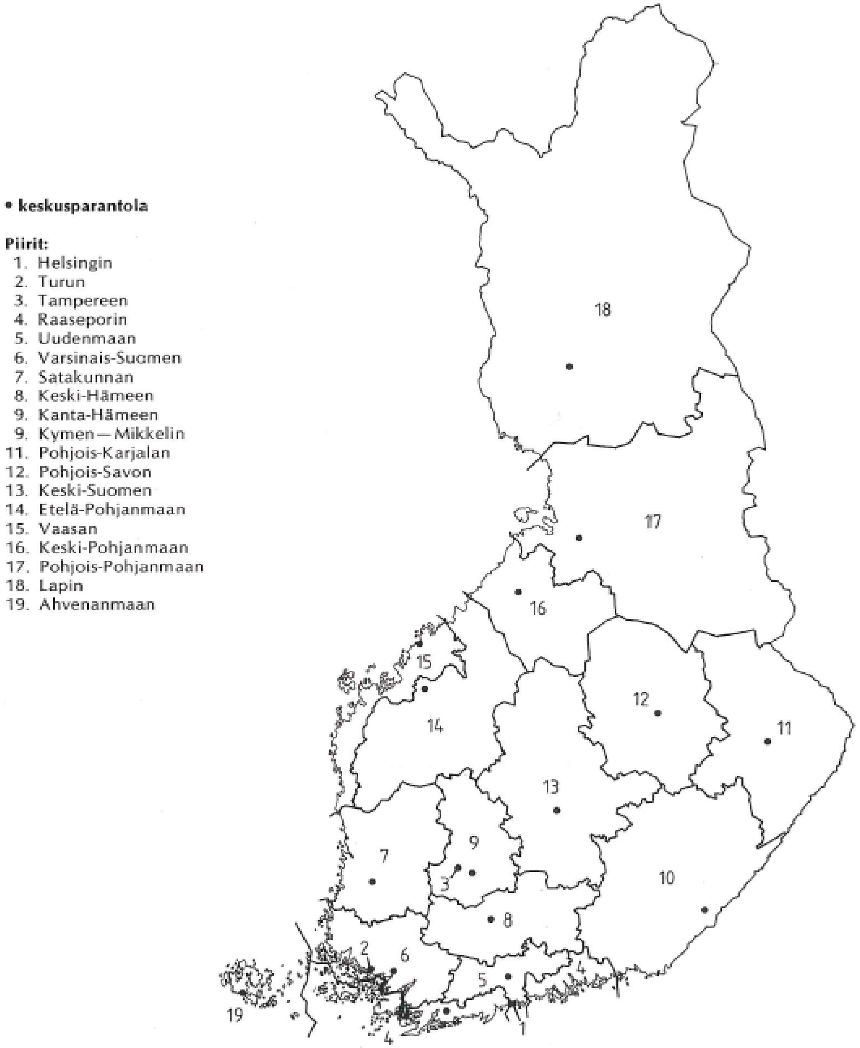
The sanatorium in Muurola was destroyed at the end of the WWII as the German troops fought against the Finnish troops in Lapland. A new main building for the sanatorium, designed by Jussi Paatela, was completed in 1952.[39] Some of the largest cities also had their own sanatoria for tuberculosis patients: a sanatorium in Helsinki, designed by Eino Forsman, was opened in 1928; a new building for the Tampere sanatorium in the Kauppi district, designed by Bertel Strömmer, was completed in 1939; and a sanatorium in Turku, designed by Harald Smedberg, was completed in 1935.[40]

The Law on Governmental Aid for Tuberculosis Sanatoria from 1929 was certainly a most important step in the organized treatment of tuberculosis in Finland. However, already in the 19th century other legislation had been implemented that affected the treatment of tuberculosis. For example. the Act on Regional Medical Organization from 1832, the Schools Act from 1872 and the Act on Occupational Care of Industrial Workers from 1889 had also aimed to have an effect on tuberculosis.

Special legislation for tuberculosis treatment nevertheless required a long period of preparation. In 1927 an act was passed that included orders for disinfection following a death from tuberculosis and obliged physicians to report new tuberculosis patients. But it was not until 1948 that the first comprehensive law on tuberculosis was implemented. The law demanded that the entire population was to be tested for tuberculosis and had to attend mass screenings. To enable for this logistically difficult task, the country was divided into 19 tuberculosis districts, which then had to organize the mass screenings.[41]

The 1929 Law on Governmental Aid for Tuberculosis Sanatoria can, however, be regarded as a milestone in the treatment of TB in Finland. The Finnish government clearly acknowledged the problem the disease caused for the Finnish population (and thus the country) and took charge. The State's significant financial engagement led to the construction of numerous large-scale institutions. The period prior to the mid-1930s can therefore be seen as a period of transformation. From then on the cure of tuberculosis patients, especially of the lower social classes, was no longer a private matter. Instead, the treatment was to take place under governmental guidance in large-scale institutions.

38 Törrönen 1984, 25.
39 Arkkitehtitoimisto Laatio 2009, 26; 30.
40 Törrönen 1984, 130–131.
41 Törrönen 1984, 27–28.



The 19 Tuberculosis Districts of Finland and their central sanatoria in 1960, when the number of beds in the sanatoria was at its highest: 6164 (Törrönen 1984, 6).

The main building of Halila sanatorium (http://www.karjalanliitto.fi).

FINNISH TUBERCULOSIS SANATORIA

The network of tuberculosis sanatoria in Finland was at its widest in around 1960. Not all the sanatoria can be discussed here, but the selection provides an overview.

HALILA SANATORIUM

Located in southeast Karelia, the Halila sanatorium in Uusikirkko was the first of its kind in Finland. It was founded by Dr. W.G. von Dittman from St. Petersburg as early as 1889. However, it operated only for a few years as it became the property of the Russian Empire and was used for treating Russian soldiers.[42] During WWII the area became part of the Soviet Union.

TAKAHARJU SANATORIUM

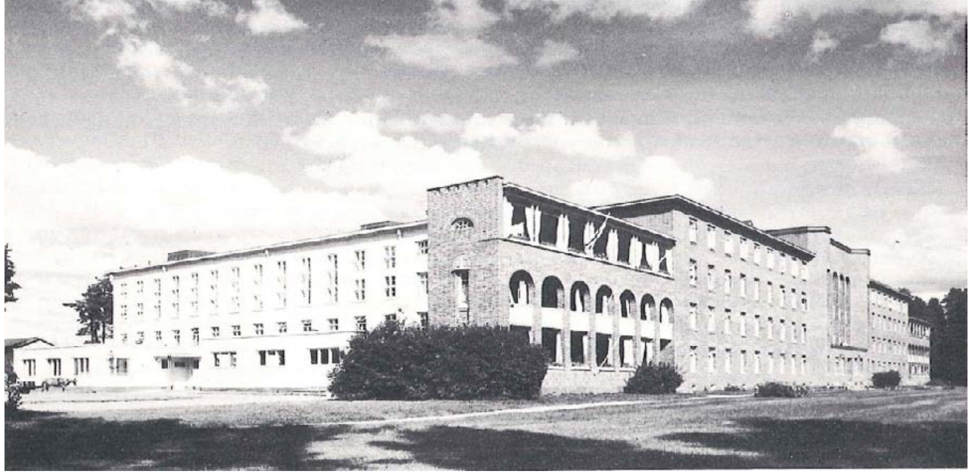
Located on the scenic Punkaharju ridge, the Takaharju sanatorium, opened in 1903, was among the first sanatoriums in Finland. The building was designed by architect Onni Törnqvist (later changing his surname to Tarjanne). The Archaeological Commission, forerunner to the National Board of Antiquities, stated as early as 1966, when it expected the preservation of the building:

Architect Tarjanne strived both in the plan and construction of the sanatorium to find the most contemporary solution in terms of economics and medical treatment. It is significant architectural monument due to the exceptionally elegant facades. Stylistically it represents the most progressive trends, based on international, rationalist architectural ideas, and which was clearly different from the more commonly popular national romantic Jugendstil in Finland.[43]

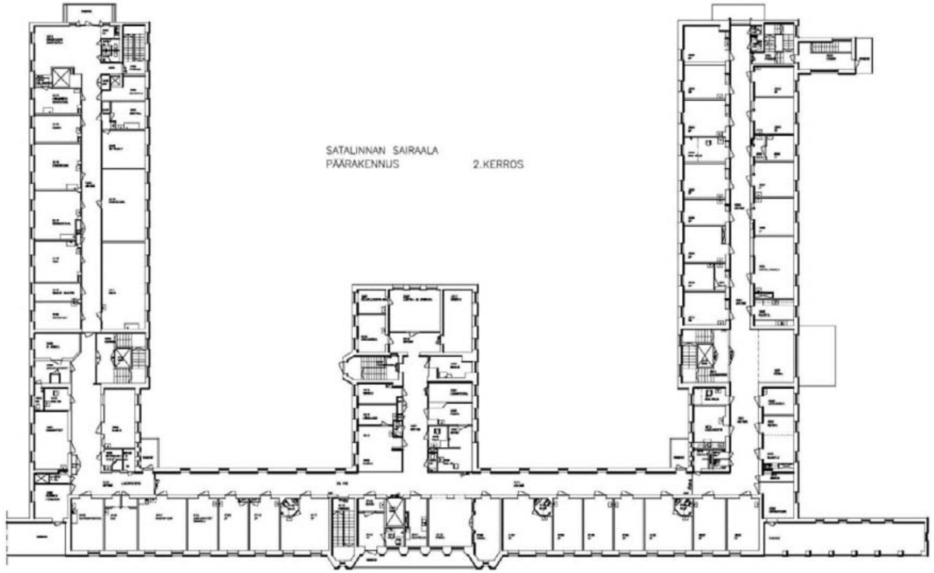
In 1899 the Finnish Senate gave the 43-hectare site to the Duodecim Society to build a 100-bed sanatorium for tuberculosis patients. The architect Tarjanne designed the sanatorium in co-operation with the physician Kalle Brax.[44] The sanatorium was purchased in 1921 by the life insurance company Henkivakuutusyhtiö Suomi. It become state property in 1941 and was used as a military hospital, later concentrating veterans' rehabilitation.[45]

Takaharju sanatorium in Punkaharju (MV/RHO 125455:4 Soile Tirilä 2001).

42 Forsius 1990.
43 Museovirasto 2009.
44 Museovirasto 2009.
45 "Kruunupuisto", Wikipedia, https://fi.wikipedia.org/wiki/Kruunupuisto [accessed 3.12.2015].



Satalinna sanatorium (Törrönen 1984, 132).



Satalinna sanatorium, 1st floor in 2013 (Sakipa isännöinti).

SATALINNA SANATORIUM

was the first of the large communal sanatoria. The architect of the first stage was Onni Tarjanne, whose design from 1903 was completed in 1925, and with a total of 260 beds, of which 100 were intended for children. The number of patients rose as extensions were completed, with as many as 600 in the 1950s and early 1960s. Thus in terms of the number of beds, Satalinna was the largest tuberculosis sanatorium in Finland.[46]

In the evaluation of the National Board of Antiquities, the sanatorium is one of the most valuable health-care complexes in Finland. The second building stage, the children's sanatorium, was designed by architect Jussi Paatela in 1927, and the new wing was designed by architect Olaf Küttner in 1937. The first stage consisted of a four-storey building characterized by the three-storey wing for the patients' reclining balconies with its distinctive arches and columns.[47]

The sanatorium was officially renamed Satalinna Hospital in 1970 when the refurbishment that had started in 1966 was completed, and the sanatorium was converted into a hospital for pulmonary diseases. Today the hospital is still partly in use as a physiatrist unit, but the premises were sold in 2015.[48] In August 2015 the Red Cross opened there a reception centre in some parts of the main building to house 260 refugees.[49]

46 Törrönen 1984, 116–117.
47 Museovirasto 2009.
48 Kuhalainen 2015.
49 Punainen Risti 2015.

The Muurola sanatorium, which was destroyed in 1944 (Arkkitehtitoimisto Laatio 2009, 19).

The new sanatorium, still with its balconies, was completed in 1952 (Arkkitehtitoimisto Laatio 2009, 20).

MUUROLA SANATORIUM

The communal central sanatorium for Lapland, designed by architect Ernst Albin Krank, was built in Muurola and completed in 1927. However, the building was destroyed by German troops during the WWII. A new main building, designed by Jussi Paatela, was built in 1951–52. He was assisted by artist Eino Kauria in the selection of surface treatments and their decoration.[50] The main building was still built in order to provide a dietic-hygienic cure, and it comprised of large balconies. In 1975 the sanatorium was taken in new use as a psychiatric hospital.[51]

THE PREVENTION WORK PRIOR TO WW II

In 1900 the national committee run by Professor A. Palmgren issued statements regarding the work for the prevention and healing of tuberculosis, which followed closely those agreed in Sweden in 1896. The duties of the committee had begun already during the latter half of the 19th century, and

50 Arkkitehtitoimiosto Laatio 2009, 21–33.
51 Arkkitehtitoimiosto Laatio 2009, 47.

the societies involved in the prevention work were established in the 1910s.[52] Two private societies, Tuberkuloosin Vastustamisyhdistys (Tuberculosis Prevention Society) and Keräystoimikunta vähävaraisten keuhkotautisten hyväksi (Collection committee for TB suffers of little means), were founded in 1907 but were combined in 1929.[53]

Scientific and medical developments in Germany were linked significantly to the process followed in Finland, where the continental ideas were followed. In the international work against tuberculosis, the links were as strong as in other scientific fields. The international process was followed as well, but until Finland became an independent state in 1917, its role was ambiguous and it could not be a member in any unions.[54]

International co-operation was established after WWI, when in 1920 the League of Nations and the United States founded the International Union against Tuberculosis. However, Finland did not join it, even though it became a member in the League of Nations during that same year. One reason for this was the discrimination against Germany, which Finland did not accept. The consequences of WWI were not to be mixed with prevention of an infectious disease. In fact Finland was asked several times during the 1920s to join the Union against Tuberculosis, but it only became a member in 1927 when also Germany became a member of both the League of Nations and the International Union against Tuberculosis.[55]

Finnish representatives were active immediately, as membership in the union widened continental connecions. Severi Savonen participated in the international congress held in 1929 in Rome, where he was very fascinated by a working unit built for 350 TB patients. At the congress Finland had an own section where they presenting the work being done in the country.[56]

HEALTH EDUCATION

An important task in the prevention of tuberculosis was the distribution of information. This was delivered by magazines, several booklets and posters, which were widely available to professionals and the general public. For example, in summer 1935 all children in elementary schools received a small

52 Härö 1992, 22–23.
53 Backmann; Savonen 1934, 5.
54 Härö 1992, 30.
55 Härö 1992, 141.
56 Härö 1992, 141.

34

suunsa eteen, sinkoilee hänen suustaan ilmaan *pienen pieniä, paljain silmin näkymättömiä limapisaroita*, jotka voivat sisältää runsaastikin tuberkelibasilleja.

Pisaratartunta.

Tällaisia limapisaroita voi lennellä jopa metrinkin päähän.

Jos joku henkilö sattuu olemaan lähellä keuhkotautista, joka tällä lailla varomattomasti yskii, joutuu tämä toinen henkilö hengittämään keuhkoihinsa ilmassa leijailevia limapisaroita ja niiden mukana tuberkelibasilleja.

Limapisaroita voi myös laskeutua ruokatavaroihin, ja tartunta saattaa siten levitä ruoankin välityksellä.

Pisaratartunnan estämiseksi on keuhkotautisen yskiessään aina pidettävä suunsa suljettuna tai pantava nenäliina tahi vasemman käden selkäpuoli suunsa eteen.

Oikea yskimistapa.

The health guide for children from 1935.

booklet *Suomen tyttöjen ja poikien oma terveysopas* (Finnish girls' and boys' own health guide). The booklet, published by the Finnish Tuberculosis Prevention Society,[57] was written by Artturi Salokannel and Severi Savonen and provided general information on health, but also included an extensive chapter on tuberculosis; describing the bacteria, the symptoms of the disease and teaching how to cough, for example.[58] Some 500 000 copies of the booklet were delivered, and it was also translated into the Sami language.[59]

Various magazines and publications were used to spread information, some of which was propaganda. For example, the widely distributed magazine *Kotiliesi* published in 1937 an article by Severi Savonen, which included a variety of photographs: Paimio Sanatorium, happy children, and people undergoing screenings. In the text Savonen concentrates on convincing people to go for screenings and on being positive about the possibilities of the cure in sanatoria.[60]

Also the contemporary media were used, in that since as early as 1927 the society had purchased a German film on the topic and in 1932 the propaganda reached a new level with the book by Maila Talvio *Ne 45 000* [Those 45 000]. The title referred to the then current number of people in Finland suffering from TB. The book was made into a film and at its premier on October 12, 1933, Severi Savonen stated:[61]

Let the white screen become a truly strong means in the whitening the dark map of Tuberculosis in Finland![62]


SEVERI SAVONEN:

Suomen keuhkotauti näyttää nuorelta

Severi Savonen's article "Suomen keuhkotauti näyttää nuorelta" *[In Finland the pulmonary disease looks young] in* Kotiliesi *20/1937.*

57 In Finnish Suomen tuberkuloosin vastustamisyhdistys.
58 Salokannel; Savonen, 1935.
59 Härö 1992, 152.
60 Savonen 1937, 776–779.
61 Härö 1992, 153–154.
62 In Finnish, "Tulkoon valkoisesta kankaasta todella väkevä ase meidän pyrkiessämme Suomen mustaa tuberkuloosikarttaa valkaisemaan!"

THE PAIMIO PROJECT

The official opening ceremony of Paimio Sanatorium was held on the afternoon of June 18, 1933. The first patients had already arrived to the sanatorium on February 2, 1933 and already by the end of April that year all the patients' rooms were occupied.[63] The whole process, from the start of the architectural competition to the opening ceremony, took four and half years and the actual construction three years.

PAIMIO SANATORIUM IN AALTO'S OWN WORDS

The completed building was published in Arkkitehti 6/1933, and was the main theme of that issue.[64] The very same text by Aalto published in the journal was used in various other publications, also internationally, as will be explained in a later chapter. It was also reprinted later and thus become a major vehicle for the interpretation of the sanatorium. Aalto explained his newly completed project as follows:

The 296-bed Southwest Finland tuberculosis sanatorium at Paimio was built by a consortium of local authorities including the City of Turku, the largest shareholder, which had an option on 100 beds.

The sanatorium site, in the Preitilä area of Paimio, is about 3 kms from the station and fairly isolated. Consequently, there were few constraints on the design of the entire building complex, and the finished building is a dominant element in the surrounding landscape.

The plan-form emerged from efforts to deal with each of the different elements of such a building separately, so that rooms of a similar nature are grouped together in a single unit, a wing of the building. The wings are then joined together by grouping them around a central core containing functions common to all the wings, such as stairs, lifts and so on. Each of the wings is positioned in the terrain according to the orientation or 'aspect' called for by the rooms within it. At the same time, each of the wings is designed to contain one type of room (or group of rooms, with similar requirements in terms of sunlight, views etc.), wherever possible. Thus it has been possible to specify the location of each of the wings very precisely.

The largest wing (A-wing) contains two-patient rooms and a separate private apartment for the ward sister at the west end. The wing is orientated towards the south-southeast, and the sun balconies at the end face due south. B-wing is orientated east-west along its long axis and contains rooms used collectively, such as dining hall, common rooms, library, reading rooms, work rooms etc., with doctors' rooms and treatment rooms

63 Törrönen 1983, 48.

64 The only other project to be featured in Arkkitehti 6/1933 was the architectural competition for the Helsinki Olympic Stadium.

Aalto on the roof of Paimio Sanatorium, 1932 (AAM 50-003-108 Gunnar Asplund)

downstairs. C-wing is the only wing with rooms on both elevations, so it is orientated in such a way that both elevations receive sunlight. From the basement upwards, C-wing contains laundry, larders, bakery, refrigeration plant, kitchen preparation areas, the kitchen with all its separate sections, and on the top floor, a hostel for kitchen and service staff. The single-storey D-wing houses the boiler room and heating-plant.

The patients' rooms are characterised as follows: the orientation of the entire wing and the asymmetric location of the windows admit plenty of morning sunshine into the rooms, but less afternoon sun. Windows are equipped with external venetian blinds to prevent excess solar gain. Windows are in wood with metal frames and are double, so that when the windows are open for ventilation, the ventilation opening is vertical; the ventilation position of the window is reminiscent of a health window in the vertical position. Heating: radiant heat by Rayrad radiators installed in the ceiling, so that a weak patient lying down will not be immediately subject to the highest levels of radiation, only to medium radiation. Internal walls: three hard walls and one soft wall to balance the internal acoustics of the room. Soft walls in insulation board faced with Enso cellulose wall finish; colours: semi-matt paint finishes, walls light in colour, ceilings darker to give a more peaceful overall effect when seen by the patient lying down. General room lighting is located above the patient's head at the junction of wall and ceiling, so that the light source is outside the field of view of the patient when lying down. Each *patient to have his/her own wash basin in the room; wash basins are of a special type constructed to make them as silent as possible during operation.*

The construction of the other rooms in the sanatorium is worth mentioning: the largest spaces, such as the dining hall and work rooms are in B-wing and face due south. The south-facing walls of these rooms are higher than the north-facing walls so that each room makes maximum use of the southern sun right into its northern-most corner. There are roller blinds to prevent the admission of too much hot sunshine. The patients' common rooms are arranged primarily so that they face in different directions to give as much psychological variety as possible; they are also orientated so that at any given time during the day, at least one room is in shadow (and at least one is facing the sun), to give a range of choice in this respect, too.

As in the majority of sanatoria in Finland, the sun balconies are common spaces, but they are of two basic types: there are balconies for 24 sun beds immediately adjacent to the wards and a larger, 120-bed sun terrace at roof level. The former are intended for patients who are in poorer health and psychologically more sensitive, and the latter for healthier patients. There are also sunbathing canopies for the staff and various terraces for different purposes. The large, roof-level sun terrace is combined with a roof garden to prevent it becoming too hot during high summer.

The kitchen, in C-wing (the utility, or services building), is linked at the same level to the dining room in B-wing, by a corridor which doubles as a butler's pantry. Food preparation areas, on the other hand, are on a different floor and linked to the kitchen by lift. Thus, food can be kept in the kitchen and served at the same floor level using wheeled trolleys (and light-weight porcelain to save weight). All the kitchen areas are in the same space with no walls or doors between them, but the kitchen is divided into separate areas by two glazed steam hoods, suspended from the ceiling, one inside the other. Cooking equipment generating the most steam and gases (stoves and cookers) is located in the middle of the room and exhaust air is extracted from the steam hoods via roof ducts, with the strongest suction from the inner steam hood. This arrangement prevents steam and odours from entering the adjoining dining hall.

The entire building has a reinforced concrete frame. The external walls are faced with brick on the outside with an insulation layer (cork or Insulite) on the inside. The structural part of the wall is of 8-10 cm reinforced concrete between these two layers. The wall is constructed as follows: the outer skin of the formwork is constructed first, then a layer of thin facing brick is laid inside the formwork, then the inner layer of formwork is constructed and a layer of insulation is attached to it; the steelwork (including ties for the brickwork and insulation) is placed inside the formwork, between the two layers, and the concrete poured on top of the steelwork joining the facing bricks and the insulation to the wall at the same time. Additional heat insulation can be added at various points to partially insulate the concrete frame.

The frame and beams of the building are arranged in such a way that there is a system of horizontal and vertical ducts throughout the building to house pipe-work, electric cables, etc. All ducts are equipped with full-height doors on the corridor side. In patients' rooms, the wash-basin traps are also located in these ducts so that all repair work can be carried out without entering the rooms.

The sun-balconies at the end of the building and on the roof, and the west-facing staircase at the end of A-wing are in fair-faced concrete which forms a contrasting element to the rest of the elevations which are in coloured render. At the east end of the sun-balcony system there is a light-weight canopy balanced on a single row of columns tied back to the 10 cm ferro-concrete rear wall with steel ties.

All roofs are flat roofs finished with slabs or gravel, or asphalt laid to falls.

As well as the sanatorium, the building complex also includes staff flats, a mains-water pumping station, a biological purification plant, a chapel and so on; details of the flats will be published separately.

The work has been carried out in the form of separate partial contracts with a local project-management office appointed by the building committee taking care of the billing work arising from supervision of the contracts. The principal project manager for this work was K. A. Kilpi, engineer.

The driving force behind the project has been the building committee works department, chaired first by Bernhard Heikkilä and later by Antti Raita.

The construction management side has striven to ensure that the design and execution of each of the contracts for specialist works has been separate, and that all detailed design and supervision has been performed by consultants, with the contractor being responsible solely for carrying out the work. Structural calculations were performed at the commencement of the drawing work in close cooperation with the architects. This work, together with the supervision of the construction, was carried out by Emil Hartela, engineer. Of all the specialists, his contribution to the work has been the most notable. Overall supervision of water supply and heating pipe-work was carried out by the Voima- ja polttoainetaloudellinen yhdistys (the Fuel and power corporation, later Ekono) with A. Hietaro as on-site supervisor, electrical work was supervised by engineer Suopanki, the purification plant was designed by engineer G. Granquist, and the paintwork supervisor was Eino Kauria. The following architects also contributed to the work in the office: Aino Marsio-Aalto, Erling Bjertnäs, Harald Wildhagen, Lauri Sipilä, Lars Wiklund.[65]

65 Translation by Nicholas Mayow in Holma (ed.) 2015.

Aalto returned to the issue of Paimio Sanatorium in his later texts. One of them, titled "The Humanizing of Architecture" was originally published in English in the November 1940 issue of The Technological Review,[66] in which he emphasized the human aspects of architecture much more widely than in the presentation of the newly built sanatorium in the mid-1930s. His idea of developing architecture further from just technical aspects:

[--]Modern architecture has been rationalized mainly from the technical point of view, in the same way as the technical functions have been emphasized. Although the purely rational period of Modern architecture has created constructions where rationalized technique has been exaggerated and the human functions have not been emphasized enough, this is not a reason to fight rationalization in architecture.[--]

I have had personal experience with hospital buildings where I was able to discover that especial physical and psychological reactions by patients provided good pointers for ordinary housing. If we proceed from technical functionalism, we shall discover that a great many things in our present architecture are dysfunctional from the point of view of psychology or psycho-physiology. To examine how human beings react to forms and construction, it is useful to use for experimentation especially sensitive persons, such as patients in a sanatorium.

Experiments of this kind were performed in connection with the Paimio Tuberculosis Sanatorium building in Finland and were carried on mainly in two special fields: (1) the relation between the single human being and his living room; (2) the protection of the single human being against large groups of people and the pressure from collectivity. Study of the relation between the individual and his quarters involved the use of experimental rooms and covered the questions of room form, colors, natural and artificial light, heating system, and so on. This first experiment dealt with a person in the weakest possible condition, a bed patient. One of the special results discovered was the necessity for changing the colors in the room. In many other ways, the experiment showed, the room must be different from the ordinary room. This difference can be explained thus: The ordinary room is a room for a vertical person: a patient's room is a room for a horizontal human being, and colors, lighting, heating, and so on must be designed with this in mind.

Practically, this means that the ceiling should be darker, with an especially selected color suitable to be the only view of the reclining patient for weeks and weeks. The artificial light cannot come from an ordinary ceiling fixture, but the principal center of light should be beyond the angle of vision of the patient. For the heating system in the experimental room, ceiling radiators were used but in a way which threw the heat mainly at the foot of the bed so that the head of the patient was outside the direct heat rays. The location of the windows and doors likewise took into account the patient's position. To avoid noise, one wall in the room was sound absorbing, and wash basins (each patient in the two-patient rooms had his own) were especially designed so that

66 Aalto 1940. The text is reproduced in Schildt 1997, 102–107.

the flow of water from the faucet hit the porcelain basin always at a very small angle and worked noiselessly.

These are only a few illustrations from an experimental room at the sanatorium, and they are here mentioned merely as examples of architectural methods, which always are in a combination of technical, physical, and psychological phenomena, never any one of them alone. Technical functionalism is correct only if enlarged to cover even the psychophysical field. That is the only way to humanize architecture.

[--] The flexible wooden furniture are a result of experiments also made at the Paimio Sanatorium. At the time of those experiments the first tubular and chromium furniture was just being constructed in Europe. Tubular and chromium surfaces are good solutions technically, but psycho-physically these materials are not good for the human being. The sanatorium needed furniture which should be light, flexible, easy to clean, and so on. After extensive experimentation in wood, the flexible system was discovered and a method and material combined to produce furniture which was better for the human touch and more suitable as the general material for the long and painful life in a sanatorium.

In a lecture given at the Vienna Architects' Association in April 1955, Aalto again referred to the same example of the lighting system of the patients' room, and even recalled that at the time he started the design of the sanatorium he had been sick and lay in bed. And yet the occasion had given him inspiration.[67]

THE INITIATIVE TO BUILD PAIMIO SANATORIUM

The initiative to build a separate sanatorium for tuberculosis patients in the Turku region was first discussed in public by Professor Severi Savonen in 1927. That same year, in an article published in the local newspaper about a hospital that the city of Turku was planning to build for tuberculosis patients, he raised the question of why the countryside was not taken into account. It took only a few months before representatives in the Finnish parliament wrote a letter to all the Finnish-speaking communities of the area inviting them all to send representatives to a meeting to be held on December 29 that same year. Savonen suggested that a 150-bed sanatorium should be built and a committee chosen to prepare the project. The chairman of the provisional committee was to be Bernard Heikkilä and the secretary Ilmo Kalkas.[68]

The process progressed rapidly and the next meeting took place as soon as March 5, 1928, in which 48 communities sent a total of 143 representatives. The building committee was chosen and their first

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67 The lecture was published as "Zwischen Humanismus und Materialismus" in *Der Bau*, No. 7-8, 1955. It is republished as "Between Humanism and Materialism" in Schildt 1997, 176-178. Translation by Timothy Binham.

68 Törrönen 1983, 32.

meeting was held that very same day. The chairman was Heikkilä, the vice chairman Paavo Saarinen, and Kalkas was both the secretary and treasurer. The other committee members were K. Hellberg, Juho Erland Pilppula, Paavo Pyysalo, Antti Raita, and Onni Rantasalo.[69] It is also notable that one key figure in the building committee was the physician Markus Sukkinen, who acted as a medical specialist for the committee. According to the minutes of the committee, the first meeting at which Sukkinen participated was held on December 8, 1929.[70]

At the time the sanatorium was completed, there were in total 52 communities in the communal federation running the Paimio Sanatorium.[71] The building committee was responsible not only for the buildings but also for hiring staff and managing as a whole the working sanatorium complex.

The site at Paimio was chosen by the building committee. The communities had suggested several locations, and five were given close consideration and for different reasons rejected. For example, the suggested site at Koski was considered too remote. The four other locations given close consideration were at Vehmaa, Laitila, Rusko and Masku.[72] The site at Paimio provided a good, dry and gravel soil, and with no swamps in the near vicinity. Also, the train station was nearby. Some of the other candidates were either located in too remote locations and without public means of transport or were in the vicinity of humid ground.[73] Paimio was active in getting the sanatorium and was willing to donate some of the necessary lands. A farmer, J. Sariola, sold two plots of land for the purpose and parts of other farms were added so that the total land area was as much as 270 hectares, of which 60 was reserved for agriculture.[74] The building committee made its decision to choose Paimio for the site of the sanatorium in June 1928.[75]

The building committee travelled around Finland to visit contemporary sanatoria. In 1928 they visited the construction site of the sanatorium in Helsinki and the Takaharju and Satalinna sanatoria. In 1932 they visited the sanatoria in Ahvenisto and Kangasala. The building committee's execution board travelled in autumn 1931 to the Mjölbollstad, Kinkomaa and Kangasala sanatoria and to Helsinki to study the so-called Rayrad heating system.[76]

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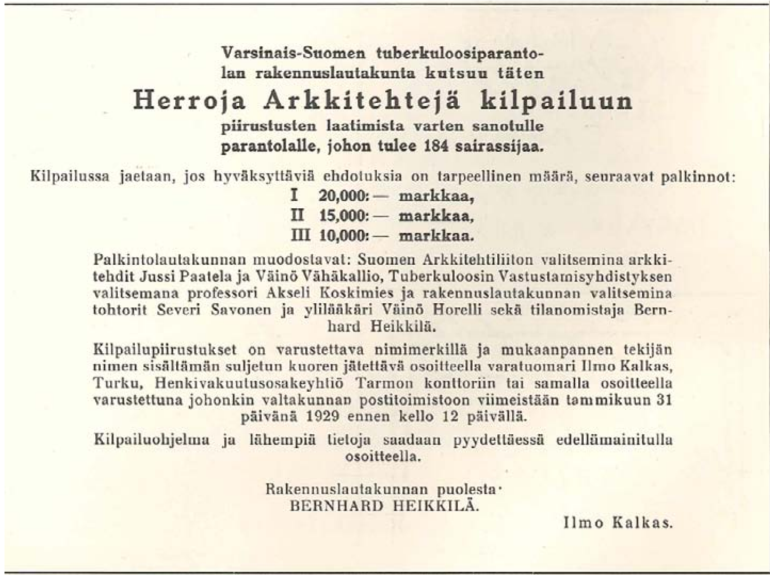
69 Törrönen 1983, 33. Sukkinen became the first senior physician of the sanatorium until 1952 (Törrönen 1983, 119).
70 Building committee, 8.12.1929; Törrönen 1983, 44.
71 Kalkas S.D., 21.
72 Jokiniemi 1958, 8; Törrönen 1983, 34.
73 Koskela 1998, 31–32.
74 Törrönen 1983, 34.
75 Koskela 1998, 33.
76 Kalkas S.D., 20.

THE ARCHITECTURAL COMPETITION, 1928–1929

The sanatorium's building committee decided on September 27, 1928, that an invited architectural competition would be held for the design of the sanatorium, and the invited architects would be Ilmari Ahonen, Eino Forsman and Jussi Paatela. The minutes of the meeting note, however, that this decision was overturned and instead the competition would be open to all architects.[77]

The invitation to the open architectural competition for Paimio Sanatorium was released in the 11/1928 issue of the Finnish architectural review Arkkitehti, both as an editorial text and a separate advertisement, which was quite common at the time. The architects Jussi Paatela and Väinö Vähäkallio were chosen to be the architects in the competition jury, the members chosen by the building committee were Severi Savonen, Väinö Horelli and Bernhard Heikkilä, and the representative of the Tuberculosis Prevention Society was Akseli Koskimies. The entries were to be submitted by January 31, 1929.[78] The architect Jussi Paatela had at that time designed several sanatoria in various parts of Finland, so he was well aware of the recent trends in the building type. As one of the most experienced architects in health buildings in Finland, he would have made a good rival to Aalto. And he had actually beaten Aalto in the invited architectural competition for the Kinkomaa sanatorium in 1927. Also, in spring 1929 the competition jury for the Kälviä sanatorium (in Central Ostrobothnia) had chosen Paatela over Aalto by 2 votes to 1. Due to administrative changes, however, the sanatorium was never built.[79] Aalto's entry included features that he would later develop in Paimio, but architecturally it looked more like his design for the second stage of Viipuri Library than Paimio Sanatorium.[80]

77 Building committee, 27.9.1928.
78 Arkkitehti 11/1928, 178.
79 Schildt 1994, 69.
80 Heinonen 1986, 247.


Varsinais-Suomen tuberkuloosiparantolan rakennuslautakunta kutsuu täten

Herroja Arkkitehtejä kilpailuun

piirustusten laatimista varten sanotulle parantolalle, johon tulee 184 sairassijaa.

Kilpailussa jaetaan, jos hyväksyttäviä ehdotuksia on tarpeellinen määrä, seuraavat palkinnot:

I 20,000:— markkaa,
II 15,000:— markkaa,
III 10,000:— markkaa.

Palkintolautakunnan muodostavat: Suomen Arkkitehtiliiton valitsemina arkkitehdit Jussi Paatela ja Väinö Vähäkallio, Tuberkuloosin Vastustamisyhdistyksen valitsemana professori Akseli Koskimies ja rakennuslautakunnan valitsemina tohtorit Severi Savonen ja ylilääkäri Väinö Horelli sekä tilanomistaja Bernhard Heikkilä.

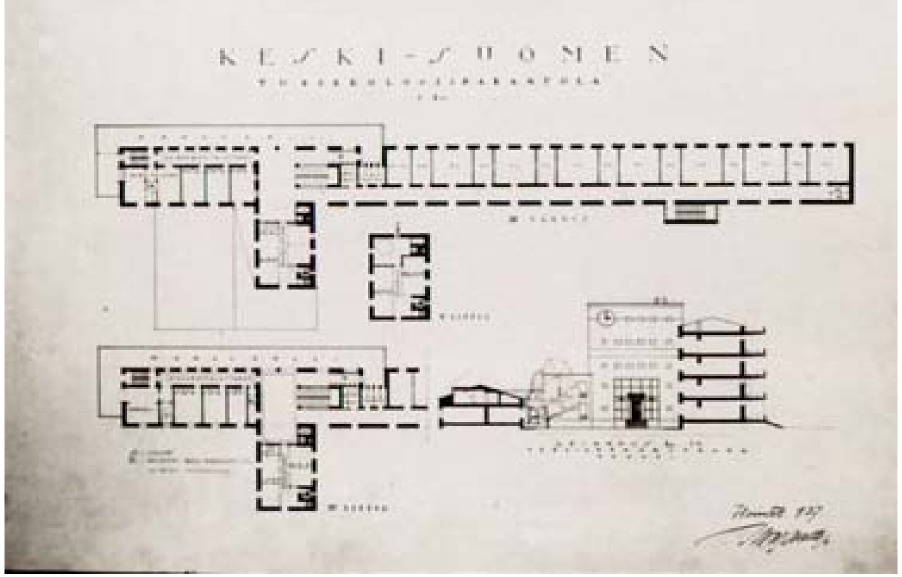
Kilpailupiirustukset on varustettava nimimerkillä ja mukaanpannen tekijän nimen sisältämän suljetun kuoren jätettävä osoitteella varatuomari Ilmo Kalkas, Turku, Henkivakuutusosakeyhtiö Tarmon konttoriin tai samalla osoitteella varustettuna johonkin valtakunnan postitoimistoon viimeistään tammikuun 31 päivänä 1929 ennen kello 12 päivällä.

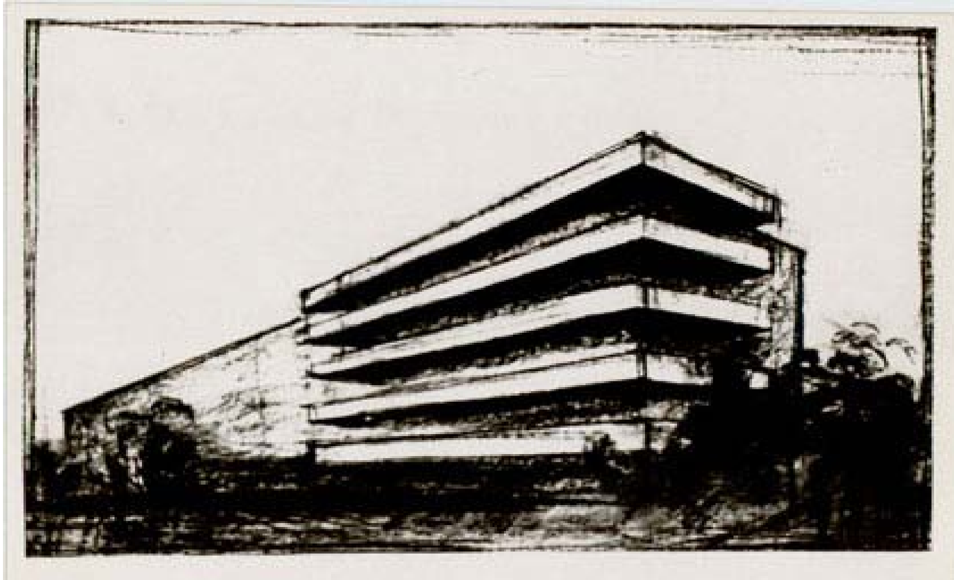
Kilpailuohjelma ja lähempiä tietoja saadaan pyydettäessä edellämainitulla osoitteella.

Rakennuslautakunnan puolesta·
BERNHARD HEIKKILÄ.

Ilmo Kalkas.

The invitation to architects to participate in the architecture competition for Paimio Sanatorium, Arkkitehti 11/1928.





Aalto's entry for the Kinkomaa tuberculosis sanatorium architecture competition, 1927 (AAM 50-23g).

Perspective sketch for the Kinkomaa sanatorium (AAM 50–23f).

AALTO'S ENTRY TO THE KINKOMAA TUBERCULOSIS SANATORIUM COMPETITION

Minnamaria Koskela describes Aalto's entry from 1927 for the Kinkomaa sanatorium as an interesting forerunner. Aalto had divided the different functions into separate sections within the main building. The entrance courtyard was also closed on three sides, the cantilevered patients' balconies were placed at the end of the building volume, and the ward was placed along a one-sided corridor, like the one in Paimio.[81]

The stylistic transition from Nordic classicism to functionalism, which is seen in Aalto's projects, is evident when comparing the Kinkomaa entry to the one for Paimio. In Kinkomaa, Aalto used mainly a classical style but also included some functionalistic features and details. According to Koskela, the latter are especially evident in the concrete structure of the balconies.[82]

Aalto's biographer Göran Schildt has interpreted the Kinkomaa competition proposal as being the first that "clearly reveals his conversion to Functionalism".[83] For comparison, his entry for the architectural competition for the Viipuri municipal library (the deadline for which had been October 1, 1927) was dominated by ideas that referred to Gunnar Asplund's Stockholm City Library.[84]

81 Koskela 1998, 45.
82 Koskela 1998, 47.
83 Schildt 1994, 34.
84 Schildt 1986, 20.

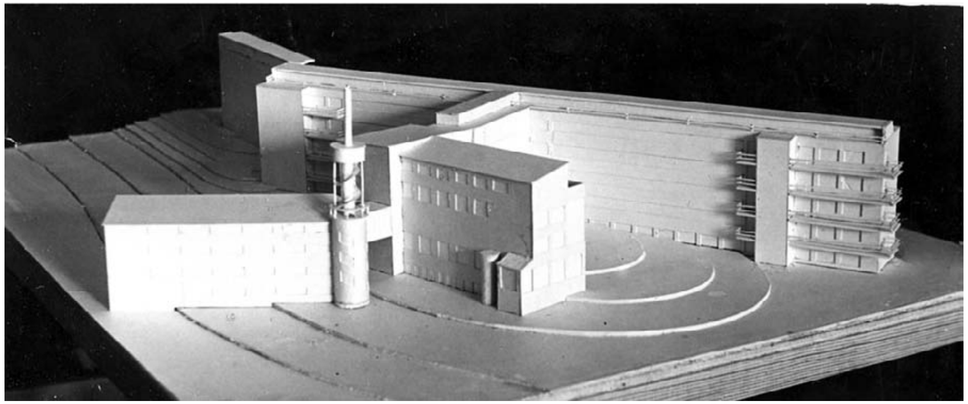
Harald Wildhagen and Erling Bjertnäs celebrating Christmas 1929 in the Aaltos' home (AAM 91-005-010).

AALTO'S OFFICE IN THE LATE 1920S AND EARLY 1930S

Alvar Aalto moved from Jyväskylä to Turku in June 1927, while Aino and their daughter followed in August that same year. The Kinkomaa competition is the first known project that Aalto undertook after arriving there. In spring that year he had won the architectural competition for the design of the Southwestern Finland Agricultural Cooperative's multipurpose building, which was to be a large complex in the city centre, and he had to make himself available at the site. According to Schildt, Aalto also took advantage of the better connections abroad.[85]

Aalto had only a few employees at the office in Turku. The only full-time employee working with the Aaltos at the beginning of the Turku office was Teuvo Takala, who was not an architect, but a model builder.[86] In the planning of Paimio, the Aaltos were assisted by two Norwegian architects, Harald Wildhagen and Erling Bjertnaes as well as the Finnish architects Erkki Bäckström, Lars Wiklund and Lauri Sipliä. Bjertnaes started working in the office already in the beginning of December 1927 and stayed until summer 1931, Wildhagen until the end of 1930.[87] Bäckström began in the office in 1928 but left the following year. Lars Wiklund started in 1929 and Lauri Sipilä in 1931 leaving the office in 1933.[88]

85 Schildt 1986, 19–20.
86 Schildt 1994, 317.
87 Schildt 1986, 39–41.
88 Schildt 1994, 314–317.



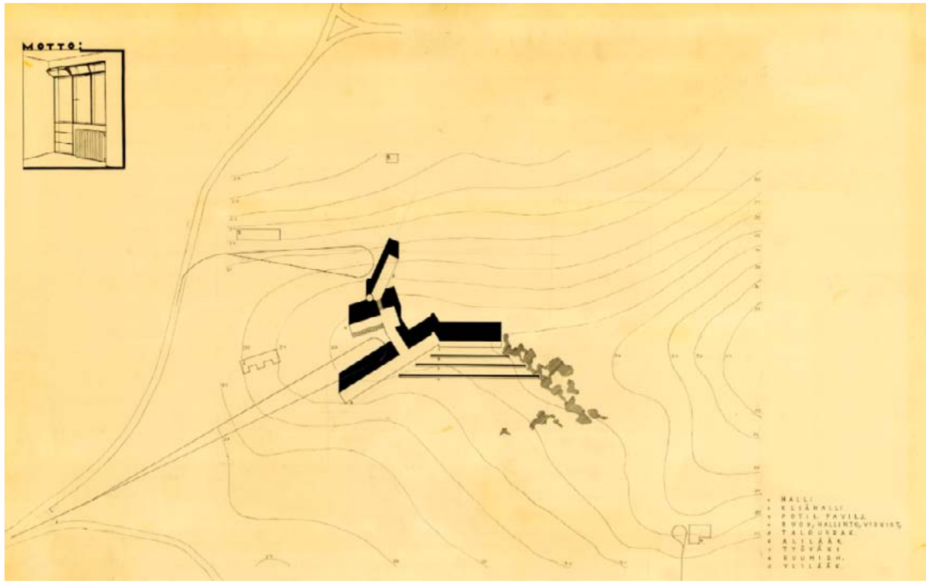
Scale model of Aalto's competition winning entry (AAM 50-003-037).

The year 1932 was hard in Aalto's office. In January Aino Aalto wrote to Wildhagen: "Life is quite different from what it was 2–3 years ago. Then we had too many parties and now we have none at all. Things are so quiet it takes getting used to…"[89]

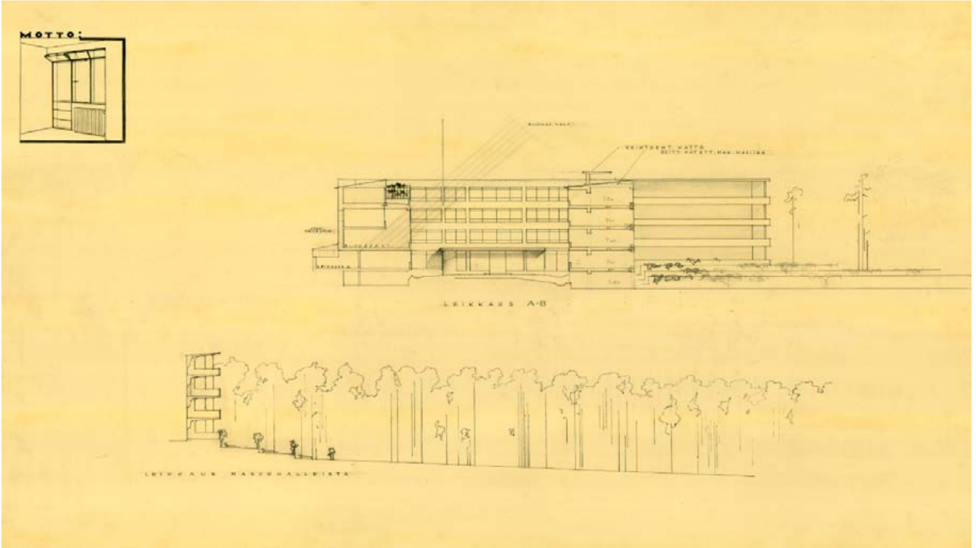
By the end of the year, nothing had changed for the better. Aalto wrote in December to WIldhagen: "A completely empty office and an unemployed chief send their greetings to the office manager of the days of the great rush."[90] The economic situation became worse, and on December 22, 1932, the bailiff came to label the better pieces of furniture at the Aaltos' apartment.

Schildt points out that the two Norwegians had been important employees, whose initials are most frequently marked in the drawings of all the projects of the time: the Southwestern Finland Agricultural Cooperative building, Jyväskylä Defence Corps building, Paimio Sanatorium, the Zagreb hospital competition proposal and various churches. Wildhagen had graduated two years before Aalto and had experience in Germany. He was a more experienced architect and more practical than Aalto, and took large responsibility of the practical matters, and was capable of restraining Aalto when he went too far.[91] In an interview Wildhagen emphasized the role of the engineer Emil Henriksson (later Hartela) in contemporary concrete structures both in the Turun Sanomat building and Paimio Sanatorium.[92] The completed sanatorium in 1933 took Aalto's career to a new level, domestically at least partly and internationally quite convincingly.[93]

89 Schildt 1986, 85.
90 Schildt 1986, 85.
91 Schildt 1986, 39–44.
92 Schildt 1986, 44–45.
93 Schildt 1986, 88–90.



The site plan in Aalto's competition winning entry (AAM 50-24).



The sections and the main entrance façade in Aalto's competition winning entry (AAM 50-29).

AALTO'S ENTRY FOR THE PAIMIO COMPETITION

The task in the competition was to design a sanatorium building for 184 patients in four separate wards. In addition to these, the building was to have a common library, reading room and dining hall for the patients, as well as a kitchen. Necessary staff accommodation, bathrooms, disinfection facilities and a ward for epidemic diseases were also to be included. Housing was needed for the doctors as well as other staff and separate buildings were to be built for the bakery, laundry and sauna.[94]

According to the competition brief, the patients' rooms for a total of 184 persons were to vary from two single rooms in a ward to four-bed rooms, so that there would be 25 m3 space for each patient. These rooms and functions, which were required in the competition brief, can be seen in Aalto's entry. He had divided some other functions slightly differently, as the mortuary, laundry, bakery and garage for three cars were suggested to be combined in a single maintenance building.[95] Aalto placed some functions practically on the ground floor below the kitchen, but the mortuary he placed in its own building, located quite remotely. The main building in Aalto's entry was a four-storey building plus

94 Arkkitehti 3/1929, 42.
95 Varsinais-Suomen tuberkuloosiparantolan rakennuspiirustuskilpailun ohjelma (competition brief) 1928, 7.

a roof terrace and basement. The main approach to the sanatorium was placed in the centre so that it can be seen from the patients' dining room, the reading room, and the long corridors of the patients' rooms. Also the physicians' rooms are located next to the main entrance courtyard. Maintenance traffic used a separate drive way, slightly to the north of the main entrance axis. The third direction of arrival was from the south, but it led only to the chief physician's villa, which was placed to the southwest of the main building.

The competition entry comprised five buildings: the main building, the chief physician's residence, a row house for the assistant physicians, staff housing, and the mortuary. The main building comprised three different wings. Each wing housed a different set of functions.

13 competition entries were received and the jury chose Aalto's entry as the winner, even though (or maybe exactly because) his entry was "somehow different from the others",[96] according to the *Turunmaa* newspaper. The jury commented on Aalto's entry – with a drawn window as the motto – as follows:[97]

This sketch is architecturally interesting, but as an entity rather restless and factitious. The compositions of the rooms are beautiful and their locations are mostly well solved, expect the pharmacy and laboratory. The main stairs is cramped. The patients' bathing department is too large. By widening the building frames, the large amount of exterior wall surface can to some extent be reduced. The overall volume is small.[98]

OTHER ENTRIES TO THE PAIMIO COMPETITION

Of the 13 entries received, four were awarded prizes and presented in *Arkkitehti* 3/1929. The second and third prize entries were large L-shaped volumes, and all four award-winning entries were functionalistic in appearance. The other entries were given only a short written description, focusing on the general layout or the sizes of certain spaces, so it is impossible to make an evaluation of their architectural styles. The entries that were left without a prize in the architectural competitions were returned to their authors but remained anonymous, and thus a comprehensive view of the entries can no longer be achieved.

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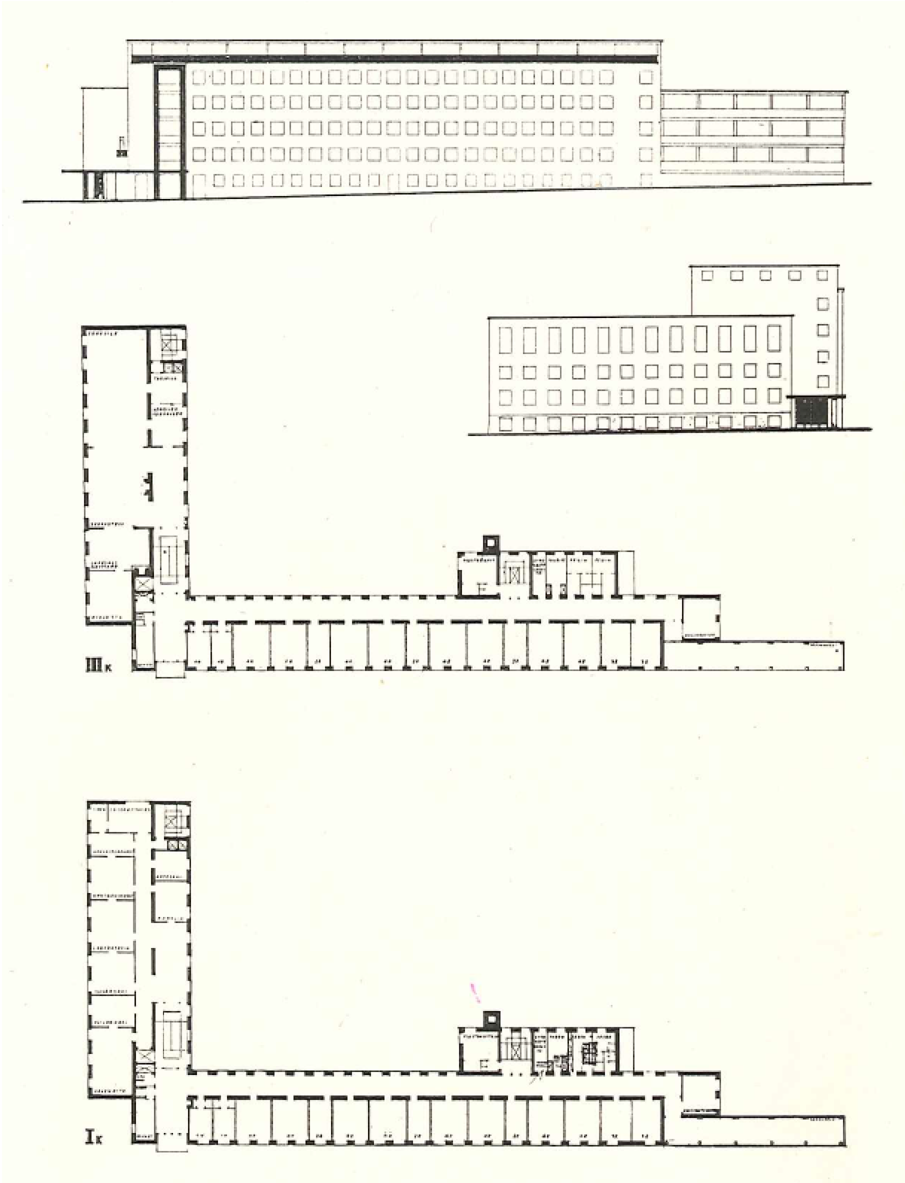
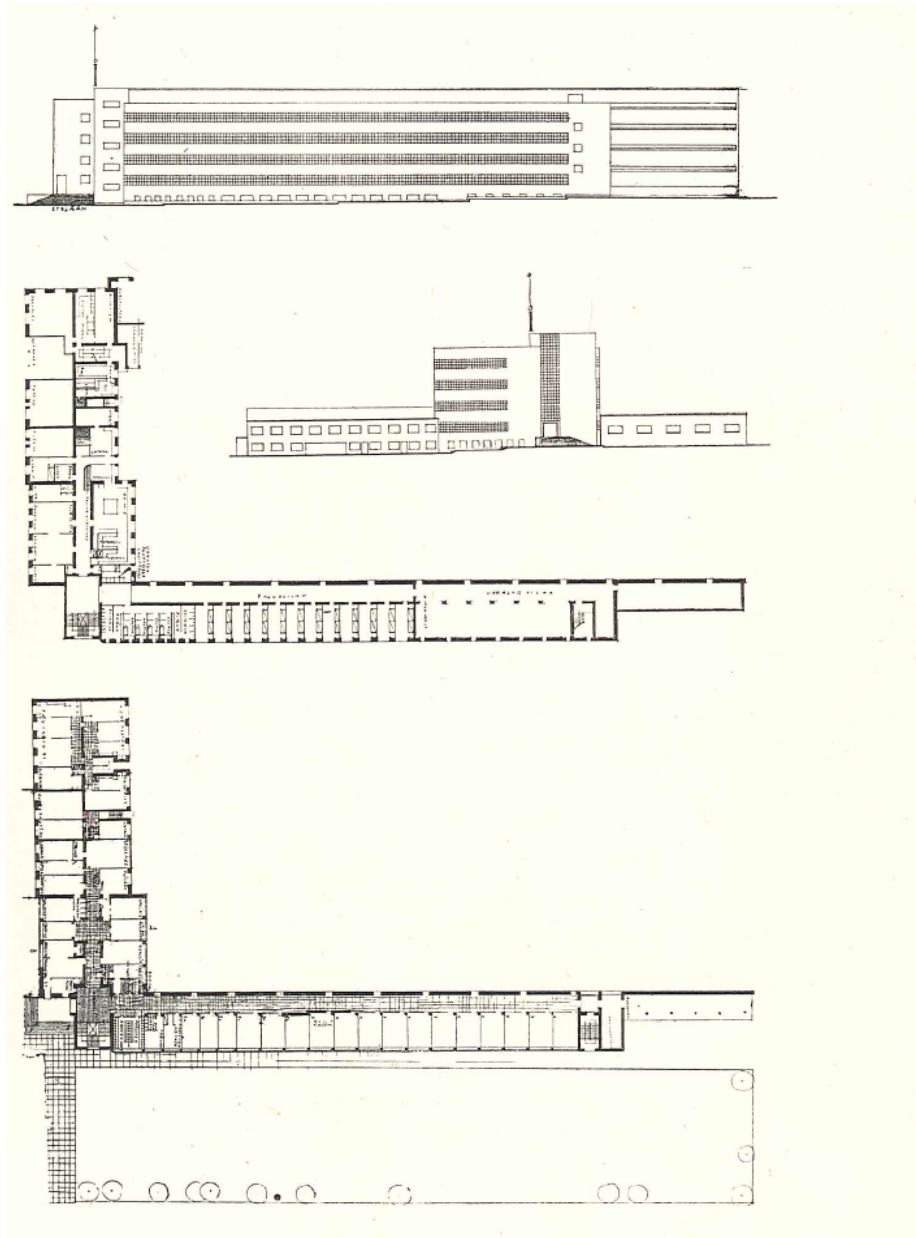
96 In Finnish: "eräissä suhteissa muista poikkeavat piirustukset" (Turunmaa 17.6.1933).

97 Arkkitehti 3/1929, 45–46.

98 In Finnish "Tämä luonnos on rakennustaiteellisesti mielenkiintoinen, mutta kokonaisuutena jonkun verran rauhaton ja teennäinen. Huonesovitukset ovat kauniit ja huoneet yleensä oikein sijoitetut paitsi apteekki ja laboratorio. Pääporras on ahdas. Potilaiden kylpyosastot ovat tarpeettoman laajat. Rakennusrunkoja levittämällä voidaan jossakin määrin vähentää verraten isoa ulkoseinäpintaa. Kuutio on pieni." (Arkkitehti 3/1929, 45–46).



*The 2nd prize entry, "Valo", by Kaarlo Borg, Olof Flodin and Paavo Hanstén (*Arkkitehti *3/1929).*

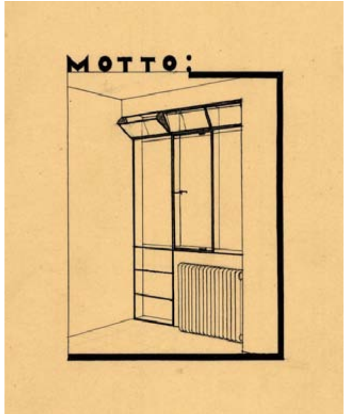


*The 3rd prize entry, "Ammon-Ra", by Antero Pernaja and Ragnar Ypyä (*Arkkitehti *3/1929).*

It may be assumed that the jury appreciated contemporary architectural expression, and despite the flaws that were pointed out in Aalto's entry it won mainly due to the architectural merits of the composition. The fascinating orientation created an inspiring overall composition, even though it was only a four-storey building, and the architecture was not as dynamic as it would finally become.

ALTERATIONS TO THE WINNING ENTRY

The building committee thought that in principle the design of the sanatorium was to be made by Aalto, but they nevertheless decided to ask opinions about his entry from the physicians Severi Savonen and Niilo Mäkinen.[99] After those were delivered, the committee still felt uneasy about the decision and thus asked for additional comments from Dr. Väinö Horelli and from Setälä, the treasurer of the Harjavalta sanatorium.[100] After considering the opinions and hearing Aalto, the building committee made the decision to award the commission for the design of both the buildings and their furniture and fittings to Aalto, who was also to supervise the construction works and make the necessary changes to the design during the implementation. The contract with Aalto was signed on June 28, 1929.[101]



Alvar Aalto's competition motto was a drawn window (AAM 50–34).

Aalto's competition entry had to be changed in many ways before the project could be realized. The overall composition of the main building was retained, but most of the interiors and specific spaces were redesigned.

At a building committee meeting on December 8, 1929, Aalto presented the final drawings for the sanatorium, but the final decision to approve them was postponed until the next meeting.[102] The greatest change to the original building design resulted from an enquiry by Turku city: on December 19, 1929 they asked to join the process and to reserve 100 beds at the sanatorium.[103] This meant adding two wards and simultaneously two storeys to the so-called A-wing, meaning that the patients' room wing was increased to seven stories (plus the basement). Thus the dominant character of the building was not present in the competition entry, but rather developed during the more precise planning stage.

The motto of the competition entry had been a drawn window, which Aalto chose to be the symbol of the whole entry, even though the tall windows of the patients' rooms were altered to more conventional square-shaped windows. The change was due to the statements of the doctors Savonen,

99 Building committee, 25.2.1929.
100 Building committee, 27.4.1929.
101 Contract, building committee files.
102 Building committee, 8.12.1929.
103 Törrönen 1983, 37.

Mäkinen and Horelli.[104] Koskela states that Aalto then used the L-shape form in the partitions of balconies in the chief nurses' apartments, which were moved to one end of the A-wing.[105] Another at least graphically important feature in the early design consisted of three patient bed decks in the grounds for summertime use. The decks were considered too expensive by the experts,[106] and were replaced by a walking route and circular fountains; that is, the layout of the design was retained but received a different use. Koskela states that the sun balconies were one theme in a conversation: separate balconies for both sexes were considered necessary since sun baths could result in voyeurism in the suggested design.[107] The opportunity for patients to sun bathe was arranged on the 7th floor of the B-wing, but with the areas protected by curtains and opaque glass walls.[108]

With regards to the main entrance hall, the most prominent alteration was done to the main stairs. It was rotated 90 degrees and simultaneously one elevator was left out, the remaining elevator being the deepest and most suitable for transporting patients' beds. So the criticism about the cramped staircase had been taken into account.

In Aalto's competition entry some staff accommodation was located above the dining hall and its mezzanine level containing the library. The third floor in the B-wing was assigned for apartments and bedrooms. Later those functions above the dining hall were replaced by work spaces for the patients. The idea of a terrace for the staff apartments was also abandoned, and it was designed in a more complicated setting of east-facing balconies and terraces. The sunbathing space for the patients was also provided as a roof terrace, as mentioned earlier.

Minor changes were made according to the physicians' wishes. For instance, the order of physicians' offices on the ground floor of B-wing was altered. Also the pharmacy and laboratory were moved from the basement to the ground floor, and the artificial sunray treatment spaces were enlarged.[109] Those changes altered the original one-sided corridor of the B-wing into a combination of waiting rooms, laboratories and so on next to the exterior wall. The corridor was partly dark and waiting spaces provided sunlight into the corridor in the middle. The operating theatre received its semi-circular shape in the later design, as in the competition entry it was a rectangular space at the very end of the corridor.

104 Koskela 1998, 67.
105 Koskela 1998, 72.
106 Koskela 1998, 70.
107 Koskela 1998, 70–71.
108 Drawing AAM 50–563, 30.4.1932.
109 Koskela 1998, 69–70.

In the competition entry, the apartments for the chief nurses were located in the middle of the wards, but in the further design they were moved to the far end of the corridors. Savonen and Mäkinen were against locating staff living quarters in the wards, but Horelli favoured a close connection to the wards, since the control of the patients' behaviour had proven especially necessary in public sanatoria.[110]

The service spaces and kitchens had to be enlarged as the estimated number of patients had increased by more than a half since the beginning of the competition process. Accordingly, the proposed widening of some of the building masses was done to both the B-wing and, especially noticeably, to the service wing C, which lost its long and slender character and developed a more complex shape. During the design period after the competition, some of the staff accommodation was also removed from the central building and placed in separate buildings. Furthermore, the boiler house and the building for garages and maintenance were added. Also, some totally new functions, which had not been required during the competition process, were now needed, resulting in the waste water purification plant and the greenhouses.

The building committee did not have the expertise in the daily routines of the sanatorium housekeeping, and no nurses or cooks were members of the committee or heard during the design process. That lead to some changes immediately when the sanatorium began operating; for example, the bakery was initially considered spacious and well equipped, yet, when Saimi Juhantalo started as the head matron in the winter of 1933, she immediately complained about the lack of cupboards,[111] which were soon to be added.[112]

In regard to the alterations, Koskela draws the conclusion that the experts interfered significantly in the design, and many of the proposed alterations were realized despite leading to major changes in the design. The windows to the patients' rooms are probably the most significant example. Luckily not all the alterations were accepted; for example, the cantilevered balcony wing without supporting pillars was considered expensive, but Aalto and Hartela succeeded in implementing the elegant design. Many of the physicians' proposals also came from their concern about the behaviour of the patients, who

110 Koskela 1998, 67.

111 According to some stories, the cupboards in the patients' rooms were a late addition and initially had been forgotten by the designers. But the preserved drawings do not support this theory, even though the cupboards mounted onto the walls may seem additions. The drawing that shows the clothing cupboards for the kitchen and other service areas also includes the principle for the patients' room cupboards, and these were intended to be made of metal, just like the other clothing cupboards. The drawing is dated January 28, 1932 (AAM 50–276). The rounded shape and the tilted top cover were used in all of these, and some were to be made of metal and some of bent plywood (AAM 50–189; 210; 239). The patients' were provided storages for various purposes: in the basement there were rooms for luggage; in the entrance hall were special shelves for shoes; in the wards, one room was assigned for clothes and the table next to each bed contained drawers.

112 Törrönen 1983, 41, 59.

were coming from the lower classes.[113]

SANATORIUM CONSTRUCTION SITE

The building process started in April 1930, and the very challenging concrete structure was completed in December.[114] The engineer designing the concrete reinforcements and structures was Emil Hartela[115].[116] Aalto wrote in Arkkitehti 6/1933:[117]

Structural calculations were performed at the commencement of the drawing work in close cooperation with the architects. This work, together with the supervision of the construction, was carried out by Emil Hartela, engineer. Of all the specialists, his contribution to the work has been the most notable.[118]

The concrete structures were also praised in the newspaper article in *Turunmaa:*[119]

Master builder Arvi Ahti had proved extensive master's skills in building the concrete structure of the tuberculosis sanatorium. It is almost dizzying to look at the pillar-like concrete skeleton. [--] It seems like a single standing wall! The truth is that there it stands at the fields of Preitilä as an enormous wonder of engineering and workmen's skills. Master builder Ahti states that the work is done with such piety that it cannot be defeated. And that we do believe.[120]

Many contemporary and experimental methods were used in the concrete construction. Building engineer Rune Cairenuis, who was involved in the structural design, told that the structure of the balcony wing was quite challenging and everybody, including Alvar Aalto himself, was anxious about its durability. Cairenuis claimed that Aalto drove to the building site one night during an autumn storm to see if the tall wing had endured. Also the machinery room was experimental and unconventional.

113 Koskela 1998, 72–73.

114 Törrönen 1983, 37.

115 According to documents, such as the building committee's description of the overall costs dated 19.12.1933, the engineer was Emil Henriksson, which was Hartela's previous name.

116 Aalto 1933, 86; Törrönen 1983, 37.

117 *Arkkitehti* 6/1933, 86.

118 In Finnish "Lujuuslaskelmat ovat suoritettuja heti piirustustyön alkuvaiheissa intiimissä yhteistyössä arkkitehtitoimiston kanssa. Tämän työn samoin kuin rakennuskonstruktiivisen ylivalvonnan on suorittanut insinööri Emil Hartela. Kaikista erikoisalojen asiantuntijoista on hänen osuutensa työssä huomattavin" (*Arkkitehti* 6/1933, 86).

119 *Turunmaa* 17.6.1933.

120 In Finnish: "Rakennusmestari Arvi Ahti on suorittanut tuberkuloosiparantolan betonirungon rakentamisessa "mestarinäytteen". Melkein päätä huimaa, kun katselee päädystä pilarimaiselle näyttävää betonirunkoa. [--] Sehän näyttää seisovan yhden seinän varassa. Tosiasia kumminkin on, että siinä se seisoo Preitilän nummella, mahtavana luomuksena insinööritaidon ja ammattikätevyyden ilmettynä ihmeenä. Rakennusmestari Ahdin vakuutuksen mukaan on työ suoritettu niin huolitellusti, ettei edes nykyinen korkea työtekniikka pysty parempaa aikaansaamaan. Ja sen me uskomme." (*Turunmaa* 17.6.1933).

The Paimio construction site (AAM 50-003-079).

Instead of being located in the basement of the main building, it was built as a separate building – so that in the case of an explosion the roof would be the first part to break and no further buildings would be affected.[121]

Kaarlo Albert Kilpi, who was the main building supervisor of the construction site, designed the concrete structures for the smaller buildings, such as the mortuary building, the staff housing and assistant physicians' row house as well as the pumping station, garage building and technical building.[122]

Kaarlo Kilpi was an educated engineer, who had studied in Germany at the Technical University in Neu Strelitz, Mecklenburg. His studies had been interrupted by WW I, but he completed them there afterwards, in 1920, returning to Finland the following year. According to family legend, his family lived not only near but actually on the construction site: in 1929–30 in the Spurila mansion, in 1931 in the operating theatre of the half-finished sanatorium, and in 1932 in one of the dwellings in the assistant physicians' row houses.[123]

Supervising the construction, Aalto spent much time on site. Thus many parts of the design were carried out and refined during the construction. Also some of the changes described in the previous chapter were designed then – some of those possibly on site. Master builder Olavi Sinervo, who worked on the site in 1930–33, has told about several incidents where Aalto had changed the drawings at the very last moment or even asked completed walls to be pulled down.[124]

Constructing the sanatorium was a large effort and involved contributions from many regions of the country. Even though the building committee had employed mostly local producers and firms, some of the required building materials were transported from long distances: for example, the slag, which was needed in huge amounts for insulation and as a filling material, was acquired not only from Turku but also, for instance, from Toijala and Riihimäki, and even from Viipuri.[125]

In addition to the previously mentioned and recognizable buildings belonging to the sanatorium were also greenhouses, located today in a state of neglect to the west of the present hospital property. Early parts of the greenhouses were designed in Aalto's office, and the Aaltos' drawings for these were accepted in August 1932.[126] The presently existing greenhouses include several original conservatories,

Alvar Aalto at the Paimio Sanatorium construction site (AAM 106228).

121 Törrönen 1983, 37–38.
122 Building committee accounting, receipts 142/1930, 122/1931 and 275/1931.
123 Kilpi 2014, 262.
124 Törrönen 1983, 30–39.
125 Building committee accounting, e g. 118/1931, 122/1931.
126 Building committee's construction board, 11.8.1932.

The nearly completed exterior (AAM L 2206 Yrjö Tuominen 1931).

Aino Aalto and Kaarlo Kilpi at the Paimio construction site (AAM 50-003-072).

while some parts were added later. According to Reijo Vihervirta, the hospital's present maintenance man, the greenhouses have not been in use for approximately 15 years.

The construction of the sanatorium was an extensive task for the whole country, and it became more expensive than had originally been estimated. The building committee completed their task at the end of January 1934, when the representatives of the communities involved declared their freedom of responsibility. The estimated costs in 1928 had been 22 million Finnish marks, which was some five million less than the final cost. Nevertheless, this equalled less than 100 000 marks per patient, which was considered the lowest price in Finland in comparison with all the other sanatoria built prior to Paimio.[127]

127 Törrönen 1983, 42.

MATERIAL SUPPLIERS AND CONTRACTORS

The building committee took responsibility for the main contract, so that they chose the builders and producers for each task. The most important contractor was the concrete frame builder, a company from Turku called Rakennustoimisto Arvi Ahti. The water and plumbing systems were built by Vesijohtoliike Onninen Oy, also from Turku. The electrical systems were mostly built by Keskusosuusliike Hankkija, who also supplied the regular lamps; according to the report of the building expenses, "only some special lights, which the style of the interiors required", were ordered from the companies Koristamo and Kaune.

The painting work was carried out by Marttisen Maalaus Oy from Turku, and artist Eino Kauria was hired from June 1932 to April 1933 as supervisor of the work. The steel windows were provided by Oy Cricton-Vulcan Ab, which was also a Turku-based company, and according to the building committee "the only one in Finland producing those". Fixed and loose furniture were produced mostly by Oy Huonekalu- ja Rakennustyötehdas from Kaarina, which produced the furniture in accordance with the Aaltos' drawings. Some of the fixed furniture was produced by Laaksosen Huonekalutehdas and T:mi Kaune, and steel furniture by Aug. Louhen Rautasänkytehdas. Timber doors came from Wilhelm Schaumans Fanerfabrik Ab, from Jyväskylä. The building committee justified their choice of suppliers and producers with their local sources. Nevertheless, some special elements came from abroad: for example, the baking oven was by Werner & Pfleiderer from Germany, the linoleum flooring came from England and Germany, but the rubber flooring again was of Finnish origin. The disinfection machinery was provided by Siemens & Schuckert.128 Most of the lamps were produced by Paavo Tynell's company O.Y. Taito Oy in Helsinki, but those were included in the Hankkija's contract of electrical supplies.129

Advertisement for Arvi Ahti's company (Aalto S.D, 59).

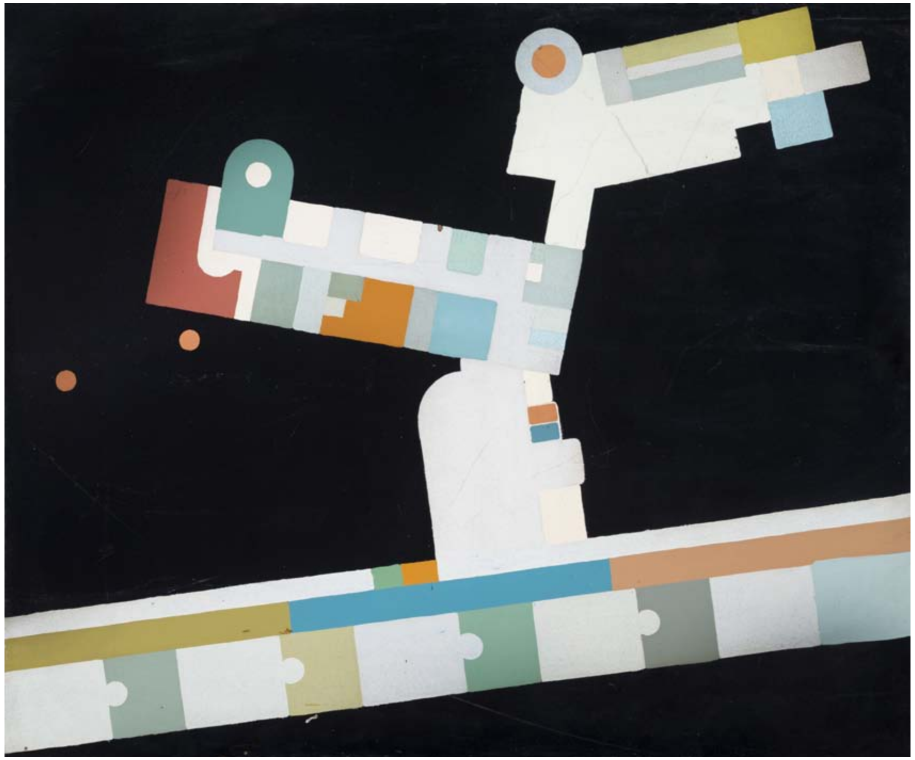
128 Building committee's description of the overall costs 19.12.1933.
129 Kalkas S.D., 13, 66; Building committee accounting, receipts 207/1933.

LIST OF SUPPLIERS

The list of contractors and suppliers was published as follows in *Alvar Aallon arkkitehtuuria n:o 1. Paimion Parantola*[130]:

Arvi Ahti, rakennusliike, Turku – concrete frame.
Vesijohtoliike Onninen – water and heating pipes.
Suomen Gummitehdas – rubber flooring.
Turun Asfalttitehdas – all flat roofs, asphalt work, stairs, mosaic-work.
Turun Kaakelitehdas – ceramic tiles.
Suomen Saviteollisuus, Paimio – lightweight blocks.
Turun Insinööritoimisto – lifts.
Vähäsillan Paja, Paimio – iron and sheet-metal work.
The Insulite Company of Finland – insulation board.
Enso-Gutzeit, Enso – Ensonit, Enso wall coverings.
Wilh. Schaumanin Faneeritehdas, Jyväskyl – doors.
Kolhon Höyrysaha, Kolho – some windows.
Crichton-Vulcan, Turku – steel windows, doors and frames.
Turun Rautakauppa – steelwork and cement.
Keskusosuusliike Hankkija, Helsinki – electrical work.
Marttisen Maalaus – paintwork.
Artur Reimer, Helsinki – stalphite painting.
Kaune, Turku – glass and metalwork.
Koristamo, Turku – metalwork.
Wärtsilä – sheet-metal radiators.
Luth & Rosén, Stockholm – panel radiators.
Willy Malmström, Helsinki - Rayrad-radiators, linoleum.
Arabia, Helsinki – sanitary fittings.
Högforsin Tehdas – kitchen stoves.
Insinööritoimisto af Forselles, Helsinki – kitchen fittings.
Mathiesen – dish-washers.
Metalliteos, Helsinki – kitchen equipment, kitchen furnishings.
Lämmityslaite – kitchen stoves in apartments.
Pietarsaaren Konepaja. – laundry equipment.
Werner & Pleiderer, Stuttgart – baking equipment.
Aage Havemanns eft, Helsinki – X-ray and light-treatment equipment.
Huonekalu- ja Rakennustyötehdas, Turku – furniture and fittings.
Aug. Louhen Rautasänkytehdas ja valimo, Turku – beds.
Huonekalutehdas ja sorvimo, Turku – miscellaneous joinery work.
Laaksosen Puuseppätehdas, Turku – joinery work.
Taito – light fittings.
Siemens Sähkö, Helsinki-Berlin – disinfection plant.
Turun Vanuliike, Turku – matresses, curtains etc. Hercünia A. G. – artificial-leather folding doors.
Persienne- ja Lipputehdas, Helsinki – blinds.

130 Holma 2015, 20.



The colour scheme presented on a board by Eino Kauria, two pieces of the ground floor plan have survived, one in the Alvar Aalto Museum (size 122 cm x 105.5 cm) and one in Paimio. (AAM digi 2661 Maija Holma).

COLOUR SCHEME AND EINO KAURIA

The painting work was carried out by Marttisen Maalausliike O.Y. from Turku according to the chosen colour scheme. Artist Eino Kauria supervised the painting work from June 1932 to February 1933.[131] That Paimio followed an artistic concept was not unusual. The artist Eklund made murals for Päivärinne sanatorium in Muhos and in Ahvenisto the same artist created the colour scheme for the whole sanatorium, including the patients' rooms and even the bed linen.[132]

Nevertheless, it is not possible to divide Aalto's and Kauria's roles in the rich original colour scheme. The executive board decided on 10.6.1932 that the members of the board, Aalto and Raita, should contact a supervisor for the painting work. The final contract with Marttisen Maalausliike O.Y. was signed on 29.4.1932, and the first calculations for the painted surfaces in the main building were made on 10.5.1932. There are receipts of payments for them from as early as 21.8.1931, but those may be compensation for painting work carried out in the housing. According to the preserved documents,

131 Aalto 1933; Building committee's files e.g. receipts of paid compensations and letter to the committee by Marttisen Maalausliike O.Y. 21.2.1933.

132 Härö 1992, 102.

Kauria came to the site in June 1932, but even colour tones were brought to the site before then, in February of that year. How Kauria came to be chosen is not documented in the files. There is a late interview with Eino Kauria, which took place on September 30 1986, made by Teppo Jokinen, who at the time was working for the Alvar Aalto Museum. In the interview Kauria explains that he had no commissions in the summer of 1932. He could not recall how he got the information about the task of supervising the painting work in Paimio, and he had never met Aalto before. But Kauria had cooperated with architect Kaarlo Borg. Kauria had called Borg and asked him for a recommendation. Borg had then called Aalto, who told Kauria to come immediately.[133]

According to Kauria, Aalto had strong opinions on the painting work. Kauria stated that Paimio was an exceptionally richly coloured hospital building, which was mostly Aalto's wish and vision. Aalto told him which colours should come where and Kauria mixed the samples. Kauria also explained that Aalto was a bit dissatisfied with the yellow tone of the rubber floor of the main staircase, which had been ordered before Kauria came to the site.[134]

Two boards of colours have survived, one in Paimio and one in the Alvar Aalto Museum. Most likely Kauria refers to those panels in the 1986 interview, as he says that Aalto had asked him to make "a special map which demonstrates all the used colours."[135]

Kauria lived with his family in one of apartments in the then recently completed staff housing. Kauria explained later that colours were mixed on site and Aalto always checked them. The exterior walls were painted with a contemporary airbrush, and allegedly the whole forest became white due to the strong wind, of which Kauria had warned the workmen.[136] In addition to the supervision of the regular painting work and design, Kauria got an extra fee in March 1933 for painting the mural in the chapel, the electrical schemes in the transformer plant and the layout of the wards painted on a cork board in the office of the chief physician.[137]

Kauria explained to Jokinen about the mural he painted in the mortuary. The current painting there, divided into sectors, however, is not by him, and he was not aware of who the author is. The original paint work covered the whole wall, and had lines made using strings.[138]

133 Jokinen 1986, interview with Eino Kauria 30.9.1986. AAM archives.
134 Jokinen 1986, interview with Eino Kauria, 30.9.1986. AAM archives.
135 In Finnish: "kartan josta näkyy kaikki värit mitä siellä on käytetty." Jokinen 1986, interview with Eino Kauria 30.9.1986. AAM archives.
136 Törrönen 1983, 41.
137 Building committee, receipts 190/1933.
138 Jokinen 1986, interview with Eino Kauria 30.9.1986. AAM archives.

FURNITURE

Aalto received a challenging task with the interior and furniture design in the sanatorium. The contemporary furniture design in Europe followed the straightforward vision of functionalism. Non-decorative furniture with steel tubes and easily cleanable surfaces were designed in the Netherlands in the late 1910s by the De Stilj group and in the Bauhaus, the famous design school in Germany. Modern chair designs, such as the Wassily chair by Marcel Breuer from 1925, became a success.[139]

The same intentions were seen in lamp design, as several models were designed specially for the sanatorium, so that they did not gather dust. The materials were of metal and glass and thus easy to clean.

OTTO KORHONEN AND BENT WOOD

For the furniture of Paimio, Aalto used steel tube furniture designed by both him and Aino Aalto. The Aaltos had developed steel tube furniture already previously, following international ideas. The most original and influential design for Paimio, however, was the bent-wood furniture, which was used extensively for both fixed and loose furniture. Paimio was almost entirely furnished with the Aaltos' furniture, which was mostly produced by Huonekalu- ja Rakennustyötehdas factory, and which was known for the high quality of its products.

Otto Korhonen was knowledgeable about wood, especially the properties of Finnish birch and was well-versed in manufacturing techniques. Alvar Aalto on the other hand, was determined to find a way to achieve a large-scale series production with a beautiful result. The modern furniture designed by Alvar and Aino Aalto emerged from the close cooperation between them and Korhonen.

In 1932 the pieces of furniture made in accordance with the wood-bending and laminating processes designed by Alvar Aalto were ready for production and marketing. Aalto and Korhonen continued their experiments in bending wood, which they intended to use for genuine series production on a large scale. In 1933 they invented a production method which could be used to bend solid pieces of wood into the L-shaped form intended for the legs of chairs and tables. The famous bent timber leg, the so-called L leg, produced for the three-leg stool, received its patent in 1933, the same year the sanatorium was completed. Yet, the three-legged stool was not used in the first interiors in Paimio, though it was later.

139 Lahtinen 2011, 27-29.

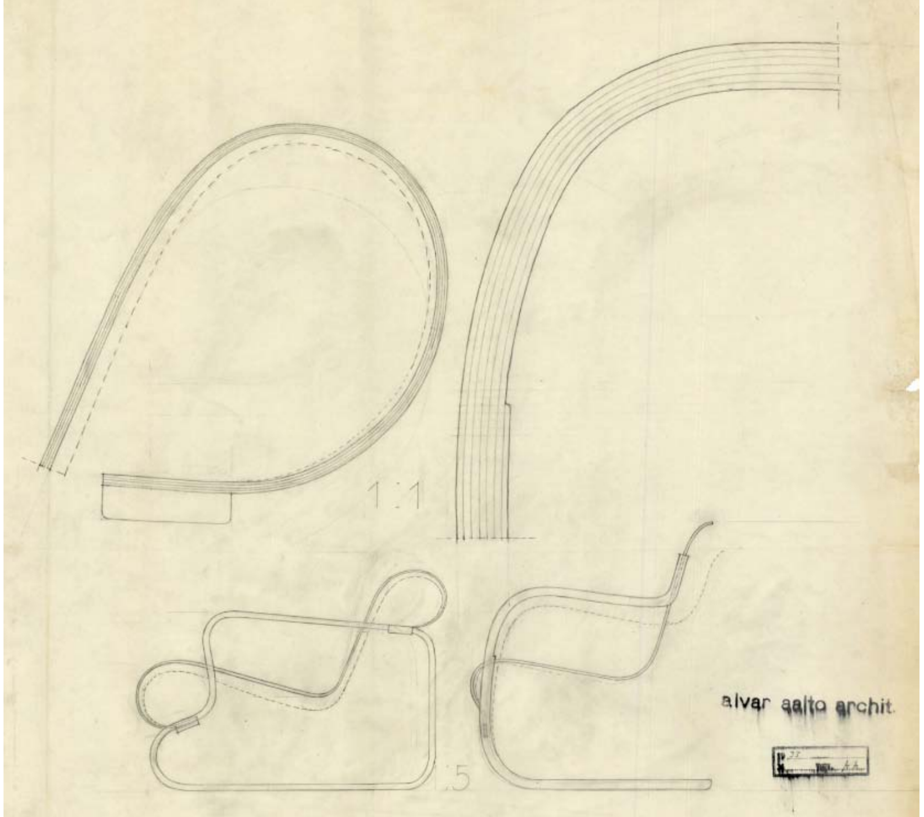
Living room in Aalto's apartment in Turku in around 1930, with a Wassily chair (AAM 91-005-013).

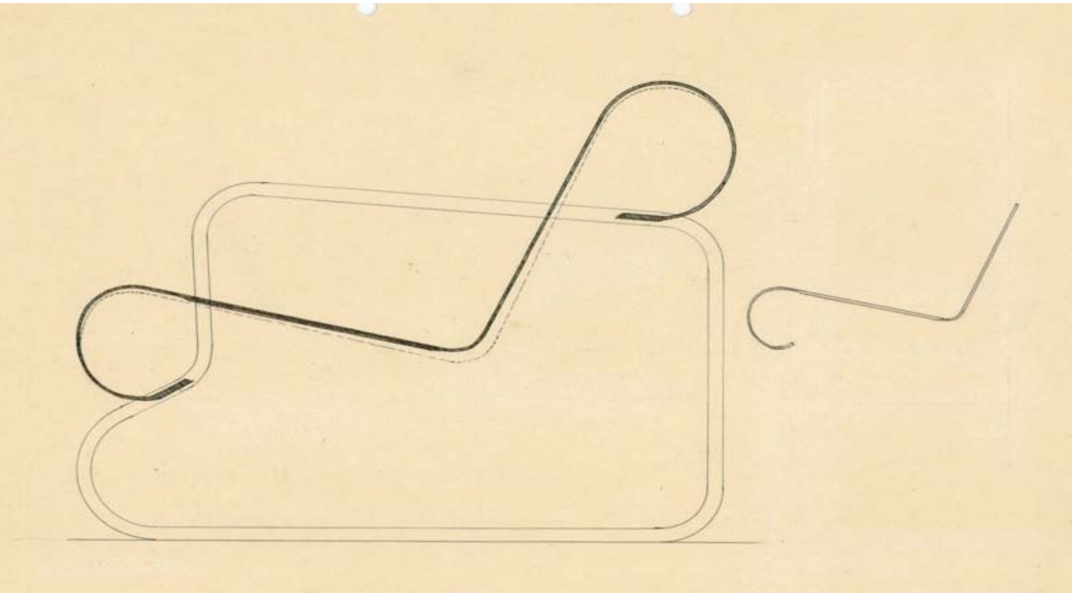
Steel and wooden leg chairs in Paimio (AAM 50-003-413; 50-003-420 Gustaf Welin).

Aalto had started co-operation with Korhonen, the owner of Huonekalu- ja rakennustyötehdas (Furniture and building work factory), in the creation of the interiors of the Southwest Finland Agricultural Cooperative building in Turku. His company manufactured the furniture for the Itämeri restaurant, but lost the tender competition for the furniture for the theatre seats and bank interior. Korhonen was constantly developing processes that impressed Aalto. Their common projects continued with the Turku Fair in 1929, where the stand representing Korhonen's factory presented several pieces designed by Aalto and Korhonen.[140]

Because of the economic depression in the early 1930s, Aalto had very few other projects in 1932–33 and he described his situation as unemployed.[141] One could assume that this gave Aalto the opportu-

140 Schildt 1986, 33–34; Lahtinen 2011, 68.
141 Schildt 1986, 85.





Elevations and details of the bent plywood chair, drawn by Alvar Aalto (AAM 96-94).

The so-called Paimio Chair has become a design icon (AAM 96-81).

nity to concentrate on the interiors of Paimio as well as other furniture studies with Korhonen, which resulted in the interesting contemporary timber solutions.

The idea of bending timber was not something new in furniture design. It had been done by Michael Thonet already in the 1830s and also in the early 20th century the Estonian company Luterna made bent plywood chairs,[142]

Korhonen's factory produced timber furniture but also many of the steel-tube legged chairs. They actually also produced a number of windows and doors. The sanatorium became an economically important project for Korhonen's factory but also a developing process that deepened co-operation between him and Aalto. This collaboration continued after the founding of Artek in 1935 and would last for decades. The timber furniture became a lifetime project for Aalto.[143]

Aalto explained the design of the wooden furniture of Paimio in an article in 1940:[144]

The flexible wooden furniture are a result of experiments also made at the Paimio Sanatorium. At the time of those experiments the first tubular and chromium furniture was just being constructed in Europe. Tubular and chromium surfaces are good solutions technically, but psychophysically these materials are not good for the human being. The sanatorium needed furniture which should be light, flexible, easy to clean, and so on. After extensive experimentation in wood, the flexible system was discovered and a method and material combined to produce furniture which was better for the human touch and more suitable as the general material for the long and painful life in a sanatorium.

142 Lahtinen 2011, 68.
143 Still today, Artek's wooden furniture is produced by the Korhonen factory.
144 Aalto 1940, reproduced in Schildt 1997, 102–107.

The elegant furniture in the chief physician's office made by Huonekalu- ja rakennustyötehdas (AAM 50-003-370).

The beds on the top floor balcony and a patients' room (AAM 50-003-258; 50-003-360 Gustaf Welin).

OTHER FURNITURE

Bent steel beds and hall beds, also designed by Aalto, were produced by the factory Aug. Louhen rautasänkytehdas ja valimo based in Turku. They produced 350 beds, 250 hall beds and 25 steel carts for the sanatorium.[145] They also provided the cupboards for patients' clothes, which were located in the centre of each ward. The firm also provided a number of laundry carts, instrument tables and other steel furniture. Even though the majority of timber furniture and fixed fittings were manufactured by Huonekalu- ja Rakennustyötehdas factory, also other firms were involved. The other suppliers were the factory Oy Huonekalutehdas ja Sorvimo, who providedr the entrance hall shoe shelves, and the factory Laaksosen huonekalutehdas, who provided in total 25 carts and a number of shelves for the storage spaces and laundry. The factory of J. A. Leppänen produced, in addition to the doors and windows, also the tables to the patients' rooms. Various stools were produced by the factory Wilhelm Schaumannin Faneeritehdas in Jyväskylä. Some individual chairs for the library, phone room, waiting room and main matron's office were supplied by the factory Keravan Puusepäntehdas Oy.

145 Varsinais-Suomen tuberkuloosiparantola, 54.

The wooden shoe shelves in the lobby were produced by Huonekalutehdas ja sorvimo (AAM 50-003-318).

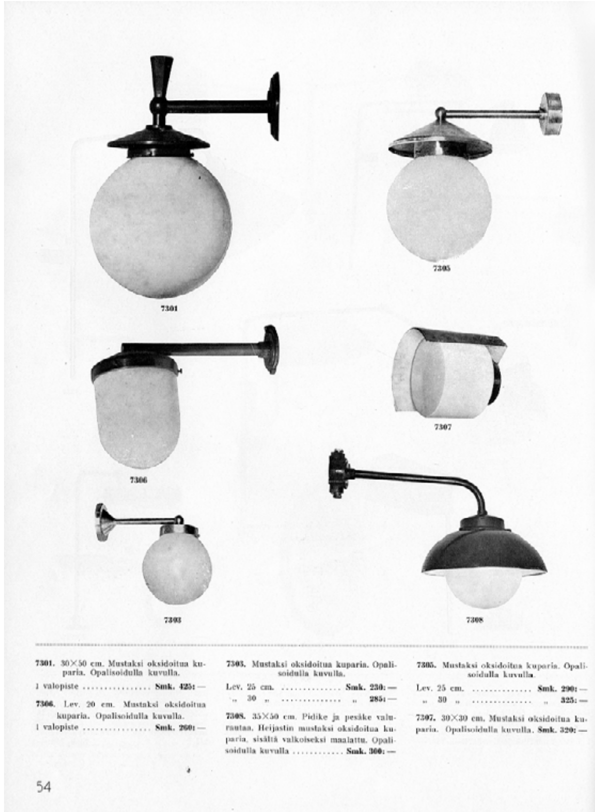
PAAVO TYNELL AND THE LIGHT FITTINGS

The lamps for Paimio Sanatorium were produced by Taito Oy, which was founded by Paavo Tynell and his partners in 1919. The company had since its beginnings close connections with architects and artists, and in the 1930s Tynell's lamps were used in almost all of the prominent buildings in Finland.[146]

Aalto had begun cooperation with Tynell's factory in the 1920s with the provision of chandeliers and metal signs, which was then followed by, for example, lighting fixtures for the Southwestern Agricultural Cooperative building, the Turun Sanomat newspaper's building and Paimio Sanatorium. [147] The cooperation lasted for a few decades and Tynell produced most of Aalto's specially designed lamps up until the beginning of 1950s. According to Pekka Suhonen, the author of Artek's history, Tynell had been close to becoming a partner of Artek in 1935 and later became a member of its board.[148]

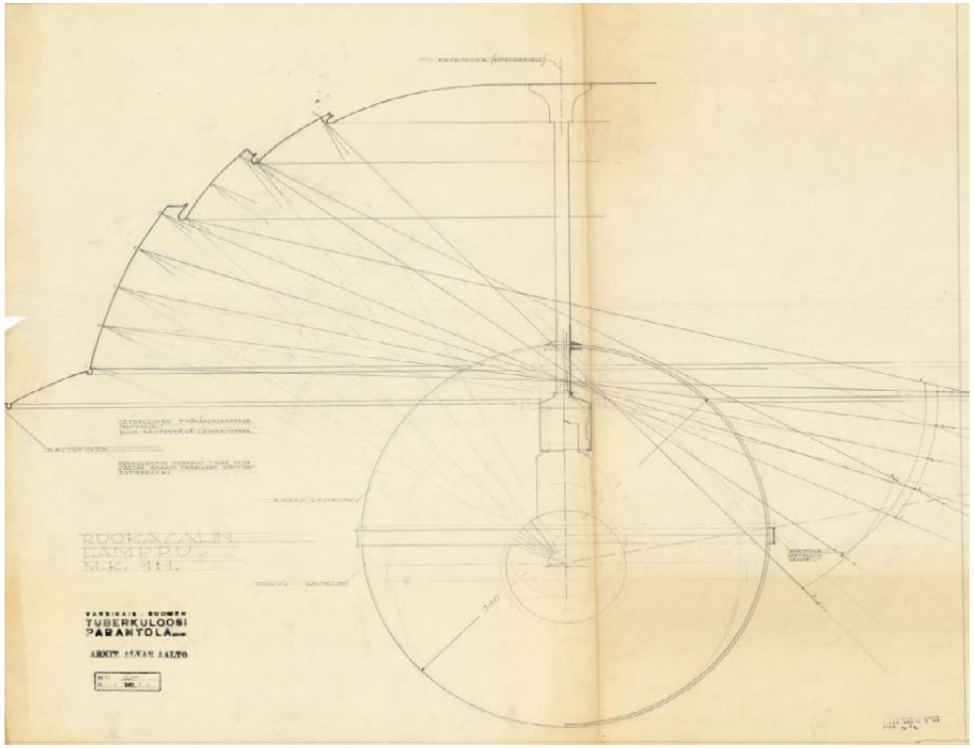
Many different lighting fixtures were designed especially for Paimio Sanatorium, and several of those became types that Taito Oy provided in its catalogues, following the idea of standardization. Some of the drawings of the lamps are also stamped with Aalto's "STANDARD" rubber stamp. Some of those were very simple designs and easily used in various buildings, and on some of the drawings are it is marked that the copyrights are owned by Taito Oy. On the other hand, for example, the rather complicated combination of the simple lamp and its semi-circular mounting placed in the ceiling of the dining hall were not regarded as standards nor marked as given to Taito Oy.

The outdoor lamp posts were also designed by Aalto. They were not produced by Tynell, but rather the company Vähäsillan paja based in Paimio, which normally produced railings and various other metalwork.[149]

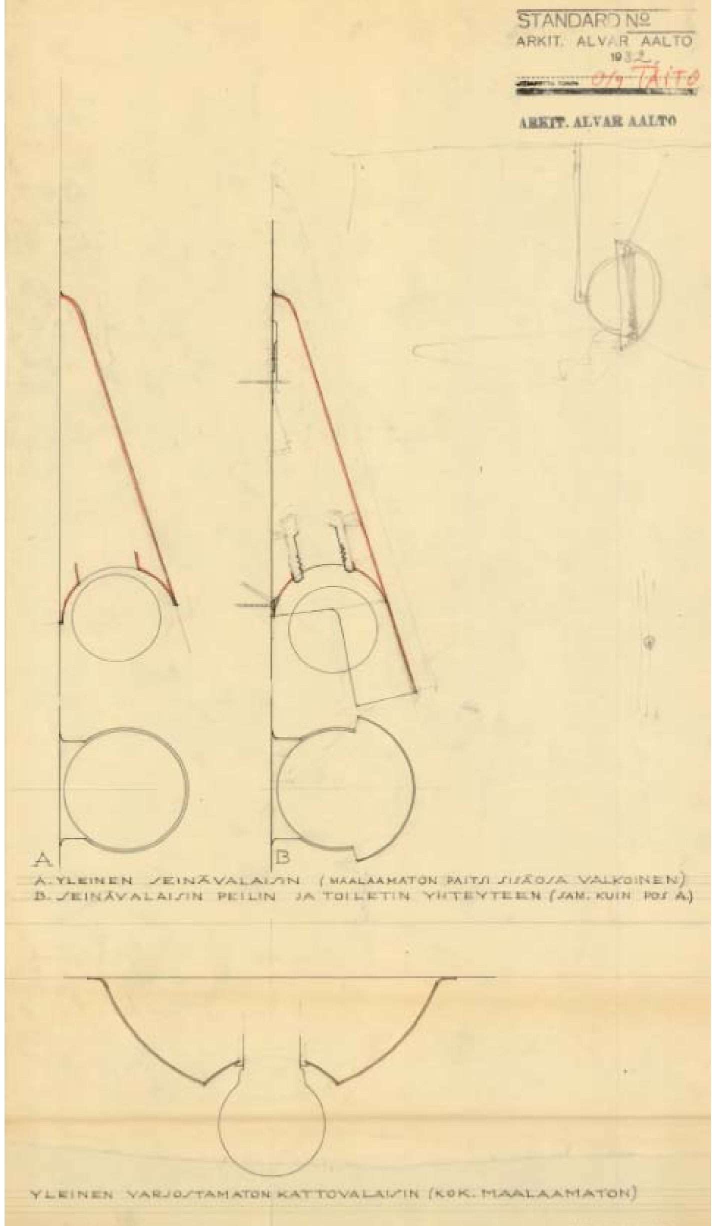


Taito Oy's catalogue N:o 10 from 1935 included lamps that were used in Paimio; for example, the middle one on the left was used on the reclining balconies (The National Library of Finland).

146 Poutasuo 2005, 25–27; Koivisto 2005, 57–59.
147 Poutasuo 2005, 25–27; Aaltonen 2005, 75.
148 Poutasuo 2005, 30, 117.
149 Aalto S.D., 61; Building committee's accounting, 558/1932.



The drawing of the dining hall lamp without the Aalto office's STANDARD rubber stamp (AAM 96-90).



A simple lamp design by Aalto used in Paimio and marked as given to O/Y Taito (AAM 96-85).

A row of ducts on top of A-wing. Note the open windows, despite the season (AAM 50-003-172).

ORIGINAL TECHNICAL INSTALLATIONS

Technically the sanatorium was almost self-sufficient. The heating was provided by its own boiler room, which was run with coal, though provided with the option to burn wood.[150] During the design and construction, also the possibility of building athe sanatorium its own electricity plant has been given consideration, though not realized, and instead the contract with the local supplier, Lounais-Suomen sähkö O.Y., was agreed.[151]

The building and design process followed the common procedure of the time. The technical working instructions described the result in temperatures and airflow, but did not exactly calculate the systems. That part of the work was left to the contractor.[152] The water, plumbing and heating systems were built by Vesijohtoliike Onninen Oy, and the installation of the water and heating systems were supervised by the companies Voima- ja polttoainetaloudellinen yhdistys and A. Hieta-aro.[153]

Water-distributed central heating had become a standard in Finnish cities by the late 1920s. Natural ventilation, with ducts leading to the roof, was regularly used in domestic buildings, but in major public buildings ventilation machinery was widely used. For example, in the Finnish Parliament House (architect J. S. Sirén, 1931) it was used in the main spaces, such as the chamber hall, kitchen and restaurant. Also the heating installations designed by Emil Keso for the Finnish Parliament building were quite similar to those built in Paimio Sanatorium two years later.[154]

150 Building committee's execution board, 21.8.1932.
151 Building committee's execution board, 23.12.1932.
152 Sainio 2012, 10.
153 Building committee's description of the overall costs, 19.12.1933.
154 The fronts of the boilers in Paimio lacked glazed tiling that was added in the Parliament House, but the system was very similar.

So far, documentation regarding the decision-making process about the ventilation at Paimio Sanatorium has not been found, but in the case of a tuberculosis sanatorium natural ventilation was the main means of ventilation, and opening the windows for ventilation was almost a self-evident habit in the daily procedures. Fleig stated in 1963:[155]

A tuberculosis sanatorium is, to all intents and purposes, a house with open windows. Mechanical ventilation does not enter into the picture because natural ventilation with fresh, ozone-rich air is of the utmost importance in the healing process.

Most of the installations and systems that were used were contemporary standard ones, but carefully designed. For example, the natural ventilation of the patients' rooms was a standard of the time, but with each room having its own duct, it proved effective and kept the hygienic separation of the patients from each other. The most advanced system was used in the main building, where the heating was distributed both with the Rayrad ceiling radiators and wall-mounted radiators. The ceiling radiators for the patients' rooms were produced by the English National Radiator Company. Those in the dining hall were produced by a Swedish company, Luth & Rosen, who also supplied the wall-mounted radiators, which included a special mounting system to prevent the gathering of dust.[156] The biological purification plant was also not a regular solution at the time. Some parts of the technical systems even proved ineffective; for example, the reserve water tank was attached to the tall chimney, which may have caused some unwelcome warming of the water. On the other hand, the installation was quite handsome and became a significant symbol of the whole complex.[157]

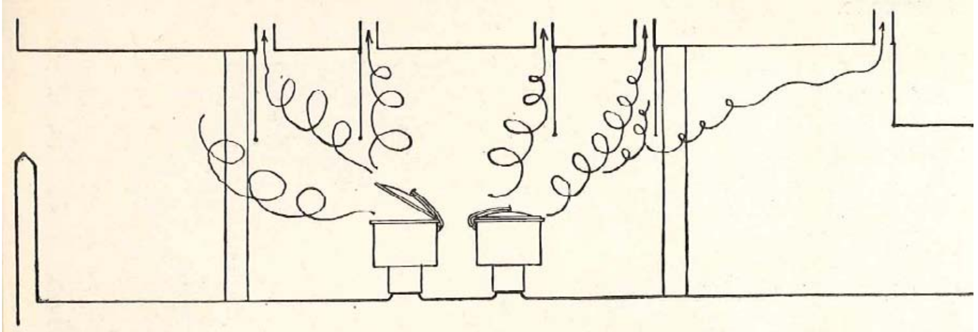
According to Jukka Sainio:[158]

The fields of construction and building techniques have appreciated neither their own history nor early installations, which has resulted in complete and irreversible demolitions during refurbishment projects.

This is also the case with Paimio, as many of the original technical solutions can no longer be found.[159]

The covers of the A-wing ducts differed from the original design (AAM 50-003-142).

155 Fleig 1963, 31.
156 Aalto; Kalkas; Savonen. S.D. 53; 75.
157 Törrönen 1983, 38.
158 Sainio 2012, 3.
159 The following chapters are brief collections of original drawings and other documentation. A more comprehensive study could be applied if fundamental technical alterations were to be designed.



A drawing by Aalto's office showing the exhaust extract systems in the kitchen was published, for instance, in Arkkitehti.

VENTILATION

The ventilation of the main building was mostly executed naturally without machinery, so that all the ducts that took the air out were separated and led to the roof. The flues had specially designed covers.

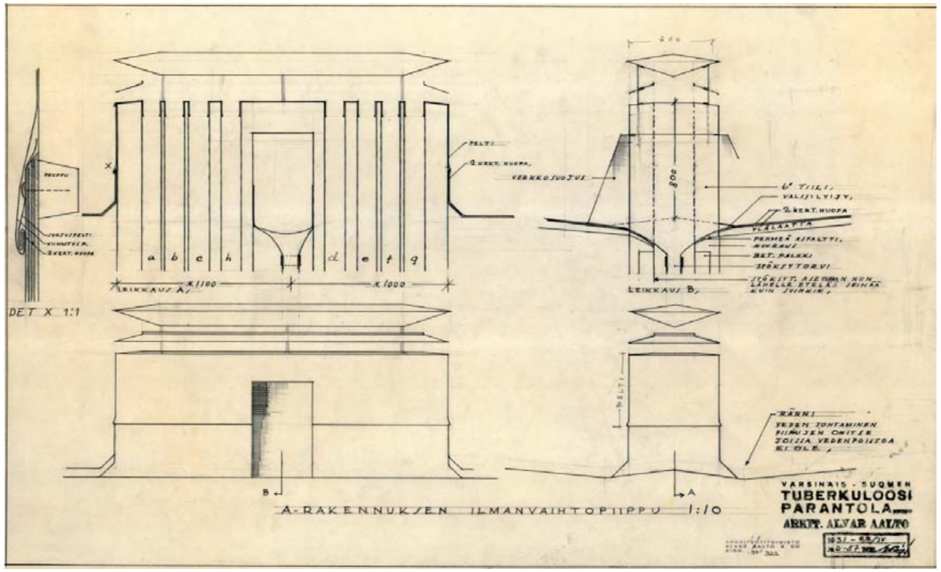
According to the working instructions, in the rooms which had to deal with extensive amounts of gas or fumes the systems were to be equipped with electrical exhaust vents. In the laundry, mangle room and drying rooms, as well as in the main bathroom and artificial sun treatment room, the incoming fresh air was to be heated in special cabinets, in which steam function radiators operated.[160] It is possible that the cabinets were never built (at least the working drawings lack such cabinets), since the air inlets were placed in the space below the windows and above the radiators. That resulted in a good airflow, while the fresh, incoming air was simultaneously heated. Most of the inlets were of a standard design, but a special lowered system was placed in the wall of the dining hall.

Only a few ventilation fans are documented in the early photographs. They cannot be seen, for example, in the roofs of the kitchen wing, but in the basement one fan can be seen at the base of a duct. In the drawings the fans are shown in the exhaust of the central area of the kitchen and one – rather peculiarly – from the porter's furniture.

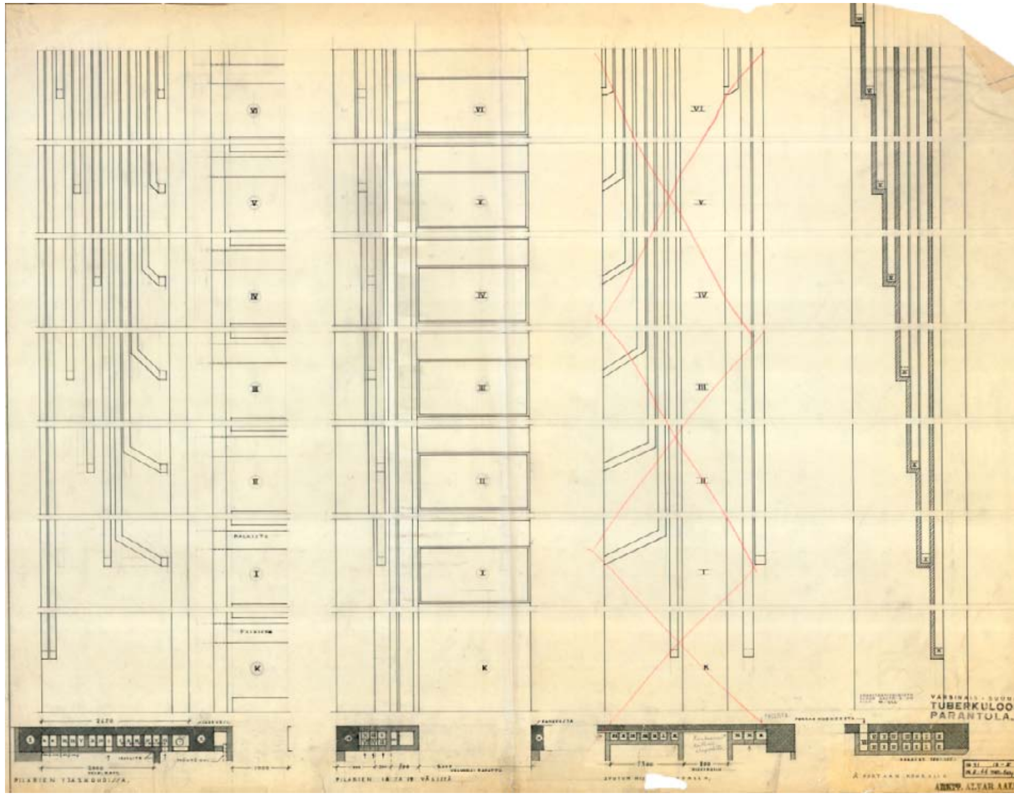
In the kitchen the air outlet was placed in the ceiling and the fumes were led out via specially designed covers, which were similar to those that Aalto used some years later in Villa Mairea. The spread of fumes was restricted by steel and glass dividing walls. In combination with the glossy white paint of the ceiling, the walls gave even a futuristic character to the kitchen.

The natural ventilation was carefully designed, even if it was not technically the most advanced system possible. Also the offices, x-ray room, artificial sun treatment room, operating theatre, and so on, were provided with natural ventilation. Thus, for instance, the patients' rooms were separated from each other, thus minimizing the mixing of bacteria. If a comprehensive system of ventilation machinery had been used, either common ducts or an enormous number of machines would have been needed.

160 Varsinais-Suomen Tuberkuloosiparantola. Vesi-, viemäri- ja lämpöjohtojen työselitys, 10.



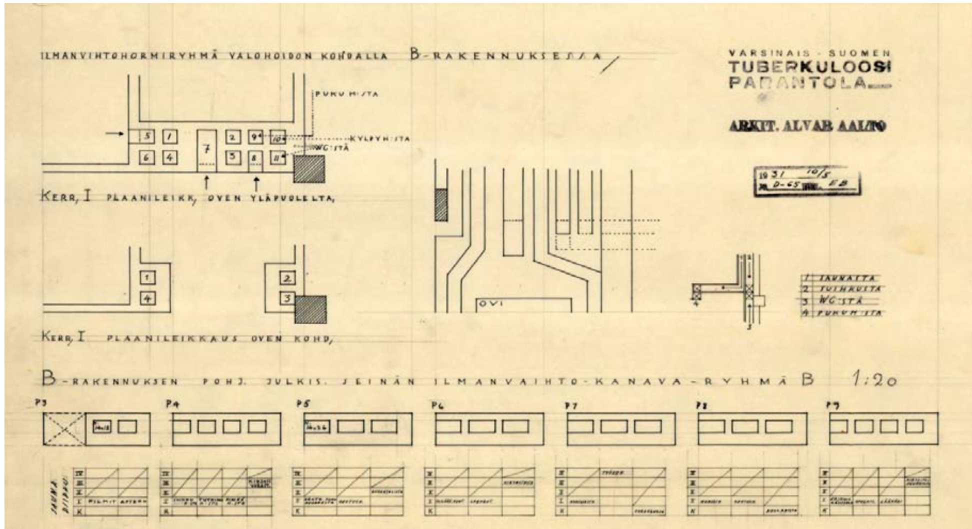
The design for the external covers of the ducts of A-wing (AAM 50–322).



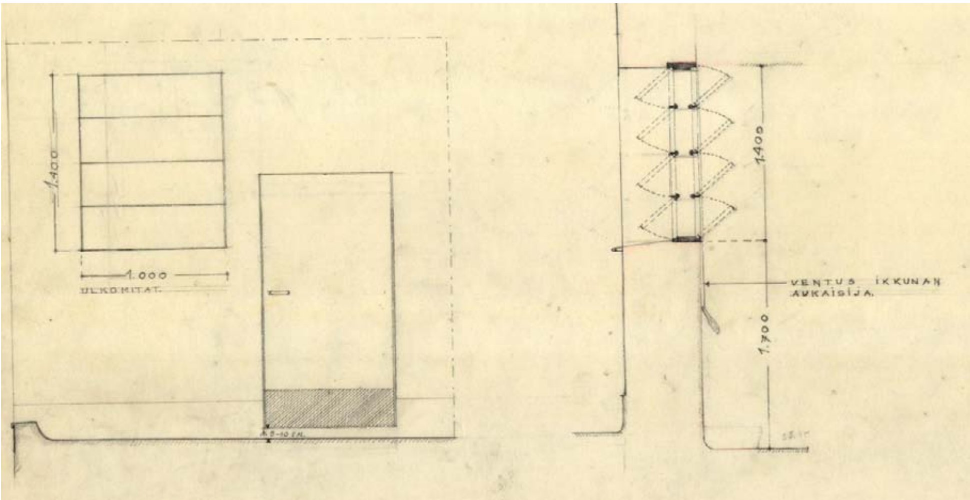
Air ducts in A-wing (AAM 50–333).

The original kitchen with air outlets and glazed steam collectors (AAM 50-003-402 Gustaf Welin 1933).

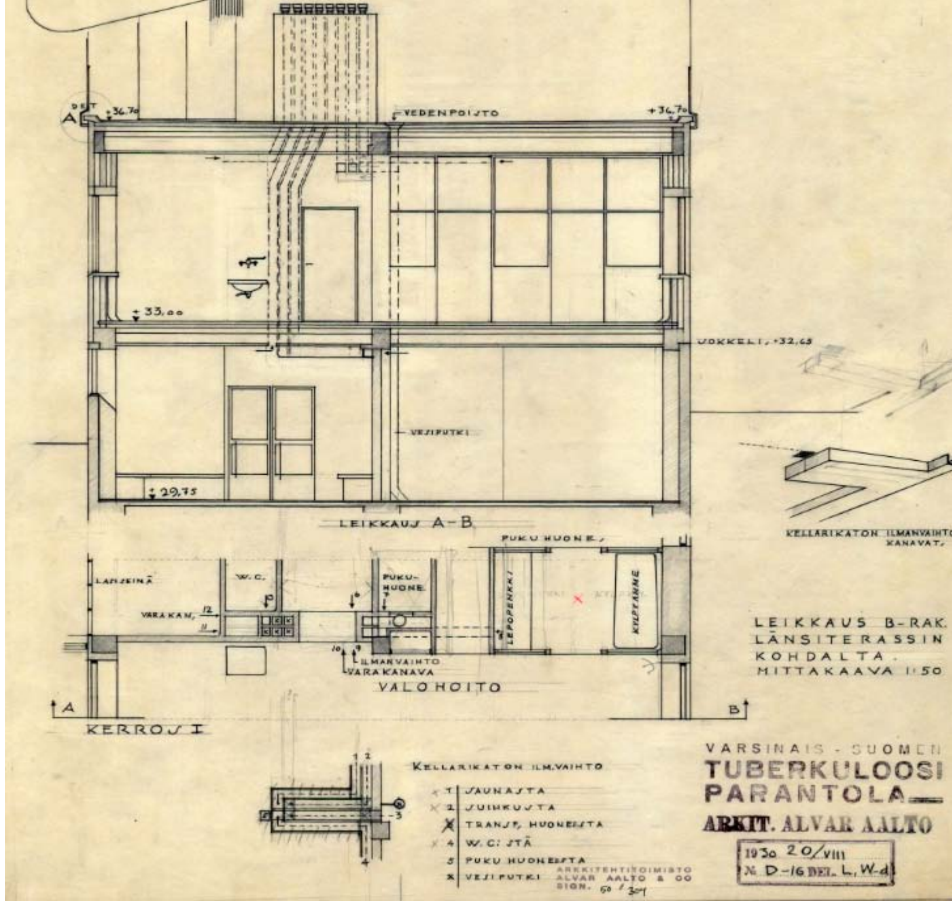
The baking oven on the basement level, an air outlet fan is visible in the far left corner (AAM 50-003-393 Gustaf Welin 1933).



The natural ventilation ducts in B-wing (AAM 50-316).

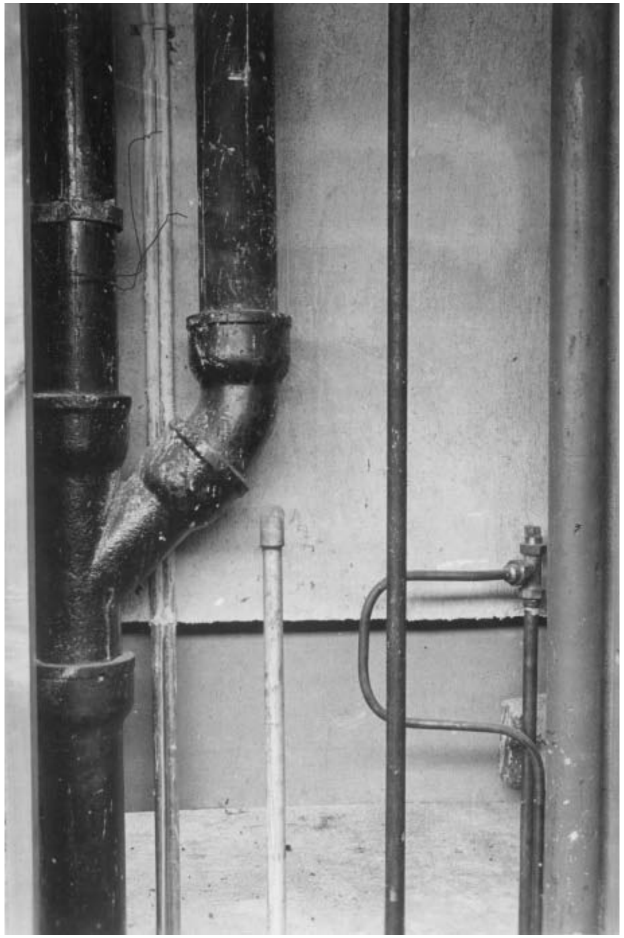


The dining hall had a specially designed fresh air inlet, but which was later removed (AAM 50–352).



The natural ventilation ducts in B-wing, section through the far end (AAM 50–304, excerpt.)

Installations in the A-wing (AAM 50-003-152 Gustaf Welin; AAM 50-003-153).



WATER PIPES AND SANITARY EQUIPMENT

In the ward wing, the fresh water pipes, sewers, air ducts and electrical wiring were placed very practically in the central wall of the corridor. The ducts could be opened on every level so that the stench traps could be maintained from the corridors without entering the patients' rooms.

The pipes were placed next to the concrete skeleton and were mostly left visible and painted in different colours according to their purpose, so that they were easily recognized.[161] The different colours are not recorded, since most of the early installations have been removed.[162] In 1933 the Swedish Technological Association gave instructions for marking the various pipes in colours: brownish red for heating, black or unpainted for gas and yellow for steam.[163] Aalto may have been well aware of the contemporary solutions in Sweden.

Most of sanitary equipment were standard products and the bathrooms and toilets were equipped in the same way as most other buildings at that time. The wash basin and the glass basin for tooth brushing intended for the patients' rooms were designed by Aalto. The idea of the wash basin was to avoid noise. Each patient had their individual basin, which in itself was a hygienic solution. The porcelain basins were produced by the Arabia factory and the glass ware spit basins were by the Riihimäki Lasitehdas glass factory.

161 Halh 1933, 65.

162 Some traces of bright red can be found on abandoned heating pipes, which have been left in the library room on the 2nd floor.

163 Stålbom 2010, 123.

Ceiling radiators in the dining hall
(AAM 50-003-397 Aino Aalto).

HEATING

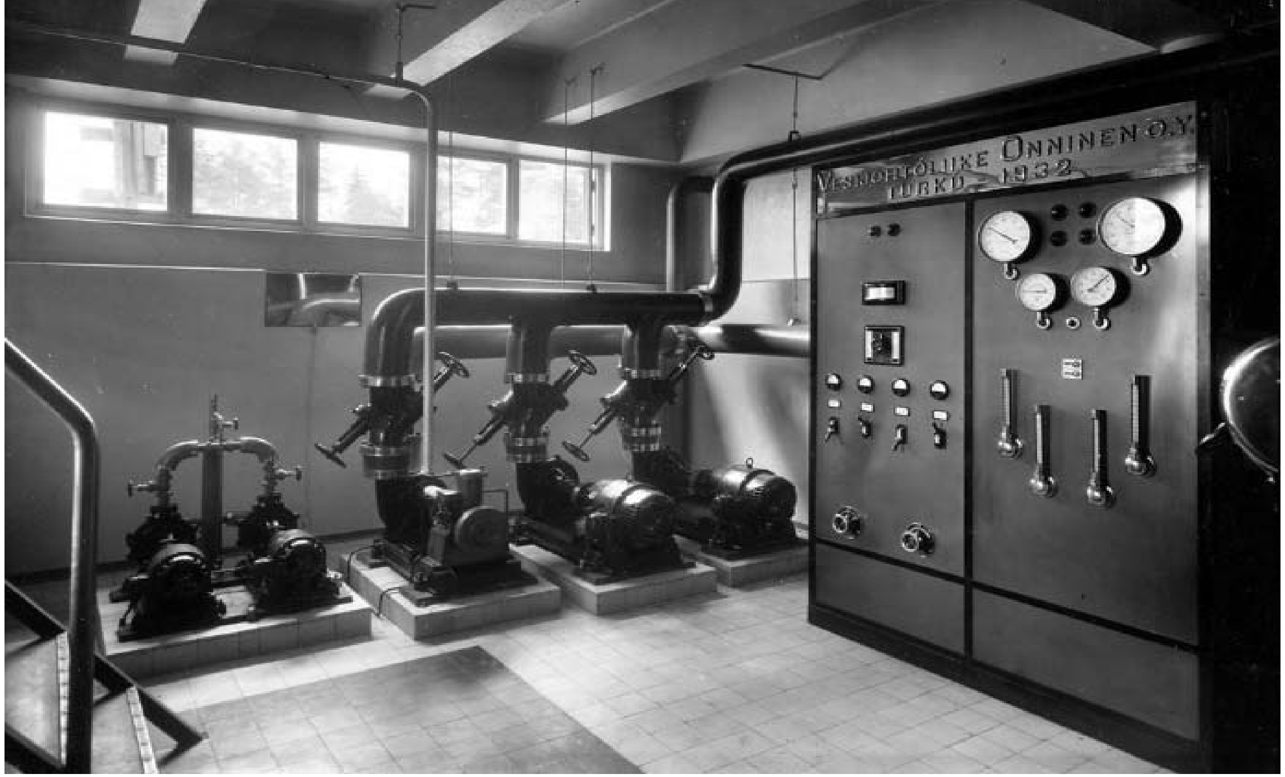
The heating system for the main building as first described in the working instructions was to comprise “regular radiators”. However; the system was partly changed during the design process and replaced by a so-called “Rayrad system” with heating panels mounted onto the ceilings.[164] Aalto explained that the heating panel is located on the ceiling of the room above the foot of the beds so that the reclining patient would not be affected by the direct heat.[165]

Many of the radiators, nevertheless, were wall mounted and with insulation placed behind them. According to the working instructions, the heating system was to be completed so that when the outside temperature was -30° Celsius, the interiors should be as follows: Patients’ rooms, bedrooms, entrance hall, corridors (except top floor) and toilets +20° Celsius; disinfection rooms, storage rooms, top floor corridor +10° Celsius; bathrooms +25° Celsius; operating theatre and artificial sun treatment rooms +30° Celsius; main bathroom, x-ray and changing rooms +24° Celsius; housing in general +18° Celsius.[166]

164 Varsinais-Suomen Tuberkuloosiparantola. Vesi-, viemäri- ja lämpöjohtojen työselitys, 9.

165 Aalto. S.D. 26.

166 Varsinais-Suomen tuberkuloosiparantola. Vesi-, viemäri- ja lämpöjohtojen työselitys. 9. The given room temperatures were rather high compared to the recollections of people who worked or were being treated at the sanatorium. There are numerous recollections of the coldness, on the other hand the habit of having windows open, even in the wintertime, is also often mentioned.



The control room with elegant equipment by Vesijohtoliike Onninen, (AAM 50-003-504 Gustaf Welin).

The pipes were left visible and painted in individual colours, as were other technical installations, so that the pipes were easy to maintain. Also the uncovered heating pipes were a source of heating in the spaces where they ran.[167]

The boilers, located in a separate building, were mostly heated with coal, and the first large shipping of coal for the sanatorium arrived in Turku harbour on November 18, 1932.[168] The type of boiler was chosen so that also wood could be used as the fuel source.[169] During the war time, the heat was gained by burning turf, which was acquired from grounds rented for the sanatorium in March 1942.[170] The use of turf continued during the late 1950s, but was terminated in 1959. In 1960 the turf plant fell victim to a fire caused by lightning, and it was never again put into operation.[171]

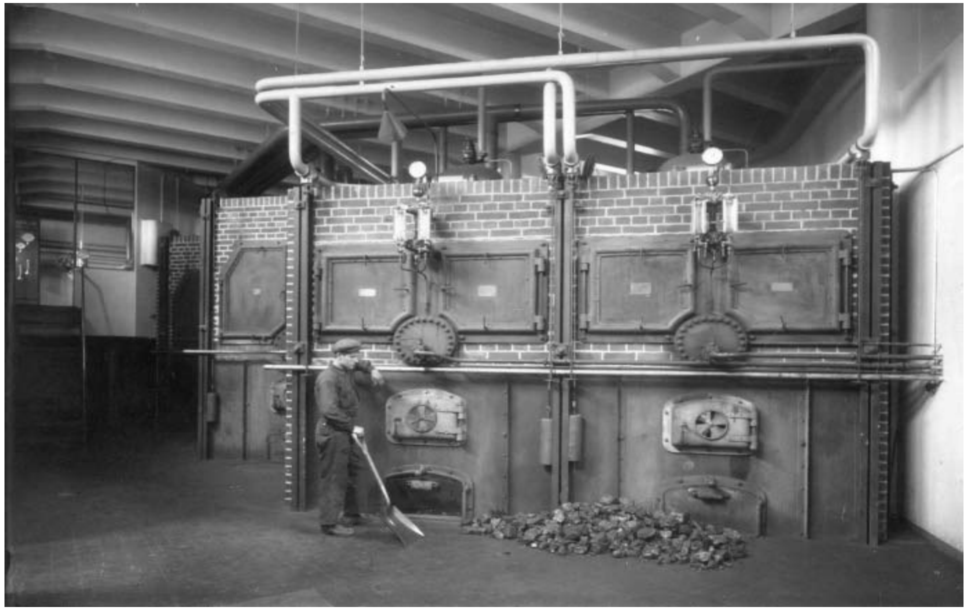
167 Hahl 1933, 65. The specific colours were mostly removed in the refurbishments during the 1980s. Traces of bright red in an original heating pipe were found.

168 Building committee receipts, 1932.

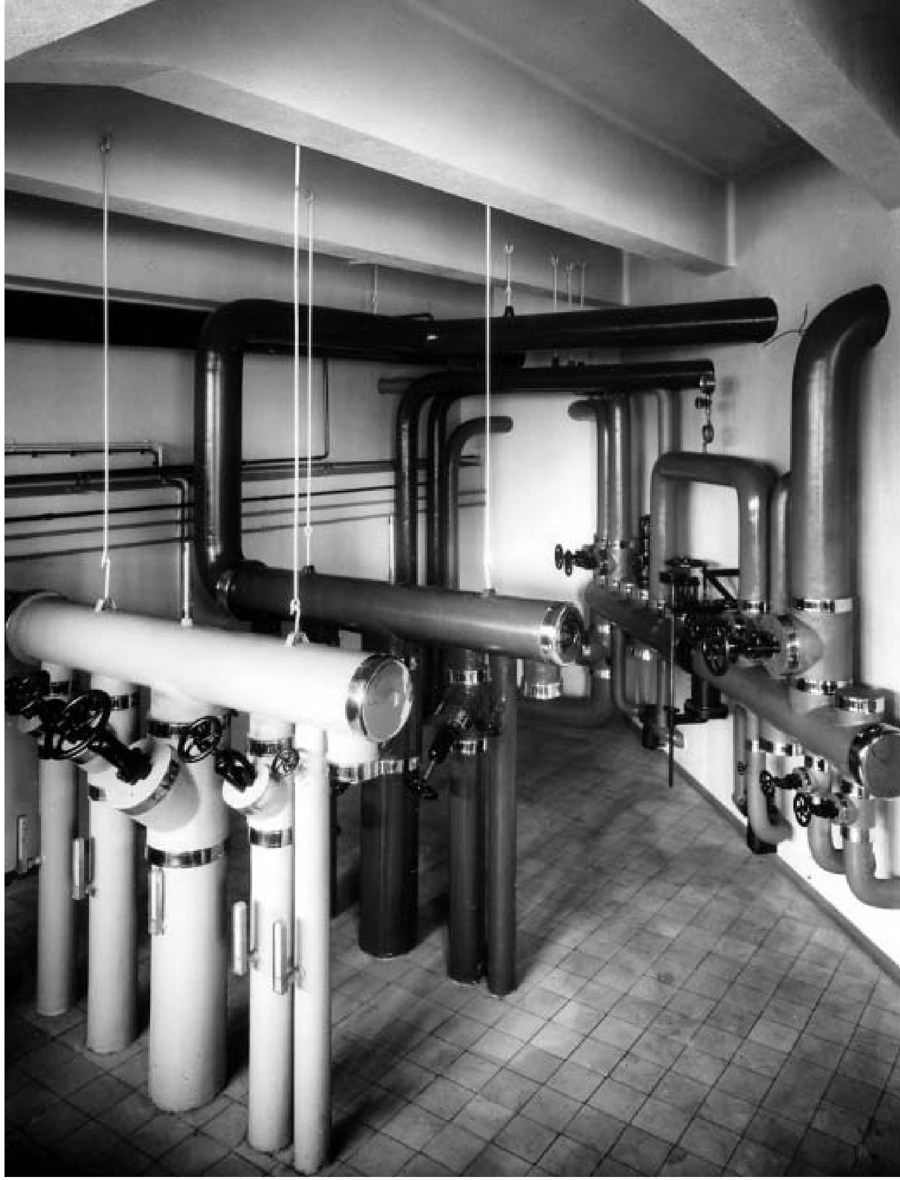
169 Building committee's execution board, 21.8.1932.

170 Jokiniemi 1958, 39.

171 Törrönen 1984, 57–58.



The heating plant in its own separate building (AAM 50-003-404 Gustaf Welin).



Different coloured pipes in the control room (AAM 50-003-411 Gustaf Welin).

WASTE WATER

The residents of Paimio were concerned about the sewer systems, which originally were planned to be executed as a "septic tank" system. This would have meant that the waste water would have been regularly collected and transported elsewhere.

The local health care authorities therefore suggested installing a biological cleaning process plant instead. This plant was ultimately designed by the engineer R. Granqvist, and built in the Paimio grounds.[172] The device necessary for grease separation was supplied by Högfors.[173]

The chief physician's house had its own separate sewer system, whereas all the other buildings were connected to the biological water purification plant. The same applied for the heating system, as the chief physician's house again had its own separate system, while the other buildings were connected to the common system.[174]

WELL AND WATER SUPPLY

The fresh water for the sanatorium came from a well near the artificial pond of Lemmenlampi within the Paimio grounds. During the careful study of the location of the sanatorium, this local water supply was expected to be sufficient. That estimation, however, turned out to be wrong and the water supply question remained a problem for decades.[175]

The water pump was placed in a separate small building next to the artificial pond of Lemmenlampi. Also this building was designed by Aalto.

ELECTRICAL INSTALLATIONS

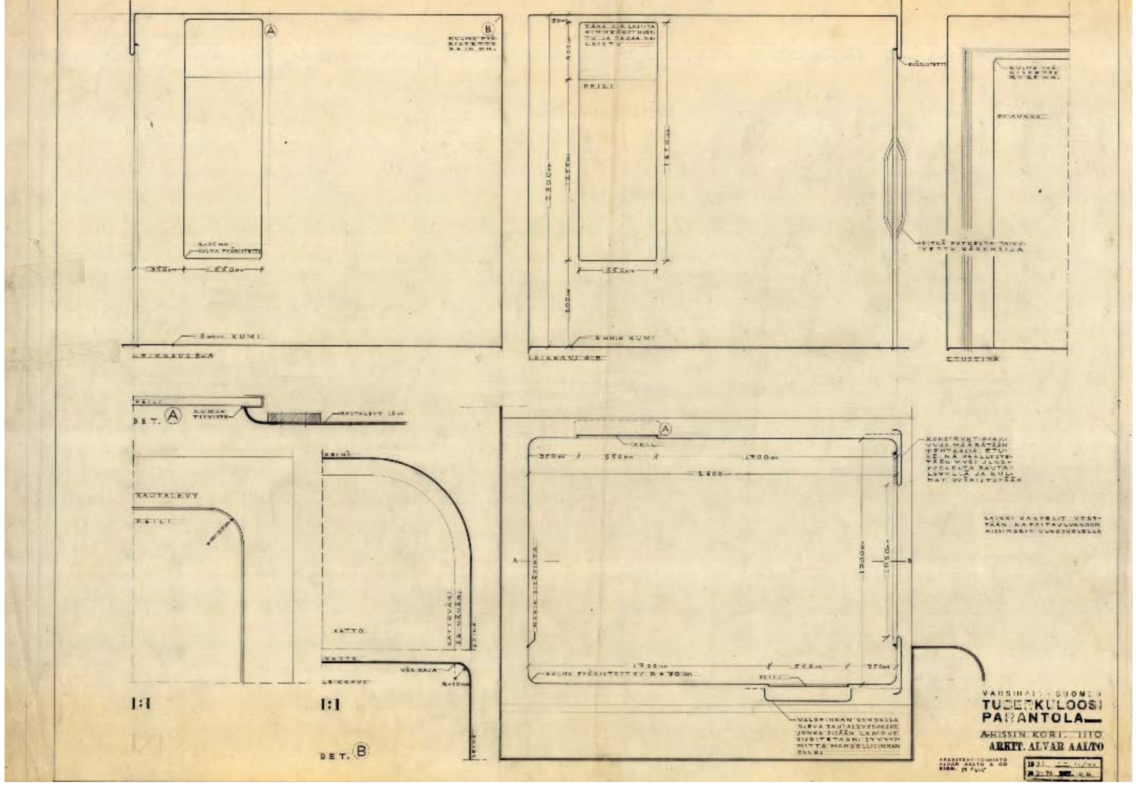
The electrical contractor was Keskusosuusliike Hankkija. In the main transformer room the different parts were separated by walls. The niches, holding the electrical installations, were closed off by timber beams in order to prevent accidental touching. The niches were further equipped with drains in case of possible oil leaks. The control room had informative paintings on the wall by Eino Kauria.

172 Kalkas S.D. 13; Törrönen 1983, 38; Building committee, 15.3.1930.
173 Building committee's description of the overall costs, 19.12.1933.
174 Varsinais-Suomen Tuberkuloosiparantola. Vesi-, viemäri- ja lämpöjohtojen työselitys, 3, 6.
175 Jokiniemi 1958, 40–41.

Transformer equipment by Hankkija, the painting work on the wall is by Eino Kauria. (AAM 50-003-405 Gustaf Welin).

The transformer room, possibly on the other side of the wall from the previous photo (AAM 50-003-506 Gustaf Welin).

The main elevators were capable of transporting 15 persons at a time over 8 stories. (AAM 50-003-344; AAM 50-003-341 Gustaf Welin).



Design for the main elevator cabins (AAM 50-355).

ELEVATORS

Elevators were an important part of the architecture in the main corridor and at the end of the patients' wing next to the apartments of the wards' chief nurses. Both had extensive glass walls showing both the machinery and movement of the elevator in the shaft.

The elevators were supplied by Turun Insinööritoimisto Oy, which produced them under license from Schindler. Four elevators were used for transporting people, one for goods, and one specially divided into two sections to transport the sputum mugs.[176] The building committee emphasized that the elevators were not more expensive than those available from other producers, but they were generally Finnish products.[177] The drawing of the elevator cabin defines the changes of the wall and ceiling colours, but doesn't mention the actual colours used.[178] According to the patients' magazine, the main elevators had different colours, one blue and one red.

176 Aalto, Kalkas, and Savonen, S.D. 57.
177 Building committee's description of the overall costs, 19.12.1933.
178 AAM 50–355.

The steam cooking equipment in the kitchen (AAM 50-003-403 Aino Aalto).

The laundry in the basement of C-wing, (AAM 50-003-410 Gustaf Welin).

KITCHEN

The kitchen was divided into different levels so that the main storage rooms were in the basement, while the bakery and further storage rooms were on the ground floor. The main kitchen was on the first floor and was connected to the dining room. The first-floor level also contained the major installations. The ovens were originally wood heated, but were replaced with electrical ones during the 1950s.[179]

The suppliers varied for each item of equipment, which in a well-equipped contemporary kitchen was plenty: steam cookers, potato washers, at least two different dish washers, and so on. The kitchen also included cool rooms, the machinery for which was supplied by the electrical main contractor Hankkija.[180]

A sign of great luxury was that the homes of the physicians and financial manager were equipped with refrigerators delivered by O/y Electrolux.[181]

179 Törrönen 1983, 59.
180 Building committee's description of the overall costs, 19.12.1933.
181 Building committee's description of the overall costs, 19.12.1933.

The sputum mug washer and original cups (AAM 50-003-408; AAM 50-003-386 Aino Aalto).

LAUNDRY

The contemporary laundry equipment was a crucial part of the hygienic processes. Located in the basement, the laundry was accessed via the main elevators and the wards had a shaft for dropping laundry directly to the basement.

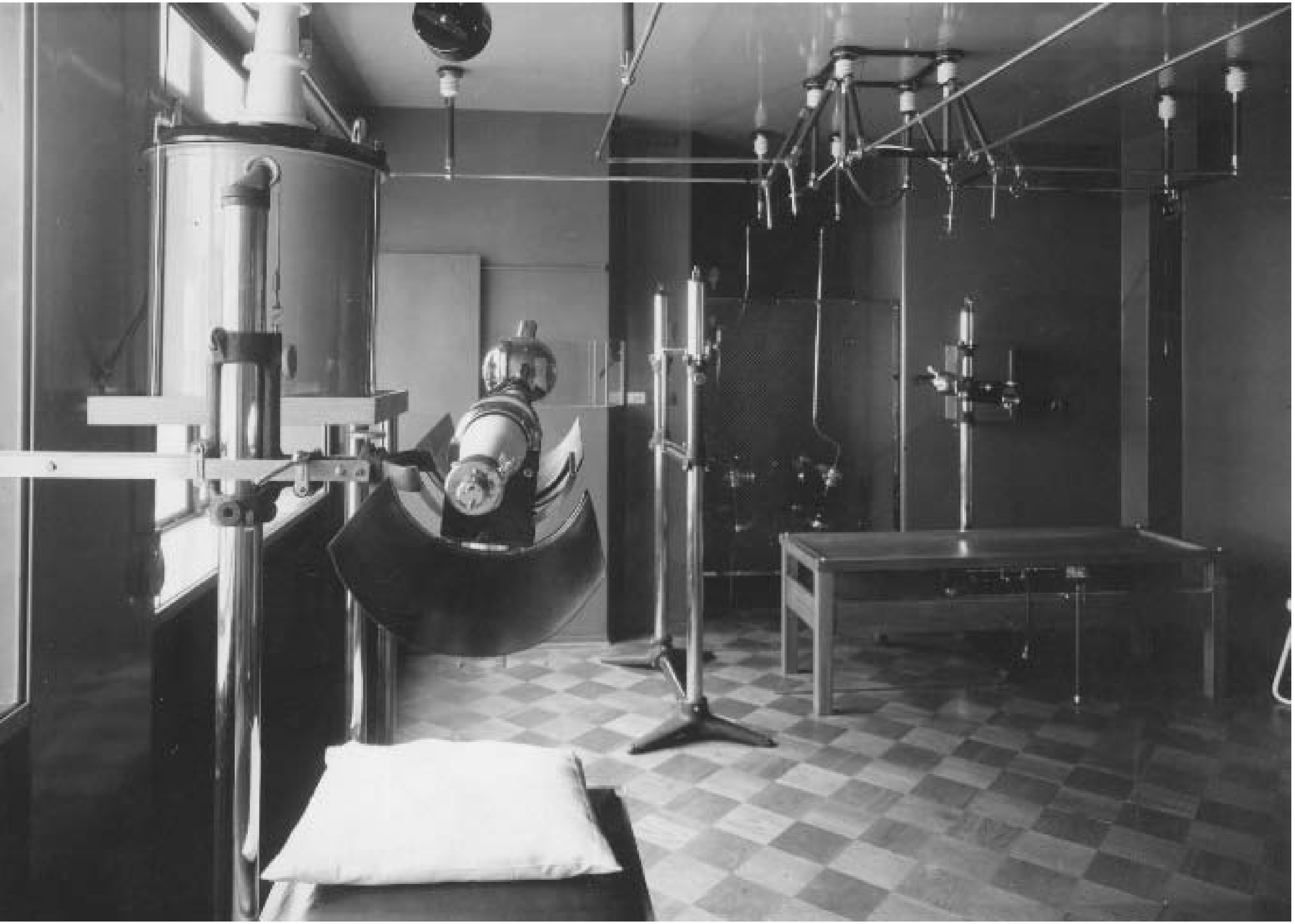
The large washing machines and mangle were produced by Pietarsaaren Konepaja O/Y, thus again being equipment of domestic origin.[182]

DISINFECTION

Located on the basement level was a disinfection room with a washer for the sputum cups, which had been developed and produced by a company called OY. Metalliteos.

Other disinfection equipment, which was also located in the basement level of A-wing, was supplied by Siemens & Schuckert, and the decision to purchase it from abroad had been made on the basis of the consultants' recommendation.[183]

182 Building committee's description of the overall costs, 19.12.1933.
183 Building committee's description of the overall costs, 19.12.1933.



The original X-ray machinery located on the ground floor of B-wing, (AAM 50-003-371 Gustaf Welin).

Hatch to the sterilization equipment room from the operating theatre, (AAM 50-003-380).

Operating theatre on the ground floor of B-wing, with a curved radiator, (AAM 50-003-374; AAM 50-003-375).

MEDICAL INSTALLATIONS

In the early years, the medical installations included the X-ray machinery and artificial sun treatment lights, which both were produced by O/ Y Aage Havemanns EFT. A/B., and were located on the ground floor of B-wing.[184]

During the 1930s, the technical installations in the operating theatre included the following features: a roof-light and extensive windows provided abundant daylight in the curved space with the operating table in the centre; next to the operating theatre was a rather small space for the sterilization of the equipment and they could be passed to the theatre via a hatch in the wall.

184 Building committee's description of the overall costs, 19.12.1933.

The chief physician's house in the 1930s (AAM 50-003-466).

OTHER BUILDINGS

The first phase of the construction of Paimio Sanatorium included, in addition to the main building, nine other buildings designed in Aalto's office: the chief physician's house, and sauna, the row house for assistant physicians, the staff housing, a garage, heating plant, water pump station, mortuary and greenhouse. In addition to these was the water purification plant, the designer of which may have been Aalto or possibly the engineer Granqvist. These buildings are described in the following chapter, while the alterations and additions are presented in the section Extensions and Renovations.

According to Raija-Liisa Heinonen,[185] housing was among the first building types in Finland to follow the trends in contemporary architecture. Aalto was one of the first Finnish architects to become involved with the contemporary ideas about housing as an architecturally important task, in the wake of the CIAM congress in Frankfurt in 1929.[186] The junior physicians' row house and staff housing were presented in *Arkkitehti* 6/1934, a year later than the sanatorium. The presentation was rather compact, only one page for the staff housing and one for the row housing.

Kaarlo Albert Kilpi, who was the main building supervisor on the construction site, designed the concrete structures for the mortuary building, the staff housing and assistant physicians' row house as well as the pumping station, the car shelter building and the technical building.[187]

HOUSING IN AALTO'S OWN WORDS

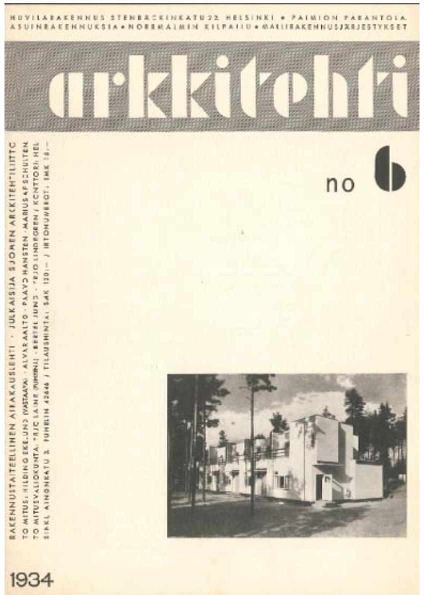
Alvar Aalto described the staff housing and assistant physicians' row house in Arkkitehti 6/1934:

The competition brief for the Paimio Sanatorium [in 1928] included specific requirements for different sized apartments for officials and staff. During the implementation, the programme was altered so that in the staff housing all the dwellings were made the "same size", but with such a system that the bedrooms were connected to the main group (living room and kitchen) alternatively. One, two or three bedrooms can be connected to a main group. The connections can be executed even after the building is completed and in use. As a result of such a system, there is the possibility that instead of the person's official position or other representational aspects, the number of children in the family may determine the size of the apartment.

185 Heinonen's research on functionalism in Finland was a pioneer work as early as in the mid 1970's. Due to sudden death of the author, it was posthumously published in 1986.

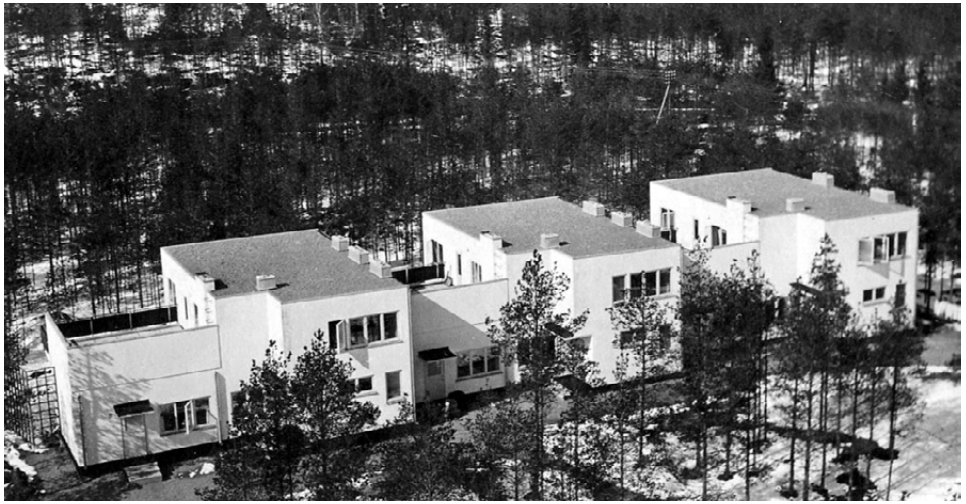
186 Heinonen 1986, 208, 224.

187 Building committee accounting, receipts 142/1930, 122/1931 and 275/1931.



The assistant physicians' row and staff housing featured in Arkkitehti *6/1934.*

The completed staff housing
(AAM 50-003-432 Gustaf Welin).



Assistant physicians' row house in the 1930s
(AAM 50-003-443a).

This "system of elastic apartment size" in practice exists only in the staff housing; the apartments of the actual officials (physicians) are part of the row house system, in which the most significant aim has been to separate the families from each other in as much as the lamellas allow it. The main means to achieve this has been to prevent the neighbour's view to the immediate surroundings of the house and the terraces of the others apartment by using two building widths.

The work has beencarried out in the form of separate partial contracts, and engineer K. A. Kilpi was the main master builder.

In the architect's office, architect Aino Marsio-Aalto has participated in the preparation of the drawings and draughts and carried out some interior designs.

CHIEF PHYSICIAN'S HOUSE

The chief physician's house, completed in 1933, was originally a rather large single-family house. The flat roofed house matched the contemporary white-washed architecture of the sanatorium's main building. The house was located on a slope facing south-west. The eaves of the building were altered by Aalto's office as early as in the 1930s.[188]

The interior of the house was divided by the functions suitable for the way of life of the chief physician. The ground floor comprised a series of hierarchically prominent spaces for entertaining guests and, on the other hand, servants' spaces hidden from view. The series of prominent spaces consists of the foyer, library, living room and dining hall. The service spaces had their own entrance and even the stairs leading from the foyer to the first floor could be closed off by a curtain. The first floor comprised bedrooms for the family and a bathroom as well as a rather large terrace above the living room.[189] Both the exterior and the interior were designed following the functionalist ideas of the time, and, for instance, on the main level the major spaces were connected to each other via large opening. However, the vertical continuity of spaces was not particularly taken into account in the realized house.[190]

ASSISTANT PHYSICIANS' ROW HOUSE

The hierarchy of the sanatorium was particularly evident in the housing facilities. Second in the hierarchy of staff, after the chief physician, were the assistant physicians. They were provided with a row house, also completed in 1933, comprised of three family dwellings.

The row house had been a contemporary idea in the late 1910s and Aalto had designed one as a student exercise in 1919, but the row house at Paimio was the first of its type by Aalto to be built. In fact, the design was the same as Aalto had used in his competition entry for the Kälviä sanatorium in spring 1929.[191] Aalto developed the design after the competition and, according to Heinonen, it become a much more interesting combination of terraces and lower and higher building volumes, creating a variety of sheltered exterior and interior places, providing simultaneously relatively good privacy.[192]

The mortuary under construction (AAM 50-003-251).

188 Böök 2011.
189 Böök 2011.
190 Heinonen 1986, 225.
191 Nikula 2014, 81–83.
192 Heinonen 1986, 225–226.

STAFF HOUSING

The staff housing was an interesting study in developing minimum apartments. The ground floor was an ingenious system of four flexible and variable-sized apartments, as Aalto explained in Arkkitehti 6/1934. The ground floor was a kind of row house, but the first floor was divided differently into single-room dwellings. The entrances to the first-floor dwellings were via a common walk-way and balcony.[193]

MORTUARY

The mortuary was already in Aalto's competition entry an exceptional square-shaped building partly dug into the ground. It was developed, however, during the design process to become a circular underground dome, completed in 1933. A wooden door leads into a chamber lit by both a skylight roof light and electrical light. At the rear of the space was an autopsy room. The floor was red brick and the dome cast concrete with traces of the timber shuttering visible. The walls supporting the concrete dome are plastered brickwork as are the partition wall, which had an abstract mural by Eino Kauria. The mortuary soon acquired the nickname "Rose cellar", possibly due to the roses planted on the artificial hill, resulting in the underground structure.

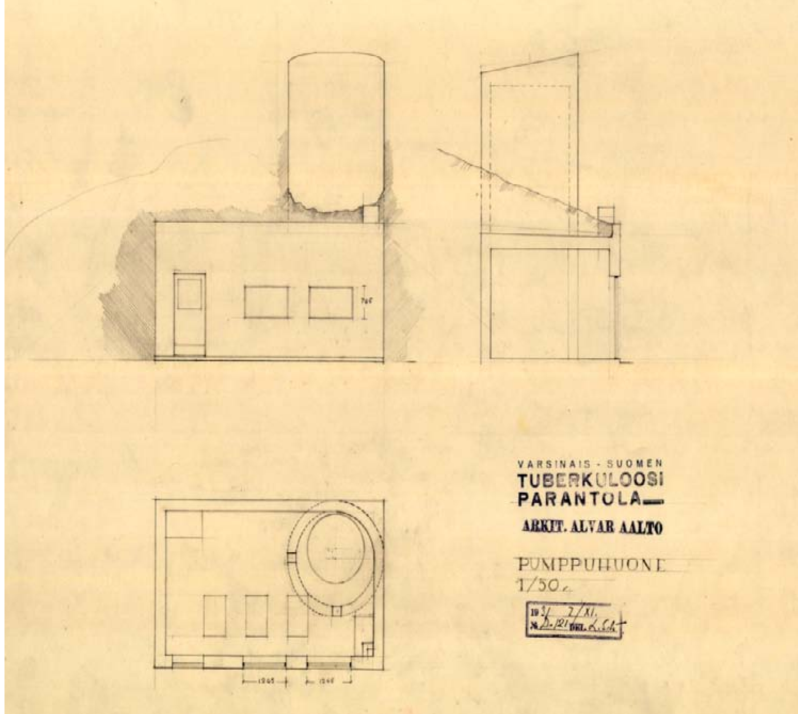
GARAGE AND HEATING PLANT

In Aalto's competition entry, the garage and boiler room were situated in the basement level of the kitchen wing, but during the design process they were separated into two small units situated next to the main building. The machinery room of the boiler house was experimental and unconventional, so that in the case of an explosion the roof would be the first part to break and no further buildings would be affected.[194]

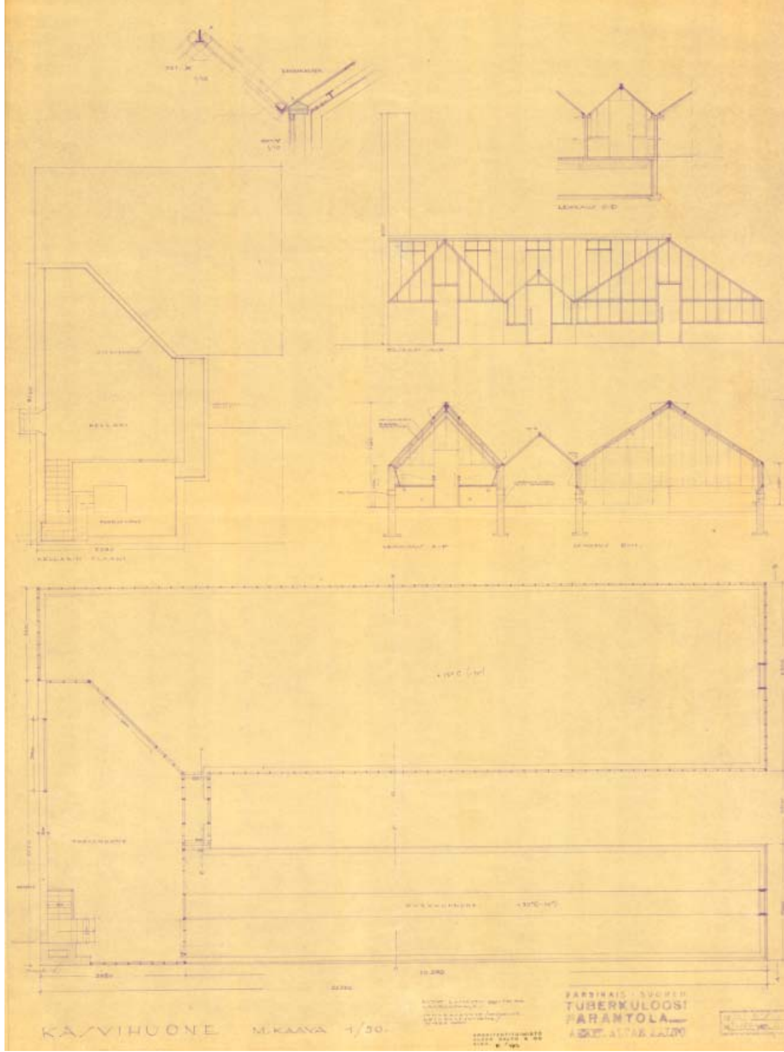
The heating plant, in the foreground, under construction (AAM 50-003-488 Gustaf Welin).

The abandoned water purification plant at Paimio in 2015 (AAM Malmberg).

193 Heinonen 1986, 226.
194 Törrönen 1983, 37–38.



Design drawing for the pump station (AAM 50-237).



Drawing for the design of the greenhouses (AAM 50-483).

PUMP STATION

The water pump station located next to the Lemmenlampi artificial pond was also designed by Aalto. The concrete structure gives the small building an appearance that reminds one of a watch tower. It was party dug into a slope, so that only the round part was visible from every direction.

Next to the pump station is a concrete structure that was necessary to create the artificial pond, Lemmenlampi. The structure has functionalistic features, such as the round platform. The original drawings of the structure have gone missing.

GREENHOUSE

The greenhouse was added to complex during the design process. Aalto designed the necessary building and received a fee for it in December 1932.[195]

The designed building comprised two sections, a smaller one for cucumbers and a larger one for other plants. The building also had a basement where the heating plant and fuel storage were placed.

195 Building committee accounting, receipts 637/1932.

WATER PURIFICATION PLANT

The drainage was discussed during the design process, as mentioned earlier, and a separate waste-water purification plant was built. The concrete structure, with a long opening strip window at the very top, was an elegant design. The original drawings have not been found, nor is the author of the design known for certain. Thus it is not clear to what extent Aalto was involved in the design, though engineer R. Granqvist was involved in the design.[196]

PAIMIO AND THE MEDICAL DEMANDS ON ARCHITECTURE

In this section the medical demands on tuberculosis sanatoria are explained and compared to the solutions that Aalto used and developed in Paimio.

The therapeutic strategy and the particular necessity for the patients' cleanliness and isolation placed specific demands on the planning of the sanatorium which had to facilitate the specific therapeutic measures. As mentioned earlier, the therapy for tuberculosis underwent developments and variations and was never an absolute given. The basic elements of the cure had programmatic implications and posed certain demands on the architecture. The medical demands can be seen as a framework that still left space for architectural interpretation and experimentation.

The following needs and aspects are reflected in the planning of Paimio Sanatorium, as discussed in the following sections:

1. (relative) separation of the complex from its surroundings
   a) people
2. b) (waste) material
3. provision of a specific internal layout that would allow for the (relative) separation between patients and staff but also among patients (to avoid cross-infection)
4. provision of a hygienic interior (materials, surfaces)
5. provision of well-lit, well-ventilated rooms
6. provision of specific therapeutic spaces for the "natural therapies"
7. (later) provision of operating theatres and associated aftercare units for the surgical therapy

196 Kalkas S.D. 13; Törrönen 1983, 38; Building committee 15.3.1930.

SEPARATION FROM SURROUNDINGS

The aspect of isolation or segregation was fundamental to the planning of the sanatorium, and concerned the sanatorium complex on different scales.

The encounter between inside and outside had to be negotiated in order to limit the contact between sanatorium interns and the inhabitants in the surroundings. One of the assigned tasks of the sanatorium was to isolate the TB patients, if only on a temporary basis and thus to inhibit contact between the patients and the public.

Although most sanatoria admitted their patients on a voluntary basis, and the separation was not to be permanent, the site was usually protected by a fence or high wall with guards regulating the entrance. This ensured that the patients would remain within the premises and also that outsiders (from curious neighbours to patients' family members) would not attempt to trespass and thus risk infection. It was, however, not only the flow of interns, patients, staff and potential visitors which had to be organised in a safe manner. A further problem was the transport and storage of dead bodies. This was, of course, not only a logistical problem. Psychologically a death amongst patients was undesirable and should thus be hidden from sight as well as possible. The alpine resorts usually moved the bodies late at night to avoid an encounter with patients. Famously, the Waverly Hills Sanatorium in Louisville (U.S.) employed a former transport tunnel to send the bodies on their last journey.

Also the morgue in Paimio was consciously positioned and well hidden in the grounds. Overgrown by grass, the vaulted space sits west of the main building. Bodies were kept there for several days during which time the families were informed and a burial could be arranged in the respective home cemeteries.

Especially after the discovery of the TB bacterium in 1882, it became crucial to protect the sanatorium's surroundings from any potentially infectious waste material. Large sanatorium complexes such as Beelitz, Zonnestraal or Paimio therefore established elaborate laundry and disinfection facilities to wash and disinfect patient laundry and bed linen on the premises.

Paimio Sanatorium furthermore built its own water purification plant to block any infectious material from leaving the grounds. How the plant was built is described in the chapter on technical installations.

SEPARATION BETWEEN STAFF AND PATIENTS

Isolation was, however, not only relevant on an urban scale. Also in regard to the internal arrangement of the institution, segregation was fundamental. The building had to be arranged in such a way that the encounter between patients and service personnel was limited. To avoid cross-infections, a (relative) separation or safe encounter had to enabled among the patients and between patients and medical staff.

The houses and apartments of the physicians and nurses (if they lived on the premises) were usually situated at a distance from the patient spaces in order to discourage private encounters between staff and patients. Servicing functions such as heating plants, kitchens, laundry rooms or storage spaces were furthermore clearly separated from patient spaces.

In Paimio the separation was not strict for the entire staff. Only the physicians' housing was clearly separated and also one staff accommodation building was positioned separately. In the latter case, the ground floor was intended for families and the first floor had small bedsit units. A number of employees, however, lived in the main building; the chief nurse had an apartment on the fifth floor of B-wing beside the apartment for the nurse incharge of the X-ray department, and the head nurses of each ward had apartments at the end of each ward. The kitchen staff had bedrooms almost in a hotel-like layout above the kitchen.

In Paimio some of the daily routines were also such that the separation was not strictly taken into account, as the medical staff ate with the patients and patients joined the tasks in the laundry, kitchen, agriculture, maintenance, and so on.

The patients have also recalled festivities which both the staff and the patients were attending. Those took place at least in Midsummer and Christmas. And chief physician , At least in the mid-1930s, April 25, the name day of the chief physician, Markus Sukkinen, was celebrated in the sanatorium, with the whole day regarded as special: there were no rest hours, but walking and outdoor activities, and in the evening a party with lotteries, dancing, and so on, took place. A female patient recalled being one of the lucky ones, who got a dance with the chief physician Sukkinen himself.[197]

Also some arrangements in the main building did not follow a principle of strict separation. The corridor in the basement below the entrance hall resulted in crossings between clean and dirty. The laundry to and from the wards was moved along the corridor to the basement of C-wing. Also the patients went to and from the bathroom facilities along the same corridor. Nevertheless, the main

197 SKS archive.

disinfection sections were well separated in their own area in the basement of A-wing, and the small operating theatre had its own disinfection room. On the other hand, the only access to the operating theatre was from the same corridor where the patients were waiting to meet the doctors and the theatre itself was separated from the corridor by only one set of doors .[198]

HYGIENIC SURFACES AND INTERIORS

To ensure cleanliness, the patient rooms in tuberculosis sanatoria would have a specific arrangement. In Paimio, for example, every patient had his or her own wash basin, and generally every sanatorium aimed to provide more toilet and shower facilities per person than would have been provided in the average hospital at the time. To avoid cross infections, the patients subscribed to strict behavioural rules,[199] and patients would keep to their assigned spaces, for instance, to their personal seat in the dining hall and on the balcony. This emphasis on cleanliness and separation was to protect the sanatorium staff from the disease, but also to educate the patients about how to behave, once they returned to their families and places of work.

In order to ensure that dirt and bacteria could be washed away easily, the sanatorium interior had to consist of smooth, unornamented surfaces and materials, which would not absorb humidity (e.g. glass, tiles or lacquered wood).

Together with the clear separation of functions, it was this emphasis on washable, smooth surfaces, and materials such as glass and steel which explains also why the sanatorium became such an important point of reference for modernism.

The materials that were chosen for Paimio were contemporary and easy to clean, such as rubber floors, linoleum, ceramic tiles, and glossy paint, and in the bathrooms so-called Stalfit, which was a domestic seamless coating method.

One major technical means for hygiene was the sputum elevator and cleaning process, which was set up with a small special elevator. The small cabin was divided from the middle so that the dirty cups were handled from the room on the right and the clean ones on the left. In the basement there were special disinfection facilities and a special washer for the sputum cups.

Bathroom in the basement of B-wing (AAM 50-003-368).

198 The hygienic demands of the surgical operations became higher and were more carefully taken into account in the late 1950s when the new ward was built.

199 For example, patients would always carry their personal bottles to dispose of the sputum.

FRESH AIR AND LIGHT

The exposure to sun and fresh air was originally anchored in the natural therapy. It remained fundamental also for the TB therapy, or especially after the discovery of the bacterium.

This bacterium would survive in stagnant air, in dark corners and within dust particles for months or even years. The exposure to light, however, would kill the bacterium and the cross ventilation of patient rooms would ensure the immediate removal of the infective agents.

The aim to "live in well-aired and well-lit rooms, so that the germs, taken up in air, can be rapidly carried away by the flow of air or killed by light"[200] was subsequently demanded by scientists such as Robert Koch and should concern not only sanatoria and hospitals but also the domestic and the work environment.

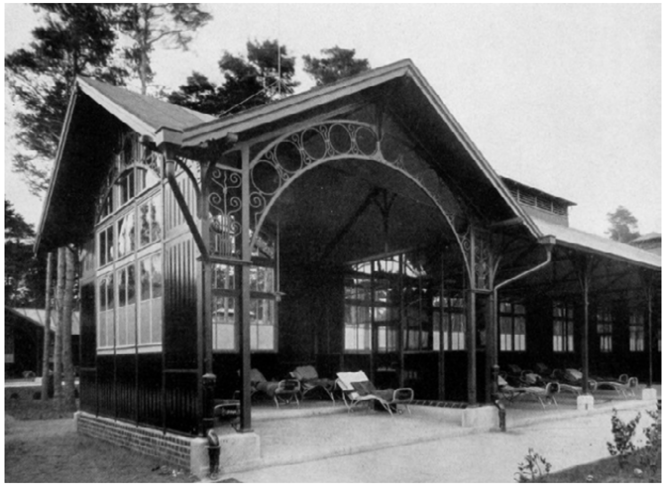
In Paimio the overall concept of arranging the wings of the main building was based on the principle of optimizing the sunlight, which was indeed one of the key elements in contemporary functionalism. The technical solutions were rather conventional but carefully designed, as explained in the previous chapters discussing the technical installations. The system of natural ventilation was used in most of the spaces, such as the patients' room, where windows could be opened and tall ducts ran from each space to the roof. Only a few outlets in the kitchen, for instance, were equipped with fans. The natural ventilation was in harmony with the ideas of natural therapy.

SPECIFIC THERAPEUTIC SPACES

The provision of specific therapeutic spaces for the natural therapies depended on the treatment and the respective convictions of the medical director. Generally, there was a demand for balconies, terraces or reclining halls for the sun and open air daybed cure, and eventually spaces for the application of water therapy, walkways in the natural surroundings, and generally spaces for exercise, occupational therapy and also eventually work therapy.

200 Koch 1967.

Children playing in the Beelitz sanatorium (children were admitted during the 1920s) (Eylers 2010, 334).



Beelitz pavilion for the daybed cure (Eylers 2010, 332).

Patients in reclining chairs on the roof terrace of Paimio, with a view of the zig-zagging walkway and fountains below (AAM 50-003-266 Gustaf Welin).

THERAPEUTIC SPACES: OPEN-AIR AND "HELIOTHERAPY"

According to the principles of the "Naturheilkunde" movement, reconciliation with "nature" was regarded as the central element in the curing process – especially in early sanatoria from Görbersdorf (1854) to Beelitz (1898), the latter being a large sanatorium complex close to Berlin intended for 2000 working-class patients.[201]

The idea of integrating the sanatorium with the natural surroundings, thus enabling the direct experience of nature (with all one's senses), was central to the architectural organisation of the first sanatoria. In order to secure an active engagement between patient and nature one had to walk through the carefully designed park landscape every day to reach the pavilions for the daybed cure, which were deliberately placed at a distance from the wards within the park. We furthermore find a number of "attractions" placed along the extensive system of walkways through the surrounding woodland – from opportunities to play games to specially created views.

201 For more on the Beelitz Heilstätten, see Eylers 2014, pp. 667-692.

The reading room in Paimio (AAM 50-003-507 Gustaf Welin).

Beelitz patients playing skittles (Eylers 2010, 332).

Although walks amidst fresh air were still considered important 30 years later, when Paimio was built, we see a different approach towards the engagement with the natural site. Aalto abandoned the romantic walkways for the sake of a far more efficient arrangement: to encourage exercise Aalto planned a series of five fountains with a zig-zag walkway connecting them. In an endeavour to maximise its length at the favourable south side of the complex, Paimio presents the patient with a walking path, which ultimately constituted an extension to the building rather than an attempt to engage with the site. The setting replaced the proposal for outdoor daybeds indicated in Aalto's competition entry.

Those patients who were strong enough, were allowed and encouraged to go for walks not only in the garden but also in the surrounding landscape, especially to the area of the Lemmenlampi artificial pond.

HELIOTHERAPY

After it had been demonstrated by Niels Ryberg Finsen (1860–1904), lecturer in anatomy at the University of Copenhagen, that the exposure to ultraviolet light had very good effects in the treatment of tuberculosis of the skin,[202] also other forms of tuberculosis came to be treated with sunlight.

202 Cf. Dormandy 2000, 157.

As with the sanatorium site, also the effect sun had in the TB therapy is, still today, not entirely clear.[203] Nonetheless, heliotherapy was still being administered in sanatoria during the 1920s and 1930s, including at Paimio. Actually the last sanatorium balconies intended for day bed cure were built in Muurola sanatorium as late as in the early 1950s. To enable the longest possible exposure to light and sun, the sanatorium provided therefore not only large windows, but shade-able terraces and balconies, ideally facing southwards.

The daybed cure meant long hours of reclining on the balconies. Some patients recalled it as a pleasant relaxing experience, but the rest cure was later considered by some specialists also to be a problem. In 1953 a committee was set up to discuss the problems in the Finnish sanatoria milieu. One of the observations was that for young and active people the forced rest cure was a psychological problem.[204]

OPERATING THEATRES

Integrating the Naturheilkunde approach with contemporaneous medical theories altered the treatment before and even more so after WW II. The idea and claim of the sanatorium treatment as being natural or supporting the body's nature stood, especially in later sanatorium examples of the 1920s and 1930s, in stark contrast to the sophistication and artificiality of the mechanical means employed. We find most advanced apparatuses (to examine and later X-ray the chest, devices for temperature recording or analysis of the sputum, etc.) being used in parallel with the suggestion to walk in the park and take pleasure in nature in order to strengthen body and soul.

Given that the sanatorium treatment was less successful than had been initially anticipated, as alternatives to the rest cure in fresh air, various amendments to the treatment or additional therapies were tried over the years. One form of treatment or experiment, which was used against TB for many years, was surgical treatment, a method that was furthest removed from the initially proposed "natural cure". One particular surgery became especially fashionable at the beginning of the 20th century, in response to a pneumothorax, which meant that under medical supervision a lung would be artificially

203 The patients' intense exposure to sun was later even regarded as counterproductive to the healing process and hence strengthening the disease instead of the body's defences against it. But still today there are also medical specialists who "believe that the exposure to sunlight has an important effect [not only] on the prevention of tuberculosis" (Overy 2007, 22), but also on its treatment. Professor Sir Maxwell Joseph and Dr. R.T.D. Oliver have argued "that exposure to sunshine and confinement in sanatoriums 'were so successful' in the treatment of tuberculosis [...] because vitamin D induced by the sun activates the phagocytes to convert TB from a lethal to a non-lethal infection as long as the diet contains sufficient zinc and vitamin A, provided for example by fat in milk." Letter from Professor Sir Maxwell Joseph and Dr. R.T.D. Oliver of St Bartholomew's and the London Hospitals, The Guardian, November 27, 2003; in Overy 2007, 224, footnote 39.

204 Parantolamiljöö ja sen ongelmia" [The sanatorium milieu and its problems], Tuberkuloosiliitto 1963, 23.

collapsed then refilled, in order to rest the infected lung.[205]

The major operation "thoracoplastia" in the early sanatoria meant that on some occasions ribs were removed to allow pressure to be taken off the infected lung. This operation was developed by the Finnish Professor Jakob Estlander (1831–1881) and used in Finland for the first time on a TB patient in 1912 by Hjalmar von Bonsdorff.[206]

The surgical treatment for TB was applied extensively after WWI, during which, triggered by an unprecedented necessity for amputations, more and more doctors had become acquainted with surgery. It is not clear whether the benefits of surgery were already in doubt in the 1920s, but certainly today the evaluation of the treatment's long-term benefits is much contested. Yet, in the 1920s and 1930s the demand on the architecture included the provision of operating theatres and respective aftercare facilities.

The Finnish medical professionals were increasingly interested from the 1910s onwards in a surgical means of cure, but up until 1928 only 39 thoracoplastic operations had been carried out. In Finland the information on tuberculosis given to the public presented the viewpoint that even those patients who could not be healed by the dietic-hygienic care could benefit from surgical operation – though only little scientific proof of the results was available at the time. Many physicians believed that by means of operations healing was still possible in very drastic or hopeless cases.[207] In Paimio there was already in the 1930s a small operating theatre on the ground floor, but the development of surgical methods resulted in the construction of an extension wing, which was completed in 1958, as will be explained in the later section on extensions and renovations.

The medical demand for cross ventilation and for light and sun, as well as the provision of open-air rest facilities, demanded the architectural negotiation between the building and the site. Surgical practice, on the other hand, although demanding a very specialised space (the operating theatre), did not pose any particular demands regarding the site or environment.

Although the dietetic-hygienic treatment (in which the natural surroundings played the fundamental role) can be considered a standard base for the TB therapy, through the addition of the surgical treatment the sanatorium became more and more a space for medical experimentation.

Paimio construction site on the cover of the popular weekly magazine Suomen Kuvalehti *issue 45/1931.*

205 Croft 2005. This kind of surgery had already been suggested in 1696 by Giorgio Baglivi, but was only carried out successfully (i.e. as Condrau notes, "the patient survived") by the Italian surgeon Carlo Forlanini in 1892 (Condrau, 131).

206 Väänänen 2000, 43; Härö 1992, 152.

207 Härö 1992, 155-157.

NATIONAL AND INTERNATIONAL DISSEMINATION

During the 1920s, Alvar Aalto had been regionally known and following the construction of the Turun Sanomat building (1928–30) became an established architect in Finland. However, the realisation of the Paimio Sanatorium put him on the international map.

Referring to Paimio, Paul David Pearson states that the "resulting building has been described by every critic who has recorded his thoughts about it as a true example of the heroic period of modern architecture."[208] Sigfried Giedion even ranked it "with the Bauhaus and Le Corbusier's League of Nations project as 'one of the institutional buildings inseparably linked to the rise of contemporary architecture'."[209]

A key to understanding why the project became of such lasting appeal for an international audience is to be found in the early publications on Paimio.

The sanatorium project was already published during the construction period. The project was introduced to the Finnish public for the first time in March 1929, when it featured, together with the other three prize-wining competition entries, in *Arkkitehti*.

As the winner of a national competition, Paimio Sanatorium was regarded as being of interest not only to the architectural circle but also to the broader Finnish public. In 1931 the advancement of the sanatorium's construction was a topic for the Finnish weekly magazine *Suomen Kuvalehti* (no. 45, 1931). But in 1932 the project would enter the international stage.

Aalto himself was the author of the article which was published in May 1932 in the Swedish journal *Byggmästaren*.[210] The sanatorium featured furthermore in the British journal The Architectural Review in November 1932, where Paimio was among a "special section of illustrations which will form one of the finest collections of photographs of steel and concrete construction in all parts of the world that has ever been published in one issue of any periodical."

The Architectural Review presented a collection of seven articles under the heading "Steel and Concrete", together with a supplement of recent buildings. Amongst the authors were Sir Edwin Lutyens, Sir E. Owen Williams and also P. Morton Shand who was probably not only responsible for the article "Steel and Concrete: A Historical Survey",[211] but also for the first publication on Paimio

208 Pearson 1978, 84.
209 Weston 1997, 60.
210 Aalto 1932, 80–83.
211 Shand 1932, 169–179.

Nils-Gustav Hahl states in the journal Domus that the article was the first to present the institute in operation (AAM archive).

Arkkitehti *6/1934 presented the housing solutions in Paimio.*

in a non-Scandinavian journal. Both the by then finished Turun Sanomat building and Paimio (then still under construction), together with Jan Duiker's Amsterdam Open-Air School, featured in the supplement in which Aalto was introduced as "a young architect who is one of the ablest and most audacious exponents of new forms in concrete."[212] The article set the bar high for future publications on Paimio; when, focussing on the "cantilevering effects", it stated, that "to praise this building would be impertinence".[213]

After sufficient premature praise, Paimio was presented in at least seven publications following its completion in 1933. The Finnish weekly everyman magazine *Kansan Kuvalehti* presented the construction site in the issue 50/1932.[214] Another Finnish magazine, *Domus*,[215] concentrated, with photographs by Gustav Welin, on the interior and furniture, but with a text by the editor Nils-Gustav Hahl, who later became one of the co-founders of Artek furniture company.

212 Shand 1932, 207.
213 Shand 1932, 206.
214 "Funkissairaala Varsinais-Suomessa" 1933, 13.
215 Hahl 1933, 63–67.

Around the time of the building's inauguration in June 1933, the Finnish journal *Arkkitehti* dedicated an extensive article to it.[216] Aalto had by then become a member of the journal's editorial board and wrote the accompanying article himself, thus providing the templet, the principal information and picture material that would be used for publications in the following years. The staff housing and the assistant physicians' row house were presented separately in *Arkkitehti* a year later, in the issue 6/1934.

In autumn 1933 Paimio was published in both France and Poland.[217] Most important for the projects further dissemination would be, however, the two English appraisals in the London based *The Architectural Review* (Sept. 1933)[218] and its sister magazine, *Architects' Journal* (Oct. 1933),[219] which were the result of Aalto's close friendship with the influential English critic Philip Morton Shand.

Shand would challenge his earlier statement that "to praise this building would be impertinence" (1932, *The Architectural Review*) with his 6-page article "A Tuberculosis Sanatorium in Finland" in the September 1933 edition of the journal.[220] In the latter, Shand paid much attention to the interior layout and explained in great detail, for instance, the operation of the heating and ventilation system in the patient rooms. His article concludes: "Even if Paimio were not the most revolutionary hospital building erected within the last decade, it would still be of immense significance on account of the structural methods adopted, and the multiplicity of new ideas, details and fitments it incorporates."[221]

The Architects' Journal published a review of Paimio only two weeks later, in the October 5, 1932, edition under the heading "Finland and England".[222] The journal provided a much more sober, mainly descriptive, article on the project. Although the author is not named, it was probably Shand who worked for the sister magazine as well, and happily copied from himself.[223]

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216 Aalto 1933, 67–91.

217 L'Architecture Vivante (no 45, autumn 1933, p.25, p.26 plans + 9 pages of images in the supplement) dedicated in a special issue on hospital architecture 12 pages to Paimio, establishing it as a principal example of functional, yet not "vulgar" hospital architecture. The Polish Architektura I Budownictwo published the project in its September edition (9, 1933, pp.288 – 289 Siwik, Przemyslew: "Tuberkuloossi Parantola").

218 Architectural Review, no 442 (Sept.) 1933, 85 – 90; P. Morton Shand: "A Tuberculosis Sanatorium in Finland".

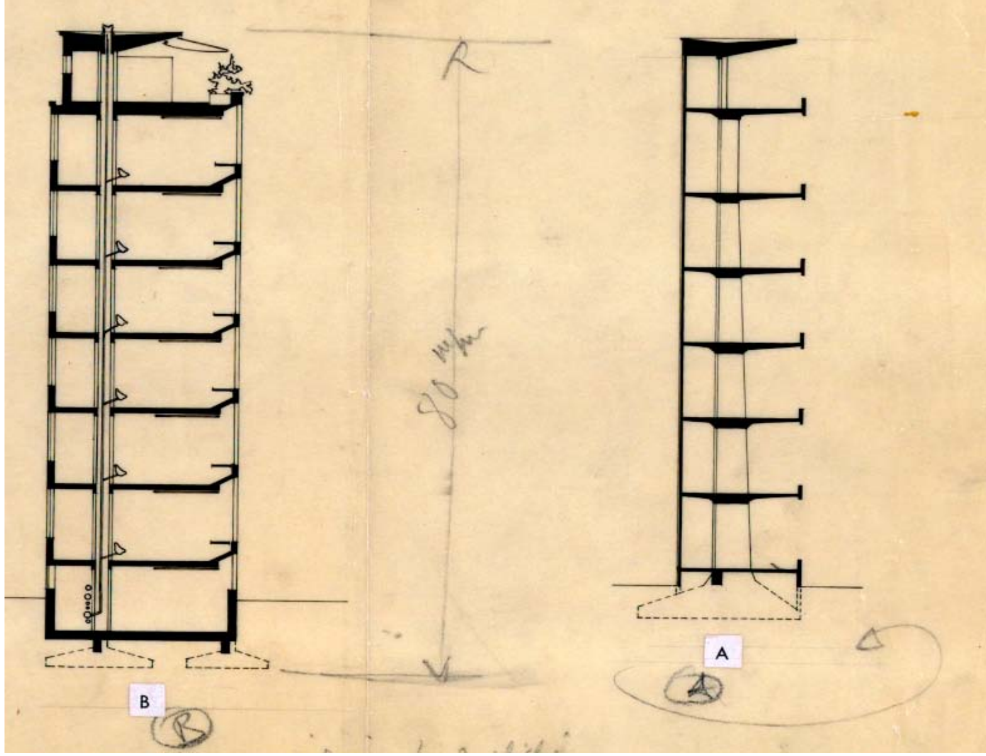
219 Architects' Journal, no 9 (October 5) 1933, 420 – 423.

220 Shand 1933, 85–90.

221 Shand 1933, 90.

222 Architects' Journal, 10/1933, 420–423.

223 While in the *Architectural Review* "On account of its isolated position the South-West Finland Tuberculosis Sanatorium at Paimio is a self-contained community." (Shand 1933, 85) "The South-west Finland Tuberculosis Sanatorium at Paimio is, on account of its isolated position, a self-contained community." (*Architects' Journal,* Oct.1933, 420).



The sections used in Fleig's 1963 monograph: the left one is altered from the situation as built (AAM 50-1038).

These two publications would reach also other English-speaking markets. Therefore, it is not surprising that, in 1934, it was not only European magazines[224] that published the project. Modelled upon Shand's article in the *Architects' Journal,* the New York-based *Architectural Record* dedicated 8 pages of its July 1934 edition to Paimio.[225] One year later, the American journal *Architectural Forum* would present Paimio in its glossy "International Section (on) Finland".[226] Here Paimio was presented as an example not only of constructional inventiveness or a prototype for the medical institution but also as an example for Finnish Architecture, and ultimately for Finland itself, which anticipated the projects' future appearance in countless (architectural) guide books.

224 Paimio was published in *Das Werk* (Oct. 1934, "Sanatorium in Pemar", 293-300), and in *L'Architecture d'Aujourd'hui* (Dec. 1934, "Tuberculosis Sanatorium, Paimio") in a special issue on hospital architecture, as in *L'Architecture Vivante* the year previously.

225 *Architectural Record* (New York), July 1934, 12–19, "Tuberculosis Sanatorium, Paimoni [sic], Finland". The project featured under "special building types - sanatorium".

226 Paimio featured in *Architectural Forum* as one example of "selected contemporary work of Finland's architects". The journal employed a much more poetic language in its appraisal of the sanatorium, calling it a "concrete fortress of health in the heart of the forests, the ideal cure-house for a greater number of patients" and "The atmosphere of clinical cleanliness is enhanced by both architecture and furnishings." "International portfolios: Finland". *Architectural Forum* (New York), Sept. 1935, 171-186.

Although Aalto had strong allies in Shand and others,[227] the architect had not left the international dissemination and success of Paimio to them. His work on the editorial board of *Arkkitehti* (in 1933 under Hilding Ekelund, who was the editor-in-chief) had provided him with a certain publishing experience and had possibly also fuelled the idea of preparing a more comprehensive publication on Paimio, which would expand on the often mainly technical descriptions of the journal articles. With *Varsinais-Suomen Tuberkuloosiparantola* [Southwestern Finland Tuberculosis Sanatorium], the first monograph on Paimio was published, a rather peculiar little book co-edited by the architect himself. (The booklet is discussed in the following chapter)

As a key project in Aalto's career, Paimio Sanatorium has been presented over the decades in numerous books, which cannot be reviewed here. Nevertheless, among the many books, *Alvar Aalto* edited by Karl Fleig, from 1963, is special since it was the widest monograph published well before Aalto's death. The drawings and photographs used are mostly the same as in early publications, but with one rather fascinating exception. In the Zagreb hospital competition entry in 1931 Aalto used above the patients' room window a special type of ceiling and floor that increased the sun gain. Such a design feature was not built in the patients' rooms in Paimio and was not shown in the earlier mentioned publications; and yet it appears in Fleig's monograph.[228] The drawing is still in the Aalto archive.[229] That kind of detail was used, however, in the chief physician's house in Paimio. It may be that this particular section was redrawn for Fleig's book, which according to Jussi Rautsi was carefully supervised by Aalto. The "revised" version of the spread later featured, for example, in the large monograph Alvar Aalto by Richard Weston.[230]

227 Cf. "Geopolitics of Fame", in Pelkonen 2009, 159-180).
228 Norvasuo 2009, 95-99; Fleig 1963, 33.
229 AAM 50-1038.
230 Weston 1995, 50.

"VARSINAIS-SUOMEN TUBERKULOOSIPARANTOLA" BOOKLET

The 75-page booklet,[231] published probably in time to be delivered[232] to the sanatorium's inauguration ceremony in 1933, was written entirely in Finnish. A wealth of images, however (some two-thirds of the 75 pages are illustrated), renders the book accessible also to non-Finnish speaking audiences. The first part of the book consists of three articles. The first article, by the physician Severi Savonen, provides a historical overview of lung diseases in Turku and its surroundings. He had been a key figure in initiating the process to build the sanatorium in the late 1920s. The second article, by the secretary of the building committee, Ilmo Kalkas, concerns the socio-political background to the project. These introductory articles, which justify the project in legitimating its socio-political relevance, is followed by Alvar Aalto's article, "Rakennusteknillinen selostus" [Building-technical report] which aimed to redirect its reader's attention away from specialist concerns to the architecture of the Paimio building itself.

That this architectural viewpoint would not have a subservient role in the booklet, but instead would take centre stage was ensured by Aalto who was not only one of three editors[233] and a contributing author but, together with Aino Aalto, also was responsible for both the graphics and photographic planning.[234] As Teppo Jokinen explains:[235]

Aino and Alvar Aalto are credited with the 'graphic layout and photographic direction' of the presentation booklet for the sanatorium and the extensive presentation of product suppliers is illustrated by photographs taken by Aino Aalto.

The largest part of the booklet thus documented the construction of Paimio and its interiors. Reproduced plans and photographs of various building stages were used and supported by advertisements for the building industries, local supply firms and craftsmen involved in the project. Aalto provided equally detailed information on structural solutions, building insulation, steel-frame windows or wash-basins, supporting every architectural detail with the respective supplier or construction firm, freely sharing experience and expertise, and indeed providing a construction manual to be imitated.

231 For a more detailed discussion of the Paimio booklet see Eylers 2016.

232 According to the dealer at the Turku-based secondhand bookstore, Brahen Antikvariaatti (which has been in business since 1961) the copies of the booklet he has seen have often included an invitation to the inauguration ceremony.

233 The editorship of the booklet was shared between the secretary of the building committee Ilmo Kalkas (the treasurer and secretary of the building committee representing Varsinais-Suomen Tuberkuloosipiiri, the founder of the sanatorium), Paimio's senior physician M.M. Sukkinen, and Alvar Aalto.

234 The general views were provided by the photographer Gustaf Welin and details by Aino Marsio-Aalto, who in this context uses her maiden name.

235 Jokinen 2014, 40.

An example from page 72 illustrates the level of detail provided in the brochure:[236]

We [referring to the Turku-based Wiklund[237] department store] *have provided the Southwestern Tuberculosis Sanatorium with, among other things:*
Cork flooring 8,595 m²
Nokia rubber flooring 1,620 m²
Enso wallpaper 3,630 m²
Insulite fibreboard 4,681 m²
Högfors special hospital stove
All the porcelain (Arabia)
All the enamelware ('Kultor')
All the aluminium cooking pots (Taloustavarat)
All the glassware (Riihimäki and Iittala)
All the knifes and forks, stainless steel (Hackman)
All the spoons, ladles for soups and sauces
All the brushes, etc. etc.
Oy. [Ltd.] Wiklund Turku.

The following pages of the booklet inform the reader about the manufacturers of the sinks (Arabia), the stoves (Kastor) and that it was the Turku 'Autohalli' garage who had "provided the Paimio Sanatorium with a 'Chevrolet' lorry and a 'Chevrolet' van". But what exactly had been Aalto's motivation to engineer this extensively detailed brochure?

There are not many records existing that could enlighten us about the exact history of the brochure. Jokinen mentions the booklet in the Paimio monograph published in 2014.[238] pointing out the important role "picture propaganda" played in the "growth of Aalto's international reputation".[239]

The booklet was ordered and created by the building committee, which decided in a meeting on

236 Part of this information and as well as a translation of page 72 of the booklet was kindly provided for the author of this chapter, Eva Eyleys, by the Alvar Aalto Foundation and in particular Arne Hästesko (curator of the Alvar Aalto Museum Architectural Heritage, Helsinki) in February 2010. The architect Markus Mikkola kindly provided translations of all other discussed pages of the booklet.

237 According to Arne Hästesko, the owner of the Wiklund department store, which still exists today (under a different name), was, it so happened, a relative of Aalto.

238 Jokinen explains that "The photographs that Aino Aalto herself took of the building approached in terms of their style, on the one hand the experimental artistic expression that had emerged at the Bauhaus and, on the other hand, the architecture and product photography that served advertising." (Jokinen 2014, 40).

239 Jokinen 2014, 40.

October 10, 1932, to publish a book describing the building of the Paimio Sanatorium. The copyright of the book was to remain with the building committee, and the committee members Aalto, Sukkinen and Kalkas would be responsible for creating the book and its contents. The print run was to be 1000 copies and the committee would pay 4000 Finnish Marks towards the cost of that.[240] Similar booklets were later published on Viipuri Library, but more often in Finland at that time of works other than those by Aalto.[241]

What was thus created was an indisputable argument for the Paimio project and ultimately an ingenious and unprecedented piece of promotion. The brochure was a solid and well-balanced act of self-defence. It constituted a spirited response to any potential adversary, and which forbade further doubt about Aalto's ability both as an architect and a strategic planner.

A postcard from the general secretary of CIAM, Sigfried Giedion, dated July 1933, shows that Aalto had sent the brochure also to his contacts abroad. Jokinen explains that in October 1932 "Giedion invited Aalto to Zurich to lecture about the modern sanatorium building from the premise of the Paimio Sanatorium, and also asked Aalto for material for presenting the building."[242]

In response to the Paimio Sanatorium material he had sent, Aalto received Giedion's answer in which he praised the Aaltos' material and formal sensitivity. He especially praised the booklet and its composition when he wrote:[243]

I find the little book and the classification of the participating firms in order to render the details more graphic exemplary.

PAIMIO AS AN ARCHITECTURAL MODEL

Paimio soon became the most prominent and architecturally appreciated sanatorium in Finland. For some reason, the only other sanatorium presented in the *Arkitekten / Arkkitehti* journal[244] was the

240 Building committee, 10.10.1932.

241 Well illustrated publications were made, for example, on the Helsinki Olympic Stadium (completed 1938), the University of Helsinki's Porthania building (completed 1957) and Oulu University (completed 1970).

242 Jokinen 2014, 40.

243 Original quotation: "Ich finde auch das Büchlein und die Einordnung der Firmen zur Plastisch-machung der Einzelheiten ganz vorbildlich." Giedion to Aalto, postcard, written in Zürich, August 6, 1933; Alvar Aalto Archives, Helsinki (translation by the author). Eeva-Liisa Pelkonen refers to this postcard in a different context in Pelkonen 2009, 163.

244 *Arkitekten* was published in 1903–21 by Tekniska Förening in Swedish and since then the journal has been owned and published by the Finnish Association of Architects. From 1921 to 1951 both Finnish and Swedish language editions were published. The journal was bilingual from 1952 until 1967. From 2000 onwards, the entire texts have been translated into English, or at least as summaries (Jetsonen 2003, 26–27).

Kauppi Sanatorium from 1939. It was shown rather briefly, with only one photograph and two floor plans in a two-page article in issue 11–12/1944 of the journal that focused on recent building in Tampere.[245]

In the Finnish context, possibly the most comprehensive explanation for modern architectural ideas was the extensive text written by Professor Hilding Ekelund (1893–1984), "Uudenaikaiset rakennukset" [Contemporary buildings] in 1938 for the book *Rakennustaide ja rakennustekniikka* edited by Professor Carolus Lindberg, part 8 of the book series *Keksintöjen kirja* [Book of Inventions]. Ekelund's text was the first extensive text on modern architectural design written in Finnish.[246] He describes solutions for various building types, including hospitals and tuberculosis sanatoria. Paimio is the only named example of a tuberculosis sanatorium in Finland, and in describing the principles for sanatoria design he mentions those of Paimio.[247] Some of the basic principles Ekelund describes can be summarised as follows:

- the normal size of a large sanatorium is 200–300 patients, so that they are better equipped, with operating theatres, X-ray facilities and artificial sun treatment rooms.
- the patients may be in relatively good condition, and thus need common spaces such as dining rooms, lounges, etc.
- the cure is based on air therapy, so sufficient balconies are to be provided. The Trenčín-Teplitz Sanatorium(1930–32),[248] designed by Jaromír Krejčár, in the former Czechoslovakia is presented as an example of a sanatorium with individual balconies attached to the patients' rooms. According to Ekelund, such a set up was common abroad, but in Finland communal balconies are regarded as both more economical and better for patients' social life and wellbeing.
- the layout of the spaces should be determined by access to fresh air and sunlight, instead of being efficiently centralized and compact.
- the sanatorium should be built in the countryside on dry ground, where the air is free of the fog, smoke and dust of the city.

Kauppi Sanatorium, from 1939, in Tampere by Bertil Strömmer (Pesonen 1964, N.S.).

245 Strömmer 1944, 128–129.
246 Helamaa 2000, 42.
247 Ekelund 1938, 484–488.
248 Register of Modern Architecture in Slovakia (S.D.).

After these basic principles, Ekelund presents the Paimio Sanatorium in detail, with texts, photographs and drawings.[249]

The influence of Paimio was seen in Finnish sanatoria design even before its completion. Heinonen names the later sanatoria by Paatela in Kiljava and Ahvenisto as well as several entries for other sanatoria competitions. Paimio was a model not only for tuberculosis sanatoria but more widely as an exemplary hospital building.[250]

Sunnuntaina, kesäkuun 18. p:nä — UUSI AURA

Maakunnallinen merkkipäivä.

Tämä kesäinen sunnuntaipäivä on maakunnallinen merkkipäivä Varsinais-Suomelle. Kuntain keskinäisellä yhteistyöllä valtionavustuksen turvin aikaansaatu Paimion tuberkulosiparantola vihitään tänään juhlallisesti tarkoitukseensa.

Tuberkulosi on kansamme pahimpia sisäisiä vainolaisia ja vitsauksia. Joka vuosi se korjaa keskuudestamme kallista viljaa. Varsinkin lapset ja nouseva nuoriso, ne ikäpolvet, joitten varassa kansamme tulevaisuus lepää, ovat olleet suurimmassa vaarassa joutua tämän salakavalan vihollisen uhreiksi. Mutta monen moni varttuneempaankin ikään päässyt kansalainen on kesken parhainta työkauttaan temmattu pois työsaraltansa monesti pitkäaikaiseen ja epätoivoiseen taisteluun tuberkulo-

Paimion Parantolan

erikoismalliset huonekalut

on valmistanut

Oy. Huonekalu- ja Rakennustyötehdas Ab.

Yliopistonk. 27. Puh. 609 ja 1124.

Varsinais-Suomen tuberkuloosiparantolan vihkiäiset tänään.

Upean laitoksen historiaa.

Varsinais-Suomen tuberkuloosiparantola Paimiossa vihitään tarkoitukseensa tänään.

Kuten muistettaneen, kääntyivät vaalipiirimme suomenkieliset kansanedustajat — lähinnä kansaned. Bernh. Heikkilän aloitteesta — lokakuussa 1927 alueensa samankielisten maalaiskuntien puoleen kirjelmällä, jossa niitä kehoitettiin valitsemaan edustajia kokoukseen, missä alustavasti oli tarkoitus neuvotella keuhkotautiparantolan perustamisesta Varsinais-Suomen kuntia varten. Joulukuun lopulla samana vuonna sellainen

saaren konepaja on valmistanut pesulan koneet ja mankelit, keittiön pöydät ja keittopadat Oy. Metalliteos Helsingistä, liedet ovat Högforsin tehtaan ja Lämmityslaite Oy:n valmisteita, osan keittiökoneista ollessa af Forselleksen Insinööritoimiston hankkimia. Leipomon on rakentanut saksal. t:mi Werner & Pfleiderer, röntgen- ja valohoitolaitteet on toimittanut Oy. Aage Havemanns Eft. Ab. Helsingistä, jäähdytyslaitoksen Keskusosuusl. Hankkija, Oy. Huonekalu- ja Rakennustyötehdas Kaarinasta on valmistanut ruokasalin ja

249 Ekelund 1938, 485–488.

250 Heinonen 1986, 241–242.

PAIMIO AS A WORKING SANATORIUM

Paimio's official opening ceremony was held on the afternoon of June 18, 1933. The event was widely covered by the regional newspapers. *Uusi Aura*, for example, wrote a detailed and elaborate description of the event, including rather detailed summaries of the speeches and the entire ceremony.[251]

The opening ceremony of Paimio Sanatorium was mentioned in *Uusi Aura* on 18.3.1933, and the next day the newspaper followed it up with a detailed summary of the event. Note the advertisement for Oy. Huonekalu- ja Rakennustyötehdas Ab featuring a table designed by Aalto

The first patients had already arrived at the sanatorium earlier that year, on February 2, and already by the end of April all the patients' rooms were occupied. The youngest of the first patients was 8 years old, while the oldest was 57. An important aspect of the curing regime was work, and during the first year all the male patients capable of working were given the task of cutting the undergrowth in the surrounding forest, while female patients focused on handicrafts with textiles. Simultaneously, agricultural production was started, where patients would also work.[252] The sanatorium's own post office, "Preitilä", was opened at the beginning of 1933.[253]

The total number of personnel working at the sanatorium was 70 in 1933. The administration had 5 employees, the medical section 36, and the maintenance 29 staff members.[254] Many tasks were also done by the patients whose state of health still allowed them to work. The number of employees at the sanatorium rose constantly during the following decade. This was partly due to governmental restrictions, which limited the daily work hours to 8. This became standard in 1946. The lack of staff accommodation therefore became a constant concern.[255] By 1946 the amount of employees was 102, in 1965 it had more than doubled from the original to 147, and by 1982 as many as 266.5 people worked at Paimio.[256]

251 *Uusi Aura* 19.6.1933.
252 Törrönen 1983, 48.
253 Jokiniemi 1958, 14.
254 Törrönen 1983, 123.
255 Törrönen 1983, 69.
256 Törrönen 1983, 123. The "half person" was working part time.

The chief physician, Markus Sukkinen, wrote in the first annual report 1933:[257]

If any overall conclusions regarding the new sanatorium can be made after such a short period of operation, the modern and practical architecture of the sanatorium and the relative large number of patients put together into it have proved positive. Also many of the contemporary solutions, which at first raised scepticism, have turned out to be practical and even excellent.

FUNDING THE OPERATION

The funding for the running expenses of the sanatorium was dependent on government aid. In 1935 the budget was 3 365 228 marks, of which the state paid 44%, communities 31% and the patients' fees covered 31%, even if half of the patients were to pay for the treatment.[258] The collected fees decreased over the years, as the funding from the communities and the state increased.

PATIENTS' WORKING DUTIES

During the 1930s the patients were regularly contributing to the agricultural work in the fields and greenhouses. This work ("occupational therapy") was believed to be an important part of the curing process. At the same time, the patients' contribution was important to the food production of the sanatorium. Already in the very first years of its operation the range of patients' work facilities was rather wide. Many of those work tasks took place outdoors, such as cleaning and cutting the near forests and gardens. In the third-floor work room women spent time weaving, sewing and completing other tasks relating to textiles, whereas male patients undertook book binding.[259]

In the 1940s the agricultural products were regularly sold, at least in Paavo Tuominen's grocery store in the nearby village of Vista. The large variety of products cultivated at the sanatorium became an important addition to the local supply also outside the sanatorium.[260]

Markus Sukkinen, the first chief physician, until 1952, was especially interested in the agricultural part of the sanatorium's daily routines, as he himself was born on a farm.[261] In 1953 the greenhouses were refurbished and an extension was built so that the overall area grew to 770 m2.[262] In 1963 the agricultural area was enlarged when a new farm was bought for the sanatorium. In the late 1950s and

257 Törrönen 1983, 112.
258 Törrönen 1983, 111.
259 *Turun Sanomat* 7.2.1934, 1; 4.
260 Törrönen 1983, 55–56.
261 Törrönen 1983, 92.
262 Jokiniemi 1958, 39.

1960s the work therapy was no longer believed to be an important part of the cure and the farms were exclusively run by personnel.[263]

The former patients' recollections, which were collected in 1971, states much the same: in the mid-1950s the patient's role in agriculture was no longer crucial, as more emphasis was given to education.[264] The education was officially started by the Union of Tuberculosis Districts in 1943, but in fact the first courses for the patients were given already as early as 1934, on the subject of accounting.[265] Also teaching on the maintenance of the building installation was given to ten patients and 22 had passed the test on accounting.[266] That was important, since many of the patients were no longer strong enough to continue their earlier professions, even if they were considered recovered.

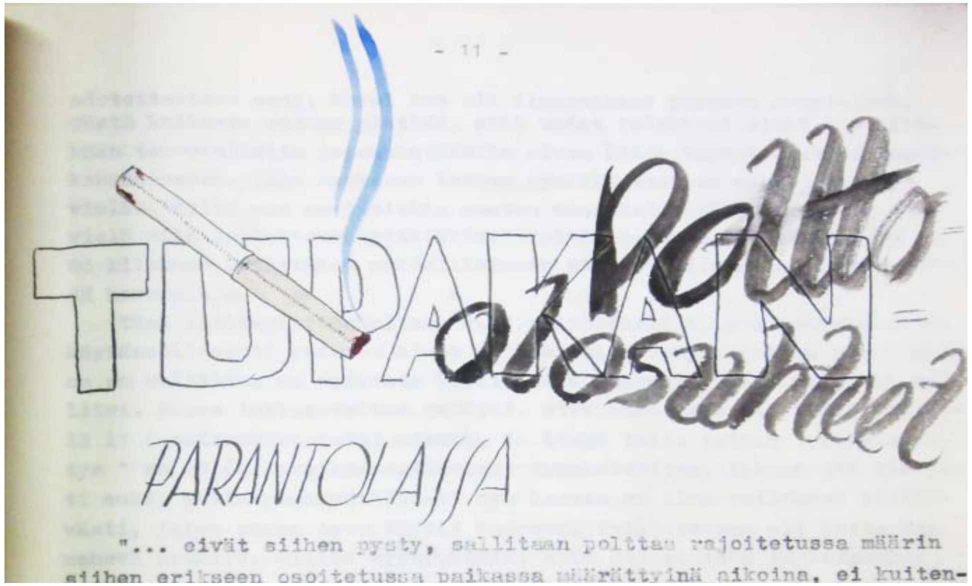
The patients also took care of cleaning their own rooms and making their beds in the morning. Other working duties were attended to according to one's condition. A female patient in Paimio in 1935 recalls that there was some time each day when the patients were allowed to do small things like reading, studying, doing some laundry, etc. Many hours of talking with other patients also took place. Also the work carried out in the special work rooms in the sanatorium were regular, as they were equipped with contemporary sewing machines, looms, etc.[267]

RULES IN THE SANATORIUM

The rules of the sanatoria were quite strict, as many of the patients have recalled. The patients lost many of the rights of normal life. The rules were, however, necessary for such big institutions and they remained more or less the same until the 1950s, and can be seen as typical of a patriarchal Christian society of the early 20th century. Also alcohol and smoking were forbidden.[268]

The problems of discipline were observed to occur more often in large sanatoria and were exasperated if the wards were large, if patients were young and depending on how the staffs' character, authority, manner and humour were suited in the relatively closed and intense working conditions.[269] Some questions were raised regarding the social life among the patients and their intercourse, which was considered to some extent positive in recovery process. According to former sanatoria employees

263 Törrönen 1983, 55–56.
264 SKS archives.
265 Törrönen 1983, 65.
266 *Turun Sanomat* 7.2.1935, 1; 4.
267 SKS archive.
268 Nenola 1986, 35–37.
269 *Parantolamiljöö ja sen ongelmia* 1963, 65.



An illustration in Pasuuna from 1954 depicting the smoking conditions in Paimio Sanatorium.

during the 1950s, the most difficult problems were due to alcohol, smoking, questions about vacations, the lack of information and knowledge, the lack of organized entertainment and so-called asocial patients.[270]

The discipline in Paimio was loosened over the years. The early years with Markus Sukkinen was also the period of the strictest discipline. Hannes Salmenkallio, the chief physician from 1952 to 1968 was, according to people's recollections, much more humane in his manners. Also the changes in attitudes in society in general had changed over the years. Smoking, for example, was allowed in the north end toilet of the ward from 1952 onwards.[271]

The patients' publication Pasuuna described in its Christmas 1954 edition, in a nearly seven-page article, the smoking conditions in Paimio. The patients who could not refrain from smoking could smoke in the very small toilet in the ward. The space was simultaneously filled with a large number of smokers, since smoking was not allowed on the balconies or during walking exercise. Smoking was rather common; for example, in the description in Pasuuna it was counted that 30 out of the 49 male patients in a ward were smokers.[272]

270 *Parantolamiljöö ja sen ongelmia* 1963, 64–78.
271 SKS archive.
272 *Pasuuna* 1954, Christmas issue.

Nevertheless, many patients recalled the quite different attitudes, even before smoking was allowed. For example, the physician Onni Nikula had suggested to one of his patients that possibly he could smoke secretly. When Sukkinen was about to force the patient to leave the sanatorium, Nikula managed to persuade his chief to withdraw his decision.[273] The control also depended on the nurses' attitudes. It was at least partly a matter of what the nurses saw or wanted to see. The nurse Angervo Raita recalled that she used to make a noise and enter the balcony somewhat slowly so that the patients had time to stub out their cigarettes.[274]

The chief physician Salmenkallio told in the patients' magazine in 1954 that he had been against rules that require a lot of observation and result in a large number of patients being forced to leave the sanatorium. He had been willing for some decades to allow limited smoking. Nevertheless, he expressed that he had been disappointed by the consequences of his decision, as kinds of smoking clubs were born in the wards. His idea had been to allow some smoking for those incapable of completely stopping, but not to the extent it had become. So he was still opposed to larger smoking rooms or other systems that encouraged smoking.[275]

The same rather liberal attitude applied to drinking, which remained forbidden, Salmenkallio, commenting on the large number of empty spirit bottles found on the lawn behind the patients' wing, stated that the amount could be considered the regular daily consumption of an institution of that size.[276]

Naturally the change from a domestic environment to a sanatorium was tremendous. In the early days it meant the hope of recovery from a fatal disease and for some patients even a change from harsh living conditions to a pleasant and easy way of life for some months. However, living in rather closed circumstances and losing some privacy may have been difficult, in addition to the quite unpleasant medical treatments. The role of being a patient for months had sometimes been difficult, especially for young people. The insecure situation regarding the disease led to unstable behaviour and possibly even desperation or, on the other hand, an easy going attitude, etc. It was stated in the 1950s that tuberculosis was as much a psychical disease as a physical one.[277]

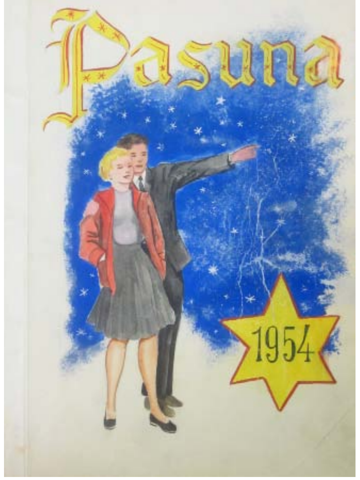
273 SKS archive; Nenonen 1986, 38.

274 Törrönen 1983, 54.

275 *Pasuuna*, Christmas issue 1954, 16.

276 SKS archive.

277 *Parantolamiljöö ja sen ongelmia* 1963, 28–32.



Cover of Pasuuna magazine's 1954 Christmas issue (left). A skilfully drawn illustration in the 1953 Christmas issue (right), Lasaretti Museum Turku.

PATIENTS' DAILY LIFE

The extensive periods of cure lasted for months, which helped to create a particular atmosphere and relationship between the patients. Tuberculosis could be a fatal disease, and the diagnosis was considered almost as an announcement of inevitable death. Many of the patients waited relatively long for a vacant place in a sanatorium, and both their physical and mental condition often weakened during the waiting period.[278]

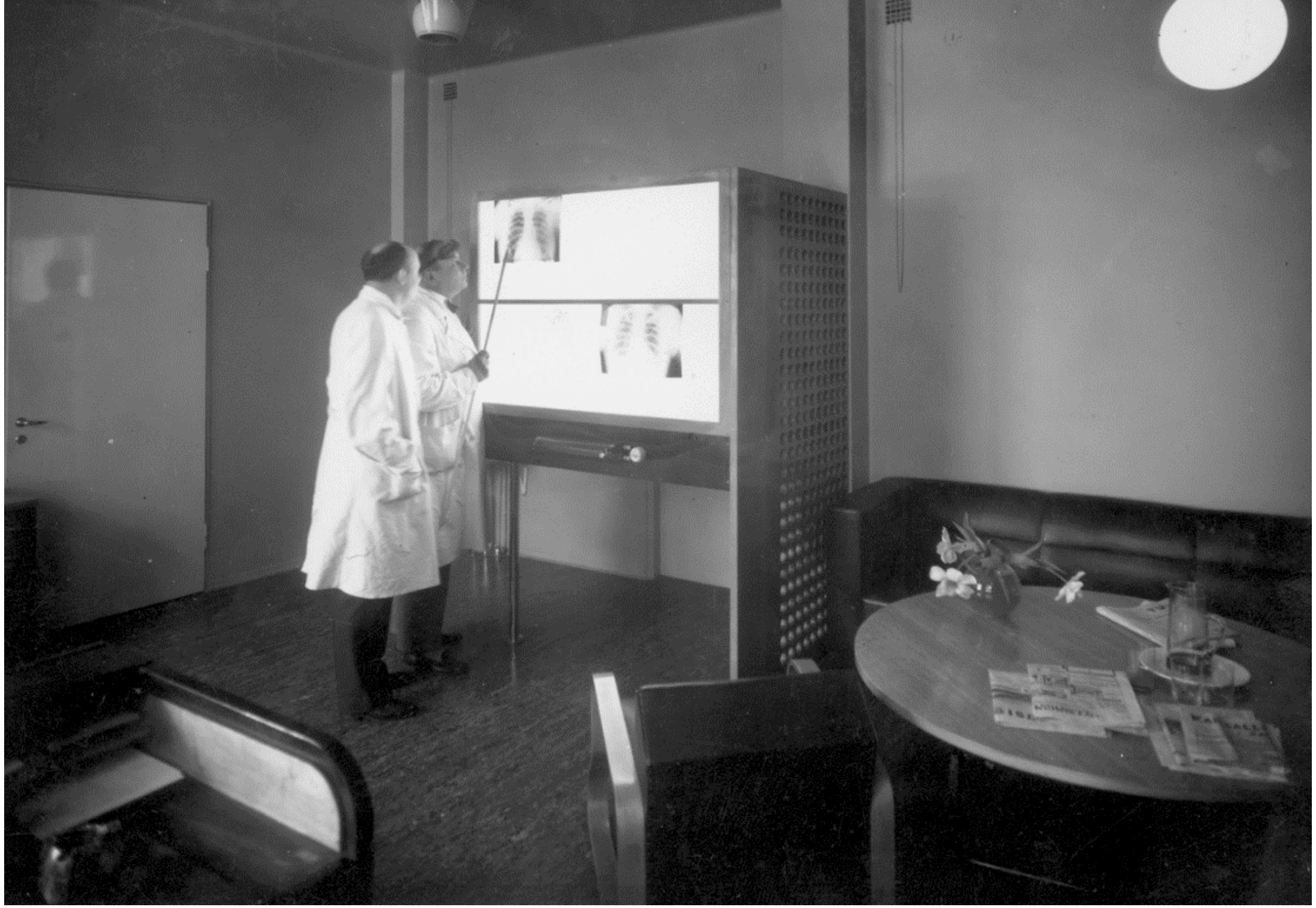
Even the journey to the sanatorium may have been unusual, as at that time travelling was not so commonplace. Also getting a place in a sanatorium was a great sign of hope.[279] Nevertheless, some patients were too desperate or could not stand the circumstances. According to Unto Heino, the chairman of the Patients' Union of Paimio Sanatorium, there were four known cases of suicide by the 1970s.[280] Already in 1933 the patients had started rather playful routines. Each ward had its own nickname and was referred to as a country or republic, and the patients had chosen representatives to communicate and arrange events with other wards. The representatives had honorary titles such as president, minister of foreign affairs, minister of finance, etc. An important part of the daily routines were the hours of air therapy, which entailed lying on beds on the balconies. That was the time during which the playful routines took place. The patients' informal "republics" also organized cooperation. The walking in the courtyard and Lemmenlampi area was also organized, so that males and females were mixed and the so-called "lumpustusparit", or courting couples, got time on their own.[281]

278 Nenola 1986, 15–21.

279 Nenola 1986, 25.

280 One jumped from a third-floor window in patients' room 13, one hanged themselves, one exploded themselves and one drowned themselves in Lemmenlampi pond (SKS archive). The number of suicides is drastically exaggerated in some scholars' texts, claiming even that the reason for closing the balconies was due to the number of deaths (e.g. Colomina 1997, 230).

281 Törrönen 1983, 61.



The main physician's office (AAM 50-003-369 Gustaf Welin).

These playfully organized habits were very common in every sanatorium in Finland. They can be seen as a counterpart to the strict daily routines that were most likely established in 1920s in the first large public sanatoria. Some former patients recalled that those every day informal habits and play were crucial parts of the wellbeing of the patients. Without those the months or even years at the sanatorium may have been intolerable.[282] Those habits dwindled during the 1950s as the curing times at the sanatoria shortened, and also the patients' societies were established formally. The Patients Union in Paimio was established on May 24, 1946.[283]

282 Nenola 1986, 59; 72.
283 Törrönen 1983, 63.

PAIMIO AND DINO BUZATI'S "SETTE PIANI"

In the chief physician's office is a large mural depicting the Paimio floor plans. Drawn on a cork surface by Eino Kauria, this plan overview might have served to map the patients' state of health while residing in the institution. Pins with patient information could easily have been added and removed from their respective location on the plan. Although this practice has not been documented, it could possibly have happened.

A similar scenario might have inspired the Italian poet Dino Buzzati to write his oppressive short story "*Sette Piani*" [The Seven Floors] in 1937. Buzzati invites us to witness the protagonist's journey through a seven-storey hospital. The patient, Guiseppe Corte, was admitted to the top floor (the floor for the least grave cases) and was swiftly moved through the institution towards the lower floors. Corte's protests did not affect the institutional course and his arrival on the ground floor where "the curtains were always drawn" and the patients' rumoured expectancy of death became inevitable.

Giuseppe Corte [...] learned about the hospital's unique practice of assigning its patients to different floors in accordance with the gravity of their illness. On the seventh floor, the top floor, only the very mildest cases were treated. Those whose forms of the illness weren't grave, but who certainly couldn't be neglected, were assigned to the sixth floor. More serious infections were treated on the fifth floor, and so on and so forth. Gravely ill patients were housed on the second floor; and on the first floor, those for whom all hope had been abandoned.

Not only did this unique system speed up service, it made it unlikely that mildly ill patients would be upset by the unnecessary proximity of other patients who might be suffering agonies, and it guaranteed a homogenous atmosphere on every floor. In addition, treatment could be perfectly graded to offer the best possible results. [...]

Each floor was like a small self-contained world with its own particular rules and special traditions that had no validity on other floors. [...] despite the fact that the institution's General Director had engraved a single address on the building.

No evidence has been found that patients in Paimio were officially divided according to the state of their disease – as Dino Buzzati illustrates so vividly in the Sette Piani. However, for reasons of institutional efficiency it could be believed that the categorization of the patients within Paimio went beyond accommodating male and female patients on different floors (levels 2, 4, and 6 were reserved for the male patients and the other three for the female patients). According to Professor Kari Liippo, patients were also grouped according to age, since younger patients were accommodated separately. The fact that there were "better" and "worse" cases was reflected in the logic of the building layout, which thus underlines Buzzati's vision in the *Sette Piani.*

The patients perhaps were not divided according to their state of disease and placed accordingly on "healthier" or "less healthier" floors (travelling literally from the seventh floor towards the ground), as in Buzzati's short story, yet they would be divided according to their ability to take part in the top-floor open air therapy.

"Intended for the more ill and psychologically vulnerable patients", Paimio provided, as Aalto explained,[284] a further wing consisting of patients' sun balconies, one for each floor and large enough to host 24 patients on their daybeds, extending as a continuation of the patient wing, whereas "the sun terrace on the very top floor, [...] had a large area for up to 120 healthier patients to recline..."

According to their assignment on the seventh floor terrace or on their own floor, patients were thus divided according to their particular state of health. Whether patients who had more difficulty in walking than others, for example, were accommodated closer to the staircase or indeed on one of the lower floors, in order to be able to get more easily to the dining hall, is open to speculation.

From today's point of view, and given the likely mortality of the disease, treating the patients' rooms absolutely the same on each floor and in combination providing a hierarchy through the choice between upper floor terrace and the terraces on floors one to six must be seen as problematic. The arrangement may have contributed to increasing the patient's mental problems, reminding them of their inevitable fate.

THE SANATORIUM AND ITS NEIGHBOURS

As mentioned earlier, many of the municipalities participating in establishment of the Southwestern Finland Tuberculosis Sanatorium hoped to have the institution built in their area. Naturally also in Paimio the question was raised of bacteria, and it was solved by the construction of the biological waste-water purification plant. The attitude amongst the people living near the site to the new sanatorium, however, may not have been studied.

In the 1952 Christmas edition of the patients' own magazine *Pasuuna* the results of a questionnaire amongst the neighbours were presented. (In fact, "magazine" may be an inaccurate description, since in the early years only one copy was made, which then circulated in the wards. In 1955 the Patients' Union acquired a copy machine and the information and humour was spread more efficiently.)[285]

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284 Aalto 1933, 84.
285 Törrönen 1983, 64.

The common attitude in the 1930s had been very practical, as posed some twenty years later: the sanatorium was an excellent thing since it had provided labour during the recession of the early 1930s, it meant steady employment for a number of people, and in turn led to other activities in the local economy and transport. Also local medical matters were resolved as more medical professionals were available in Paimio. Fear of the disease diminished over the years, as only one of the ten inteviewed neighbours mentioned the increase in the risk of tuberculosis and did not like the patients visiting local shops. Mostly the local residents were satified with the sitation, but some were disturbed by very practical matters, such as the behaviour of some patients, their regular trespassing and littering on the road next to the local shops.[286]

SURGICAL OPERATIONS

Surgical operations were in the 1930s part of the cure, as some operations were carried out using local anaesthesia. There were small operating theatres in the sanatoria and specialized physicians carried out the operations in various sanatoria. In the 1940s, Professor Arne Johannes Palmén from Helsinki was the physician who carried out the large operation of removing the ribs of patients at the sanatoria in Paimio, Pikonlinna, Satalinna and Salpausselkä.[287]

The operations were painful and not all the patients survived them. In the recollections of the patients, there are several explanations about both the operation itself but also the awkward period of waiting for it. Such a large operation, in which part of ribs were removed, was scary and resulted in numerous jokes in the sanatoria, one more part of the difficult life in sanatoria. A common joke was that the rib bones were afterwards given to the dog of some sanatorium personnel.[288] The car park in Paimio was in the middle of the main entrance courtyard, and as the patients noticed the car of the travelling physician from the long corridors, they would say: "The executioner has arrived!" or "The butcher has come!"[289]

In the 1940s many promising results of vaccinations were achieved. The Calmette vaccinations and good results from X-ray screenings, which were already widely used in Finland after WW II, diminished the spread of tuberculosis.[290]

286 SKS archive.
287 Törrönen 1983, 64; Väänänen 2000, 43.
288 Nenola 1986, 47.
289 SKS archives.
290 Savonen 1947, 7.

In 1958, with the operation being in use for a quarter of a century, the chief physician Hannes Salmenkallio wrote that the results vary a lot; some of the patients recover to continue their original work, but many survive yet are haunted by the disease for decades and are incapable of continuing their previous work. The after-care of the patients was a wide and international theme among professionals.[291] The disease no longer caused that many deaths, but the loss in lungs resulting from the disease and possible operations meant invalidity in some degree. Thus the need for rehabilitation increased.[292]

The first removal of part of a lung was carried out by Dr. P.E.A. Nylander in 1937.[293] The developed operations become a more important means of cure after the WWII. The developed methods in anaesthesia, as well as better medicines, resulted in better opportunities in surgery. The operations involving the partial removal of lungs were carried out in Paimio from 1955 onwards. Consequently, the original operating theatre in Paimio became too small for the purpose. The new operation wing was completed in 1958. These kind of changes took place in various sanatoria. [294]

RE-USE PERIODS IN FINNISH SANATORIA

Severi Savonen wrote a pamphlet in 1947 supporting a proactive means of screenings and vaccinations:

If the extensive fight will begin, the map of tuberculosis in Finland shall within already ten years be totally different from that today. Optimism of this kind is not daydreaming, it is based on facts.[295]

Savonen's optimism became a reality, and the fight against tuberculosis in Finland had proved efficient by the late 1960s, mostly due to the medical cure. Many of the sanatoria were converted into contemporary hospital uses, which was also the case in Paimio.

THE OBSOLESCENCE OF THE SANATORIA NETWORK

The changes that took place in the Paimio Sanatorium were a reflection of the development in treating tuberculosis and later more generally in hospital strategies in Finland. From the 1930s until the late 1950s the sanatorium operated under its original purpose. In 1949 an extensive vaccination project was launched, as a result of which, according to Savonen, the Finnish population become the most

291 Salmenkallio 1958, 57–58.
292 Härö 1992, 190.
293 Härö 1992, 157.
294 Törrönen 1983, 79.
295 Savonen 1947. 51. In Finnish: "Jos voimaperäiseen taisteluun ryhdytään, on keuhkotautikarttamme jo 10 vuoden päästä oleva toinen kuin nyt. Tällainen optimismi ei ole mitään haaveilua, se perustuu tosiasioihin."

widely BCG-vaccinated population in the whole world.[296] That same year, legislation for X-ray screenings was established and the work was assigned to the tuberculosis districts of municipalities. This effort continued compulsory until 1989.[297]

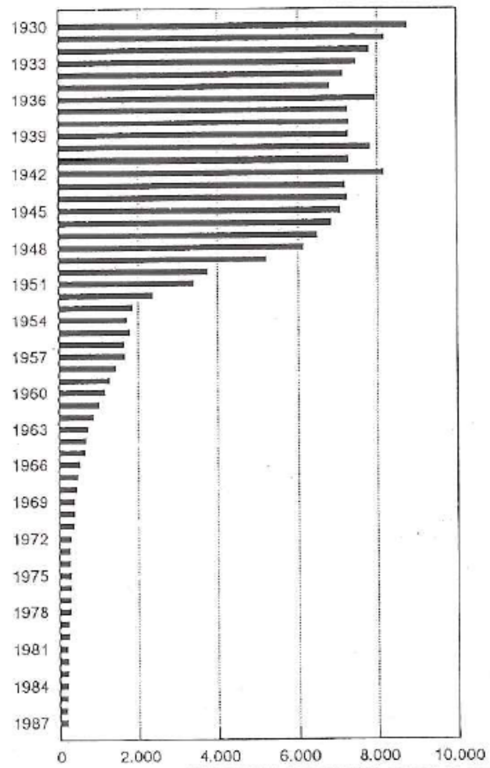
The governmental and communal effort in covering the costs of the sanatoria and the treatment continued after the introduction of legislation in 1929, as explained earlier. Before WWII the treatment of tuberculosis patients mostly focused on the general welfare and the strength of the patient; that is, it was based on hygiene and diet, which included long periods of rest in fresh air. Surgical operations (such as the pneumothorax) were developed in order to rest the damaged parts of the lung. Although these interventions did not lead to a permanent cure of patients, they were nevertheless pursued further. And in the 1950s the new medical means also enabled more extensive operations. The period of surgical operations, such as removing parts of lungs, continued until the late 1960s.

The development of a pharmaceutical cure was the key factor in overcoming tuberculosis. In 1948 the outpatient work and guidance given by special communal tuberculosis offices became free of charge, and in 1957 the treatment in the public sanatoria became totally free for the patients. Four years later also the costs of medicine were covered by public money.[298]

As regards the architecture of Paimio as well as many other sanatoria, the surgical operations brought about more changes in the buildings as the developed surgical operations become a more important means of cure as explained in the previus chapter.

The pharmaceutical treatment against the TB bacteria was developed already during the 1950s and became increasingly effective and more widely accepted. By the 1960s the patients could be identified earlier than previously, and could therefore receive the treatment before the disease had developed for too long.[299] The medical cure and also preventative measures such as vaccines had thus become very efficient.

After a successful pharmaceutical treatment against TB had finally been developed, tested and refined in the 1950s, the tuberculosis sanatoria became increasingly obsolete. Consequently, from the mid-1960s until the 1980s a third period in their history meant a gradual shift from their use as tuberculosis sanatoria to general hospitals, often focusing on lung diseases and rheumatism.[300]

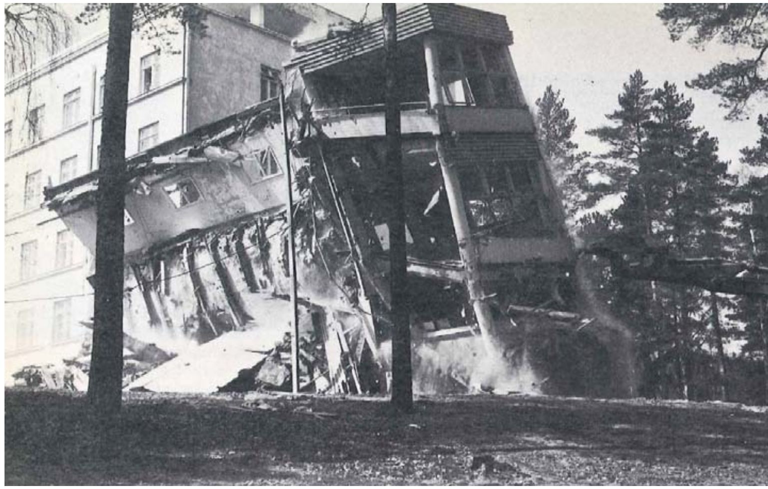


Deaths caused by tuberculosis in Finland, 1930–1987 (Härö 1992, 226).

296 Härö 1992, 172.
297 Härö 1992, 175–178.
298 Törrönen 1984, 69.
299 Törrönen 1984, 28.
300 In 1983 there were still some 800 beds in the tuberculosis treatment. Törrönen 1984, 7, 8.

In the early 1980s Sirkka Törrönen wrote an extensive history of the Union of Tuberculosis Districts.[301] She stated that the history of the large institutions for the treatment of tuberculosis in Finland since 1933, when the union was established, can be divided into three periods. The first period lasted until the 1940s, when the large sanatoria were built. The second period was the time of the refinement of the organization and the major period of tuberculosis treatment, and which lasted until 1964, when the district hospital system was set up. The number of patients' places in tuberculosis sanatoria was the highest in 1960 as there were all together 6164 beds in 18 central sanatoria. The third period was the running period of the sanatoria from the mid-1960s to the 1980s.[302]

In addition to Törrönen's three decades old analysis, we can see that during the last two decades it has been seen that the former sanatoria were unsuitable for use as general hospitals. The use of the sanatoria as hospitals can be seen as the fourth period, lasting from the late 1970s to the 2000s, but which is now shifting towards a new period. Therefore new uses for these hospital buildings have been found or will have to be found in the future. Those new uses may require, and in many cases have led, to a second period of extensive renovation and refurbishment, as is described in later chapters.



The balcony wing at Kinkomaa sanatorium being demolished (Törrönen 1984, 72).

THE RE-USE OF SANATORIA AS HOSPITALS FROM 1970S

The number of deaths caused by tuberculosis diminished strongly from the late 1940s onwards, but the number of infections remained high until mid-1960s.[303] As already mentioned, Savonen's optimism about the disease became a reality and the fight against tuberculosis in Finland had proved efficient by the late 1960s.

The law was changed in 1965 so that the sanatoria could be partly used to treat also diseases other than tuberculosis. Two years later the new law allowed the tuberculosis districts to be combined into health care districts.[304] Thus many of the sanatoria were converted into contemporary hospital uses, which was also the case in Paimio.

The executive board of the Union of Tuberculosis Districts had already in 1959 discussed the future of the large sanatoria, since the number of beds was greater than would be needed in the future. The discussions among the professionals focused, however, on the lack of new specialists in the field of tuberculosis treatment, which still remained an issue. The discussions resulted in a suggestion in 1962

301 In Finnish, Tuberkuloosipiirien liitto. Törrönen 1984.
302 Törrönen 1984, 7.
303 Väänänen 2000, 79–82.
304 Väänänen 2000, 82–83.

to the National Board of Health that the number of communal beds should be reduced.[305]

A special seminar on the re-use of the sanatoria buildings was held in 1967. And in the early 1970s both discussions and changes in the legislation continued. By the early 1980s the large public sanatoria had mostly been converted into general hospitals, focusing on rheumatism and internal diseases. This type of conversion had been seen by the authorities and governmental institutions as the only possible solution.[306]

At the end of 1986 the successor of the communal federations that had built many of the public sanatoria was disbanded as the special legislation regarding tuberculosis was replaced by a new law on infectious diseases. This new legislation put an end to the Tuberculosis Districts of Finland and the sanatoria became part of the hospital districts. On January 1, 1987, the new law on infectious diseases resulted in the end of the Southwest Finland Tuberculosis District, the successor of the original client. Paimio hospital became part of the Turku University Hospital. The relatively simple way of treatment and life in a sanatorium up until the late 1950s had over the decades turned into quite a different set of demands in a hospital facility.[307]

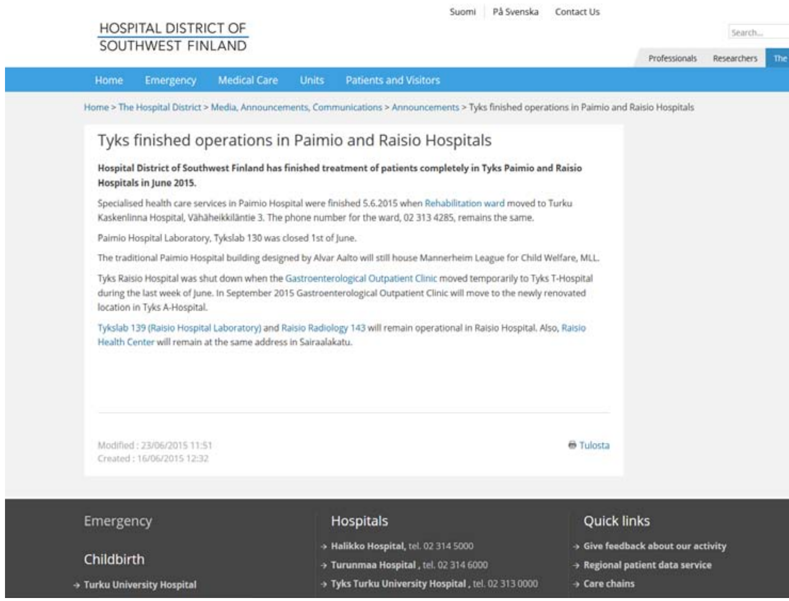
THE SECOND REUSE IN THE 21ST CENTURY

The sanatoria thus became part of the hospital network. Some of the former sanatoria are still today used as hospitals (with various modifications, which had become necessary in recent decades). Since, however, many of the large sanatorium complexes were situated in rather remote locations, they were no longer considered appropriate for contemporary hospital use, despite continuous refurbishments and modernization.

In the 21th century many of the large sanatoria have again been (or are about to be) converted and are now used for treatments which may not be as dependent upon contemporary technologies or the close connection to densely populated cities. Those uses include, for example, the care for the elderly, alcoholics, children, mentally disabled or mentally disordered. These changes and reuses are currently undergoing rapid development.

The new health-care units are often run by enterprises, foundations or other third sector operators. They may provide their services for communities or the National Pensions Institute, individuals or other institutions operated by public money which are purchasing the services for citizens. Recent

305 Törrönen 1984, 72.
306 Törrönen 1984, 74–75.
307 Paimio Hospital 2003, 15.



Internet page announcing that the Turku University Hospital had closed Paimio Hospital.

decades have seen a period of bidding competitions and new enterprises taking care of various tasks. Those same tasks were in the last decades of the 20th century organized publicly as a part of the Nordic welfare state. We are currently witnessing fundamental changes in Finnish society. As the number of elderly people is greater than ever, also the demand for various proactive treatments is growing.

This situation also contributes to a great pressure on the current health system and the changes in the Nordic welfare state may be significant in the near future. It is not only the way in which services are funded or organized that is under consideration in governmental and health care districts. The communal structures in regard to the ownership of the health institutions (even in regard to the actively operating hospitals) may change, not to mention complexes that may not meet the current standards.

THE END OF PAIMIO HOSPITAL

The hospital uses in the original Paimio Sanatorium buildings were gradually closed in the 2010s and the last rehabilitation ward moved to the Turku Kaskenlinna hospital on June 5, 2015.[308]

On January 10, 2013, the Alvar Aalto Foundation organized a meeting with the Hospital District, the National Board of Antiquities, Docomomo Suomi Finland and Icomos 20th Century Finland in order to discuss the necessary interventions to secure the preservation of Paimio's historical value. The question of listing the hospital, for example, on the ICOMOS Heritage Alert list or in the European Heritage Days' Heritage in Danger list was discussed. The value of the building complex was understood by the owner, the Hospital District, and the legislation regarding its protection was strong, and thus such listing was not seen as necessary at that time.[309]

In April 2014 the first new users of the Paimio main building moved in. The Mannerheim League for Child Welfare, MLL, has been using parts of the main building, as well as the apartment buildings, since then. The maintenance is still run by the personnel of the Turku Hospital District, as it is a valuable and irreplaceable part of the ongoing history, dating back to the construction of the Paimio Sanatorium.

308 Varsinais-Suomen sairaanhoitopiiri 2015.

309 AAM archive, minutes by Jonas Malmberg of the meeting held at the Aalto Studio at Tiilimäki 20, Helsinki, 1.10.2013.

EXTENSIONS AND RENOVATIONS IN PAIMIO SANATORIUM AND HOSPITAL

The history of Paimio Sanatorium and later Paimio Hospital follows the general medico-political developments in Finland. Its first years in the 1930s were marked by the commencement of the sanatorium operations. Some additional paint work was necessary soon afterwards, but more extensive repainting took place in 1949–51. However, it was with WW II that major changes were necessary in the operations of tuberculosis sanatoria in Finland.

WW II IN THE SANATORIUM

During the Winter War (1939-40) the recently completed medical institutions and also the tuberculosis sanatoria were an important factor in the treatment of the soldiers and other people wounded in the war. The sanatoria were increasingly used for the wounded, whose numbers grew steadily. In autumn 1939 only 1400 tuberculosis patients remained in the sanatoria, which had some 6000 beds. The military use continued until early 1940. During the Continuation War (1941–1944) many sanatoria were again in military use, and the treatment of tuberculosis patients was virtually halted. The tuberculosis treatment restarted in the sanatoria in 1945 and 1946.[310]

Also Paimio was used for military purposes during the war. However, a larger amount of tuberculosis patients continued to be treated there besides the wounded soldiers. The wards on the four top floors were in military use and the two first floors were in use as a tuberculosis ward. This double function continued in Paimio until early 1945.[311]

MÄNTYLÄ STAFF HOUSING, 1949

Mäntylä, the new staff housing, was completed in 1949. It was designed by architect Lauri Sipilä, who had worked in Aalto's office and been part of the original design team. The main contractor for the work was Kivikartio Oy and the work was supervised by Sipilä and the master builder Aimo Aro. The electrical installations were carried out by Oy Sähkö Ab, and the sanitary installations by Vesijohtoliike Onninen Oy.[312]

Mäntylä, which originally contained places for 30 persons, was refurbished in 1975–76 to make instead 15 single room apartments with sufficient comfort.[313]

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310 Härö 1992, 166.
311 Törrönen 1983, 68.
312 Jokiniemi 1958, 40.
313 Törrönen 1983, 81.

PAINTING WORKS IN 1949–51

The first big renovation to the main building came after WW II, as rather extensive repainting took place in 1949–1951 when paint and other building material was again available. The building's war-time use as a military hospital had caused notable wearing of the interiors.[314]

WELL CONSTRUCTION UNTIL 1954

The fresh water for the sanatorium was received from a well near the artificial pond of Lemmenlampi. Following a careful study of the location of the sanatorium, it was expected that the water supply would be sufficient. That estimation, however, turned out to be wrong, and the water supply remained problematic for decades. During that time as many as five wells were built and the engineering office Vesiteknillinen insinööritoimisto Vesto studied the options, leading to the construction of yet another new well in 1954.[315]

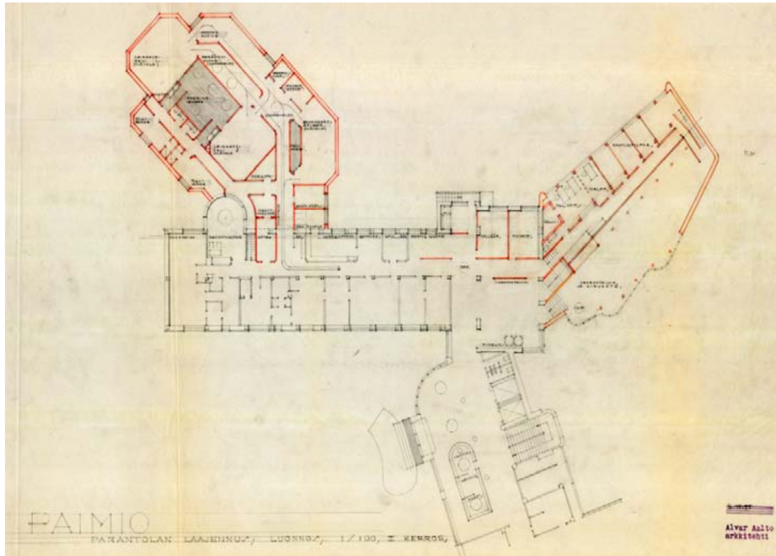
NEW OPERATING THEATRE WING, 1958

The design for the operating theatre wing was made by Aalto's office. In the draught plans from 1955 there was also another extension, a new wing to the rear of the building.[316] The unrealized extension would have included an auditorium on the first floor and on the ground floor there would have been a library and activities for the patients as well as some administration offices. The extension on the rear would have necessitated the removal of the large windows in the patients' day room, converting it into an extension of the dining room, as well as including an entrance and foyer to the proposed auditorium.[317] The funding was not acquired, however, and the more modest design was developed the following year.[318]

The extension next to B-wing was completed in 1958 and provided not only new operating facilities but also new maintenance workshops and a main storage in the basement. The extension was equipped with mechanical ventilation, and the dining hall – still serving as a festival hall, since the other extension was not built – received also a fresh air fan, placed in the corner. Some further changes

314 Jokiniemi 1958, 22–23.
315 Jokiniemi 1958, 40–41.
316 AAM 50-989 – 50-991.
317 AAM 50-1017.
318 Törrönen 1983, 80.

Mäntylä staff accommodation, with the new barrier-free entrance in 2014 (AAM Malmberg).



Draught proposal of the ground floor of B-wing, from 1955 (AAM 50-989).

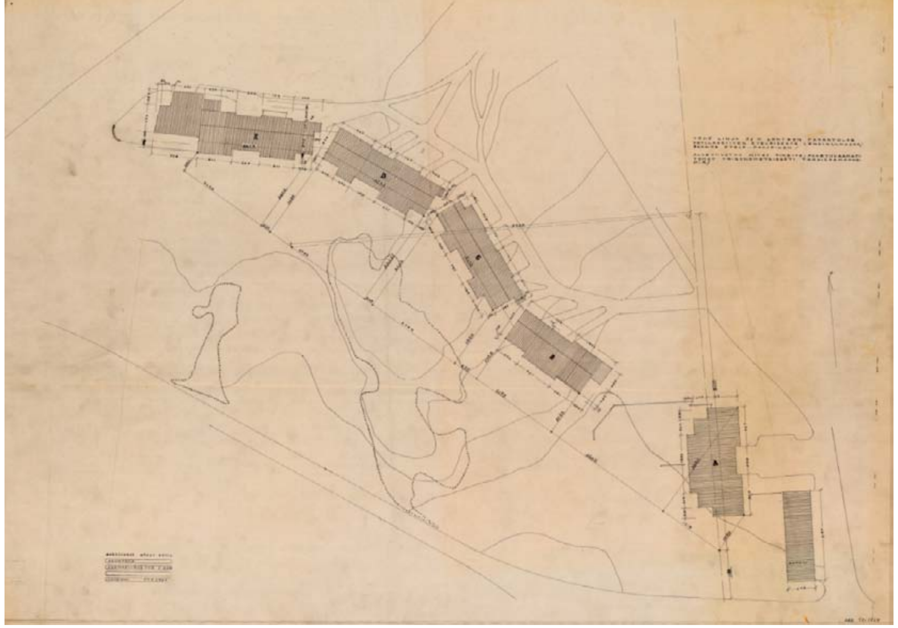
The operating theatre wing next to B-wing in the 1970s (AAM 5305 Mikko Merckling).

were made in the basement, as the bathing areas were rebuilt.[319] Also the staff sauna in the basement was refurbished in its original space.[320]

Quite extensive changes were made on the ground floor. The physicians' offices were altered, the X-ray facilities were enlarged and the old operating theatre was converted into a meeting room. The porter and the post office received a new setting – with prominent curved glass walls – in the middle of the main entrance hall. The original open character of the porter's room and a round telephone booth were removed (though remnants still remain partly visible in the ceiling of the corridor). The corridor was closed off and the direction entering the building was changed. From then onwards, visitors have to turn to the right from the main doors. The entrance received a second set of doors, the steps inside the hall were removed and steps were installed instead on the exterior. According to the drawing from Aalto's office, the original glass part above the main doors was cut smaller.[321]

These changes to the ground floor of the main building resulted in the closing off of some of the original open views. Also, with the addition of glass fire doors to the corridors the continuity of changes resulted in a loss of lightness and the flow of space in the central areas.

319 Törrönen 1983, 80.
320 AAM 50-1097.
321 AAM 50-1071.



Site plan of the Kyykartano staff housing (AAM 50-1824).

Kyykartano staff housing (AAM digi 1526 Jonas Malmberg).

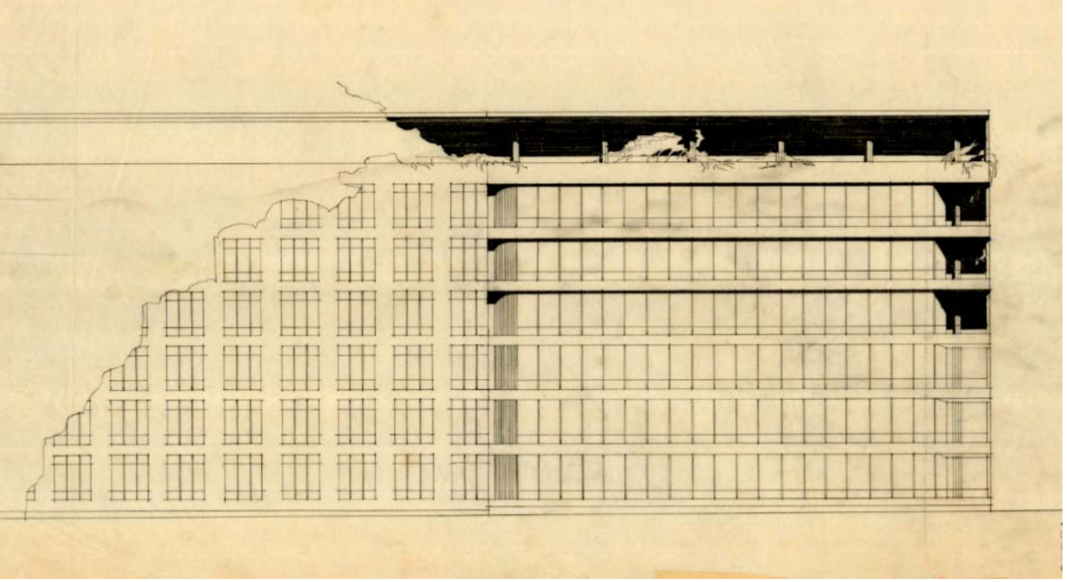
KYYKARTANO STAFF HOUSING 1962

The lack of staff housing had been a difficult problem from the very beginning of the sanatorium. The planning of the staff apartment building began in 1960. In order to save some expenses, the executive board of the Tuberculosis District thought to use another architect and asked Aalto to choose the location. This did not please Aalto, and in the end he was assigned the entire design task. The draught plans were approved on April 29, 1960. Construction began the following year, and the contractor was Oy Laaksonen & Kumpp. The complex, which consisted of 48 dwelling units, was completed in 1962.[322]

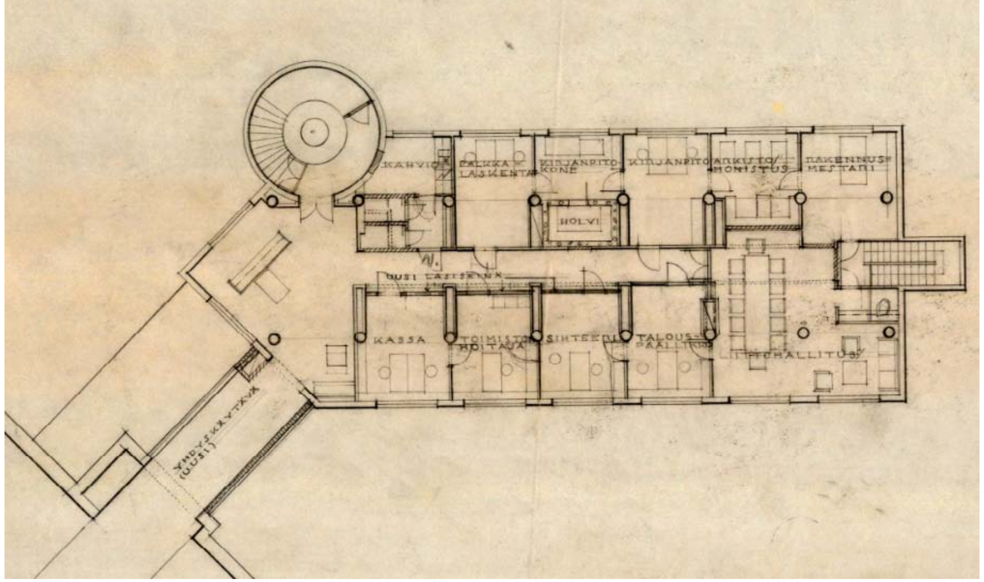
The larger apartments, with two or three rooms, were intended for the senior nurse, maintenance chief, gardener and head matron. The nurses received rooms in shared three-bedroom apartments. Moving to a building separated from the main building resulted in an increased sense of privacy. The staff accommodation in the main building was therefore no longer very appealing.[323]

The serpentine building received the nickname Kyykartano (Viper hall) by chief physician Hannes Salmenkallio, referring most likely to both the form of the building and the character of some of the nurses living there.[324]

322 Törrönen 1983, 80–81.
323 Törrönen 1983, 81.
324 Törrönen 1983, 81.



Elevation of the glazed balconies in A-wing (AAM 50-1206).



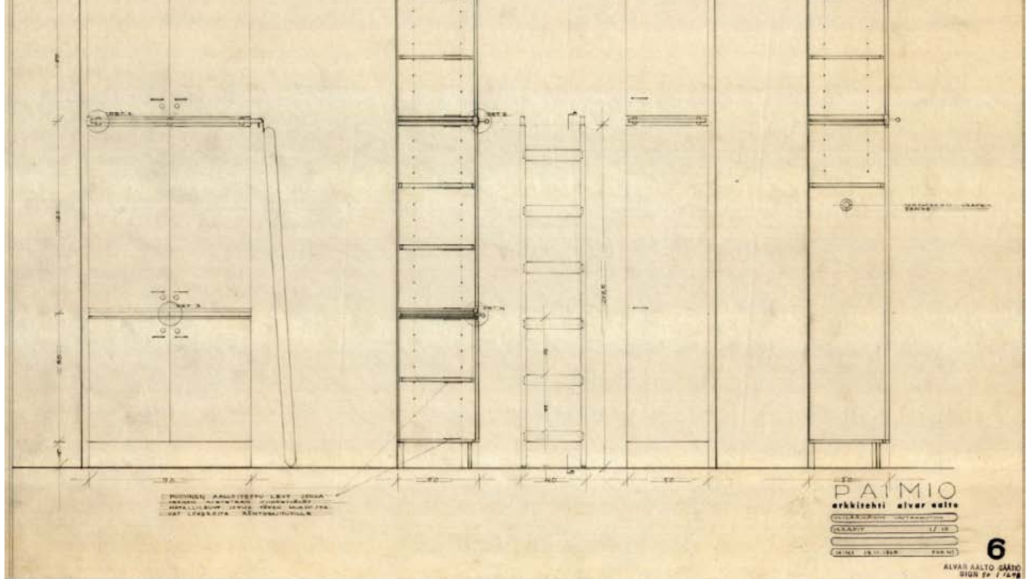
Study for the offices above the kitchen, from 1969 (AAM 50-1328).

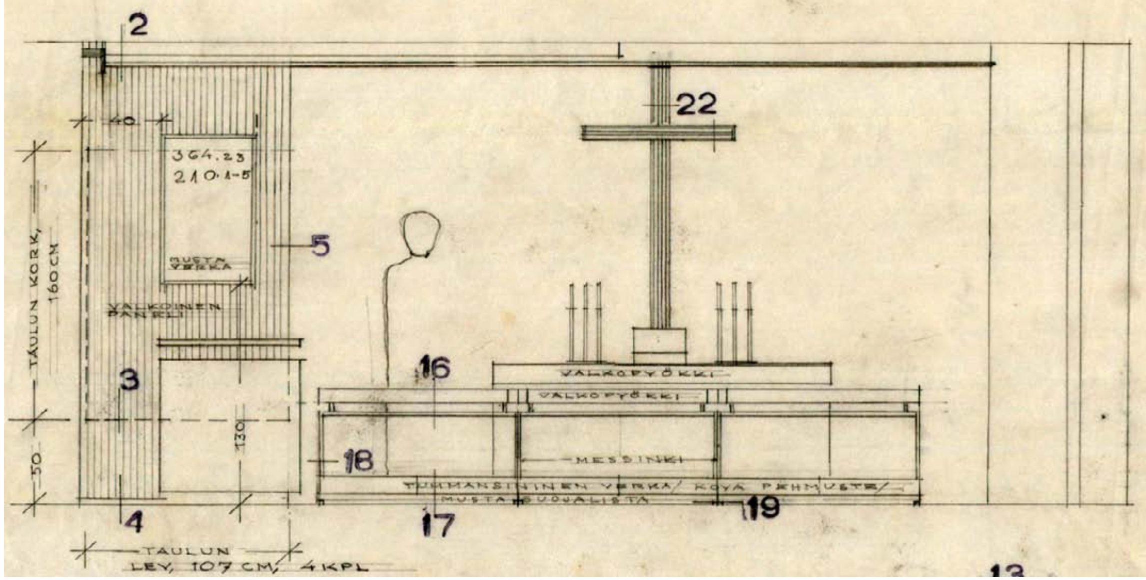
CHANGES TO IMPROVE FIRE-SAFETY EFFICIENCY, 1963

On June 14, 1962, a fire safety examination was carried out in the main building, and a statement was presented by the authorities on June 26. Several deficiencies were noticed in the fire-safety efficiency and protection. [325] It seems that the requested improvements were done simultaneously with the glazing of the balconies (see next chapter) and the fire safety examination may have had to do with the extensions to the wards, even though that is not mentioned in the statement.

In Aalto's office Heikki Tarkka designed the necessary interventions. The existing doors between the wards and main stairs were modified with new glass, rabbets of steel were added and the thresholds and hinges were renewed. New fire exit stairs were added and the old ladder to the projector room next to the library was removed.

325 The fire-safety deficiencies included the following: The main staircase was open to every level and the doors were not classified. Also the ducts in the patients' wards lead through the entire building and were covered only by plywood doors. They expected the wards to be separated from the main staircase by protective doors and the long hallways were to be cut into three sections by glass walls. Each part of the building was to have at least two separate exits. The existing glass doors were to be converted so that they could be regarded to some extent as fire proof. Both the horizontal and vertical ducts were to be cut on each level or room. AAM archive. Statement by Ilmari Juvakoski and Esko Hongisto, 26.6.1962.





GLAZING OF THE BALCONIES, 1964

Changes in the curing approach and the provision of antibiotics had by the early 1960s diminished the role of fresh air therapy. In 1963 the project to convert the balconies into extensions of the ward was started. The need for administrative spaces and rooms for various treatments was urgent. The idea is said to have been sketched by the physicians, mostly by Dr. Risto Lahesmaa, whose thoughts were presented to Aalto's office for further study. The glazing was designed in Aalto's office and, for instance, the need for emergency stairs was studied in many ways. The executed solution was such that the very end of each balcony was left open and equipped with an emergency staircase. Also the top floor balconies were left open. The renovation was completed in May 1964.[326]

The new staff housing Kyykartano had been completed in 1962. In the late 1960s also the previous staff apartments in the main building were amended. The top floor above the kitchen was converted into administration offices for accounting and many of the small bedrooms were converted into offices and physicians' rooms. Also some fixed furniture was designed, for instance, for the chief physicians' office in 1968 and 1969.

In the 1960s also a space for religious events and lectures was built in the basement of A-wing. A room the size of three original patients' rooms was equipped with adequate technical equipment and furniture, such as benches, crucifix and pulpit.

326 Törrönen 1983, 81.

Fixed furniture in the chief physician's office (AAM 50-1298).

An elevation of the fixturesin a space for religious events (AAM 50-1252, excerpt.)

THE RE-USE AS A HOSPITAL

The purpose of the rather extensive refurbishment carried out in the 1970s and 1980s was to convert the sanatorium into a contemporary hospital. Some of the changes were executed with sophisticated details, such as the second-floor office spaces. Nevertheless, the additions are rather complicated, with a system of two parallel corridors, something that despite the interesting layers of reused and new fixed furniture is somewhat incompatible with the straightforward original sanatorium layout. Some other changes, such as those in the basement, resulted in a labyrinth of spaces serving the hospital complex.

As mentioned earlier, the relatively simple way of treatment and life in a sanatorium up until the late 1950s had over the decades turned into quite a different set of demands in a hospital facility. Finally, on January 1, 1987, the new law of infectious diseases resulted in the end of the Southwest Finland Tuberculosis District, the successor of the original client. Paimio hospital became part of the Turku University Hospital.[327]

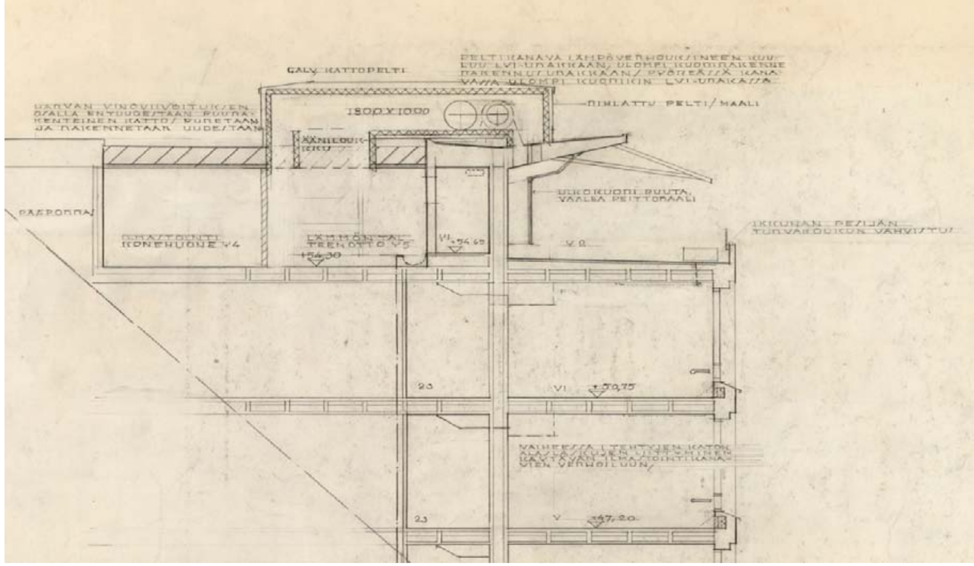
RENEWAL OF THE WARDS 1974–1979

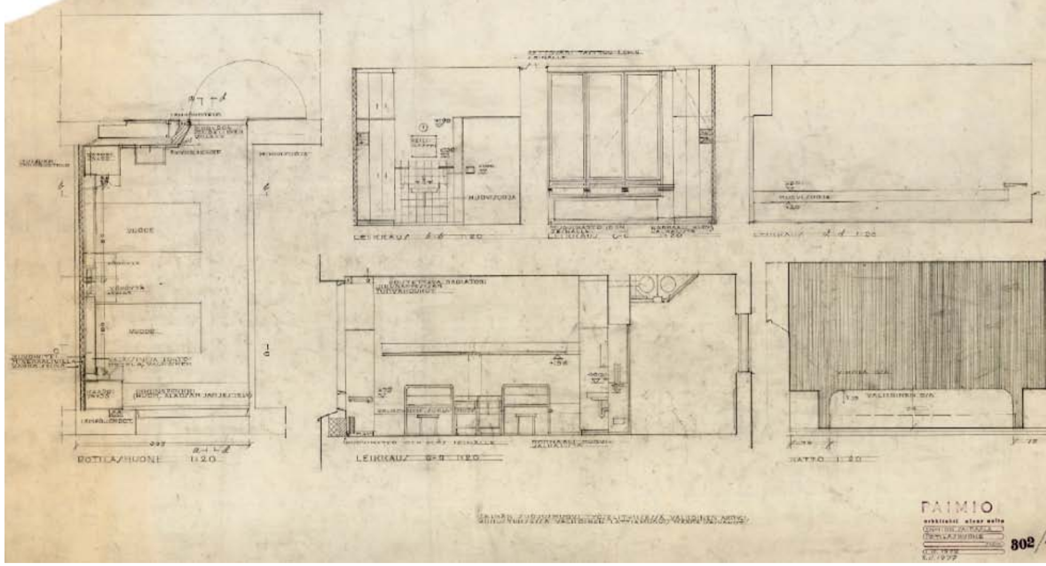
In 1971 Paimio Sanatorium was renamed Paimio Hospital. At that time there were three wards for tuberculosis, two for other pulmonary diseases and one ward for various other diseases.[328] In January 1973 a department of internal medicine, largely specialized in rheumatic diseases, was opened.[329]

The extensive renewal of the wards had been planned up until the mid-1960s. The refurbishments were started in autumn 1974. First of all, the offices, physicians' room and a new elevator for the wards were built. The next stage, in 1977–1979, included the renovation of the patients' rooms. Also, new bathrooms were built and the steel stripped windows of the corridors were renovated. The rooms received mechanical ventilation, which made changes to the top floor balconies necessary. New sanitary spaces for the personnel were built in the basement. The construction work was carried out by Insinööritoimisto Kalevi Saksi Oy.[330]

The renewal of the basement was carried out in the 1980s, when also the new morgue and laboratory were built. Those changes, as well as the 1970s renewals to the nurse's offices and a new elevator (which replaced the sputum elevator in the wards), meant spatial changes also for A-wing.

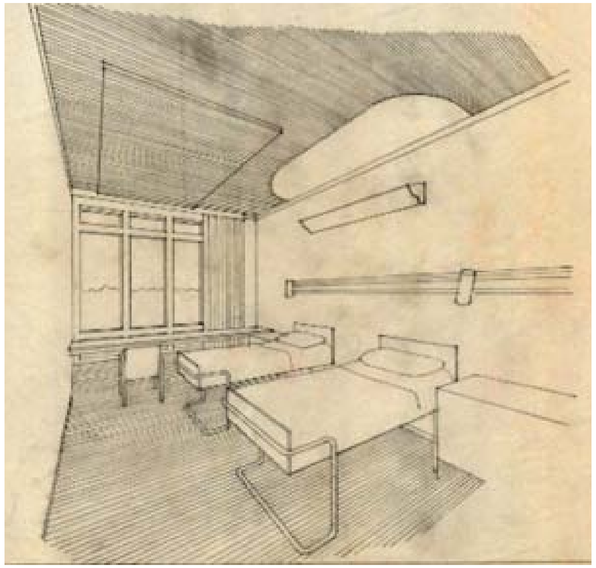
327 Paimio Hospital 2003, 15.
328 SKS archives.
329 Paimio Hospital 2003, 14.
330 Törrönen 1983, 81–82.





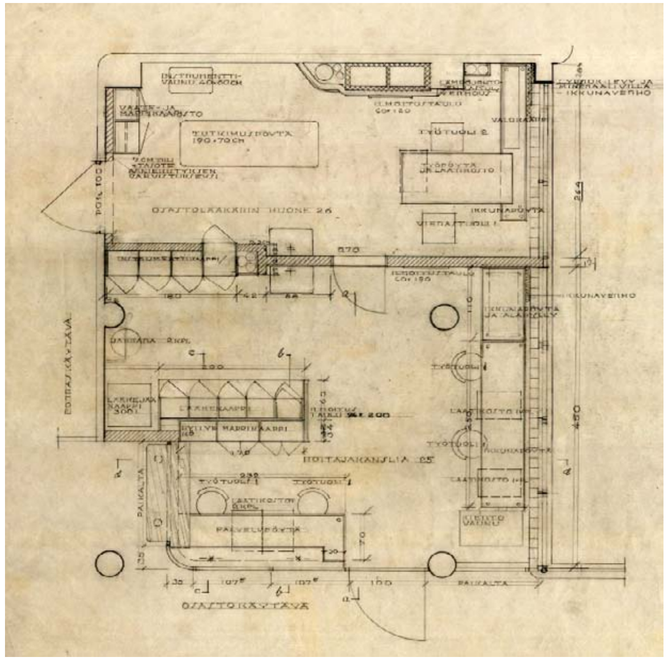
Changes in the patients' rooms included the addition of fixed furniture; note the partial suspended ceiling in the corridors (AAM 50-1489).

Ventilation machinery was placed on the roof terrace. The terrace between the long corridor and the main staircase was built in (AAM 50-1502, excerpt.)



A sketch for an unrealized proposal for the renewed lighting of a patients' room, 1972 (AAM 50-1347).

The offices of the wards were renewed, including the organization of the rooms (AAM 50-1422, excerpt.)



KINDERGARTEN, 1976

The chief physician's house was converted into a kindergarten in 1976. In making those changes, only minor modifications were necessary. On the first floor the staircase was separated from the corridor by a wall. Also the plumbing and electrics were redone, as well as extensive paintwork.

In accordance with a plan from 1989, the former servant's room was opened into the kitchen in order to get a larger entrance for the children to the courtyard. Also on the first floor the room leading to the balcony was opened up so that the wall to the corridor was removed.

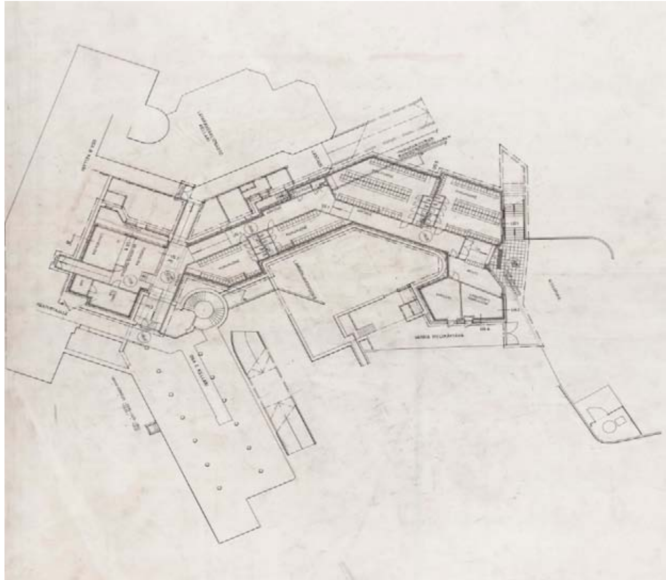
Renewals to B-wing in the 1980s

The renewals to B-wing in the early 1980s were extensive. The introduction of mechanical ventilation demanded that the ceiling be lowered. Also some of the most valuable spaces, such as the day room, were altered and equipped with a new, partly lowered ceiling and new sliding doors. Also one of the fireplaces was demolished. The facilities for the chapel in the basement of A-wing were moved to two other locations. The regular events were held in the refurbished day room on the first floor, and some of the fixed furniture built in the 1960s was reinstalled in the day room. A new morgue with a small chapel, together with a ramp for a hearse, was built in the basement of A-wing.

The ground floor was equipped with a barrier-free entrance. Also the former physicians' offices and X-ray department on the ground floor were converted into spaces for contemporary treatments.

On the upper floors, the apartments and guestrooms as well as staff rooms were converted into offices and treatment rooms. The former staff dining room on the second floor, which had earlier been used for physiotherapy, was converted into offices. The physiotherapy section received a larger space on the third floor.

Major changes took place on the first floor and in the basement, where new underground spaces were built beneath the courtyard next to the 1950s operating theatre wing. A new X-ray department and swimming facilities were built in the basement of the main building. Multiple changes have resulted in a rather complicated basement level, where it is difficult to orientate oneself.



The plan of the underground extension, at the basement level (AAM 50-2197).

NEW OFFICES FOR FINANCES AND ADMINISTRATION

Housing had been a constant problem for the sanatorium, but as the standard of living developed, more and more members of staff had apartments outside the hospital area. Consequently, the staff apartments in the main building from the 1930s were converted into offices and meeting rooms for the finance department. The process began in 1980, so that the offices that had replaced the housing above the kitchen in the 1970s now received a new use as administration offices. The finance department moved there in 1981 and the administration the following year.[331]

CHANGES AFTER AALTO'S OFFICE

The refurbishment was designed by Aalto's office, yet the architect himself had not been personally responsible for the process. Alvar Aalto passed away in 1976. Even before his death, the architect Heikki Tarkka had been mainly responsible for the refurbishment of Paimio carried out by Architects Office Alvar Aalto Co.[332] Paimio Hospital was officially protected as a national monument on March 18, 1993, as will be explained in the next chapter. The Aalto office was led by Elissa Aalto until 1994, when she herself passed away. From 1996 onwards the architects' office responsible for the refurbishment has been LRP Architects, for decades under architect Ola Laiho and later Jaakko Rautanen.[333]

The last two decades have resulted in a number of changes and refurbishments, some of which have been quite extensive, such as the renewal of the operating theatres in 1999 and 2005, or the kitchen in 2000 and 2014. Some of them focused on particular rooms, converting them to meet some new use, such as the nurses' and wards' offices in 1999 and 2001. Some of the changes entailed the insertion of extensive technical installations, despite their relatively small size, for instance, creating isolation rooms for infectious diseases, which required their own technical rooms on the seventh floor.

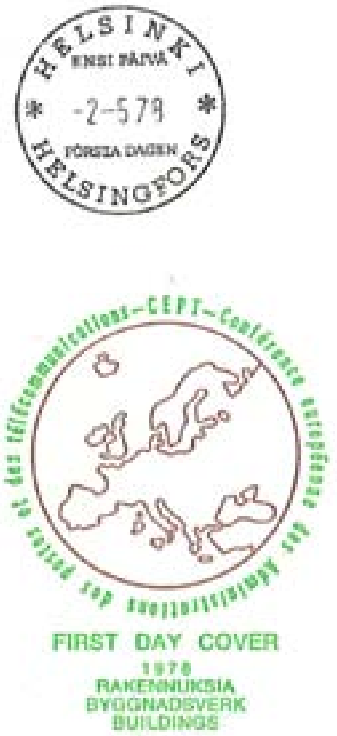
PROTECTION

In the 7/1977 issue of Arkkitehti Maima Norri wrote a strong critique of the renovation process of the wards in Paimio:

The patients' rooms in Paimio Sanatorium are to be completely rebuilt, apart from one museumified room. The round cornered cabinets and silent basins are to be replaced with standard models. [--] In widening the doors the original birch plywood doors are to be replaced with painted plywood

A postcard of Paimio Hospital in 1996 (AAM ar 25-2 Jussi Virmajoki).

331 Törrönen 1983, 81.
332 Törrönen 1983, 83.
333 Laiho et al. 2009



Paimio Sanatorium depicted on a postage stamp published by the Finnish Post in 1978.

doors with standard fittings. Why is the original birch plywood surface not good enough? Transferring the door handles designed specifically for Paimio to the new doors would surely not have been insurmountable? The radiant heating system applied in Paimio was so radical in its time [--] and the radiators placed in the ceiling that were in use for almost fifty year systems will now give way to a more old-fashioned system. The sanatorium's original ventilation was a natural system, the ducts for which are located in the corridor side walls. The original ducts will not be utilised in the renewal of the ventilation system. Gypsum board ceilings with lists are to be built in the patient corridors, behind which will be placed the new ducts.

The major refurbishment in the 1970s became a public concern, even though Aalto's office was still involved in the design. In the late 1970s also the National Board of Antiquities started to pay attention to modernist architecture. Architect Maija Kairamo, who worked at the National Board of Antiquities, recalls the meeting held at the Museum of Finnish Architecture on February 15, 1978, which she herself attended. According to her, Elissa Aalto was not aware of the quality nor the quantity of the designed refurbishments, which were being run in the Alvar Aalto & Co. office by Heikki Tarkka. Before the meeting Kairamo had visited the site and got the impression that the fundamental values of the sanatorium were being destroyed during the process. The visit to the site and the meeting formed an important starting point in the preservation process, which, according to Kairamo, were previously considered impossible, as Alvar Aalto was alive. [334]

The process of the re-use of Paimio as a specialized hospital did not satisfy everyone. The process was too radical for some, and some members of the board believed the transformation to be too difficult. Eino Seikola, who was a representative of the building committee for the reuse process stated: [335]

334 Kairamo Maija as related to the author (Malmberg) at Tiilimäki 29.10.2015.
335 Törrönen 1983, 82.

Removed wash basins, designed by Alvar Aalto on the building site during the refurbishment (Arkkitehti 7/1977, 15).

The conversion into a general hospital has been difficult, especially designing the laboratories took a long time. As long as Aalto was involved in the design, the Tuberculosis District's general board did not need to interfere. Since 1977 the National Board of Antiquities has got involved in everything.

The Government of Finland gave the decision no. 43/561/92 on March 18, 1993, in which the Paimio Sanatorium was protected as a national monument. The buildings included in the decision were the main building, the chief physician's house, the physicians' row house, the mortuary chapel, the former heating plant and garage building. Also the surroundings of those buildings are to be maintained so that their integrity will be retained. The refurbishments carried out since then have been supervised by the National Board of Antiquities. [336]

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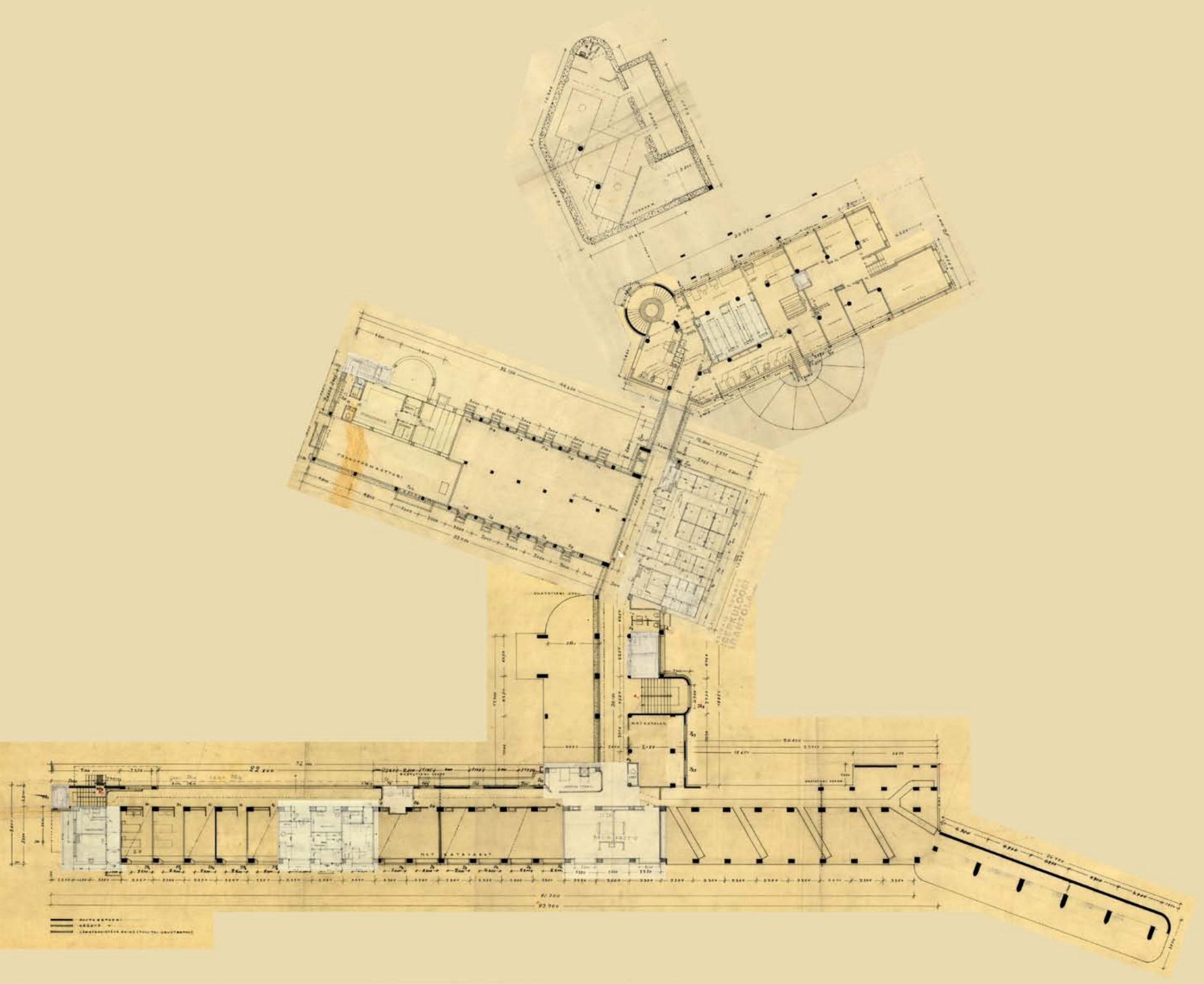


PHYSICAL EVIDENCE

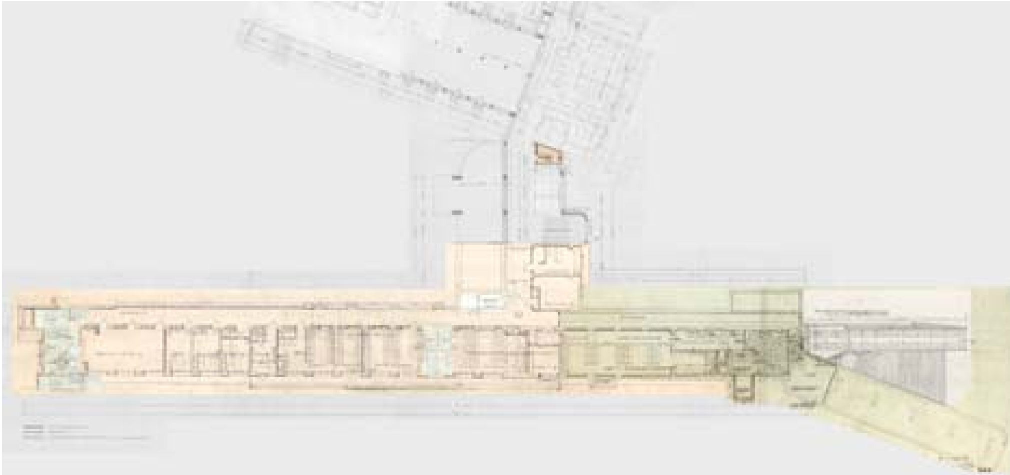
ORIGINAL FLOOR PLANS AND MAJOR CHANGES

Jonas Malmberg

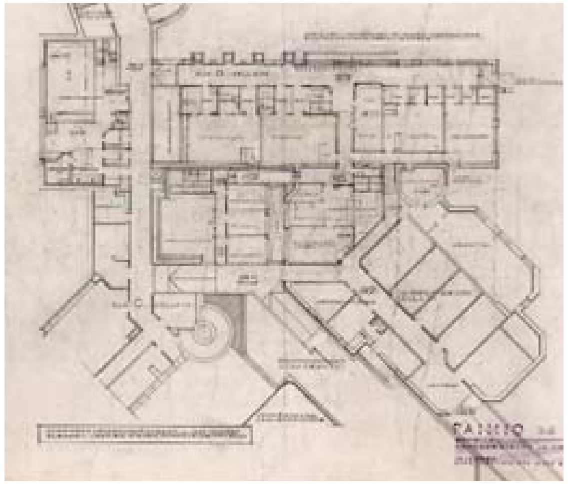
Basement in the 1930s (digitized drawings by Aalto's office combined in 2015)

MAJOR INTERVENTIONS IN THE MAIN BUILDING – BASEMENT:

1958 Operating theatre wing



1970s Refurbishment in A-wing



1980s B-wing alterations

1930s A-wing: some spaces created in the east part of A-wing without Aalto design drawings. An entrance was built on the southern side, which was removed in the late 1970s

1958 Operating theatre wing and B-wing: the new operating theatre wing was built, staff sauna was refurbished

1964 A-wing: the three patients' rooms at the west end were combined to create a space for religious events and lectures, as well as staff facilities

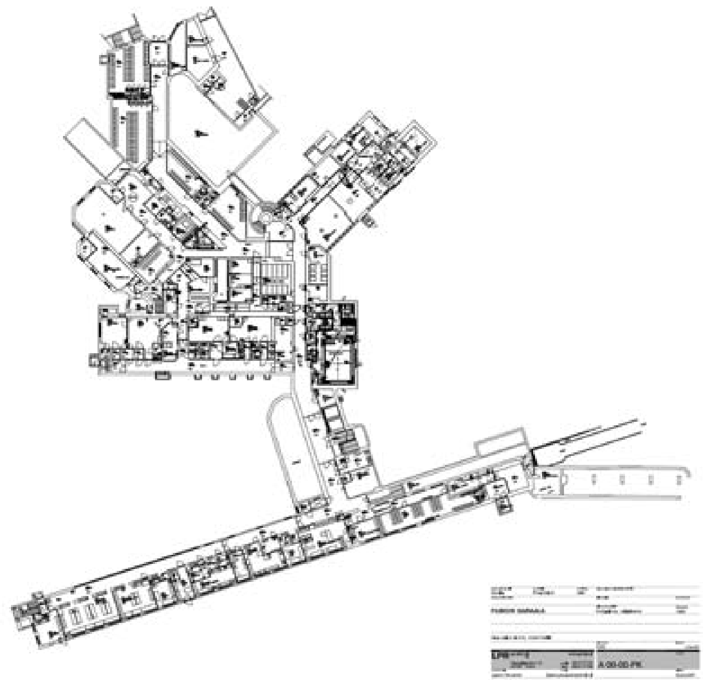
1974–79 A-wing: total refurbishment (except the 1964 alteration) and chapel room with new or enlarged entrance to the east

1982 C-wing: alterations in the service rooms, new rooms next to B-wing connection 1982 A-wing: laboratory built in the west end

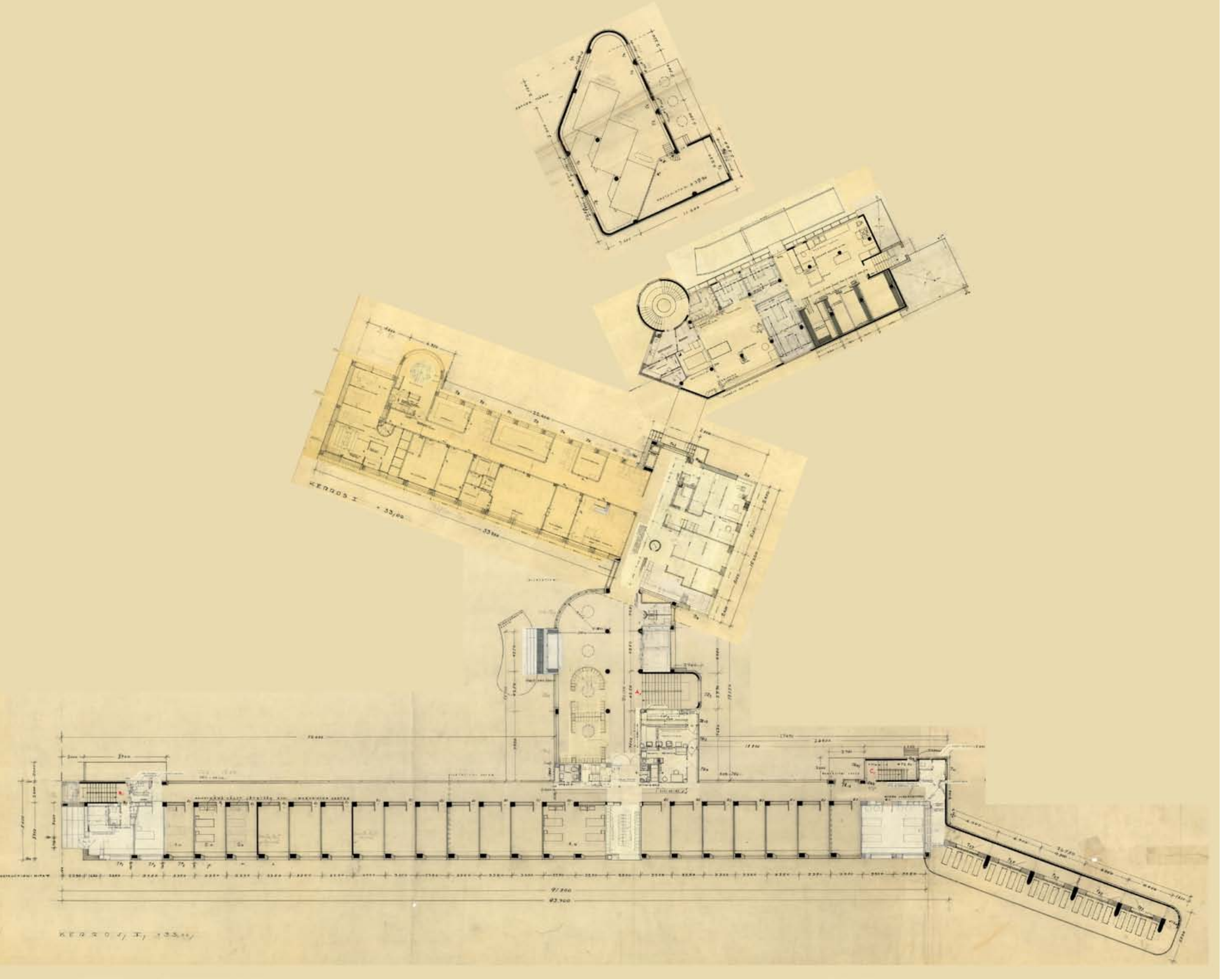
1984 B-wing: baths were replaced by a pool department, and new X-ray department 1984: Underground facilities between B- and C-wings, additional entrance

1986 C-wing: new reading room

2006 B-wing: pool area renewed



Present status drawn by LPR Architects

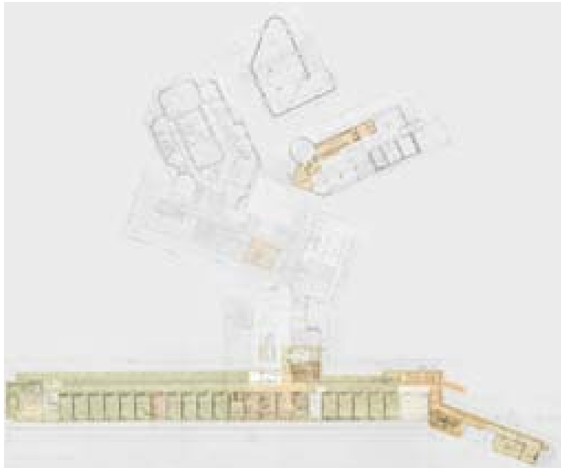


Ground floor in the 1930s (digitized drawings by Aalto's office combined in 2015)

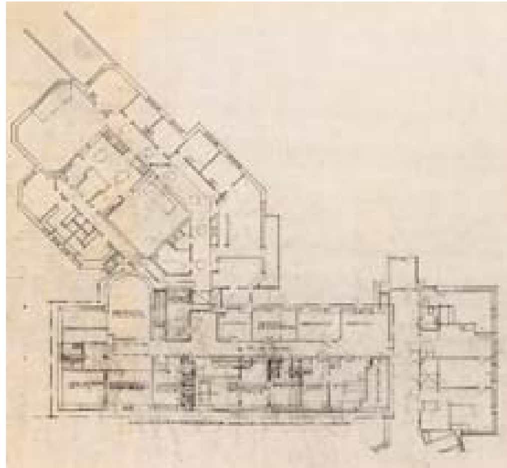
MAJOR INTERVENTIONS IN THE MAIN BUILDING – GROUND FLOOR:

1958

1960s



1970s



1980s B-wing

1958 New operating theatre wing and B-wing: offices altered, X-ray facilities enlarged, old operating theatre converted into a meeting room. The porter and post office setting built. The B-wing corridor remodelled. The entrance received a second set of doors, and the interior steps removed

1964 A-wing: balcony closed and converted to extension of the ward.

1965–69 B-wing: offices, X-ray, main elevators

1974–79 A-wing: total refurbishment (museum room retained)

1980s B-wing: offices refurbished, treatment rooms built, new window added, partial lowered ceiling in the entrance hall (to portier's cabin); new entrance in the north.

1986 Operating theatre wing: spatial alterations in corridors, ventilation machinery renewed

1990 B-wing: entrance hall renovated (north corridor draught lobby 1998, elevators 2001) 1990s A-wing: common spaces refurbished

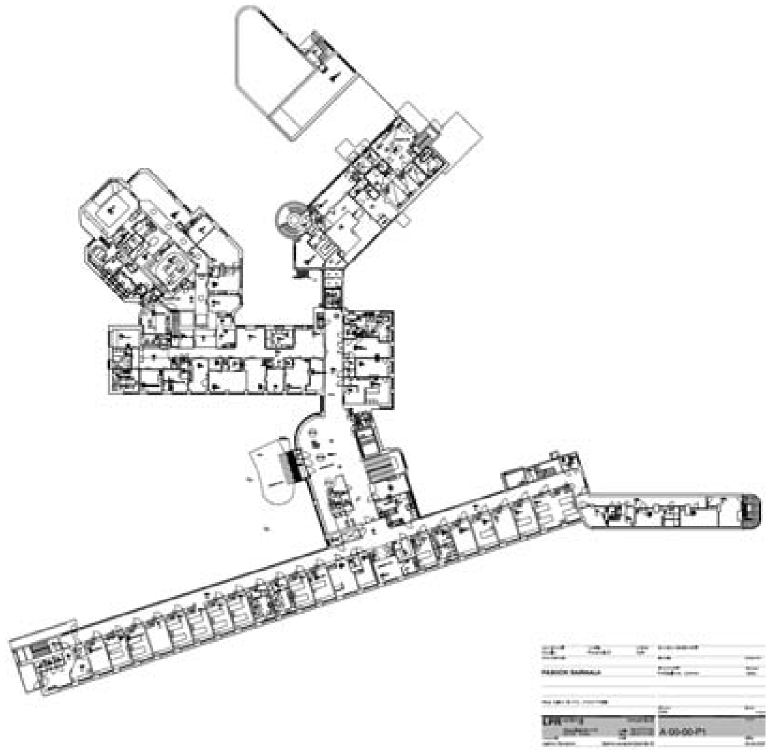
1992 C-wing: new loading bridge

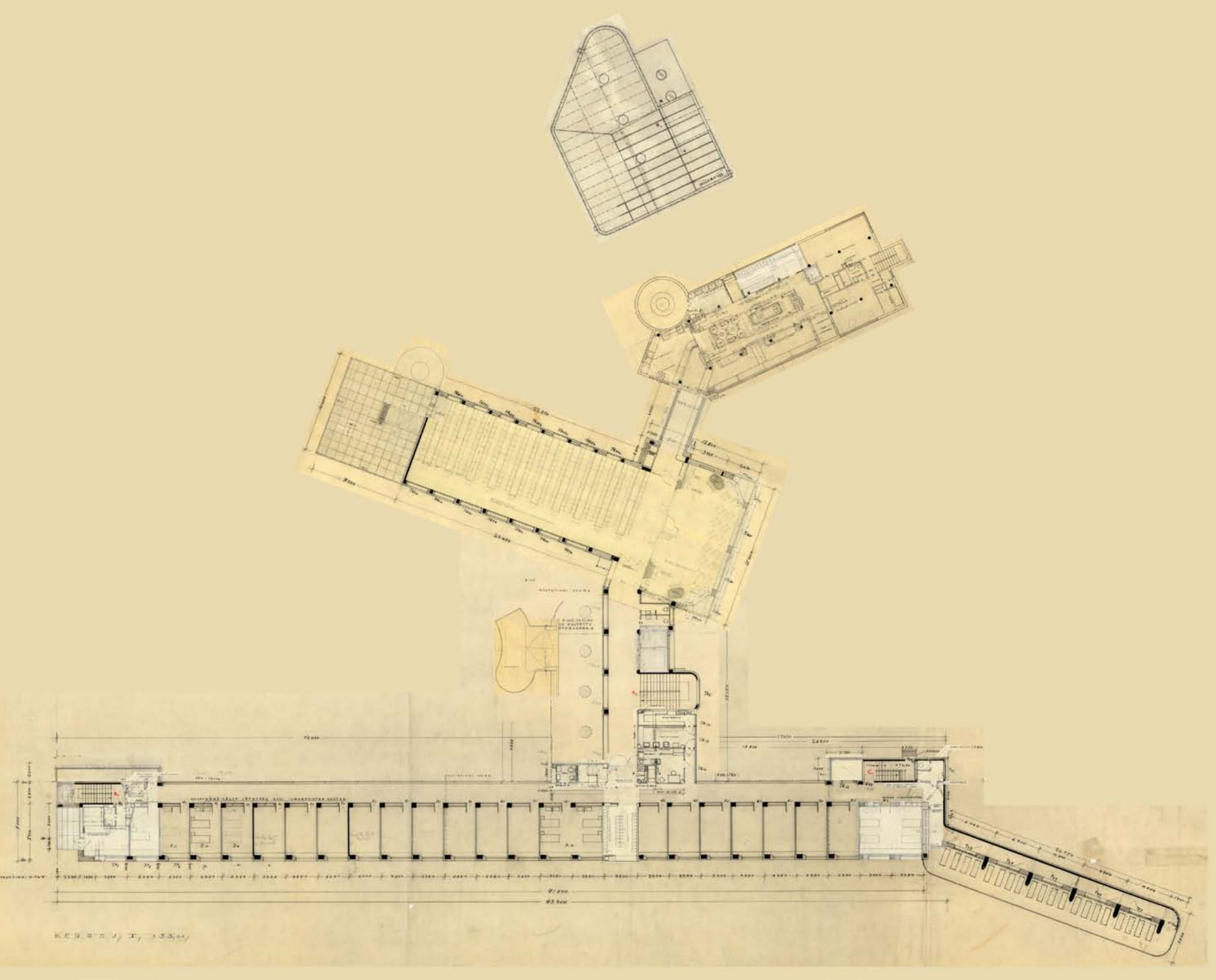
1995, 2005 Operating theatre wing: refurbished

2000s A wing: multiple minor alterations in specific rooms for various purposes

2001, 2015 C-wing: kitchen refurbishments

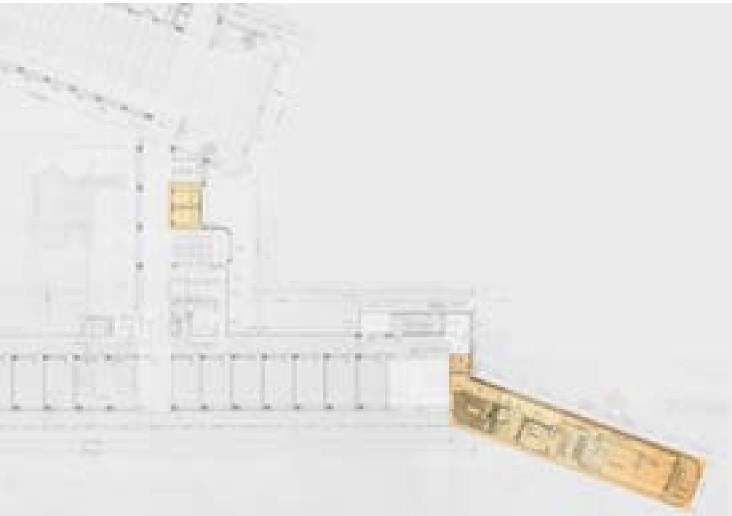
2005 B-wing: entrance hall restoration





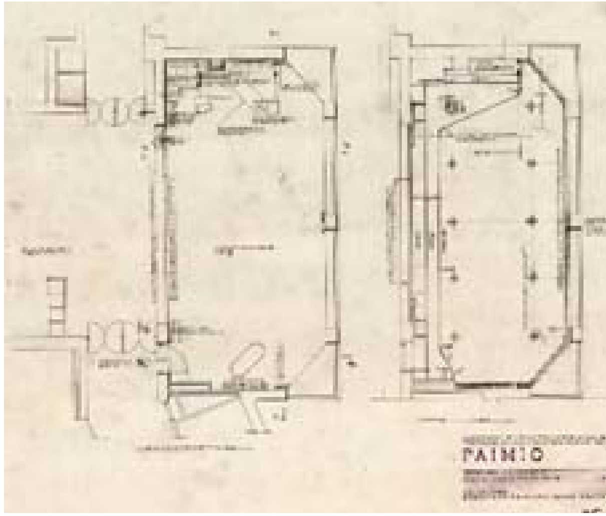
First floor in the 1930s (digitized drawings by Aalto's office combined in 2015)

MAJOR INTERVENTIONS IN THE MAIN BUILDING – FIRST FLOOR:



1960s

1970s



1985 Drawing of alterations to the day room

1958 B-wing: new operating theatre wing closed some north-facing windows in the dining room

1964 A-wing: balcony closed and converted to an extension of the ward

1973 C-wing: kitchen refurbished, furniture in dining room

1974–79 A-wing: total refurbishment

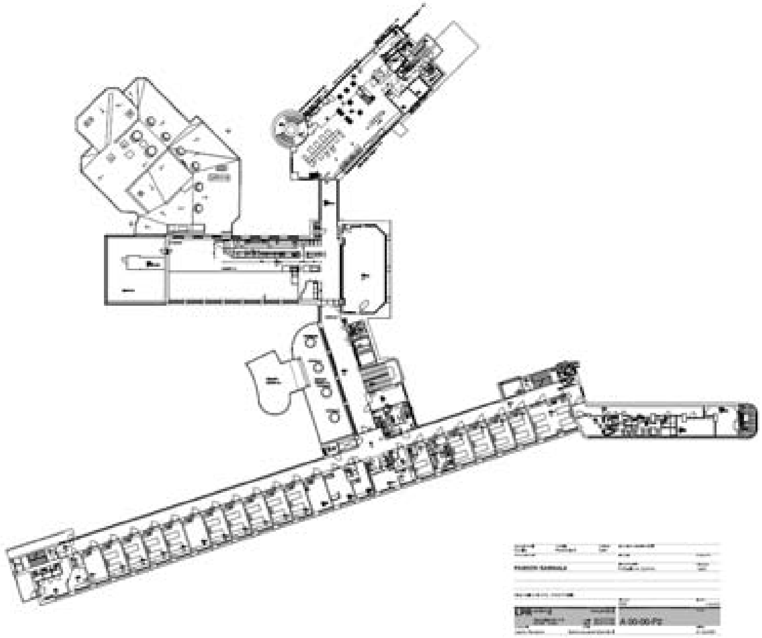
1980s B-wing: refurbishment of day room (ceilings, one fireplace removed, symmetry lost, some fixed furniture taken from the basement lecture space), dining room floor renewed, sliding door replaced, acoustic panels

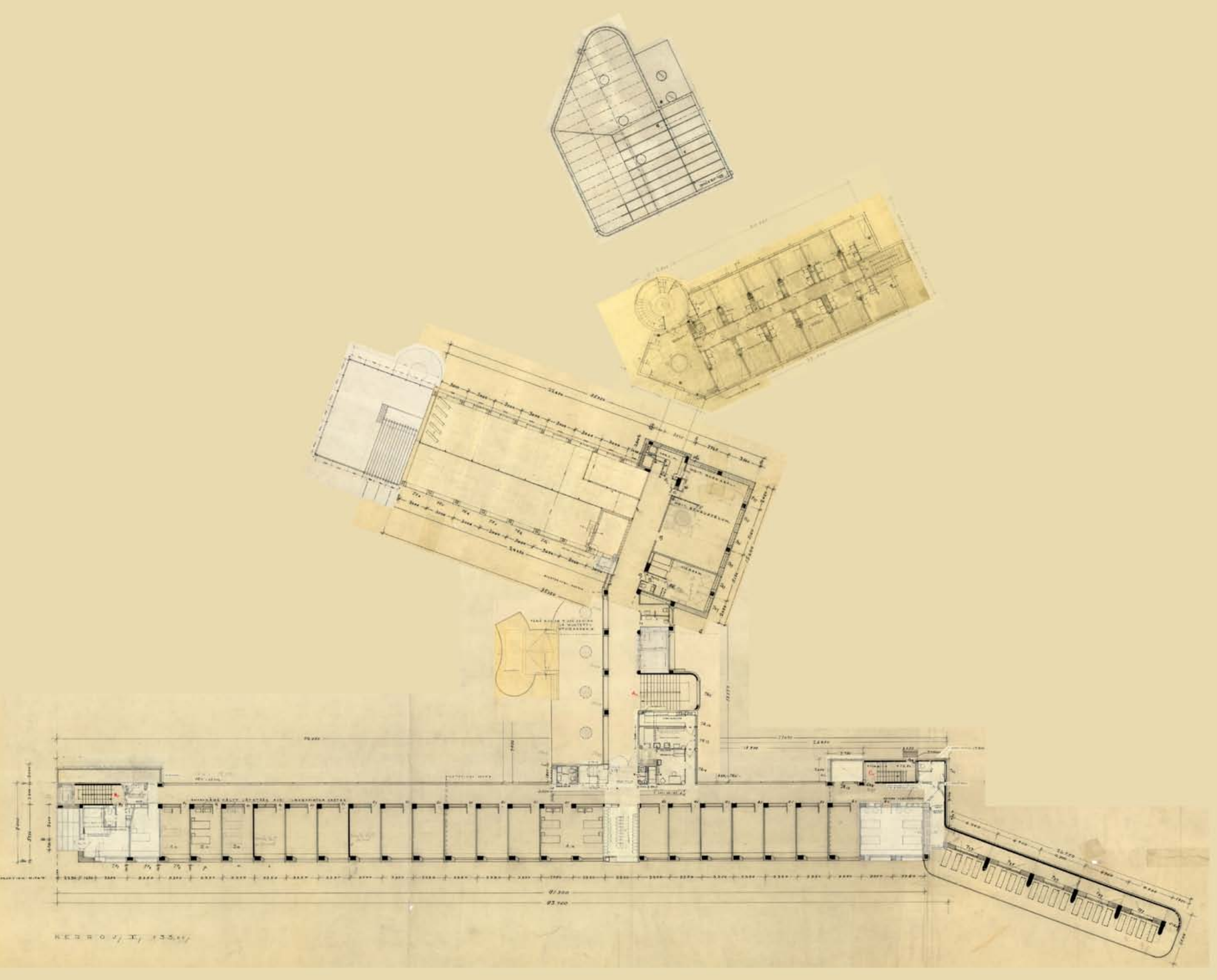
1990s A-wing: common spaces refurbished

2000s A-wing: multiple minor alterations in specific rooms for various purposes 2006–07 B-wing: lunch room fixed furniture etc., and painting of day room

2014 C-wing: kitchen refurbished

2015 B-wing: dining room acoustics improvement designed (not executed by 1/2016)

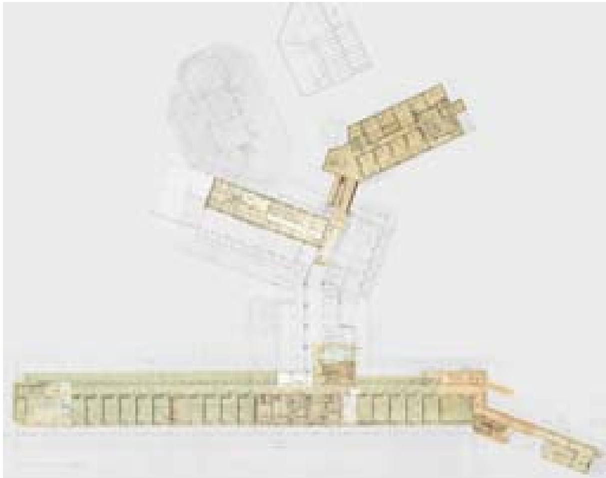




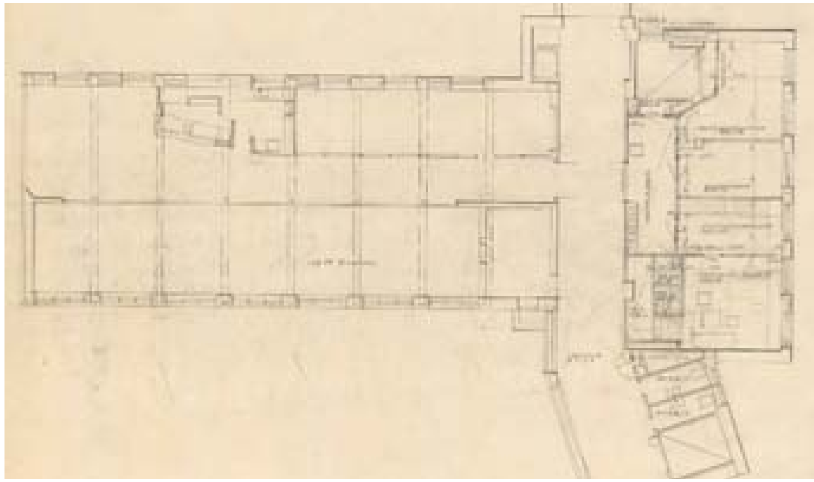
Second floor in the 1930s (digitized drawings by Aalto's office combined in 2015)

MAJOR INTERVENTIONS IN THE MAIN BUILDING – SECOND FLOOR:

1960s



1970s



1985 B-wing offices and canteen

1961–63 B-wing: entrance to the balcony of the projector room, nurses' lunch room replaced by spaces for physiotherapy

1964 A-wing: balcony closed and converted to an extension of the ward

1973 C-wing: staff apartments converted into offices and meeting rooms; connection to B-wing built (possibly first in 1970 and in 1973 as heated space, display case added 1988)

1975 B-wing: part of the library used as a patients' union canteen

1974–79 A-wing: total refurbishment

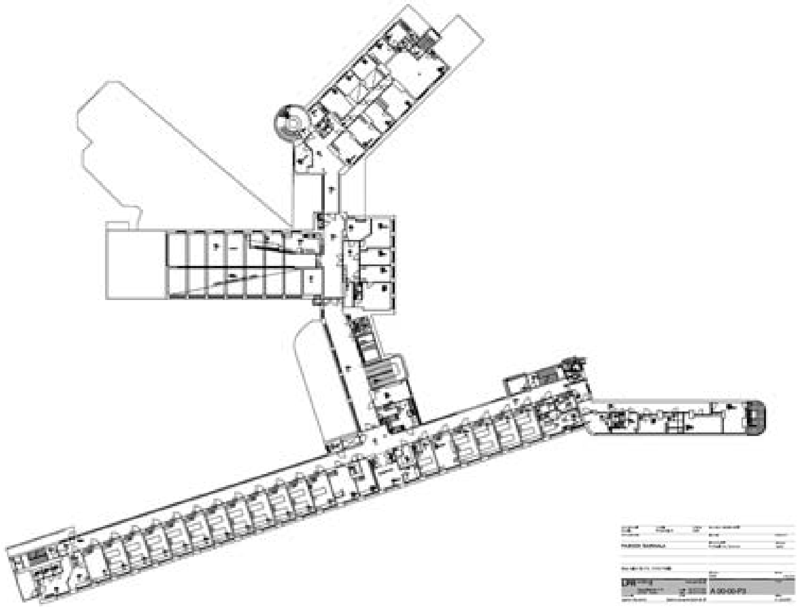
1981 C-wing: minor spatial changes in offices, one office room built in the lobby

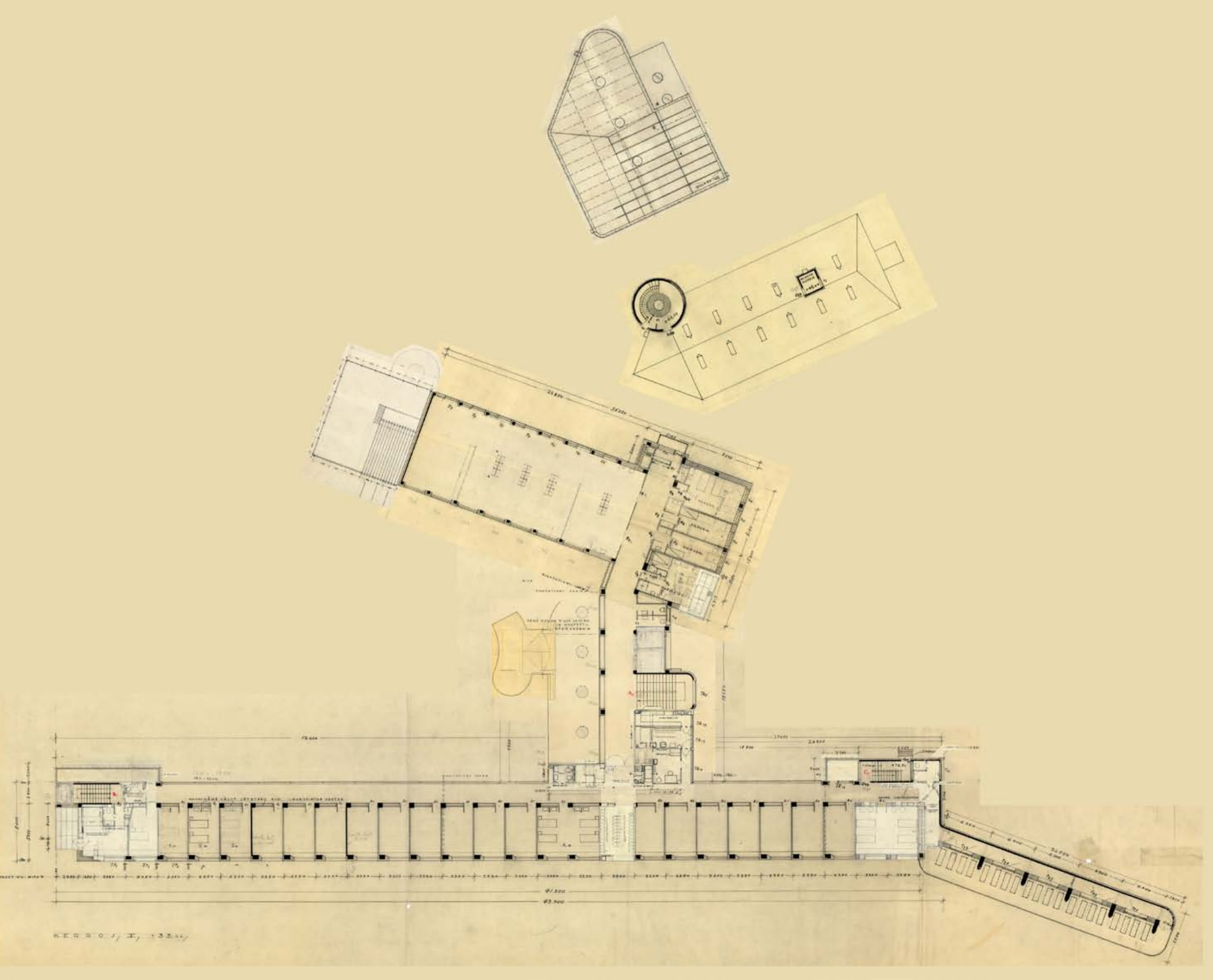
1985 B-wing: therapy spaces converted into offices (one window added)

1986 B-wing: library removed and canteen refurbished (removed in 2007, ceiling retained)

1990s A-wing: common spaces refurbished

2000s A-wing: multiple minor alterations in specific rooms for various purposes

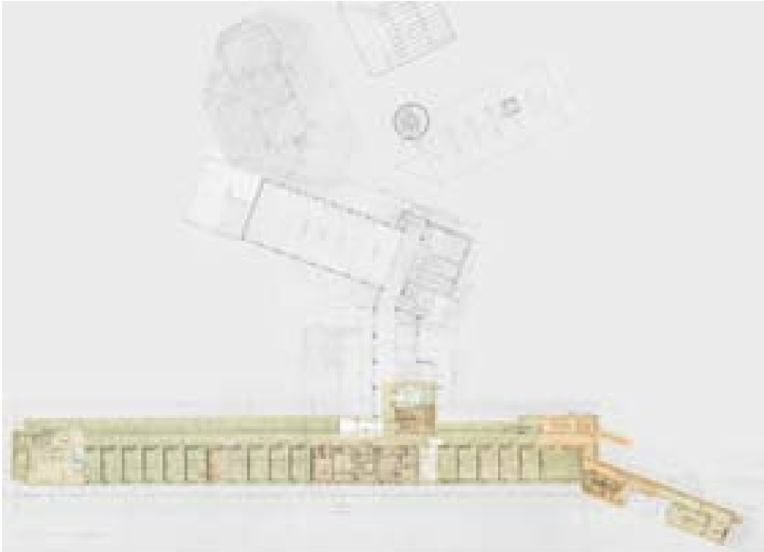




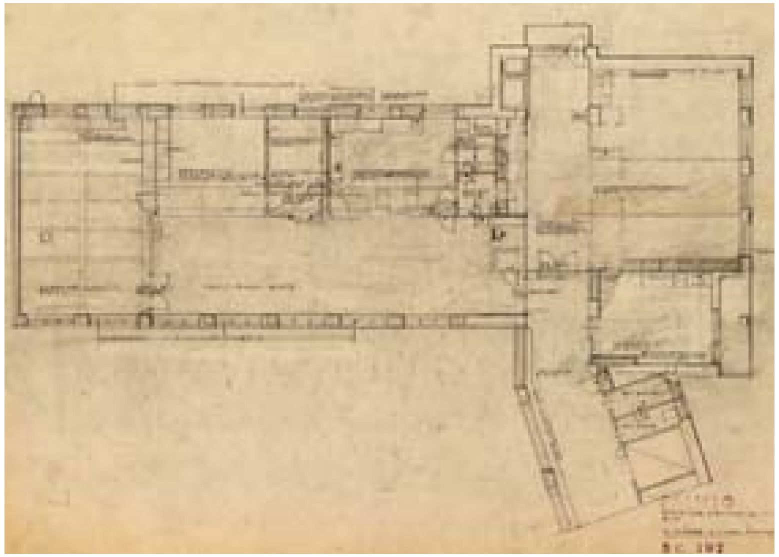
Third floor in the 1930s (digitized drawings by Aalto's office combined in 2015)

MAJOR INTERVENTIONS IN THE MAIN BUILDING – THIRD FLOOR:

1960s



1970s



1984

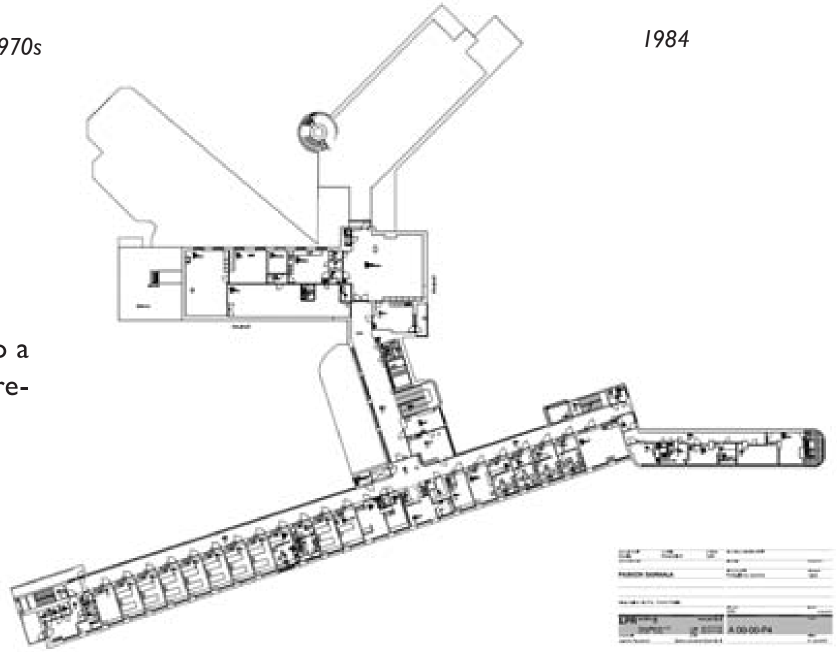
1964 A-wing: balcony closed and converted to an extension of the ward

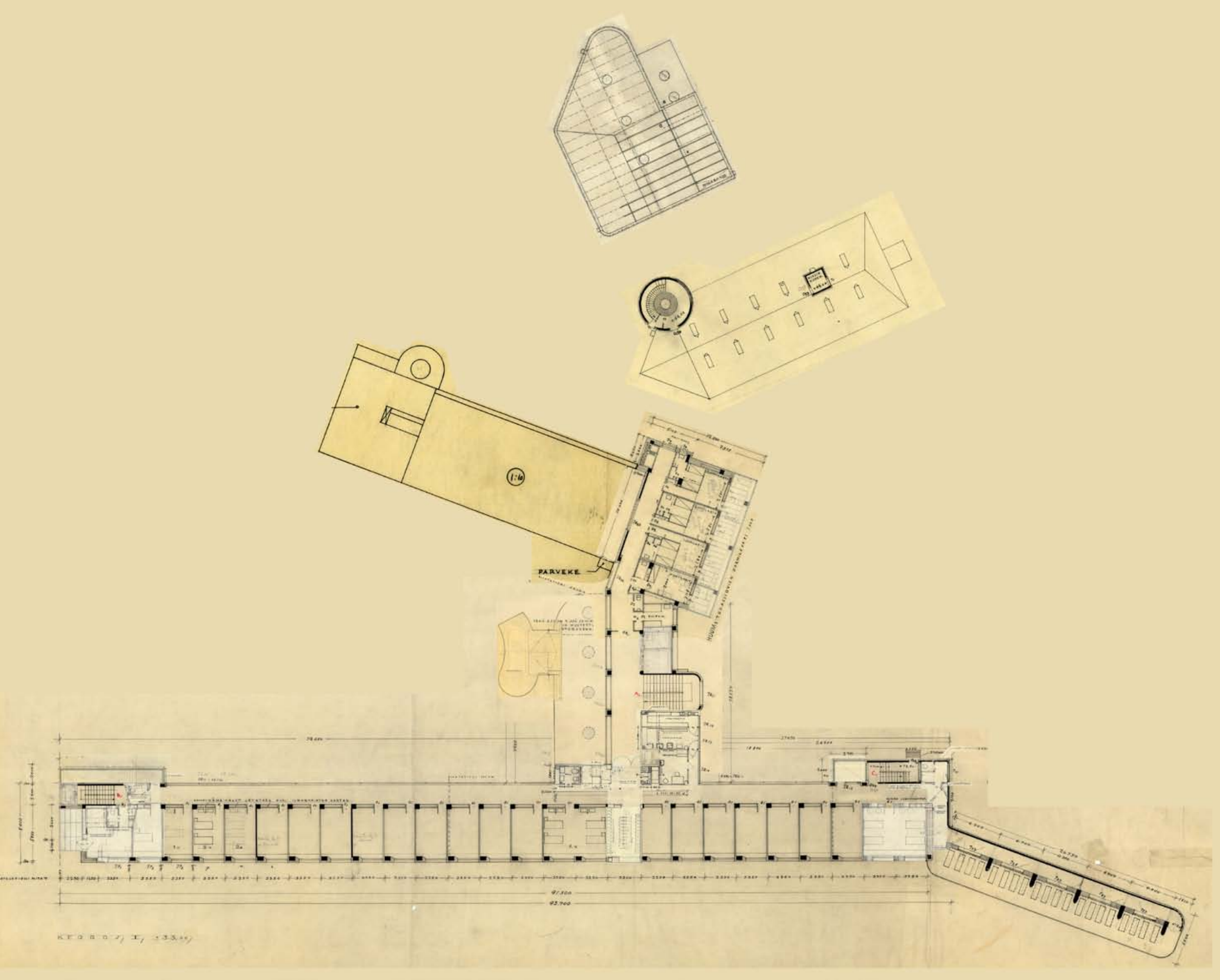
1974–79 A-wing: total refurbishment

1984 B-wing: dwelling rooms and workroom and corridor spatially altered in a refurbishment into a gym and hobby rooms (also a ventilation machinery room built), a fire-proof door (possibly 1963) re-used as gym door

1990s A-wing: common spaces refurbished

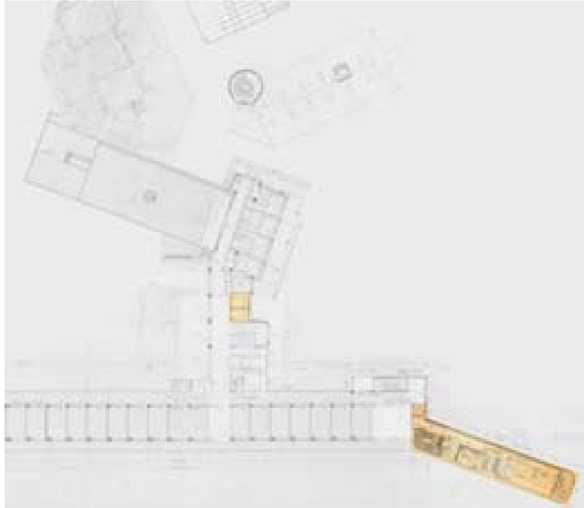
2000s A-wing: multiple minor alterations in specific rooms for various purposes

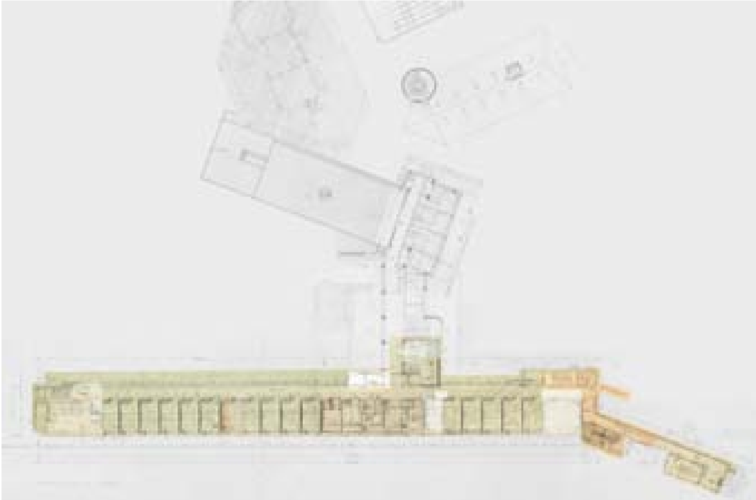


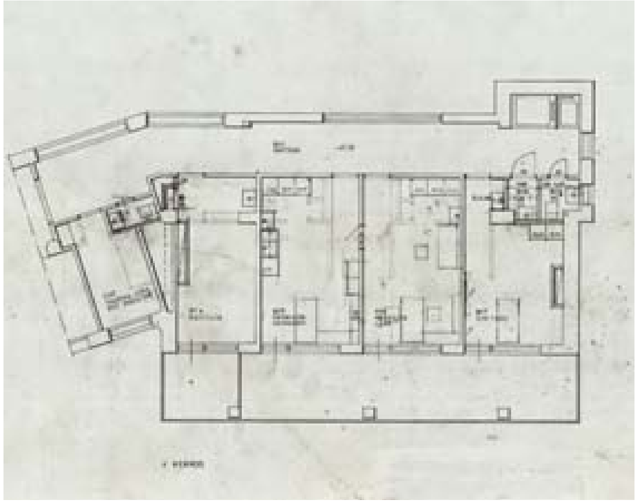


Fourth floor in the 1930s (digitized drawings by Aalto's office combined in 2015)

MAJOR INTERVENTIONS IN THE MAIN BUILDING – FOURTH FLOOR:



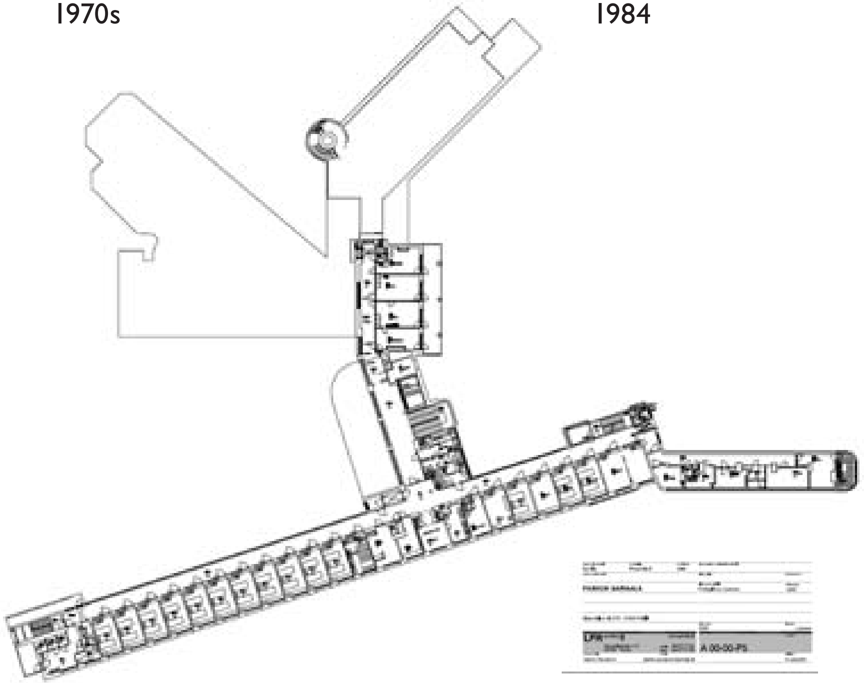




1960s

1970s

1984



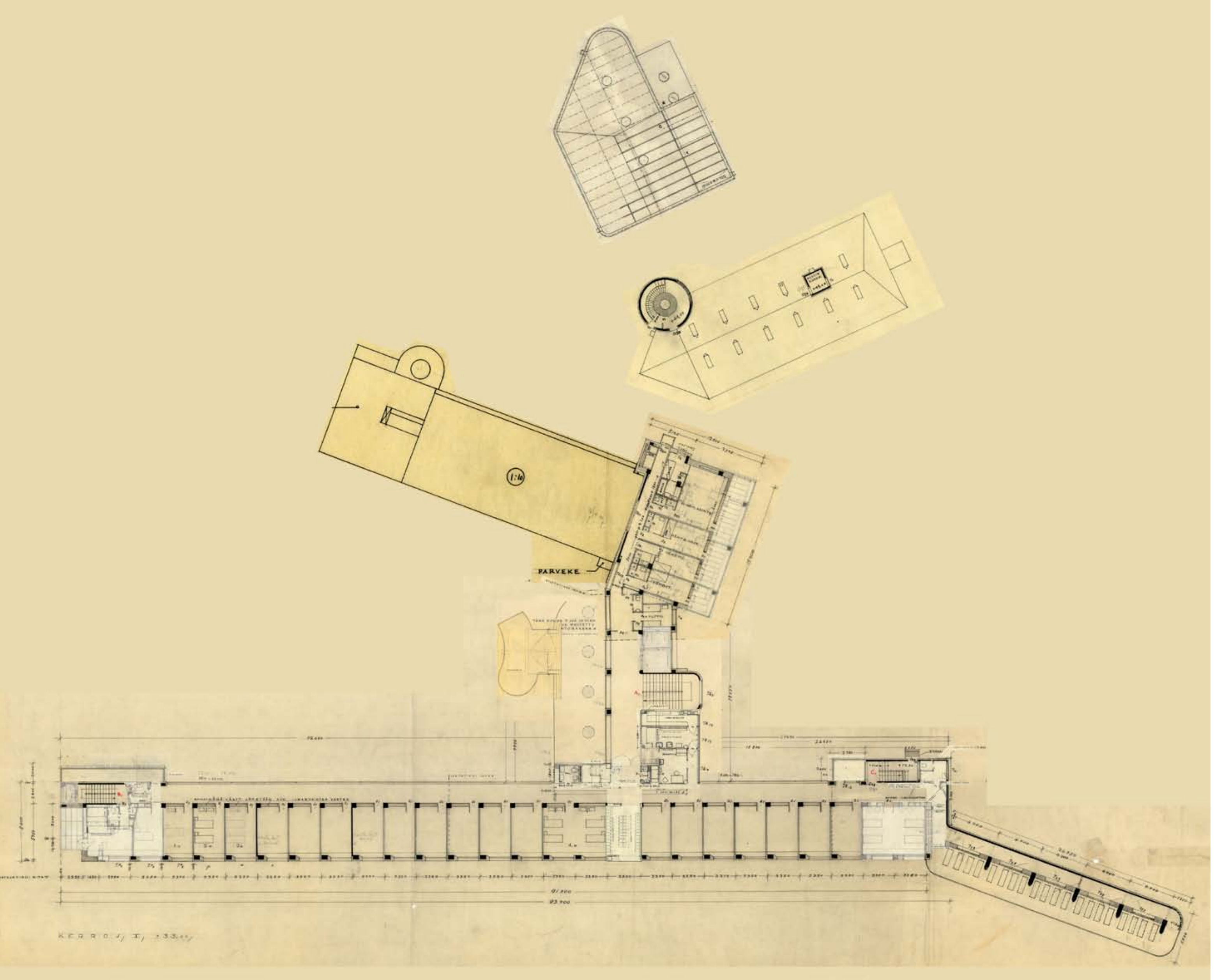
1964 A-wing: balcony closed and converted to an extension of the ward

1974–79 A-wing: total refurbishment

1984 B-wing: total refurbishment; dwelling rooms converted into offices

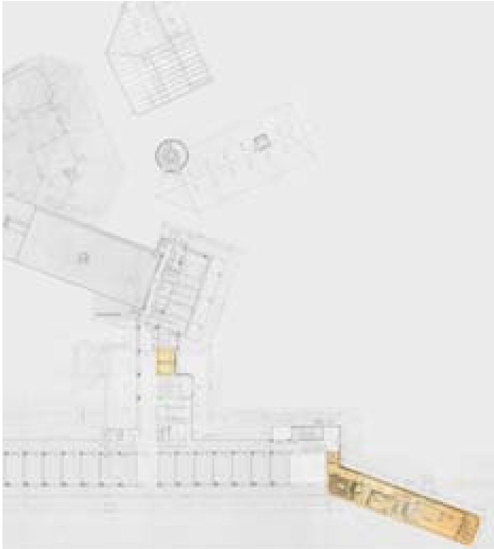
1990s A-wing: common spaces refurbished

2000s A-wing: multiple minor alterations in specific rooms for various purposes

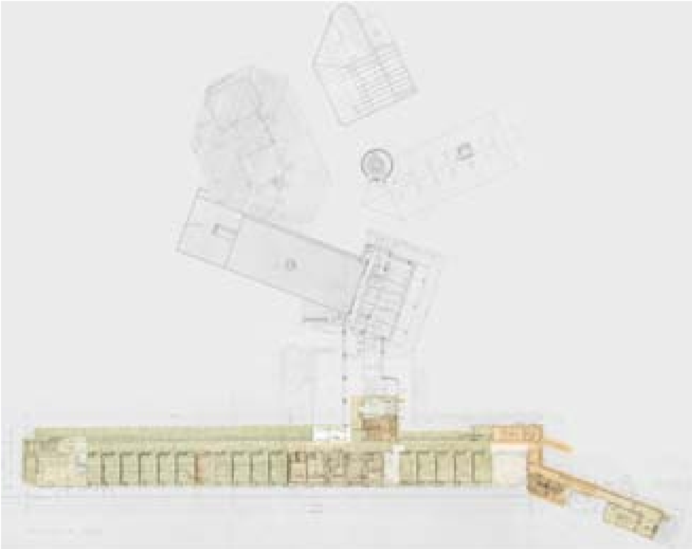


Fifth floor in the 1930s (digitized drawings by Aalto's office combined in 2015)

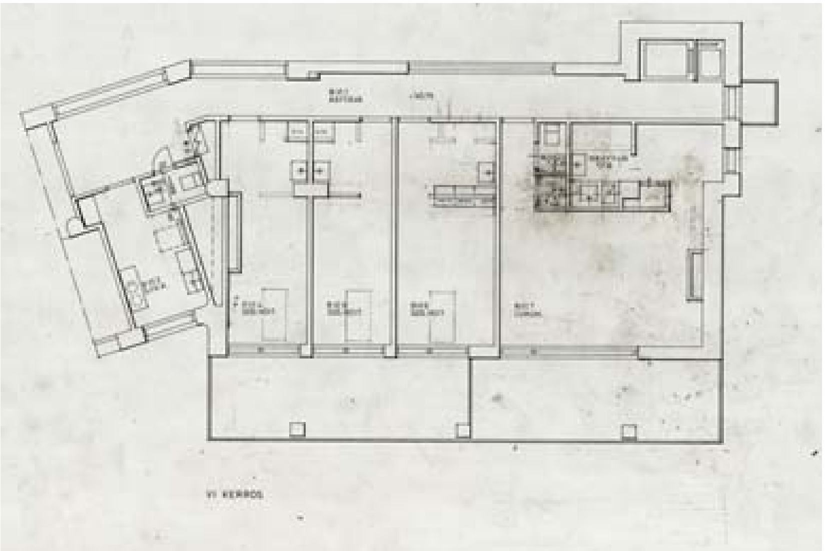
MAJOR INTERVENTIONS IN THE MAIN BUILDING – FIFTH FLOOR:



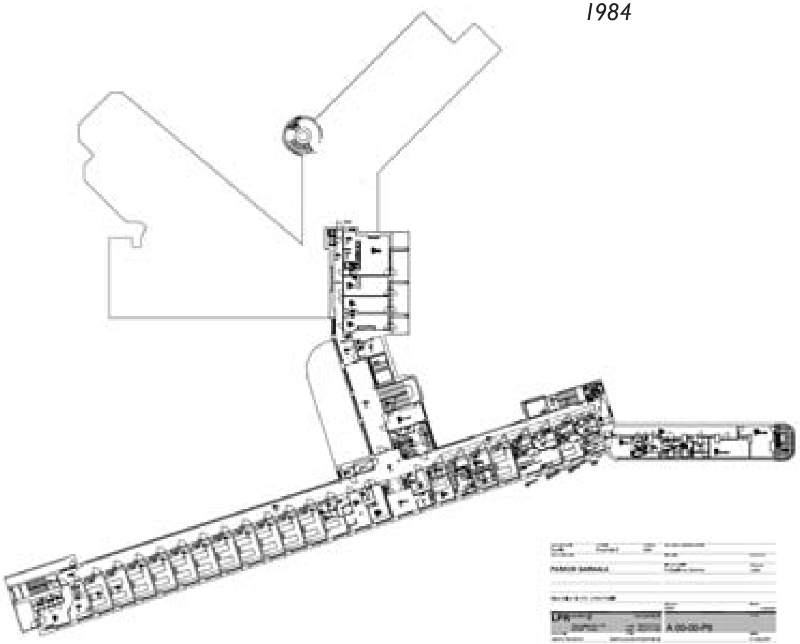
1960s



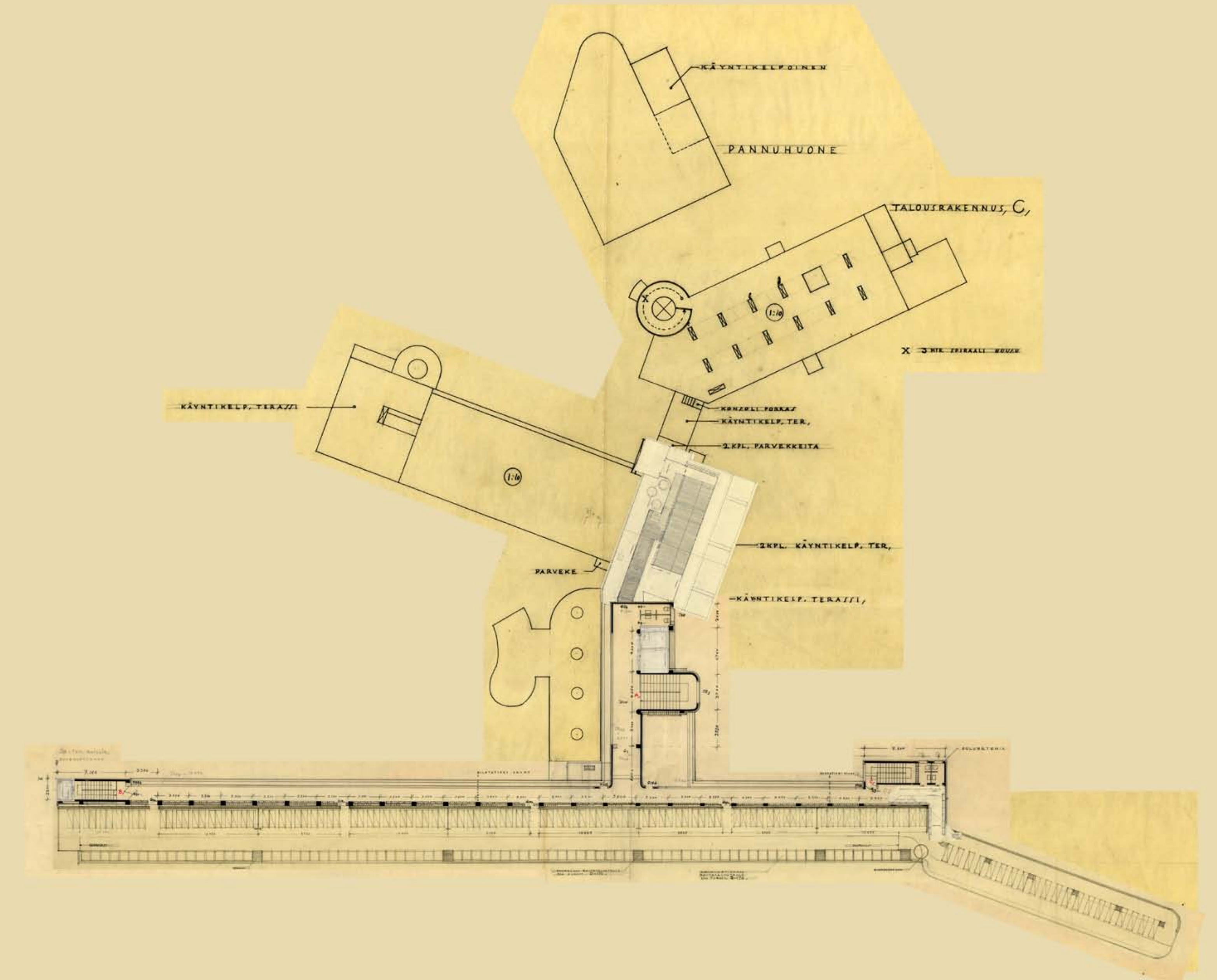
1970s



1984

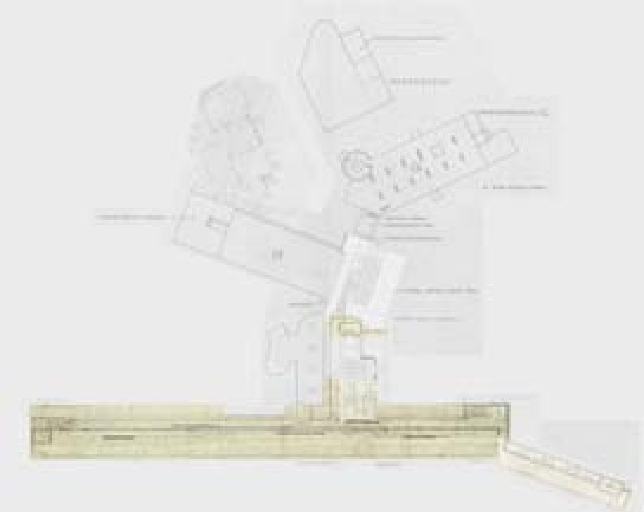


1964 A-wing: balcony closed and converted to an extension of the ward
1974–79 A-wing: total refurbishment
1984 B-wing: total refurbishment; dwelling rooms converted into offices
1990s A-wing: common spaces refurbished
2000s A-wing: multiple minor alterations in specific rooms for various purposes
2010 A-wing: some patients' rooms converted into offices (mostly electrical works)

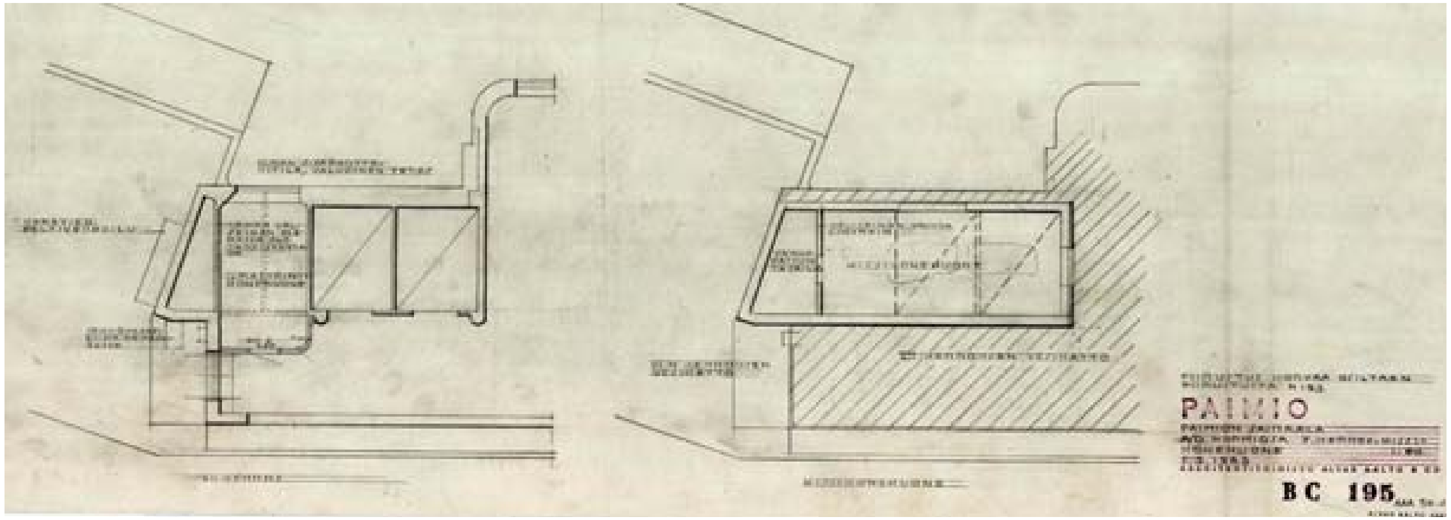


Sixth floor in the 1930s (digitized drawings by Aalto's office combined in 2015)

MAJOR INTERVENTIONS IN THE MAIN BUILDING – SIXTH FLOOR AND ROOF:



1970s



1984

1964 A-wing: mechanical ventilation led to the roof

1974–79 A-wing: total refurbishment, large ventilation machinery rooms and ducts built (pipes on 7th floor and roof); east-facing terrace converted into ventilation machinery room; required space for new elevator

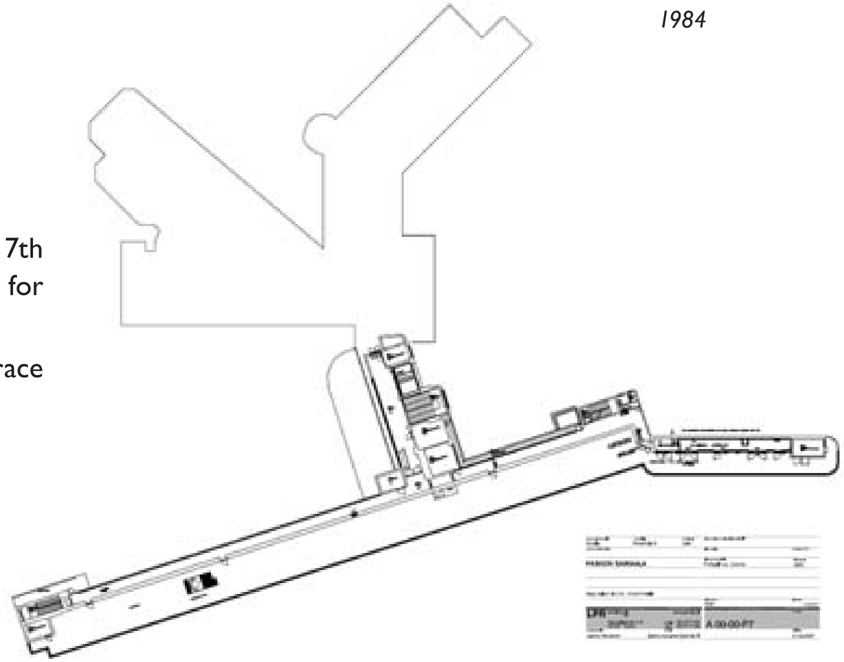
1977–79 B-wing: roof repaired, the height altered (visible in the façade), sun deck on the roof terrace removed

1982 A-wing: basement laboratory ventilation led to the roof

1984 B-wing: ventilation machinery room, toilets removed and windows replaced by vent

2001 A-wing: east end machinery room walls and façade to the balcony renewed

2011 B-wing: roofing at the flag balcony redone



TECHNICAL FEATURES AND THEIR CONDITION

Jonas Malmberg & Jukka Sainio

The following description of the current technical installations is a result of studies made by Jukka Sainio and Jonas Malmberg in December 2015 and January 2016 as part of the Paimio Sanatorium CMP.

The major changes in the technical installations and operations have been taken into account, but minor interventions, which may serve only a small number of rooms or which have resolved some specific requirement related to the hospital use, have been excluded. The excluded interventions include the four separately completed quarantine rooms (the last in 2003), which were built in the patients' wing (A-wing) Despite their relatively small size, the interventions have entailed, for example, the installation of separate ventilation machinery and ducts leading to the roof terrace.

- The original installations are described in the historical survey part of the CMP, but most of the installations and systems that were used were contemporary standard ones, yet carefully designed:
- The ventilation of the main building was mostly executed naturally, without machinery. Only a few rooms, which had to deal with extensive amounts of gas or fumes in the systems, were equipped with electrical exhaust vents.
- The central heating was based on the circulation of hot water and was distributed mainly with wall mounted radiators. The most interesting and relatively scarcely used feature was the heating panels located on the ceiling in the patients' rooms and in the dining hall.
- The electrical installations followed the standards of a well-equipped contemporary hospital or sanatorium.
- The pipes were placed next to the concrete structural skeleton and were mostly left visible and painted in different colours according to their purpose, so that they were easily recognized and maintained – and their technical appearance was suited to the contemporary Functionalist architectural vision.

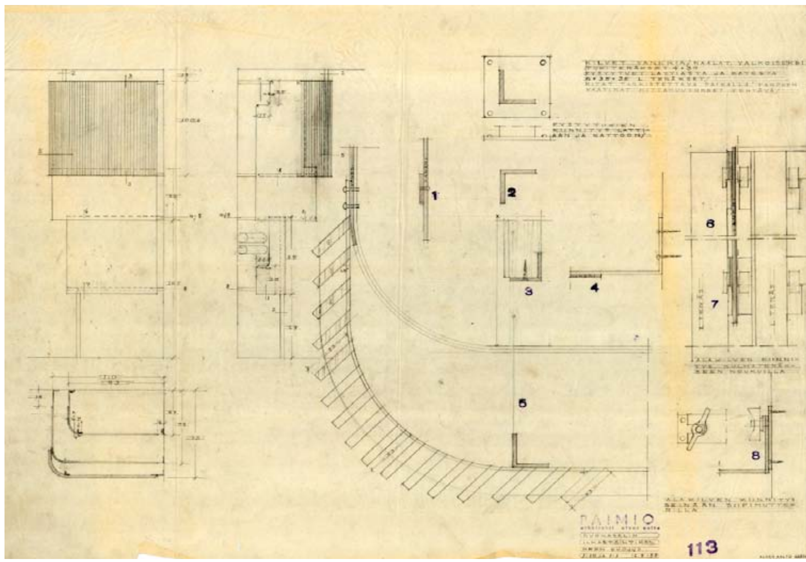
The building was completed in 1933 and, at least according to such official sources as the early annual reports, the users were very satisfied with the selected and built technical and architectural solutions. The first big renovation to the main building came after WW II, as rather extensive repainting took place in 1949–1951. In 1958 the new operating theatre wing was completed, which resulted in major changes on the ground floor of B-wing. The extension to the operating theatre wing was equipped with mechanical ventilation. The dining hall received a fan, placed in the corner of the space, the cover of which was designed in Aalto's office – in 1983 the cover was reused as a phone booth, but was later removed.

THE BACKGROUND AND DESCRIPTION OF THE CURRENT SYSTEM

The current technical installations are the result of the over eight decades period of building, maintenance and renovation. Some of the refurbishments have fundamentally changed the original or previous installations and their logic. The current status includes also numerous minor alterations in use, as well as the inevitable renovations of the systems of heating, plumbing, sanitation and ventilation. The major interventions have been faced as the technical and economic running periods of the installations have expired. Also in the future it will be necessary to make the appropriate timing for any intervention in order to maintain the values of the site.

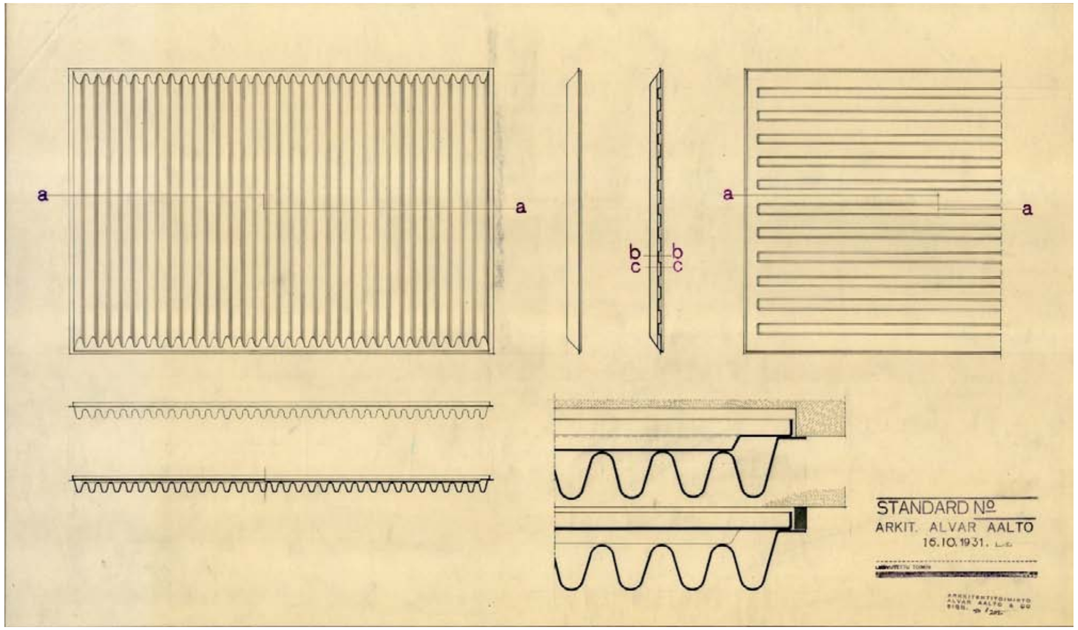
Major interventions in the technical systems, such as the replacement of the original natural ventilation by mechanical ventilation, have resulted in significant new architectural or technical features in the interiors, roofs and exteriors. From the current point of view, however, abandoning mechanical ventilation and returning to fully natural means would be impossible in regard to any predictable future use – except as a museum. Thus in the near future the main challenge will be to develop the architecturally unpleasant changes made during the 1970s and 1980s so that they could fit better within the original architectural character of the building.

Despite the extensive and fundamental nature of the refurbishments, some details of the original technical systems have been preserved. The most interesting one is the heating panel in the so-called museum room (i.e. the patients' room), which still functions. Also some of the original wall-mounted panels, whose installations were described as "dust free", are still in use. Some architecturally important ceiling panels like those in the dining hall are kept in place even if they are no longer in use.



The cover of the new fan designed in Aalto's office (AAM 50-1171).

The original “dust free” mounting of a radiator (AAM Malmberg).



The drawing of the wall-mounted radiators (AAM 50-202).

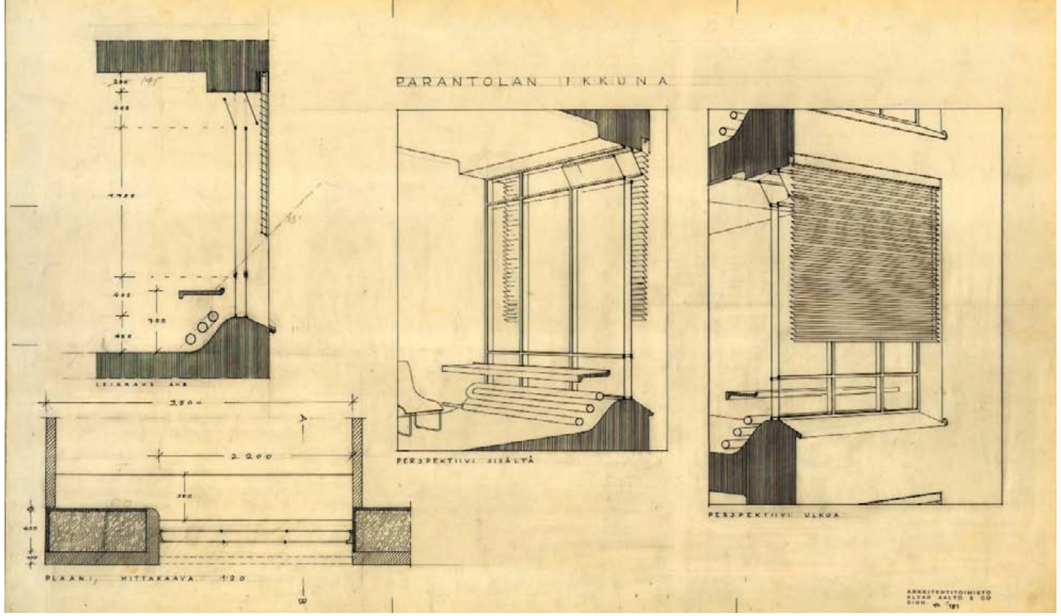
HEATING

The original heating plant used coal, turf and wood, but since the 1960s also oil was gradually included in the sources of energy. In 1980 the new power plant was completed, comprising of three large boilers: one used heavy fuel oil and two light fuel oil as their sources of heat. Those boilers, as well as their oil tanks and the tall steel chimney, were removed in 2007, as the complex was connected to the municipal central district heating system in 2006. The heat exchangers linked to this system were renewed in the 2010s. The first equipment was used for only five years, but the present ones should have some 15 to 20 years of working life remaining.

The handsome boilers from the 1930s were demolished in 1980. In hindsight, the loss is crucial, since almost all of the large boilers in Finland from that period have been lost. While architecture and interiors have been preserved, the value of technical installations has not been seen in Paimio or other heritage sites.

The heating panels mounted on the ceilings of the patients' rooms were replaced in the 1970s by regular wall-mounted radiators installed beneath the windows. One assumes that the change was an agreeable one from the users' point of view. This is the only way to eliminate the draught from the windows in the Nordic climatic conditions. The ceiling panels have scarcely been used in Finland since around the 1930s. They have later been used in the electrical heating of single-family houses and since the 2010s more often in cooling and occasionally also in heating systems in contemporary office interiors and warehouses. The choice of heating panels on the ceilings combined with natural ventilation was a very peculiar one in a 1930s sanatorium. According to the minutes of the building committee, the decision-making process was difficult. Instead of the usual concerted decision, they ended up voting on the issue. The arguments for ceiling panels were based on the possibility of having a lower room temperature in the wintertime, as the panels provided the thermal radiation from the ceiling for the objects and patients. Since neither the preserved minutes nor other sources can provide the full insight, it seems obvious that Aalto was very keen to use the unconventional system of the ceiling panels.

The original heating panels in the dining hall, today unused (AAM L2168 Judith Turner).



The drawing presenting the patients' room included a steam-based heating device placed under the window table (AAM 50-181).

A corridor in A-wing with the partial suspended ceiling (AAM Malmberg).

The heating pipes, as well most of the radiators, were replaced in the 1970s and 1980s. Thus they still have a long technical life span. The preserved original ones are, however, at their end of their life from both the technical and economic points of view. Still, the original radiators, partly imbedded in the wall, are to be preserved as original parts, as well as because of their special mounting method, described as “dust free”.

Some drawings depicting the radiators in the patients’ rooms shown them placed below the window table. Those were intended to operate using steam. Such installations are not documented in the early photographs, and so far it is uncertain if those were ever built.

The owners of the building have systematically recorded the heating energy used in their properties. As measured by volume, Paimio Sanatorium is not alone among the relatively inefficient sites. Still, because the main building is comprised of several narrow building volumes it is uneconomical compared to other equivalent buildings. The difference to, for example, Raisio Hospital is not significant. Over the last 10 years, the Raisio Hospital has used approximately 2% less heating energy than Paimio Sanatorium. Some other properties have nevertheless been much more economical; for example, in the far more compact Turku Surgical Hospital building the heat energy consumption has been only 63% of that of Paimio Sanatorium.

However, in the historically, architecturally and culturally valuable Paimio Sanatorium, any means and methods that alter its original architectural character cannot be used. For example, externally added insulation is out of question. To some extent the energy efficient can be improved by new technical installations, such as ventilation equipment with a more efficient heat-recovery capacity than the current one. Still, systems based on a vast amount of electrical installations or electronics, and whose lifespan may be short, should be evaluated critically.

PLUMBING

The plumbing equipment, including both water supply and drainage, was mostly renewed in 1970s and 1980s. In the 2010s the main ducts in the basement level were renewed. The normal interval for plumbing renewals should be 50–60 years, meaning that the installations from the 1970s and 1980s still have some 10 years of technical lifespan. The local flaws are to be repaired and replacements are to follow the maintenance schedule and procedure on the site.

Original technical equipment in the basement of C-wing (AAM Malmberg).

VENTILATION

The most fundamental change in the technical installations in Paimio was the introduction of the mechanical ventilation that replaced the original natural ventilation system. The original decision to use mostly a natural ventilation system is interesting, but unfortunately we were unable to find any details about the decision. The choice may be regarded as “conventional” or even “old fashioned” because the mechanical systems were already available. For example, mechanical ventilation was extensively used in the Finnish House of Parliament, built in 1926–1931. It is quite likely that the medical treatment methods, which focused on fresh ozone-rich air, were easily combined with natural ventilation and open windows. Also the separate ducts for each patients’ room was hygienic as there was no need for mixing the airflows. There may also have been some doubts about the new mechanical ventilation methods.

Similarly, there is no record of the decision-making process in the 1970s regarding the introduction of mechanical ventilation, with a large single unit for the entire A-wing. Was the natural ventilation inefficient, or were only contemporary trends followed? The reuse as a hospital resulted in change of the general condition of the patients. In early sanatorium year they were relatively young and usually well able to walk. In a hospital ward the number of bedridden patients probably increased. Thus the ventilation via windows open all year round – as seen in many early photographs – was no longer possible.

The way in which the mechanical ventilation was introduced in Paimio is common in buildings without the necessary spaces intended for such technical installations, and where the lack of vertical height in the spaces is the norm. The architectural disadvantages of the installations are obvious, especially in A-wing, where they inserted horizontal main ducts on the rooftop and roof balcony as well as suspended ceilings in each ward corridor. This resulted in fundamental flaws in the architecturally valuable interiors and roof balcony, as well as in the overall character of the main building.

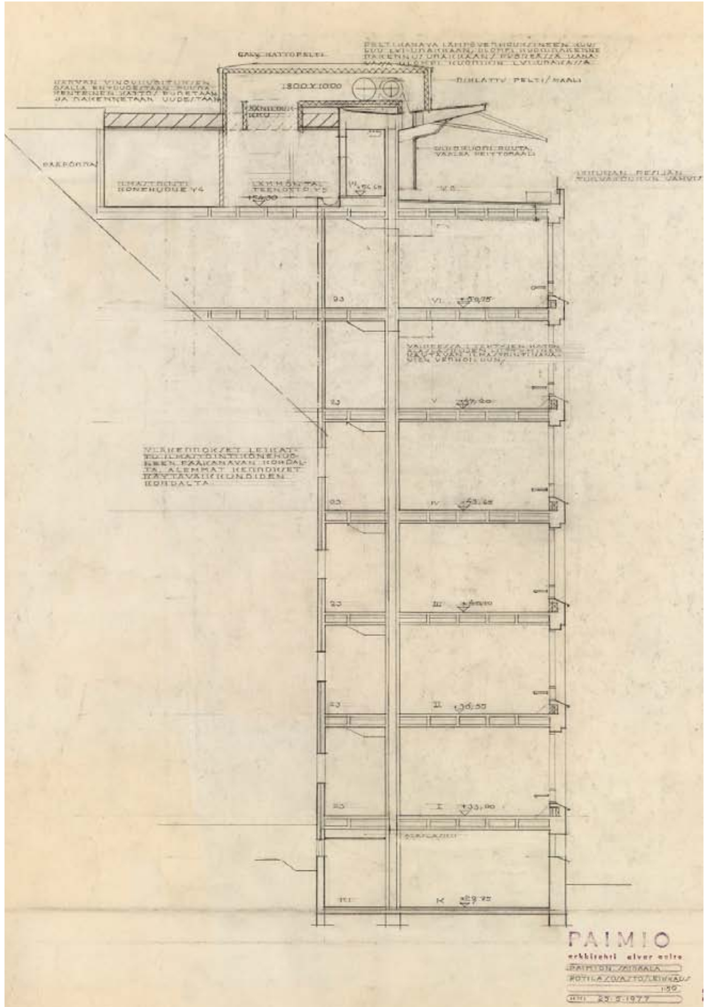
ELECTRICAL INSTALLATIONS

Both the high and low voltage installations work well, even if some parts are out of date and require renewal. The current high-voltage system comprises five conductors. The renewals and necessary upgrading of electrical installations can follow the refurbishments and other interventions. On the other hand, modernization of electrical installations may usually be executed, if necessary, without interruptions in the use. Working in spaces while other technical installations are renewed is often impossible and therefore it is necessary to move to sufficient temporary premises.

OTHER INSTALLATIONS

There is a medical gas oxygen distribution system, and its needs and interventions are linked tightly with the use of the main building. Some of the current systems may turn out to be unnecessary with the new uses.

The air-conditioning and cooling system is currently installed only in the fresh air systems of the operating theatre wing and some technical spaces. The building automation is to be renewed when the equipment reaches the end of its life span.



The fundamental changes to the ceilings, rooftop and roof terrace are well seen in the architectural drawing by Aalto's office (AAM 50-1502).

The ventilation machinery serving A-wing (AAM Malmberg).

Installations on the roof top of A-wing (AAM Malmberg).

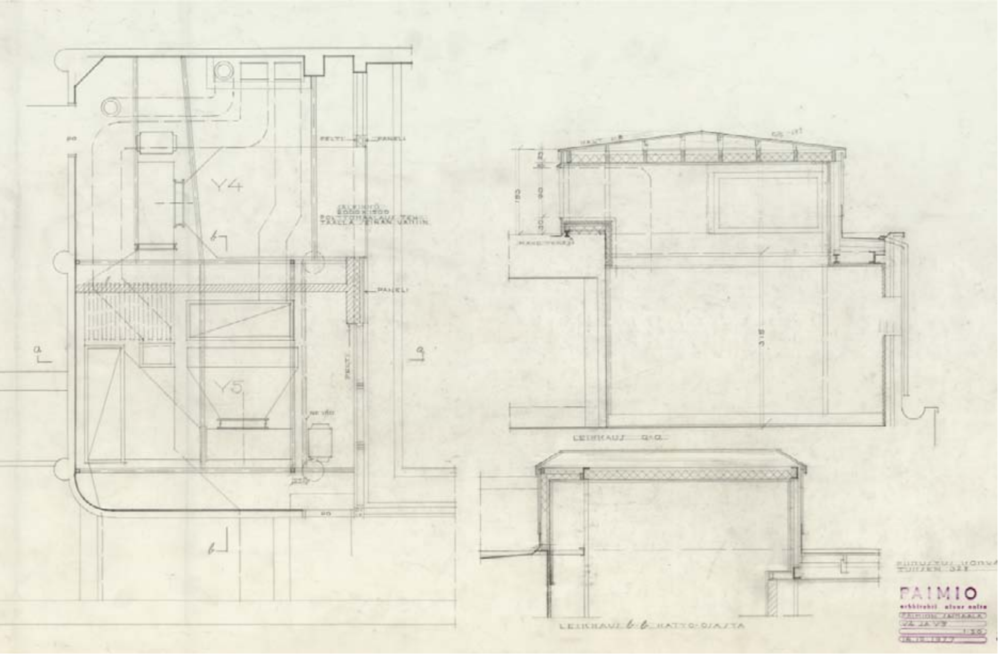
MAJOR RENOVATIONS

A-WING

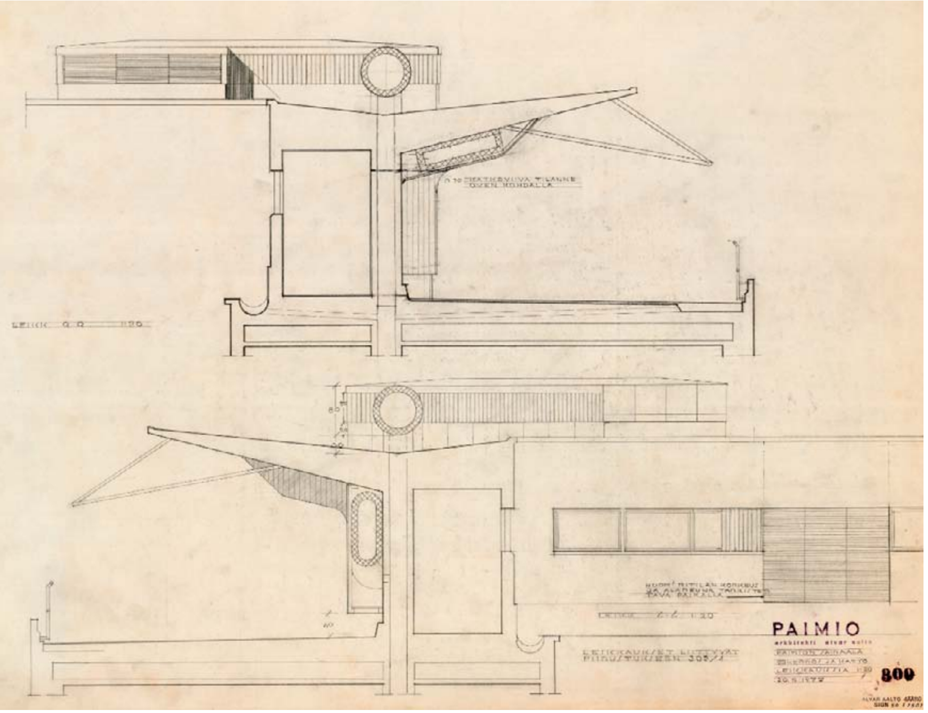
The early history of the interventions in the wards is closely linked to the changes in the treatment of tuberculosis and the development of medical cures. The later history is related to the reuse of the building as a general hospital. The balconies at the eastern ends of the wards became unnecessary and were converted in 1963–64 into extensions of the wards, including various common spaces. These new interior spaces were equipped with mechanical ventilation, which were partly retained during the 1970s refurbishment.

The refurbishment of A-wing took place in 1974–79 as the treatment of tuberculosis had come to an end. In this renovation the rest of the patients' wing was fitted with mechanical ventilation, which required the partial suspended ceilings in the wards and on the roof terrace. Some of the original terraces were converted into ventilation machinery rooms. Practically the whole of A-wing was ventilated by a single incoming and exhaust air unit, which included a heat recovery unit. It was also equipped with an evaporating moisturizer, which was most likely disconnected soon after its realization. Moisturizing in a 1930s building carried serious threats to the structures and also to the hygiene of the ventilation. In the tight machinery room, the careful cleaning and maintenance required by the system was practically impossible.

The wooden blinds were part of the original equipment of the patients' rooms (AAM 50-003-250).



The ventilation machinery serving A-wing in an architectural drawing by Aalto's office (AAM 50-1528).



The rooftop and roof terrace installation in an architectural drawing by Aalto's office (AAM 50-1501).

The partially suspended ceilings were installed in the day room in the 1980s (AAM Malmberg).

The pool in 2015 (AAM Malmberg).

The calculated air flow in a patients' room used in the design in the 1970s was greater than the current requirement (1.5 dm3/s/m2 or 10 dm3/s/patient). The intended air flow in 1970s was 2 dm3/s/m2, which was equivalent to 16.5 dm3/s/patient. The built machinery had only one oversized unit, which served the whole of A-wing. So the need for maintenance or other interruptions in its operation stopped the ventilation in every ward. Due to the extensive size and use of the ventilation structure, in reality the air flow was most likely significantly less that was intended.

The ventilation of the basement ward, which in the 1960s had been converted into a lecture room, was refurbished again in 1982 when the spaces were converted into a new laboratory.

During the summertime the extensive solar gain was originally prevented by external adjustable blinds. It is not recorded when the original timber blinds were abandoned, but the last ones were removed in the refurbishment in the 1970s.

The main ducts on the basement level have been renewed in the 2010s, but most of the vertical sections date from the major refurbishment of the late 1970s.

B-WING

When the new operating theatre wing was built in 1956–58 the doctors' rooms and treatment rooms as well as the offices on the ground floor of B-wing were renovated. The refurbishments that took place in the wards in 1974–79 continued in B-wing during the 1980s, which then became ventilated completely by mechanical means.

The basement was completely refurbished at the time that the new X-ray department was built. Also the former bathroom was replaced by a pool and sauna department in accordance with design drawings from Aalto's office dated 1984. On the 6th floor, the toilets next to the main stairs were replaced by a ventilation machinery room. Also the partially suspended ceiling was built in the 1st floor day room and dining hall. On the 3rd floor the spaces were divided into small hobby and therapeutic rooms as well as a gym. A ventilation machine room was built on the 3rd floor, in the middle of the hobby rooms and above the original library. Part of the library was converted into a canteen in accordance with drawings from 1986, and new partially suspended ceiling was built. The ground floor spaces were renovated again in 1988. The pool department was re-furbished in 2006.

C WING

The first renovation of the kitchen took place in 1972–73. Also the 2nd floor, above the main kitchen, was converted into offices for the financial administration. The design, including the mechanical ventilation, dates from 1973. The ventilation machinery installed on the 2nd floor is still in use. The kitchen was re-furbished again in 1994 and 2014, but during the last intervention the machinery was not completely replaced but rebalanced and extensively maintained with new bearings. The refrigeration rooms and their machinery were renewed in 1985 and 2001. The solutions for the ventilation machinery of C-wing date mostly from the 1970s and 1990s.

OPERATING THEATRE WING

The operating theatre wing was completed in 1958. The use of the facilities has technically been exceptionally demanding. The ventilation was renewed in 1986. A new operating theatre was built 1999 with new ventilation machinery. The existing systems date mostly from those two interventions. It is difficult to convert the rooms and technical systems intended particularly for operating theatres and their services to new uses.

The roof top of C-wing in 2015 (AAM Malmberg).

AAM L 351 Martti Kapanen

AAM AV 4264 Maija Holma

AAM digi 2087 Maija Holma

FURNITURE AND LIGHTING

Katariina Pakoma

For Alvar Aalto, the interior design of a building, including the furniture and lighting design solutions, was an intrinsic part of the architectonic totality. The starting point in the interior design of Paimio Sanatorium within this overall design concept was, beyond the requirements of the hospital, the social and psychological needs of the patients.

Aalto was assisted in the interior design of the sanatorium by his wife, architect Aino Marsio-Aalto. The cooperation led to the design of fixed furniture and new lamp models for the interior, as well as a series of lightweight and easy to move and clean furniture. Most of the furniture was designed, in accordance with the spirit of the time, as standard furniture and was simultaneously incorporated into the sales ranges of Artek (founded in 1935) and Aalto's then partner and lamp manufacturer Taito Oy.

INVENTORY OF AALTO FURNITURE AND LAMPS

In 2014 the Turku Lazaret Museum (a hospital museum administered by the Hospital District of Southwest Finland) compiled, under the direction of museum assistant Anna-Maria Niinikoski, a thorough room-by-room inventory of Aalto furniture and lamps at Paimio and, related to this, an illustrated artefact inventory. The inventory also included the Aalto furniture and lamps for the sanatorium that were classified as so-called museum pieces. The role of the Aalto Museum in the project was to inspect and complement the information in the inventory report. The inventory catalogue (in Excel format) was complemented by, for instance, additional information based on the source references and the picture documentation was also expanded by the addition of identifying images.

The inventory work has been limited to the documentation of movable Aalto furniture and light fittings in the sanatorium. The majority of these have been a part of the interior furnishing since the time of the building's completion, or as furniture added to the building during its first decades. Aalto furniture has been supplied for the interiors during the ongoing decades in connection with alterations, as well as interior design plans made by the Aalto office, or directly via Artek. The sanatorium's own carpenters have also created variations of some of the existing Aalto models in order to improve their usability – and in doing so created new variants from the old ingredients.

The inventory catalogue comprises the design and manufacturing information for each individual object (a total of approximately 800 items), their characteristics (dimensions, colour, material, condition), and location at the time the inventory was carried out. In addition, the table includes references to existing engineering drawings and other documentation. Aalto furniture and lamps classified as "fixed" have not been listed in this inventory.

Only scattered examples of original Aalto furniture remain in the various rooms. The spaces defined as so-called museum rooms contain a larger number of the original artefacts; for instance, one of the patients' rooms has been reconstructed to correspond with the décor of the 1930s. The "row chairs" and dining tables of the dining hall are still in their original use, as well as the entrance hall armchairs. The furniture in the chief physician's office, part of which was made as unique pieces, is still in working order, having been restored. Furniture and lamps that have received the status of museum artefacts have been placed individually or in groups in different rooms of the hospital, while others have been placed in the hospital's central storage facility.

The amount of free-standing furniture and lamps stored in the sanatorium building and its extensive storage room – and thus outside the actual inventory – was a surprise to those compiling the inventory. An enormous amount of furniture that had previously been in use is currently stored in several separate storage rooms, mostly original furniture from the patients' rooms: hospital beds, night stands, hall chairs and stools. Also taken out of use are original light fixtures, and sanitary ware and their fittings – though some are completely unused and still in their original protective packaging. These Aalto furniture and lamps in storage have been listed, but mainly still await their specific cataloguing.

In the inventory project it has been possible to take advantage of the extensive expertise in Aalto design of Kaarina Mikonranta, who has for many years been a curator at the Alvar Aalto Museum. More specific information was also obtained from drawings, documents and artefact collections held by the museum, as well as the hospital's own archival sources. Also Reijo Vihervirta, who has been property manager at the sanatorium for many years, has been an important source of information.

LITERATURE AND COLLECTIONS

Heikinheimo, Marianna (2000). *Building historical survey of the Paimio Sanatorium area.* A consultant work commissioned by the National Board of Antiquities.
Pakoma, Katariina (ed.) (2002). *Golden Bell and Beehive. Light Fittings by Alvar and Aino Aalto.* Design by Alvar Aalto no. 1. Alvar Aalto Museum: Jyväskylä.
Mikonranta, Kaarina (1994). "Breakthrough for Birch", in Tuukkanen-Beckers (ed). *Alvar Aalto: Points of Contact.* Alvar Aalto Museum: Jyväskylä.
Mikonranta, Kaarina (1998). "Alvar Aalto. Master of Variation", in Tuukkanen, Pirkko (ed.), *Alvar Aalto Designer.* Alvar Aalto Museum: Jyväskylä.
Hipeli, Mia and Laaksonen, Esa (eds.): *Alvar Aalto Architect Volume 5. Paimio Sanatorium* 1929–33. Alvar Aalto Foundation and Rakennustieto: Helsinki.
Alvar Aalto Museum, drawings collection
Paimio Sanatorium, furniture and lighting fixture drawings
Alvar Aalto Museum, design collection
A total of 88 objects have been donated by the Hospital District of Southwest Finland to the Alvar Aalto Museum collections: furniture, lighting fixtures, building parts and textiles.

THE COLOUR SCHEME

Elina Riksman

The colour research executed during 2015 was conducted as part of the Conservation Management Plan (CMP) study. The purpose of the colour research was to produce vital information for the CMP research group in order to outline the look of the original colour scheme and to help to perceive the state of preservation of the interiors. The intention of the research was also to further the understanding of value and importance of different spaces, areas and rooms, and finally to enable the evaluation of these spaces. The research was conducted with the guidance and financial help of the National board of Antiques.

The main idea of the colour research was to form a general view of the original interior colour scheme. The two-part report (see appendices) presents the results and conclusions of the colour research, based on the data gathered in situ, in a laboratory, and in the archives of the Alvar Aalto Museum, the Hospital District of Southwest Finland and the Lasaretti Hospital Museum. The research addressed the main building, the chief physician's villa, the junior physician's row house, the two-storey staff housing and the mortuary (the so-called Rose Cellar).

The colour scheme of Paimio Sanatorium was originally designed by Alvar Aalto together with artist Eino Kauria. Kauria was commissioned to work at the Paimio Sanatorium building site, to lead the paint work and coordinate the colours used. Kauria arrived at the building site relatively late, in June 1932, when the staff housing had already been built and others, including the main building, were well on their way to completion.

Kauria stayed in one of the Staff house's apartments with his wife and child during the building of other buildings. Alvar Aalto visited the site almost daily from Turku, according to Kauria, and the pair inspected the proceedings of interior work together.[1] Later examples of Eino Kauria's interior colour designs in Finland include significant monuments of the Modern in Helsinki era, such as Lasipalatsi ["Glass palace"] commercial building (1934-36) and Tilkka Military Hospital (1936).[2]

The documents found in archives during the Conservation Management Plan research have provided vital information for the colour research of Paimio Sanatorium. Documents such as receipts of procurement, transcripts of meetings, original drawings, letters, notes, and contracts, have provided an

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1 Interview of Eino Kauria by Teppo Jokinen of the Alvar Aalto Museum, 30.9.1986, Helsinki.

2 Leena Makkonen. *Modernismia Helsingissä*. Kirjapaino Uusimaa, 2012. Internet publication: http://www.hel.fi/hel2/ksv/julkaisut/kirjat/ModHKI_fi.pdf

insight into the proceedings of the interior finishing work done at the site. Photographs taken of the buildings after they were completed give, of course, the most powerful evidence of the original situation of the interiors.

As a final task, Eino Kauria was commissioned to paint a large board presenting the finalized colour scheme of the Main building. The "colour board" painted by Kauria is, according to an interview with the artist in 1986, not a plan of the colours that the painters on site were to use, but rather a final, executed result of the colour scheme in the main building.[3] This colour board was one of the main motifs and defining factors for this research. One of the aims was to find in situ the colours presented on Kauria's board.

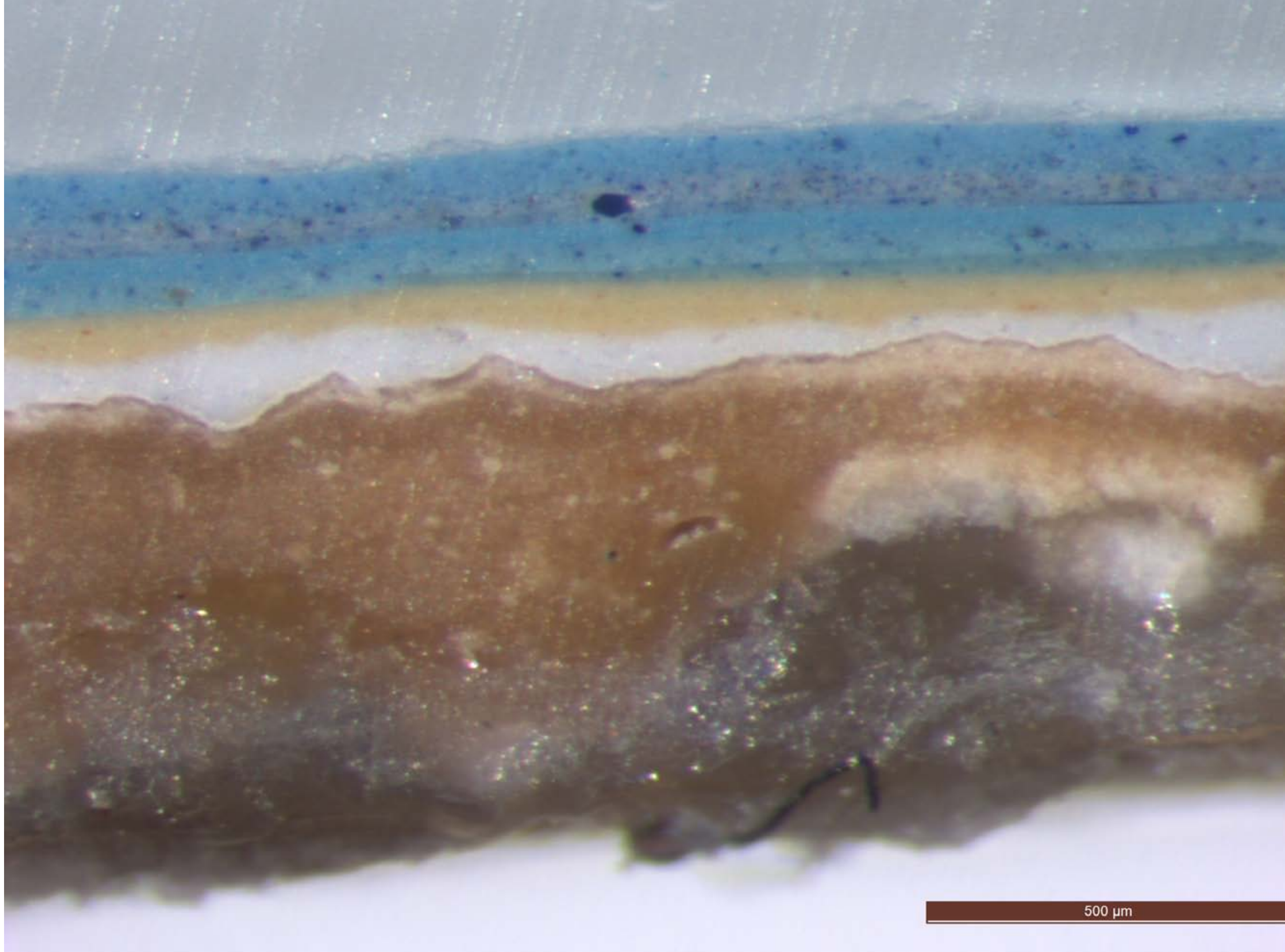
THE RESULTS IN THE MAIN BUILDING

The results of the colour research of the main building differ in many ways from the present situation. Probably the biggest difference between the present light, white-washed appearance and the original one is evident on the ground floor of B-wing and the operating theatre wing, which were originally very brightly and imaginatively coloured. This difference is, of course, due to the change of use, as the ground floor of B-wing now serves as an office wing. None of the original colours can be seen in the present appearance of the ground floor of B-wing. However the colourations of the dining hall, as well as lounge next to it, are relatively close to the original ones found during the research. The dining hall's original ceiling radiators, along with the surrounding ceiling, had more earthy green tones compared to the hues they display today. The third-floor reading room is coloured quite precisely in the same way as it was originally, thanks to the well-executed colour research by Katja Aaltonen in 2000. The only difference is the flooring, dating back to the 1990s or even the 1970s, which does not at all fit the original look and design of the reading room interior.

The wards of A-wing gave mostly a consistent result when compared to the Eino Kauria colour board. The board shows three different colours for the main corridors of the wards: green, blue and ochre orange. All these hues were found as presumed original layers, but surprisingly also in three ward corridors the under-most layer was shown to be a bright yellow. This finding was unexpected but clearly evident in both cross-section samples and in an excavation in situ. The yellow somewhat certainly is shown to be the original paint layer, but it is unknown why these three floors (1st, 4th and 5th floors) were painted first yellow, but then with green, blue or ochre orange to form a consistency of colour in each ward. In the 1986 interview with Kauria he states that Aalto was not happy with the yellow

3 Interview of Eino Kauria by Teppo Jokinen of the Alvar Aalto Museum, 30.9.1986, Helsinki.

An excavation of research point no.79 on a ward wall shows the original yellow paint layer (AAM Elina Riksman).



A cross-section sample no. 79 from a ward wall shows the same layers as the excavation (AAM Elina Riksman).

flooring he had specially made for the entrance hall and main staircase of main building. He regretted the choice of colour and complained about the matter to Kauria. The order for the yellow flooring, however, could not be cancelled. It is possible that this one failed choice of yellow colour has something to do with the colour selections in the walls of the wards as well. The flooring of the wards was almost black linoleum. It is possible that the three wards had yellow walls, but Aalto and Kauria changed their minds during the paint work and changed the colour plan to follow the three-colour system of ochre, green, blue, and ochre, green, blue. The corridor of the isolation ward in the basement floor was painted with the same orangey ochre as the ground floor and 3rd floor.

The patients' rooms showed little information due to the total renovation during the 1970s. The ceilings were the best source for finding the original colour. The so-called museum room – a patients' room left presumably in its 1970's state – presents some surfaces that show layers of the original colour. The four different colours used for the ceilings of the patients' rooms are presented in the Kauria colour board. The only exact same colour as in Kauria's board was a vibrant light green. Other findings included a dark blue and a dark grey. The comparisons to these colours are not exactly found in the Kauria colour board. However, the same green ceiling colour can be found also in the reading room ceiling. One of the greyish greens presented in the Kauria colour board can be found in the original layer of the 1st floor lounge. The mixing of paints by hand was such a laborious job, that it seems obvious that a larger colour patch was made and used in several spaces.

The entrance hall showed few layers as it has been scraped relatively clean in a resent renovation. The original photograph states that the ceiling might have had a significant hue, something different than pure white or cream white. The gloss finish is nonexistent and the appearance in photographs is matt. The columns and the main door jambs have high-gloss finishes in white.

ORIGINAL MATERIALS OF THE PAINT WORK

Both the mixing of paints on the building site and purchasing readymade industrial paints seem to have been the choice of Kauria and the painters. According to the original receipts and documentation of the building site, the painting company Marttisen maalaus Oy from Turku bought readymade paints by the kilo with different serial numbers and colour codes. They also bought large amounts of lacquer (a base for mixing paints), zinc white, lead white, ultramarine blue, crete, yellow ochre and "black" pigments, as well as white spirit and boiled flax seed oil to mix paints on the building site.

The receipt from the Oy Wiklund Ab hardware store does not state the producer of the paints ordered for the building site. It lists the names of the colours: white, light green, bluish green, light

Krista Hackzell, a chemist and lecturer from Metropolia University of Applied Sciences shows the students of interior conservation how to use the X-ray fluorescence instrument (AAM Elina Riksman).

yellow, and light blue. These same 4-5 colours were ordered in three different types of paint: a base paint (to be sprayed), the enamel paint (acid resistant, to be sprayed), and enamel paint (normal, to be sprayed). All these colours can be found in the original layers around the building, but the equivalence of the codes in a 1930's colour chart has not yet been discovered. Some products, such as flax seed oil, for the Paimio building site were bought from the Tikkurila paint factory, which is still in operation in Vantaa, Finland. The company runs a small archive of paint charts, with two colour charts dating back to 1938, but none of these charts carries the same colour codes as the receipts of the Paimio building site.

The later renovations have left their mark in a very noticeable way between the layers found: the light-weight white filler used on the wall and ceiling surfaces that most likely dates to the 1970's renovation and again in the 1990's renovation. These light-weight modern fillers are present in almost all cross-section samples and excavations in situ, and they helped in recognizing the real age of layers beneath them. As some excavation points have shown, the layers present 12-19 layers at most. The average number of layers is under 10. This, of course, varies between the different spaces, due to their original function and level of usage. Some spaces have gone through several paint jobs, most likely because of their detrition in daily hospital use. Some heavy-duty surfaces, such as the corridor walls of the wards, had the most paint layers. On the other hand, it was obvious that in some spaces all the surfaces had been sand-blasted or scraped clean in a former renovation and therefore the original surfaces were lost for good. In these cases, only 3 to 4 layers of paint and filler were found. Another method for recognizing the age or the actual original layer was cross section samples. The samples showed clear differences between modern plastic filler paints and oil-based paints with pigments and organic fillers like crete, zinc or barium sulphate. The samples were examined under microscope and photographed. The X-ray fluorescence research method gave further information about the actual consistency of the layers exposed. Those results are presented in the Appendices: Colour Research Part 1.

The paint types of the original, under-most layers were determined in situ by testing their dissolution in solutions. For example, the oil-based paints reacted by dissolving them in a solution of ammonia (NH_3, 12%), isopropanol alcohol (C_3H_8O) and distilled water.

CASE METROPOLIA

Metropolia University of Applied Sciences is the only university in Finland to carry the discipline of conservation. Their students of interior conservation were invited to take part in the Paimio Colour research. The collaboration entailed lectures addressing modern architecture in Finland, an excursion, field study and laboratory research. The conservator and Metropolia lecturer in building conservation

Anne Räsänen and laboratory engineer and chemist Krista Hackzell led the group of students when they participated in lectures given at the Alvar Aalto Foundation and during the excursion to the Paimio hospital premises. The lectures prepared the students to comprehend the problems regarding the conservation of modern architecture. The lectures addressed the typical building materials used and the different surfaces and textures found in Finnish modern era buildings, as well as the typical problems encountered on the conservation sites. These themes have a pivotal role in the education of future Finnish conservators, as the built environment in Finland comprises mostly of relatively young buildings.

The field study in the Paimio main building involved an equipment exercise, as students made X-ray fluorescence measurements in different surfaces of the interior. These measurement results are presented in the Colour Research Report Part 1 in the appendices of Conservation Management Plan. Students also had a laboratory exercise addressing the paint layers found in the Paimio main building. Some samples were given to students from the main building and made in to cross-section sample mouldings. The samples were given a microscope analysis and photographed by the students.

FURTHER RESEARCH

A natural next step in the Paimio Sanatorium colour research would be the exterior colour research, as it has been excluded from the present research. Further research should also address the furniture and fixed furniture of the staff housing as it played a crucial part in Aalto's original plan. This future research should cover the doors, windows, original cupboards and kitchen cabinets. These can be found in 2016 in both the chief physician's villa and in the middle apartment of the junior physicians' row house, but not in the staff housing.

A more detailed and precise examination of the so-called Rose Cellar, the sanatorium's original mortuary, should be undertaken when its restoration and conservation planning starts, as the mural found there has many layers that have a complex origin. The mural in general is in a poor condition; although it has now been examined visually and manually to find the loose areas and lagoons, it should be examined, measured and re-scanned again order to make final conclusions about its condition and level of deterioration. The conditions in the cellar have not been stabilized, and consequently humidity and sub-zero degrees have an effect on the surfaces and structures. In the 1986 interview, Kauria talks about the unusual technique he used when painting the mural. This narrative is addressed in the Colour Research Report, Part 2.

An aerial view of Paimio Sanatorium during the 1930s (AAM ar26-21).

PAIMIO SANATORIUM LANDSCAPE

Jonas Malmberg & Jere Saarikko

The location for the sanatorium was chosen partly for the sufficient amount of landscape comprised of pine forest and rather dry soil. Another key element was the amount of agricultural landscape that could be acquired for use by the sanatorium. The landscape was in many ways part of the curing process and vital for the whole complex and its original operation.

MAJOR CHANGES TO THE SURROUNDINGS

New buildings have brought changes to both the routes and the surroundings. The immediate surroundings of the main building underwent changes during the construction of the operating theatre wing in 1958 and the underground extensions next to it in 1983. The latter also resulted in changes to the service entrances. The entrance courtyard was originally used also as a parking lot, with a gravel surface and demarcated by some bushes. The entrance area was renewed in 1964 when lighting structures were added. The garden next to the open terraces with fountains was removed between 1948 and 1958, though one of the fountains was preserved.

Planting boxes on the roof terrace of A-wing (AAM 50-003-262).

A view from the garden of chief physician's house towards the main buidling (AAM 50-003-465).

New staff housing was completed in 1949 and 1962. In summer 1964 new parking facilities were constructed, done and also around that time new maple trees were planted. The chief physician's house was converted into a kindergarten in 1975, which also led to changes to its surroundings. A new power plant and maintenance facilities were built on the north side of the hospital in 1980 and 1983.

The rather young pine forest in which the sanatorium was built has matured. None of the original vistas exist today, though some immediately next to the buildings could be opened up by cutting back some of the vegetation. The long views, such as the one from the balcony of the chief physician's house towards the main building, no longer exist and should not be re-made. Also the rather prominent appearance of the main building overlooking the agricultural landscape northwest of the sanatorium is no longer as strong as it was originally due to natural maturation of the pine forest. The maturation of the trees is, of course, natural and even an anticipated outcome, but in some cases the overgrown vegetation should be cut back.

The sanatorium set in its forest and agrarian landscape during the 1930s (AAM 50-003-306).

PRESENT STATE OF THE SURROUNDINGS

The landscape of the Paimio hospital area was carefully studied by landscape architect Jere Saarikko in 2007. His master's thesis *Paimion sairaalan ympäristön historiaselvitys ja kunnostussuunnitelma* [Histori-cal report and conservation plan for the Paimio hospital environment] (Saarikko 2007) focused on the surroundings of the buildings from the 1930s, as well as later housing and the Lemmenlampi area where the pump station is located.

Saarikko's goal was to examine the current authenticity of this landscape, to document its present state, and to prepare a landscape conservation and management plan. He studied how the pine-covered heath surrounding the hospital had been turned into a suitable site for a sanatorium, outlined which design objectives for the landscape had been implemented, and assessed how the landscape had changed and evolved. His study also includes an analysis of the site's historical values, as well as a recommendation for action based on the analysis. The surrounding landscape was an integral part of the overall architectural composition and an important tool in the patient care. Saarikko's analysis concludes that numerous structural changes and the redevelopment of the surrounding vegetation have radically changed the appearance and overall sense of the space around the hospital. Among the key problems that were found were the changes in landscape type: i.e., the transformation of the pine forest and the disappearance of essential garden compositions.

Besides protection, a culturally significant landscape requires maintenance and conservation that take into account cultural-historic values. The plan in 2007 focused on the regeneration and vitality of the pine forest and on the preservation and rehabilitation of the overall spatial structure and essential garden compositions. The goals were to strengthen the identity of the place, show the history, and emphasize the individual characteristics of different areas. It was seen to be particularly important to highlight and protect the status of the pine forest, to restore its light appearance and the dominance of pine trees. The plan did not purposefully introduce new features to the landscape, but rather attempted to clarify and reinforce the existing ones without enforcing major changes.

The results of the study and its suggestions for maintenance have mostly been followed in the actions taken since 2007. Nevertheless, many of the key elements were not executed, especially those requiring the planting of vegetation. The current status of the landscape was revisited by Jere Saarikko and Jonas Malmberg, first in wintertime conditions on December 17, 2014, and then in early summertime conditions on June 5, 2015.

In this reevaluation of the Conservation Plan, the main goals are as the same as they were in 2007. In the future the possibility of establishing new uses and increasing tourism may require some further actions, which will have to be studied as the issues arise.For example, the visitors' route to the site could follow the original one, though access by foot should be encouraged in order to give sufficient time to explore the south façade of the main building and to experience the power of the main entrance courtyard. The option for a new parking area for coach traffic has been found near the junction of the roads Ruokolinnantie and Alvar Aallon tie.

PHOTOGRAPHIC STUDY

The changes to the surroundings can be studied by comparing the early photographs to present-day ones. These comparisons follow Jere Saarikko's studies from 2006, while the present situation was documented in June 2015.

SOUTHERN GARDEN

1930–40s: The garden was light and open. There were gravel paths next to the main building and around the fountains. Next to the fountain are two lindens and graminoids (Sukkinen's photo collection).

2015: The view is more open than it was in 2006. The other lindens have been cut down. The plants around the preserved fountain resemble the 1940s state. The paths are no longer visible. An asphalt road at the front leads to the 1960s nurses' apartment building. (AAM Malmberg).

1934: The path with the fountains is completed. Some birches are left next to the walk path. At the east end of the garden the end of the grass lawn is seen (AAM 50-003-266 Gustaf Welin).

2015: Some of the birches, fountains (exept one) and the paths are removed. The mountain pines at the balcony are over grown. The grass lawn covers most of the original garden area. The surrounding forest has grown as well as the survived birches. (AAM Malmberg).

1933–36: Young vegetation around the building, and the lawn is well kept. Gravel paths are linking the building and surroundings. (Pietinen in Saarikko 2007, 56).

2015: The trees have reached the height of the main building. Garden like plants have been added in the southern side. (AAM Malmberg).

1930s–40s: The birches are approx. 10 meters tall. The garden is still relatively open. (Sukkinen in Saarikko 2007, 57).

2015: The birches have been cut. The low garden like vegetation in front of the former balcony wing. (AAM Malmberg).

1950s: East side garden relatively open. Douglas firs and cedars are rather young. The view from the main stair case was open. (Jaakkola in Saarikko 2007, 57).

2015: Only few tall pines left, the Douglas firs as well as cedars have been cut. (AAM Malmberg).

1940s: The court yard and car park in front of the main entrance is of gravel and bushes of one species are planted. (Sukkinen in Saarikko 2007, 58).

2015: The entrance court yard is without car park, road is widened to be suitable for the large vehicle and paved with asphalt. In the middle of the loop there are rows of flowers. The row house is seen in the back, but more sheltered by the bushes than in the 1940s. (AAM Malmberg).

Early 1930s: Chief physician's villa with the fence and the creepers. T he grid of apple trees is just planted. (AAM 50-003-466).

2015: The villa was reused as a kinder garten in the 1970s. New fence has been added since 2006. The fence with creepers has been removed earlier. Many of the apple trees have been cut. (AAM Malmberg).

1930s: Chief physician's villa seen from the grid of apple trees, the ground is of grass (Sukkinen in Saarikko 2007, 59).

2015: New play ground of the kinder garten has been built since 2007. Only parts of the original fence and low garden wall around the villa have survived (AAM Malmberg).

1940s: The view from the roof terrace of the chief phycisian's villa is dominated by a large round shape, gravel cul-de-sac. (Sukkinen in Saarikko 2007, 59).

2015: The road is smaller and the round shape has been removed. The is paved with asphalt. A lamp post designed in Aalto's office has been added. (AAM Malmberg).

1930s: The ditch that was used for croquet playing seen from the roof terrace. The sanatorium stands behind the relatively young forest. There was a path around the ditch (Sukkinen in Saarikko 2007, 60).

2015: The ditch is well visible, but its' shape has been softened. The path can no longer be seen. A variety of bushes have been removed from the ditch since 2006, but some have been left. (AAM Malmberg).

1934: The phycisians' row house soon after completion with open courtyards enclosed by a cut hedgerow (AAM 50-003-448).

2015: The yards have a variety of trees e.g. cherries and plums. The over view is confused. (AAM Malmberg).

1930s–40s: The phycisians' row house seen through pine forest, the front is rather open. The paths are of gravel. (Sukkinen in Saarikko 2007, 61).

2015: The pine forest has been grown, the entrances in to the apartments are sheltered by vegetation (AAM Malmberg).

1950s: The staff housing buildings are seen in a forest, the path is paved with slates (Sukkinen in Saarikko 2007, 62).

2015: Some of the pine trees have been cut, and paths are of asphalt (AAM Malmberg).

1930s–40s: Lemmenlampi articial pond was created by a dam. The pond and the concrete structure of the pond are seen behind. The area around the pond was well kept. (Sukkinen in Saarikko 2007, 63).

2015: The former pond is grown and can hardly been recognized (AAM Malmberg).

2015: The conctere structures have survived in the forest (AAM Malmberg).

SOURCES

Saarikko, Jere (2007). *Paimion sairaalan ympäristön historiaselvitys ja kunnostussuunnitelma*. [Historical report and conservation plan for the Paimio hospital environment]. Espoo: Teknillinen korkeakoulu, Arkkitehtuuriosasto.

DOCUMENTARY EVIDENCE

ARCHIVES

Timo Riekko

Most of the archival material related to the sanatorium is still located in the hospital area. The archives are managed by the Hospital District of Southwest Finland (later HDSF) and are reasonably well arranged and preserved. The oldest material is from the planning stage of the sanatorium. The quantity of material in the archives is extremely large and during this project we could focus mainly on the material from the construction time in 1930´s and certain key periods in the history of the sanatorium. So still a lot of material is waiting to be researched. A good example of the invaluable material in the archives is the material bills and receipts from the construction time. From those you can find out exactly what type of materials (paints, floor materials etc.) were used in the construction of the building. During this project we scanned and photographed hundreds of pages of documents from the HDSF archives.

The other main source for archive material is the Alvar Aalto Museum. All the original drawings made in Alvar Aalto´s architectural office are located at the museum. If you include all the buildings in sanatorium area there are over 2500 drawings for the Paimio sanatorium in the archives of the Alvar Aalto Museum. During this project all the drawings were scanned and they are now available for researches in digital format. There is also a large quantity of historical photographs that were organized and digitized. A lot of photographs were given more detailed information or even new photographs were identified as belonging to the sanatorium building.

This project was the first time anyone has systematically gone through all the archive sources that have material on the Paimio sanatorium. Even though in many cases we managed only to touch the surface of the archives we know have a better understanding of what type of material can be found in each archive. We also had the opportunity to compare the materials in different archives. This resulted in some material exchanges between the archives. For example all the older architectural and HPAC drawings were transferred from HDSF archives to the Alvar Aalto Museum since most of that type of material were already there.

LITERATURE AND OTHER RESEARCH

Jonas Malmberg

Alvar Aalto started to promote his major project even before it was completed in 1933. This resulted in wide publicity already in 1930s, as described earlier. Sigfried Giedion included Paimio Sanatorium in the second edition of his famous book *Space, Time and Architecture*, published in 1949. He stated that Paimio Sanatorium was one of "three institutional buildings inseparably linked to the rise of contemporary architecture" – the others being Walter Gropius' Bauhaus at Dessau and Le Corbusier's proposed League of Nations Palace in Geneva. Giedion's book became almost compulsory reading for students of architecture in the latter half of the 20th century.

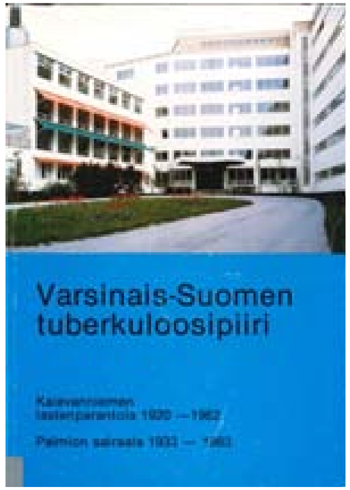
Aalto's worldwide reputation has emphasized this over the years, which has strengthened the legacy of Paimio Sanatorium and later the hospital. A complete list of books dealing with Paimio Sanatorium would be vast: if one makes a computer search with the key word "Alvar Aalto" one gets nearly 400 matches alone from the collection of the University of Helsinki Library.

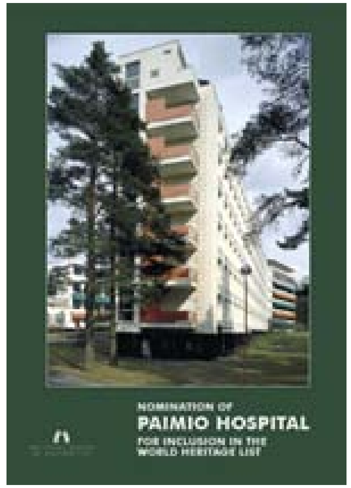
Significant research on both Alvar Aalto and Paimio Sanatorium has been made over the decades. An important study *Varsinais-Suomen tuberkuloosipiiri,* by historian Sirkka Törrönen, was published in 1983 on the occasion of the 50th anniversary of the sanatorium. At that time, more first-hand sources and people involved in the building process were available to provide information.

In 2005–2007 the proposed nomination – later withdrawn – of Paimio for inclusion on the UNESCO World Heritage List resulted in a good description of the history of the building titled *Nomination of Paimio Hospital for Inclusion in the World Heritage List* by Margaretha Ehrström (et. al). Also the most recent volume, Vol.5, in the Alvar Aalto Foundation's monograph series *Alvar Aalto Architect*, published in 2014, was Paimio Sanatorium 1929–1933.

There is also currently much foreign research related to Paimio; for instance, Eva Eylers' doctoral thesis *Hygiene and Health in Modern Urban Planning – The Sanatorium and its Role within the Modernist Movement,* completed at the Architectural Association in London in 2010, is a good example of in-depth studies related to Paimio Sanatorium. Many of the international scholars have been strongly dependent on the earlier literature sources available in English, such as Göran Schildt's 3-volume biography on Aalto.

Unfortunately, there are very few studies by people capable of in-depth research in the early archive sources, which are of course mostly in Finnish. However, on almost the same day that this CMP was published, January 29, 2016, an in-depth research of this kind was presented at Aalto University, namely Marianna Heikinheimo's doctoral thesis *Architecture and Technology: Alvar Aalto's Paimio Sanatorium.*





AAM av 371 Maija Holma

PART III
CONSERVATION POLICY

PROTECTIVE DESIGNATION

Nina Heikkonen

Paimio Sanatorium is a property of national significance. Legal protection in Finland applies at National, Regional and Municipal levels. These documents provide guidance for building conservation and the management of cultural properties, establish the boundaries of protected areas and define land use monitoring. National Land Use Guidelines establish the hierarchy of the planning process, which is specific to Finland. It has three levels: the Regional Land Use Plan, the Local Master Plan and the Local Detailed Plan, connected with cultural heritage issues.

PROTECTION AT NATIONAL LEVEL:

- Building Protection Act 60/1985, for Paimio Hospital, Council of State decision no. 43/561/92, 18.3.1993
- Nationally valuable cultural-historical environments, National Board of Antiquities, 1993 (rev. 2009)
- Finnish Architectural Policy, 1998
- The Land Use and Building Act, 2000, renewed; The National Land Use Guidelines, 2000, as part of the Land Use planning system
- National Strategy for building conservation and maintenance of the architectural heritage (with a special programme on the 20th century heritage), 2001
- Cultural environment Strategy, 2014
- Nature Protection Act; Forest Act; Soil Act are used as the Legal tools for environment and nature protection

PROTECTION AT REGIONAL AND MUNICIPAL LEVELS

- The Turku City Regional Land Use Plan; for Paimio Hospital no. YM1/5222/2003. This is the main planning document and legal tool, which defines the built-up area, zones of protection (SR 577009), forest and recreation areas, and agricultural and ground water areas, which are prohibited from intensive construction and aim to preserve built heritage and landscape values
- The Local Master Plan, final approval 2012, specifies the direct regulation of building, preservation of natural and cultural heritage, as well as the quality of the living environment and the reduction of environmental hazards
- The Local Detailed Plans regulate building and physical townscapes and landscapes, including conservation measures, which make this preservation plan of special importance regarding preservation. At the moment, there is no Local Detailed Plan in force for Paimio Hospital Area

Through the Building Protection Act (60/1985) (Council of State decision no. 43/561/92, 18.3.1993), the protection of the Paimio Hospital encompasses the main hospital building, the former heating plant, the garage, the former staff housing, the former junior physicians' row house, the former chief physician's house and the funerary chapel (Rose Cellar), as well as the surrounding area.

The protection covers the exterior of the buildings, the original interiors, the building structures, the building parts and the remaining fixed furniture and fittings, including the original lamps and details. The protection stipulations also state that the protected buildings and their surroundings must be maintained and conserved in accordance with their architectural and cultural-historical value.

The argument for the decision to protect the building has been that "Paimio Sanatorium and the residential and utility buildings is a national building monument of cultural-historical importance with regards to building history, architecture, building technology as well as its uniqueness."

According to the protection stipulations, the National Board of Antiquities1 must approve all repairs and alterations. The National Board of Antiquities is an expert body responsible for protection and restoration issues in Finland. The specialised knowledge of the Alvar Aalto Foundation and the Alvar Aalto Museum as the preservers of the Alvar Aalto architectural heritage is also available. The parties coordinate research and other activities linked with Aalto's architecture.

THE PROTECTION STIPULATIONS

1. The exterior of the protected buildings must be preserved and in repairs original colours and surface treatments must be used.
2. The original interiors, structures, building parts, remaining fixed furnishings including original lamps and details of the hospital building, the former chief physician's residence, the junior physicians' row house and the funerary chapel must be preserved and the colours and the materials of the original designs must be used in repair work.
3. The protected buildings and their surroundings must be maintained and conserved in accordance with their architectural and cultural-historical value. The buildings must be used so that their cultural-historical value is not endangered, and their use must serve the hospital function or a function that is in concordance with the original activity. Any repair or alteration work must be in concordance with the architectural value of the site and approved by the National Board of Antiquities.
4. The National Board of Antiquities has the right to issue more detailed guidelines about the application of the protection stipulations and to grant minor exceptions from them.

PRINCIPLES OF RESTORATION AND USE

Jonas Malmberg & Sakari Mentu

The general restoration principles are set out in this section discussing the executive strategy. The primary objective of the principles of restoration and use, is to facilitate the management of future alterations from the perspective of building conservation and to ensure the preservation of the unique architectural-historical value of Paimio.

PROTECTION ORDERS

The key protection objectives for Paimio have been defined in the protection decision issued under the Act on the Protection of Buildings. According to these, the appearance of the buildings must be preserved and in any repair work the original colours and surface treatments must be used. In the main building, former chief physician's residence, assistant physicians' row houses and burial chapel the following must be preserved: the original interiors, structures, building parts and remaining fixed furniture, including original lamps and details. Also in their repair, the colours and materials of the original designs must be used. The buildings and their surroundings must be maintained and preserved in a way dictated by their architectural and cultural-historical value. The buildings must be used in such a way that their cultural-historical value is not compromised, and the use should serve the hospital functions or functions that are consistent with the original activities. The repair or alteration work carried out in the buildings must be consistent with the architectural value of the site and they must be approved by the National Board of Antiquities.

NOTES ON THE PROTECTION ORDERS

The section concerning the restoration is based on existing protection orders. The specifications and comments presented below do not substantially change the original content of the orders.

The protection orders issued under the Act on the Protection of Buildings do not specify the content of the definition "original interiors, structures and building parts". In this context, it has been considered important to treat any alterations carried out up until the completion of the 1958 renovation as comparable objects to the original building parts; evaluating Aalto's work from different periods according to their importance is not an appropriate starting point for restoration planning. As has been described in the part of the report on the history of the alterations and use of the building, the 1958 alterations were still a solution for the use of the building as a sanatorium. However, in this work the Aalto office altered, for instance, the exterior architecture of the operating theatre wing and key interior spaces linked to the main entrance to such an extent that the original situation would no longer be attainable without – in today's perspective – unnecessarily large-scale reconstruction. On the other hand, most of the subsequent alterations have involved solutions to topical functional or technical questions without long discussions about architectural issues.

It is no longer possible to ascertain the original colours and surface treatments of all interiors of the different buildings. Restoring large entities to the appearance they had in the 1930s may be technically unfeasible. Partial restoration of groups of spaces can lead to conflicts that are difficult to resolve. Stylistically integrating individual spaces or groups of spaces would be possible in principle. Reconstructive restoration can be an option if the initial situation has been carefully examined and adequate information about the previous appearance is available. The overall architectural integrity must not suffer due to the alterations.

"*Hospital operations*", which had in practice become distanced from the everyday life typical of the sanatorium of the 1930s already before the closure of tuberculosis sanatoriums, further changed form during the era of the orthopaedic hospital, and in terms of the current use became a kind of footnote. Presently it can be seen that "harmony" comes more from using the hospital facilities and surrounding park area in a way that corresponds with the nature of the activities – that is, in a peaceful way – rather than hospital operations that literally correspond to a sanatorium use.

"*Authenticity*" and "*integrity*" have significance above all as evaluation criteria, and not so much as conservation values. Authenticity is not the permanent and unambiguous property of the site; the cultural values of an authentic site are conveyed in a credible way by means of the forms, materials, use and environmental totality. Integrity (comprehensiveness, honesty) can be architectonic, functional or the integrity of the environmental totality. Solutions related to the emphasis or return of integrity require in-depth knowledge of the site, particularly if some detail perceived as disturbing is in the process of being removed in order to highlight the integrity of the whole.

ASSESMENT OF VALUES

Jonas Malmberg & Sakari Mentu

The states to be achieved through the conservation, use and maintenance of Paimio are described below from three different viewpoints: the significance and attraction of the sanatorium as an architectural monument, its cultural-historical significance, and its usefulness from the point of view of present and future users. When assessing future measures and uses, it is recommended that both the preservation of the unique characteristics and the usability be taken into consideration.

1. ARCHITECTURAL VALUE

Paimio is an **architectural monument of international significance**. The buildings and their surroundings have a special place in the complete works of Alvar Aalto, the history of Nordic modernist architecture (Functionalism) and in the history of European architecture. Paimio influenced the works of many architects during the 1930s, but its influence as a model example has been considerably more enduring.

It is due to the significance and high quality of the architecture that the sanatorium has become an attraction and a site for cultural tourism. The objectives of tourism and exposition must be seen as having equal value as other uses, while at the same time generating additional value for other functions.

Note!

As a site of cultural tourism, Paimio is an indivisible totality: any alterations made to the spaces and buildings in the area must be designed with equal precision. Highlighting the original architecture (and any alteration stages comparable to it) in a way that is as impressive as possible can in some cases require the removal of disturbing structures or surface treatments. The initial data for all alteration or repair projects must include an extensive study of the original architectonic and technical solutions, the alteration stages of the building, colours and furnishings. Reconstructive alterations must not be based on assumptions.

2. CULTURAL HISTORIC VALUE

Paimio Sanatorium is at the **national level a cultural-historically significant totality**, which bares witness from point of view of the history of medicine and the societal and social development of the early 20th century, as well as the history of both Finnish architecture and building technology. The area has remained in a use that corresponds to the original use, but is not in its original use.

Alterations have been made to the buildings of the sanatorium area in accordance with functional requirements. The alterations are signs of the historical stages of the hospital, but their architectural quality varies. Some of the alterations have blocked vistas and covered details in the original interior. The approach to structures built since the 1950s will in future repair work require case-by-case assessment: one must consider the relationship of the historical weight of evidence to the architectonic integrity.

Note!

The cultural-historical values and the architectonic totality are equally to be taken into consideration in the restoration. In places it is possible to emphasise the recognisable features of the original tuberculosis sanatorium. The sanatorium-like character of centrally located and significant spaces – for example, the operating theatre wing and the main entrance hall – must be taken into consideration. It is possible to illustrate to visitors the historical stages of the buildings also through lighter means than just restoration. Whenever possible, the new uses should harmonise with the original room programme and the level of technical installations of the original sanatorium.

3. USE VALUE

The preservation of a large site that demands continuous maintenance requires staff resources, financial revenue and investments. **The buildings and the area must be in use to such an extent and in such a way that their maintenance is economically viable.** Preserving the cultural-historical value and the use of the sanatorium as, for instance, a cultural tourism attraction must be examined as mutually supportive objectives and not as conflicting ones.

Note!

The possibility of raising the degree of use of the building and placing new functions or structures in the area must be assessed in relation to the threat they pose to the original structures and architectonic totality. One must also identify those sites for which a more intense use would create a real threat and to re-direct elsewhere the changes required by such a use. In this case it is not possible to determine in advance the intended use, and thus the study is limited to the "alteration tolerance" of each space or correspondingly its "vulnerability".

The continuity of the maintenance – dating back to the original construction of the sanatorium carried out by long-term staff with an in-depth knowledge of the site – is exemplary in this particular case. The continuity of this unique maintenance work, exemplary even from a cultural-historical viewpoint, must be ensured. The site will have the character of an international architectural site, which it began to attain already in the early 1930s. This use must be taken into consideration in parallel with the other uses, but with its present potential the role of an exhibition and museum object is insufficient to ensure the preservation of the site. The potential offered by the spaces to be reserved for the use of an exhibition and museum object should be examined.

AAM digi 2059 Maija Holma

PART IV
IMPLEMENTATION STRATEGY

AAM digi 2034 Maija Holma

GUIDELINES AND RECOMMENDATIONS

RESTORATION AND CONSERVATION

Jonas Malmberg & Sakari Mentu

PROTECTION OF AN ARCHITECTURAL MONUMENT

The objective of the restoration planning must be to combine in a natural way the working spaces of the building and the spaces that are used more as tourist attractions. In any solutions stark internal demarcations must be avoided. Alterations should be made only when they are technically or functionally necessary or lead to the better perception and understanding of the original architecture.

Justified reconstructive restorations carried out as conservation work can be permitted but pastiches are not allowed. Designing new structures and replacing earlier unsatisfactory alterations are solved by means of infill building. The materials and colours of Aalto's architecture must be taken into consideration and can be applied in the new structures – without, however, copying original details and solutions in a misleading way and without creating peculiar combinations.

Alterations carried out in the surroundings and the recurrence of vegetation have considerably changed the spatial layout and general appearance of the sanatorium grounds. The major part of the original central features can still be preserved and restored. Alterations carried out within the area of the sanatorium's internal vistas must be designed with particular care. In the surroundings of the main building the aim should be to restore it as close as possible to the original situation. The buildings and natural environment of the sanatorium area form a cultural-environmental totality, the different parts of which must always be examined together from the viewpoints of restoration measures and use. No single measure must influence the other parts of the totality in a disturbing way.

The "edge zone" of the sanatorium area can be the target of special study (how it is perceived physically and functionally, whether the greenhouses are part of the sanatorium complex, etc.).

The example spaces and spatial groups presented below have been selected from the main building, so they represent fairly comprehensively situations that have been preserved and come about in different ways. Thus the presented objectives also allow for comparisons with other spaces that have been preserved or have changed in a corresponding way. The stages in the history of the spaces, their cultural-historical value, and their functional significance in sanatorium and hospital operations as well as the objectives of preservation have been transmitted verbally. Likewise, as best as possible, spaces and spatial groups have been identified, the preservation of which requires new uses; such entities include the basement spaces of the patients' wing and the sun balcony wing.

Basement A-wing, chapel (AAM Sakari Mentu)

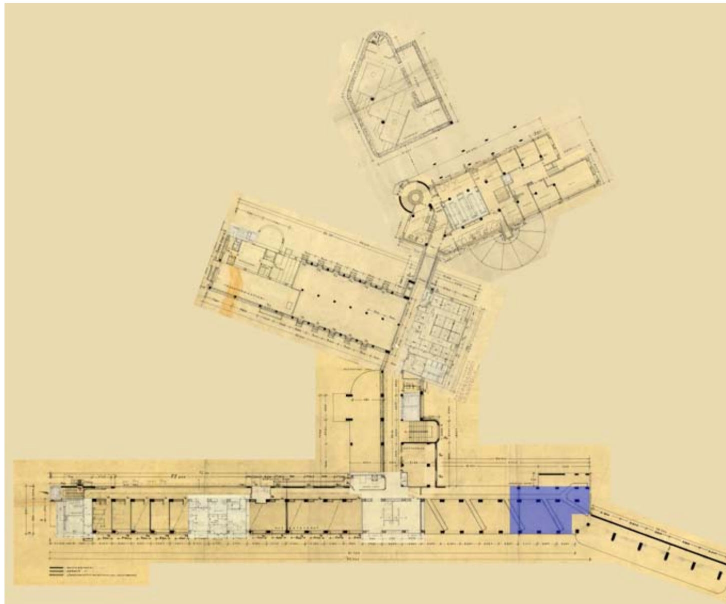
Basement A-wing, chapel (AAM Jonas Malmberg)

Basement A-wing, chapel (AAM Jonas Malmberg)

Basement A-WING: CHAPEL AND MORGUE

- **The chapel is part of the basement, the uniqueness of which is created by unique furniture and fittings. The space must not be altered without a pressing reason but, for instance, a direct access outside could functionally be a valuable option, the utilisation of which come under consideration. Technical equipment, such as cold storage, would have to be examined from the viewpoint of the possible risks they create.**
- The unique and exceptional interior designed under the direction of architect Heikki Tarkka (designs from 1987) was a replacement for the Rose Cellar morgue. The architectural design as a whole was unique but compared to Aalto's 1930s modernism it was hesitant.
- In the original plans there is in this location an unexcavated space and tunnels for pipes. According to some sources (e.g. Törrönen 1983, 41-42), a food storage was built in A-wing already in summer 1933 and the access door was placed on the south façade. Drawings of this have only been obtained from the time of the 1970s alterations – where the door is shown as having been removed – but the extent of the cellar area in use is not evident from these.
- The space has few later additions or layers, so it corresponds with the solutions dating from the original building period. Artwork structures specifically designed for the space were made in the hospital workshop (communication from Reijo Vihervaara).
- The totality, in regard to its use and long design history, has a cultural-historical value. But its potential, for instance, as an architectural attraction is less than that of the central spaces of the sanatorium. The usability of the space is poor.

Basement A-wing, chapel (AAM Jonas Malmberg)

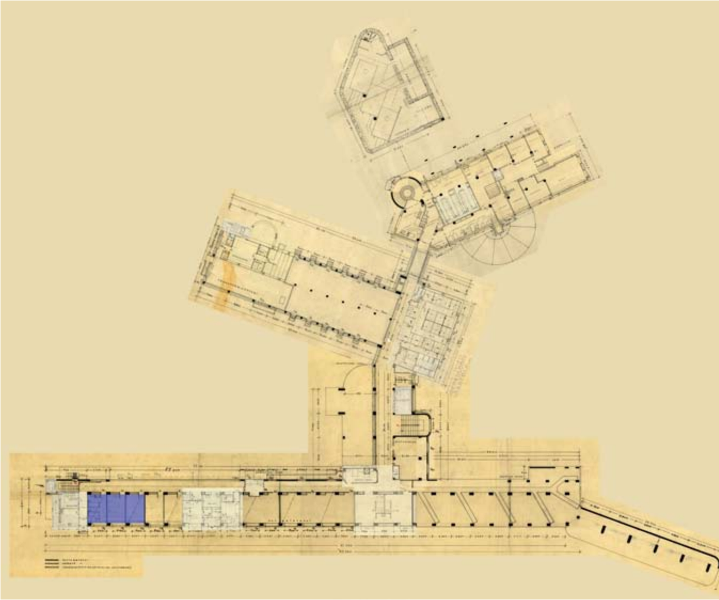


Basement A-wing: quarantine ward
(AAM Sakari Mentu)

Basement A-wing: quarantine ward
(AAM Jonas Malmberg)

Basement A-WING: QUARANTINE WARD PATIENT ROOMS / PRAYER- AND LECTURE HALL / LABORATORY SPACE

- **The end of the basement floor (wider than the study area) offers the potential for a variety of activities as it has, for instance, its own entrance. The space or spatial group can be modified within the existing framework. The building stage associated with its original use should be identified.**
- Originally, the space comprised three patient rooms of the quarantine ward, which probably were similar to the other patient rooms.
- The three rooms were combined by removing the dividing walls. As a result, a prayer- and lecture hall was created, for which unique fixed and moveable furniture was designed under the direction of architect Heikki Tarkka. Also the detailing was carefully executed. The plans were drawn up in 1964-65.
- In the 1980s, in accordance with designs drawn up by Heikki Tarkka, the former quarantine ward was transformed in its entirety into a laboratory, and which had no particular architectonic objectives. It was at this point that the furniture and equipment that had been specially designed for the use of the prayer- and lecture hall were moved to the patient lounge on the first floor. Due to use, the surfaces and furniture have been renewed since the 1980s.
- The basement is a space with various uses, and its hierarchic value has correspondingly changed: the group of patient rooms belonging to the perhaps scary contagious disease ward became an exceptional and carefully designed prayer- and lecture hall. After that stage, the space became part of the laboratory operations, without any particular user or cultural-historical significance.
- Preserved parts linked to the original building stage include: the load-bearing structures, the side corridor adjacent to the spaces (albeit the end of the corridor is altered and supplied with suspended ceilings) as well as the windows of the rooms, replaced by thermal glazing in the 1980s. The space itself has been changed a lot, and as such has no particular cultural or building-historical significance. A particularly interesting detail is the door openings of the patient rooms, the dimensions and door jambs of which have been preserved but not the doors themselves.

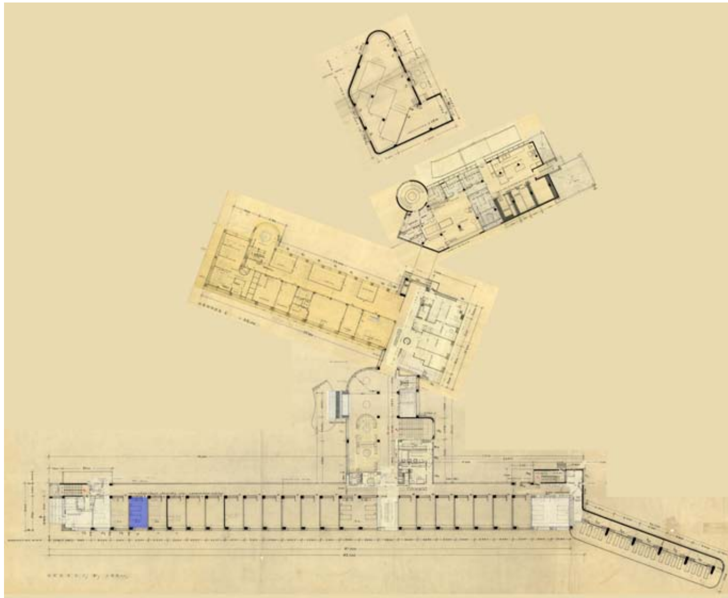


The museum room (AAM Sakari Mentu)

Ground floor A-WING: MUSEUM ROOM

- **The museum room represents mainly the 1970's view of the original patient room (for instance, in terms of colours the totality does not fully correspond to the original and the age of the floor is unknown). The patient room has become one of the key spaces in the use of the sanatorium for tourism, and it has attained an iconic position. The space in use as a museum could be developed to better correspond to the original, for instance by means of the original colours or window blinds. On the other hand, the space can be preserved as it is, and the creation of a new museum room can be considered at a location which is best suited to the circulation routes of the visitors.**
- In its original use the space was a patient room. The objectives of Aalto's sanatorium architecture are encapsulated in the patient room and its fittings. Hygiene was strived for by means of easily cleaned materials and specially designed pairs of washbasins. The lighting, heating and colour scheme were designed for the needs of Aalto's so-described "horizontal man".
- The original furniture and fittings as well as the door to the patient rooms were preserved in the 1970s renovation. Even after the renovation, the patient room had a use that corresponded with the original one; hence in the renovation it was fitted to, for instance, the hospital's gas system as required for patient use.
- Even by international comparisons, the original furniture and fittings of Paimio Sanatorium have been both well and extensively preserved, also beyond the museum room. Making these more extensively accessible to visitors than at present by means of informative collections is justifiable.

Patient room in 1933
(AAM 50-003-361 Gustaf Welin)



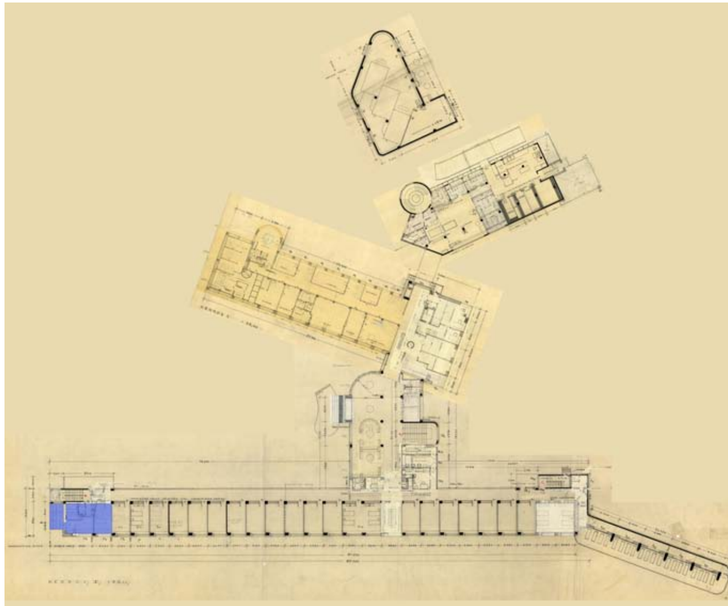
Ground floor A-wing: ward nurse's apartment.
Photo from 3rd floor (AAM Jonas Malmberg)

Ground floor A-wing: ward nurse's apartment.
Photo from 3rd floor (AAM Jonas Malmberg)

Ground floor A-WING: WARD NURSE'S APARTMENT / WARD WET SPACES

- **The versatile development of the original ward nurse's apartment, which was later converted into a wet space for the ward, would be possible. The objectives could be connected, for example, to the needs of washing, the exhibition use of the building or other activities. The original spatial solution should be taken into consideration. The balcony enables new possibilities and its utilization should be strived for.**
- In its original use, the end of the ward was the ward nurse's own private apartment with its own balcony, next to which was situated a single-person patient room.
- Having the ward nurse to live in the main building was an important design solution, one which was discussed at the planning stage. The nurse's monitoring role was central, yet on the other hand privacy was provided by the separate staircase (which in the 1970s was opened to become part of the side corridor by removing the toilet) and the end balcony which was significant for the architecture of the building.
- The use of the space was changed in the 1970s to toilet and washing facilities, when also the space that had been extended to the adjacent patient room was connected more clearly than previously to the ward corridor. Apart from the balcony, the space no longer conveys the message of dwelling activity, but of a stage in the history of the hospital.
- In recent years, a patient room has been arranged next to the patient room that functions as a museum room, which tells about the 1970s stage, and in place of the former wet space photographs, a scale model, lamps and other objects have been placed that support the exhibition activity.

Ground floor A-wing: ward nurse's apartment, 1930s (AAM 50-003-358)



Ground floor, entrance hall in the 1930s (AAM 50-003-320)

Ground floor in the 1980s, entrance hall before new opening at the end (AAM av 818 Martti Kapanen)

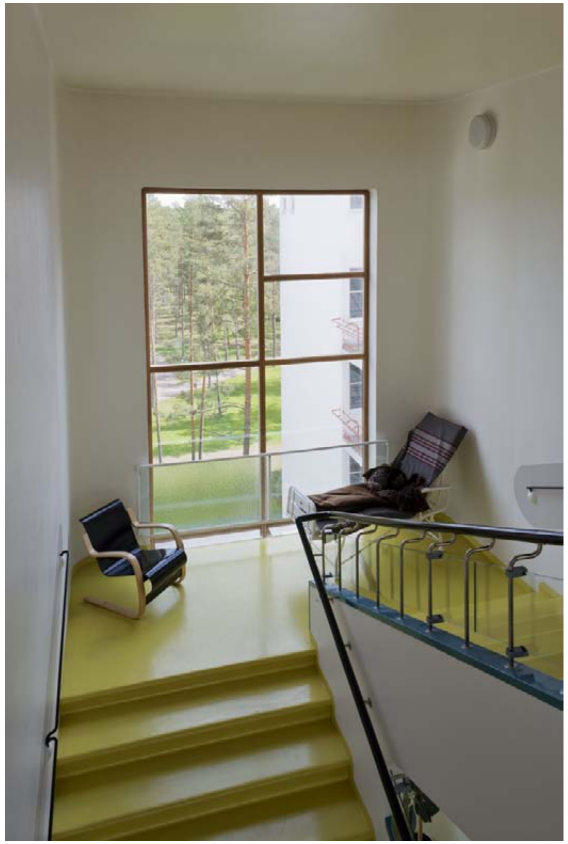
Ground floor, entrance hall in 1997 (AAM av 510 Maija Holma)

Ground floor ENTRANCE HALL AND MAIN STAIRS, B-WING CORRIDOR

- **The entrance hall is one of the main interior spaces, significant in terms of both its functional aspects and its history of use. It was a space of arrival into the original building, one of cultural-historical significance, and closely connected to the first experiences the patient had on arriving at the sanatorium. For example, in several recollections collected during the 1970s the patients at the sanatorium during the 1930s referred to its atmosphere. The alterations to the lobby in 1958 established a status against which any future alterations are compared. Presently the space is somewhat disjointed and alterations that would be favourable in terms of the architectural totality can be considered.**
- **The situation regarding the B-wing ground floor corridor is linked to the situation of the lobby established already during the 1950s. In connection with any future alterations, it is recommended that the opening up of the corridor in the direction of the rear yard should be investigated.**
- The lobby is a central space, the overall dimensions of which have been preserved. Its situation corresponds mainly to the stage established in 1958.
- The corridor running from the lobby to B-wing has also changed spatially: it was originally open via the porter's space towards the direction of the rear yard, and by the widening of the corridor created also a space for a circular telephone booth. The space was more diverse than the present central corridor and it continued without any intermediate doors towards the waiting area in the consultation department and corridor. The corridor is subtly divided from the lobby by the difference in surface materials.
- The largest changes to the lobby were made already in 1958 when a reception desk replaced the area of wooden shelves used for the patients' outdoor footwear, and additionally the fixed furniture has been altered at different stages up until very recently. The reception booth with its free-form glass wall has been fitted tightly around the outline of the original circular skylight. In its detailing, the booth is a carefully considered entity which can be recognised as having an architecture that differs from the original. The present appearance of the booth still mainly corresponds to the 1958 design, but the rear space, where there was originally a posting point, has been altered more than the visible part and the receptionist's space.

Entrance hall, B-wing corridor (AAM Jonas Malmberg)

Main stairs in the 1970s
(AAM 109677 Piero Berengo Gardin)



Main stairs in 2014
(AAM digi 2080 Maija Holma)

- In the 1958 alterations the orientation of the draught lobby, steps and even the entry into the building was changed. Earlier the patients being admitted to the sanatorium continued their way to the right, to the footwear shelves, while other arrivals were directed immediately to the left towards the reception desk visible in the corridor. From 1958 onwards, the receptionist has been located at the front to the right in the partly free-form booth. The draught lobby was added and the internal steps removed in 1958 (then the exterior steps were raised and the window above the exterior door was lowered, and later, probably in 1989, a handrail was added). The floor material was renewed most recently in 1990. Still in the plans at the end of the 1950s, the flooring is indicated as rubber – thus corresponding with the original – and the drawings state that yellow rubber flooring and marbled rubber tiles are to be used.
- A part of the original lamps in the lobby and stairs have been preserved. The moveable armchairs in the lobby correspond to the original grouping in front of the curved window.
- The corridor of B-wing was altered in 1958 to become a central corridor, at the end point of which the window was opened to become an entrance. Its structures were renewed in the 1980s and most recently in 1998. A trace of the former telephone booth is visible in the ceiling of the corridor.
- Following alterations, the central and open interior space linked to the lobby has lost its transparency. The functionally and architectonically diverse space has become a conventional central corridor. The placement of doors in the corridor was altered in the 1980s when a hatch for the present service point was built. The hatch was later covered with an opaque membrane which is alien to the architecture of the building.

- **Preserving the appearance of the main stairs is of central importance. In terms of lighting fixtures, there is reason to examine the possibility of returning the original lamps (presently in storage) to their original locations. In any future alterations the connection of the main stairs in the direction of B-wing on the different floors should be examined (see 3rd floor workshop, below)**
- The main stairs has mostly retained its original appearance. The floor surfaces have been renewed (the original yellow rubber flooring has been preserved in the floor of a cupboard) such that the difference in colour at the edge of the treads has disappeared. The handrails of the main stairs are original, and the paint on the wall in an area that follows the handrail resembles the original solution. The windows in the stairs have been renewed (in a plan from 1989). It was proposed already in 1957 to renew the flooring with rubber tiles and it was probably renewed most recently in 1990. It seems that the 2005 repairs focused on the paint work. A safety guard was added to the stair rail in 2014, though a safety guard at floor level in front of the windows was added earlier. The safety guards and their details are temporary in character.
- **In future repairs and alterations to the lifts, the opening of the lift shafts into the lobby and floor landings should be emphasised and the original transparency and machine-romantic atmosphere strived for.**
- The lifts were a central part of the operations of the building. In terms of technical performance, the large lifts in Paimio were in their time a remarkable achievement in Finland. Originally the patients' use of the lifts was limited.
- The lifts connected to the lobby and the different floors of the building have been renewed twice, most recently in 2001. The original ones were substantially transparent and the ceilings and walls were in different colours. According to the patients' magazine and the colour compilations prepared by Eino Kauria, one was blue and the other was red. The metal parts at the front of the lifts are mentioned in a newspaper article (Hahl 1933) as being red, but it has not been possible to confirm this from removed building parts. In some plans a window has been proposed in the exterior wall of the lift shafts, which was never implemented, apart from the window of the machine room that was assembled from the round glass elements of the machine room.
- The present solid lift doors with only small glazed parts, as well as the general appearance of the lifts, conflict with the totality of the lobby.

Entrance hall, lifts in the 1930s
(AAM 50-003-340 Gustaf Welin)

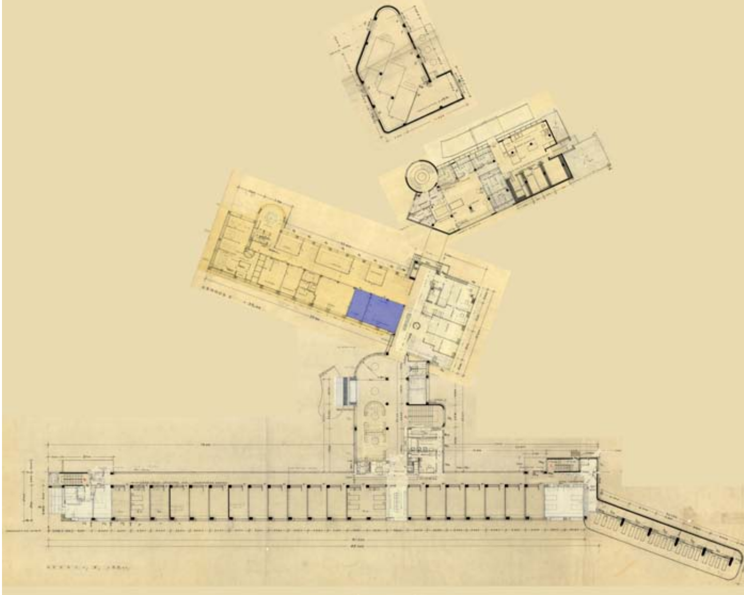
Entrance hall, lifts in 2015
(AAM Jonas Malmberg)

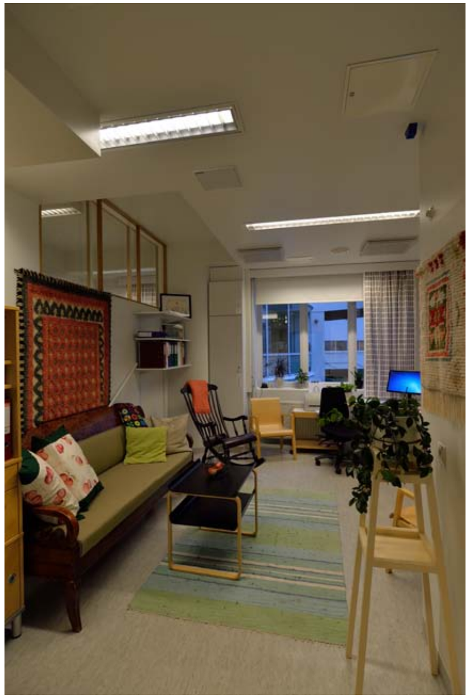
Chief physician's workroom in 2015
(AAM Jonas Malmberg)

Ground floor B-WING: CHIEF PHYSICIAN'S WORKROOM AND SECRETARIAT

- **A place originally of great significance in the hierarchy has become one of many office and activity spaces. The uniqueness of the space has disappeared under layers of alterations. The aim should be to return the former workroom and secretariat to its original dimensions and with materials corresponding to the original ones. Further, the secretariat should be furnished with preserved original furniture. The pair of spaces could become a functionally authentic office for the director of the building, and with a representational conference room next to it.**

- A consultancy department was originally situated on the ground floor of B-wing, and the first in the row of rooms was the chief physician's secretariat and workroom. The original chief physician's secretariat was at the top of the operational hierarchy and the room was furnished with unique pieces of furniture. Also the fixed furniture had features specially designed for the space, such as a wall-mounted light box, with bespoke protective glass, for viewing X-rays and a pinboard made from cork boarding specially built into the wall, and on which Eino Kauria painted the layout of the sanatorium rooms.
- The space was altered in 1958 by adding a dividing wall, so that the workroom of the secretary was divided off from the secretariat. It was probably also at this point that the cork board wall with Kauria's painting was removed. In 1969 new fixed furniture was again designed for the chief physician's room. There is a plan for the alteration of the secretary's room dated 1969 and another from 1976. In the plans from 1984 and 1987 the space that remained adjacent to the secretary's room was indicted for use for ECG research. Nowadays the room is an office.
- The original colour scheme of the chief physician's room and the whole consultancy department was considerably more diverse than it is today. The present colour scheme dates from the 1980s, but the number of colours was probably reduced already from the 1958 alterations onwards. In the 1987 plan the rooms are reserved for ECG research as well as spirometry. In 1988 the plans for the surface materials and colour schemes for the rooms were updated, and which the present situation to a large extent will probably continue.
- In 1983 new facilities were designed on the second floor for the chief physician, when Professor Tala asked architect Heikki Tarkka to take into consideration the fixed and moveable furniture so that they could be utilised in the new space due to the pleasantness and additional value they brought to the interior. Original moveable furniture has been preserved in different parts of the main building.
- The doors have been renewed and thermal glazing has been installed in the windows, probably during the 1980s.
- Nowadays the rooms house the offices of the Mannerheim League for Children Welfare's Foundation for the Rehabilitation of Children and Young People.





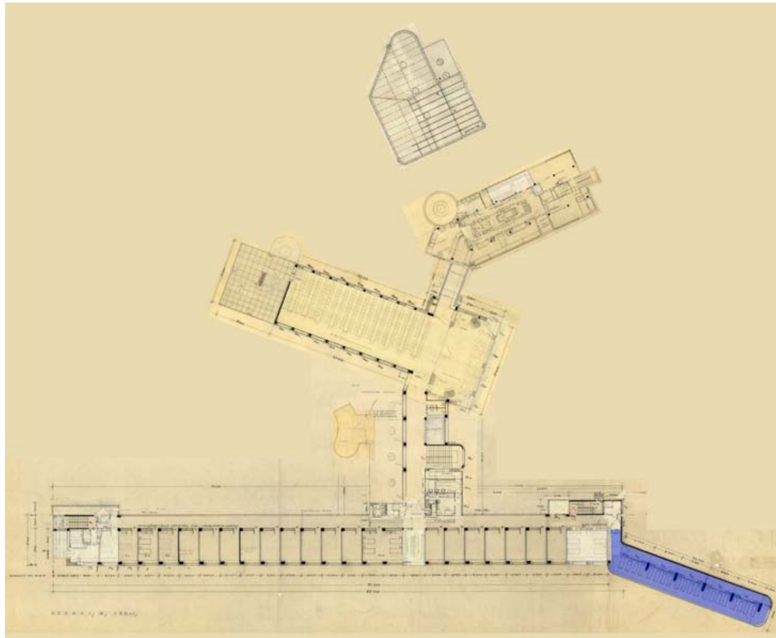
Chief physician's workroom in 2015
(AAM Sakari Mentu)

Former sun balcony in 2015
(AAM Sakari Mentu)

Ground floor to 5th floor A-WING: FORMER SUN BALCONY

- **The open sun balconies were a powerful architectonic motif, the filling-in with glazing of which – transforming them into rooms for hospital use – has been the most significant alteration carried out on the facades of the sanatorium. Returning the balconies to their original use has sparked debate already for decades – most recently Natalia Dushkina described the magnitude of the loss in connection with the processing of the proposal for inclusion of Paimio in the World Heritage List. In the restoration plan, returning the sun balconies into open balconies is not seen as a necessary objective. The impressiveness and integrity of the architecture of the façade, the preservation of the 1960s alterations as being cultural-historically valuable, and the possibility, in relation to a room programme, of placing difficult functions in the patient rooms of the balcony wing are all objectives to be seriously considered – albeit each with a different weighting. Functional needs that arise with future uses can be resolved by means of these spaces. Opening up the sun balconies for the needs of architectural tourism is not justified, but depending on the real needs also this option can be investigated, for instance, emphasising the original openness of the balconies, particularly at the curved part of the balcony balustrade at the joint section.**
- The sculptural form and bold structure of the sun balcony wing raised international attention already at the time of the sanatorium's completion, and even the construction stage in 1932 was presented in international publications.
- Nowadays the sun balcony wing, rebuilt as an internal space, is a sign of the change in the treatment of tuberculosis, and ultimately the change of the wards' operations from that of a sanatorium to a hospital. Because of this change the sun balcony wing was preserved in use and the original structure was protected, such that the structure has been preserved (sun balconies that were no longer in use were demolished, for instance, at the Kinkomaa sanatorium in the 1970s)
- In their original use, the sun balcony was the place nearest to the patient ward where the patients could recline. Reclining on the sun balconies was a central generator of social cohesion between the patients, because the several hours long period of reclining was repeated several times a day. When, by the 1960s, the medical and surgical treatments had evolved, the reclining treatment was removed from the available treatments.


AAM 110297



Former sun balcony in 2015
(AAM Sakari Mentu)

Former sun balcony in 2015
(AAM Sakari Mentu)

Former sun balcony in 2015
(AAM Jonas Malmberg)

- The sun balconies were converted into internal spaces in 1963-64 when patient lounges, physician's secretariat, staff social spaces, smoking rooms, and wet spaces were placed there. In the alterations, the ends of the balconies were left open and a fire exit stairs was added, the change applying to the wards on each floor. The open balconies at the end of the wing and the roof terrace still demonstrate the original design solution.
- Certain interior spaces were altered slightly with the renovation of the wards in the 1970s, when the physician's room was changed to suit the teaching activities of a university hospital. Amongst the lamps and moveable furniture are pieces from the Artek range from various decades. Preserving them and keeping them in use is justified. The windows were later at least partly renewed.

AAM Jonas Malmberg

AAM digi 2100 Maija Holma

AAM av 5373 Mikko Merckling

1st to 5th floors A-wing: the patient wing corridor with adjoining spaces

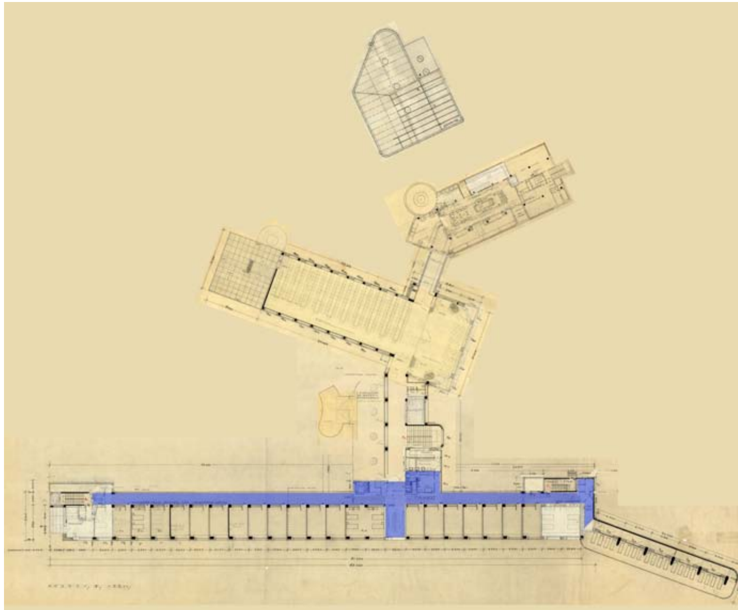
AAM 50-003-328 Gustaf Welin 1933

AAM 109471 Gustaf Welin 1930s

AAM 50-003-153 Gustaf Welin 1933

1st to 5th floors A-WING: THE PATIENT WING CORRIDOR WITH ADJOINING SPACES

- **The flooring material in the corridors changed in the 1970s from the original strong patterned flooring to the present vinyl tiles. At the same time, the original birch-veneer doors were changed for wider, white-painted birch-veneer doors. The shape of the corridor is disrupted due to the suspended ceiling. Returning the aesthetic of the original corridor, for instance in regard to its grey-green flooring and suspended ceiling, would be justified if no technical need can be shown for the presence of the suspended ceiling. The present appearance of the office is for the most part appropriate for the space. The "lack" of a toilet at the end of the corridor is not a problem in regard to the overall space. If necessary, it would be possible to develop the stainless steel structures of the new lift in the middle part.**
- The side corridor of the wards is an essential part of the architectonic and functional idea, where the patient rooms open up in the direction of the daytime sun. The colours in the corridors differed on each floor, which affected the appearance of the entrance yard at night.
- The side corridor overlooked the entrance courtyard and observing the people passing by was a highlight for the patients.



AAM Sakari Mentu

AAM digi 2112 Maija Holma

1st to 5th floors A-wing: the patient wing corridor with adjoining spaces

AAM ar 24-2

AAM L 1927 Pellervo Oksala 1970s

- In 1963-64 a side corridor was continued in place of the sun balconies (see above). A second gable end was opened up in the 1970s renovation when the toilet was removed from the end of the corridor. In the same renovation, the special sputum lift and the hatches linked to it, as well as the adjacent toilet, were removed. Also the glass walls of the office were altered at that time. The doors of the patient rooms that open out into the corridors were widened and the suspended ceiling housing ventilation ducts as well as lamps changed the cross-sectional shape of the corridor. Thermal glass was installed in the windows.
- The dayroom, situated around the middle of the ward, was originally a cloakroom for outdoor clothing and the transparency from the lobby is partly an original motif. The functions of the space were changed probably already in the 1950s, converting it into patient lounges, and telephone booths were added in 1957. In the 1970s renovation, a space was opened up from the kitchen alcove, which had been divided off from the adjacent room. The lounge spaces were renewed in 1996. The technical infrastructure shafts of the patient rooms can be maintained from the corridor side – albeit the hatches have been renewed. At least some of the original signalling lamps of the patient rooms have been preserved behind the suspended ceiling.

Dining room, 1970s (AAM av 5351 Mikko Merckling)

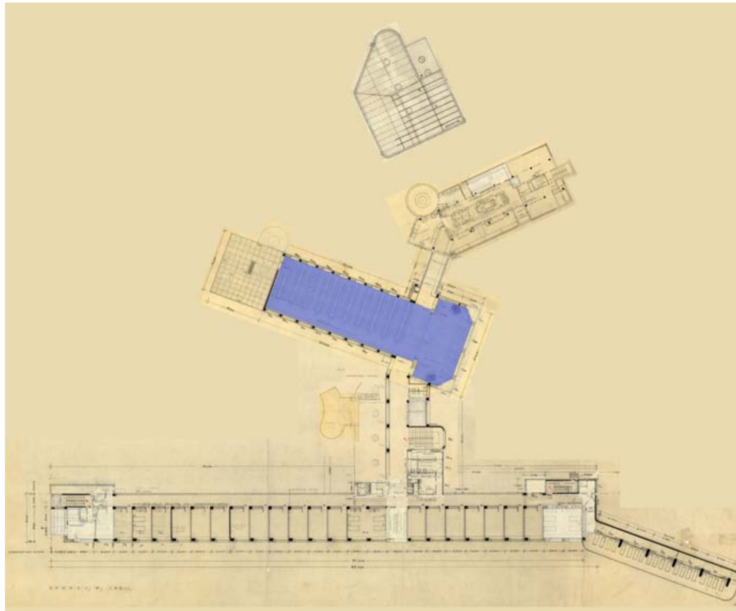
Dining room, 1980 (AAM av 824 Martti Kapanen)

Dining room, 1970s (AAM 110247)

Dining room, 1930s
(AAM 50-003-401 Gustaf Welin)

1st floor B-WING: DINING ROOM AND PATIENTS' LOUNGE

- **The dining hall and patients' lounge together form the architectonically most significant interior in the building, and which is related to the most challenging issues of restoration and conservation. In all alterations the aim should be to achieve the original design solutions from the 1930s. Developing the ventilation system so that it modifies the form of the patient lounge less than it does at present could create problems for the spaces on the ground, second or third floors – something that can be investigated when necessary. Returning the overall symmetry of the patients' lounge as well as the need for the chapel fixtures should be investigated.**
- The ensemble created by the dining hall and patients' lounge was one of the most significant architectonic interiors of the building and it opened out via large glazed areas in different directions. The patients' lounge and dining hall are spatially interlinked but the slightly different tones of the linoleum flooring (greenish grey and dark grey) and the different types of furnishing give each space its own individual character.
- During the sanatorium period, patients as a rule ate in the dining hall, which was a central activity space. Also, among other things, films were shown there. The patient's lounge was a place for social interaction.



Patients' lounge, 1970s (AAM av 5378 Mikko Merckling)

Patients' lounge, 2015 (AAM Sakari Mentu)

- On the whole, the ensemble has been preserved unchanged. The biggest changes are an alteration in the suspended ceiling that contains the technical infrastructure (carried out in the 1980s), when also the German manufactured folding partition door was renewed. At the same time, the lounge also started to be used as a lecture hall, and furniture and equipment that had been situated in the basement were moved there. One of the tiled stoves was dismantled. The floor material was changed from the original strongly patterned linoleum to a neutral patterned vinyl flooring.
- The furniture in the dining hall has changed so that the circulation, due to the positioning of the serving counters, has moved from the window wall to beneath the library balcony. Originally there was no serving counter in the space, and one specially designed for it first appeared at the latest in the 1970s, after which it was altered many times as need required. The major part of the present solution was implemented in 2006. At the end of the 1950s a protective cover was made for the new ventilation installation, which was later converted into a telephone booth, but which subsequently was removed. The dining hall furniture is mainly original or equivalent to it. A renovation plan for the tables was made already in 1964. The number of tables has been reduced from the original due to the introduction of the serving counters. The history of the furniture's red colour is not clear, but the furniture was probably originally black.
- The original radiators in the upper part of the space have remained in use and the ceiling radiators are also in still place albeit not in use. The original lamps and the most important doors are also preserved, except for the folding partition door. The ventilation window situated next to the door leading to the terrace, the hatches of the projector room in the loft area, and the ventilation installation that ran through the room have all been removed.
- The surfaces of the space have been hard and thus were acoustically challenging already to begin with, but this has been compounded by the fact that tablecloths are no longer used, the floor tiles are harder than linoleum, and by changing the fabric-covered sliding partition doors for ones with a hard surface. Also the surface material of the table tops, which seems to have been changed in the 1960s, is probably harder than the original one. Acoustic boards were added to the walls of the dining room in the 1980s, and the issue was taken up again in 2015. The reverberation problems that presently occur when dining should be studied also in regard to identifying alternative dining spaces.

Library, 2015 (AAM Jonas Malmberg)

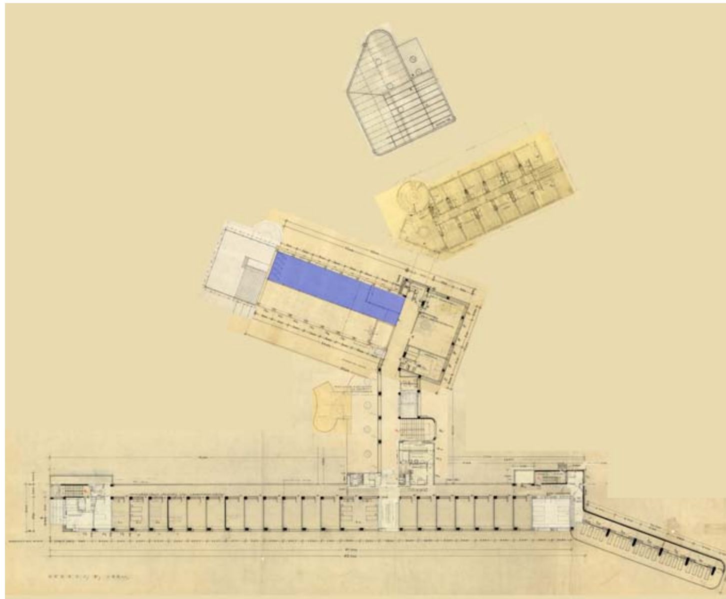
Library, 2015 (AAM Elina Riksman)

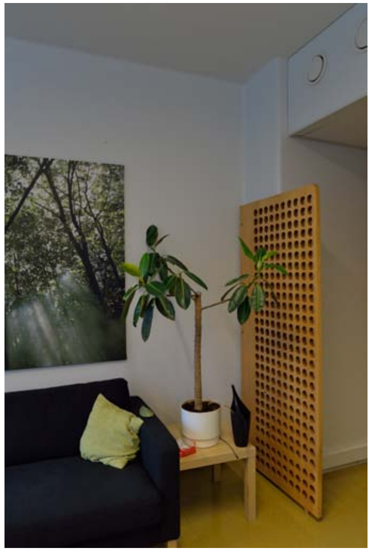
Library, 1970s
(AAM av 5357 Mikko Merckling)

Library, 1933 (AAM 50-003-507 Gustaf Welin)

2nd floor B-WING: LIBRARY

- **The space is linked, via the dining hall, to the most significant interior spaces of the building. Suspended above the dining hall, it is particularly innovative structurally. In any alterations to the library space, the original 1930s design solutions should be kept in mind.**
- In terms of the history of patient activities, the space previously had key uses: reading room, library, and patient cafeteria. The original furniture has been removed.
- As a whole the space has mainly been preserved: a closed-off part adjacent to the door has been removed, shop fittings were added (plans from 1973 and 1986) and then subsequently removed. What still remains are the suspended ceiling installations, which give an indication of the shape of the former cafeteria and the ventilation solutions. In connection with future ventilation improvements, alternative routes must be examined, for instance, with routes through the 3rd floor.
- A rail has been successfully fitted within the overall layout of the window wall (plans from 1975).
- The colour scheme was made in the 2000s, and its historical equivalence, according to the latest colour research, is reasonably good. However, with the next renovations, certain details, such as the boundaries above the dividing wall windows, should be clarified. The installation ducts for the ceiling radiators of the dining hall show traces of the colour coding for the technical infrastructure. The floor material has been changed from a strong patterned linoleum to an evenly coloured yellow linoleum, which gives the space a somewhat disjointed impression.





AAM Sakari Mentu

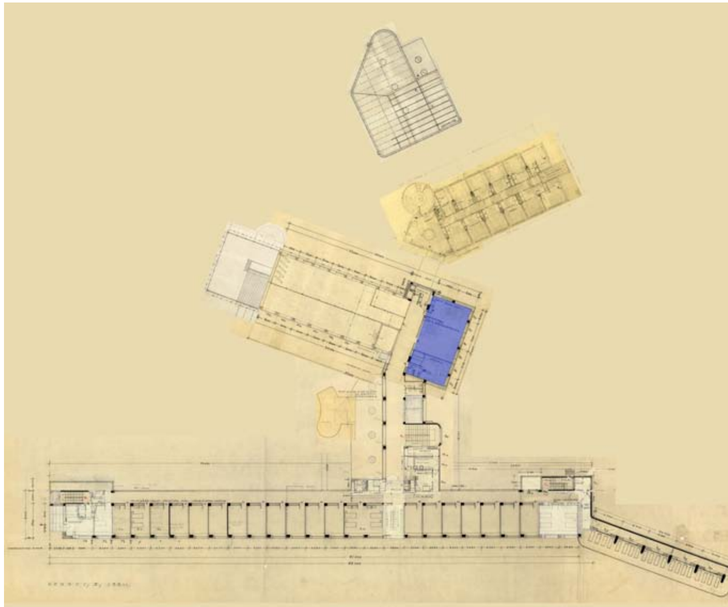
AAM Jonas Malmberg

Nurses' dining hall and lounge, and guest room / chief physician's office, 2015

2nd floor B-WING: NURSES' DINING HALL AND LOUNGE, AND GUEST ROOM / CHIEF PHYSICIAN'S OFFICE.

- **Returning the spatial group to an open space, as it was in the 1930s, is not justified, but rather the alterations from the 1980s should be preserved. If the more extensive open spaces identified elsewhere (e.g. 3rd floor) are insufficient, possible changes to the spatial group can be examined.**
- The nurses' dining hall and lounge formed a fairly large, uniform and open space adjacent to the corridor. At the end of the corridor was a serving counter for food.
- Even from the beginning, the space was hierarchically and architectonically significant, but the hierarchy was highlighted in the 1980s alterations when the spaces adjacent to the corridor were rearranged to create an office for the chief physician and head nurse. The construction of the parallel corridors, which were built at this time, is complex, and which is further emphasised by the glass doors opening into the corridor. The view at the end of the earlier corridor was closed off and became darker than previously following the raising of the linking corridor in the 1980s, albeit that no photos have yet been found of the glass wall next to the serving unit. According to the drawings, the walls above the serving table were glass.
- The offices built in the 1980s have refined upper windows and other design solutions. Previously used fixed furniture was brought from the chief physician's ground floor office on the specific request of Professor Tala. The totality is in many aspects stylish, and the most elegant of the Paimio interiors realised under the direction of architect Heikki Tarkka.
- As such, it tells about the changes in the hospital operations. The spaces have a use value as offices.

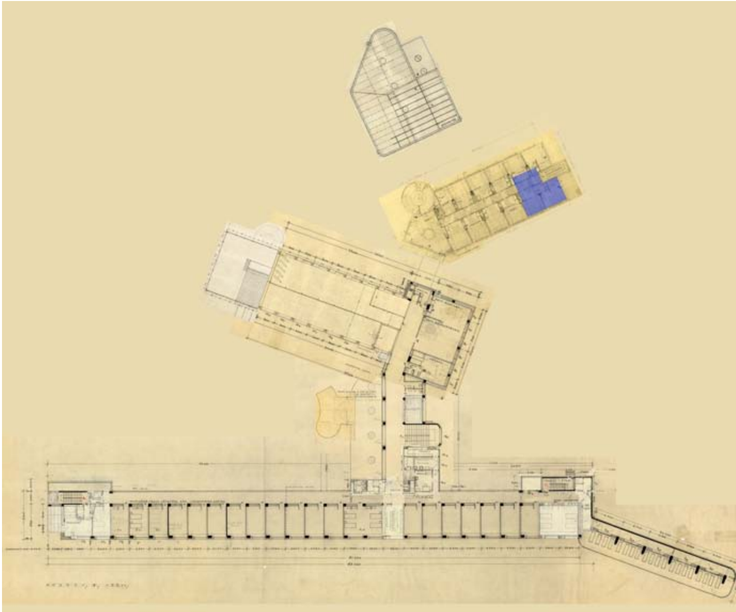
Nurses' dining hall in original state (Paimio Hospital).



Sanatorium board conference room / library, 2015
(AAM Jonas Malmberg)

2nd floor C-WING: SANATORIUM BOARD CONFERENCE ROOM / LIBRARY

- The kitchen staff accommodation, a "hotel" with a central corridor, has become a complex of different types of offices and conference rooms. If the need arises for changes in the accommodation or for a less hierarchical use than at present, then one consider returning to a central corridor layout that corresponds to the original one.
- The present situation follows the 1973 plans (draft plans were made already in 1968) for the alterations of the board conference room, where a fairly large space was created from part of the corridor and the accommodation. This cut off the clear central corridor layout, which in a spatially simple way continued all the way to the stairs. The diverse system of suspended ceilings for the ventilation was designed already in the 1970s. In the plan from the 1980s, the space is presented as a library.
- The alterations tell about the different stages in the operations of the sanatorium and hospital, where the accommodation use was changed in some places into treatment facilities and elsewhere into facilities that catered for the growing bureaucracy and administration.
- The new space is furnished with refined Artek furniture and ceiling lamps; the space nowadays also contains a collection of original furniture moved here from elsewhere. Particularly the use of the special pieces of original furniture so that they are accessible to visitors can be seen as justified.



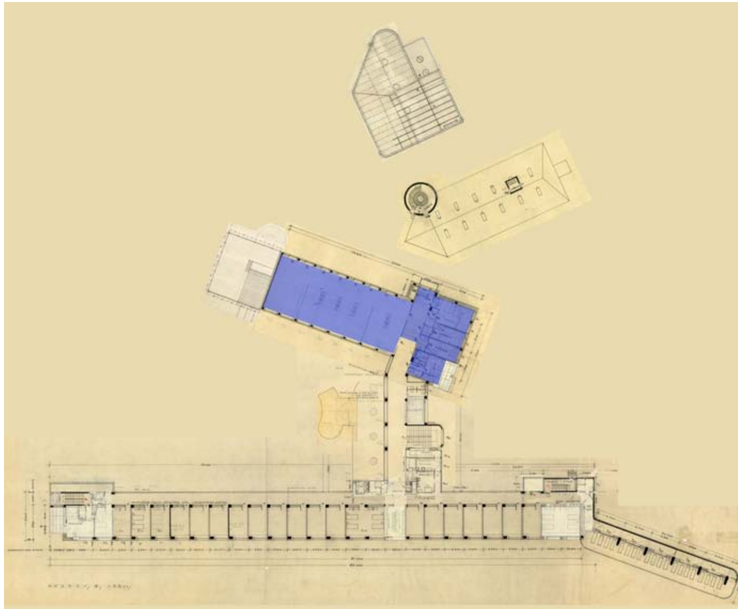
Workshop, corridor, guest rooms / gym hall, 2015 (AAM Sakari Mentu)

Workshop, 2015 (AAM Jonas Malmberg)

3rd floor B-WING: WORKSHOP, GUEST ROOMS AND ASSISTANT PHYSICIAN'S ROOM / ACTIVITY SPACES, GYM HALL, SECRETARY'S OFFICE

- **If the need for changes arises, then in the spatial layout of the 3rd floor of B-wing, a solution corresponding to the original situation should be aimed for, with a central corridor that ends in a balcony wall. Parallel to this, the space of the former open workshop can be returned. Returning the dimensions of the small accommodation rooms does not seem justified, but spaces can be developed according to need as a unit larger than the single patient room or office. The ventilation of the dining hall had been unsatisfactorily routed through the 3rd floor already in the 1980s. In the future, requirements connected with the ventilation of both the dining hall and library loft may have to be routed via the 3rd floor.**
- Above the library is a large open space, the workshop. The workshop was a space for work training and teaching, but also a place where festivities were held. On the other side of the central corridor were accommodation units. The workshop's original furniture, which is very sturdy in comparison to the bent plywood furniture, has been preserved though removed from use.
- - The workshop was divided up, no later than in the 1980s, into small activity spaces and offices, but some parts of it were taken into use already in the 1960s for physiotherapy.
- - The gym hall was built in the 1980s in place of the corridor and accommodation, and it cuts off the view from the main stairs towards the balcony at the end of the corridor. The gym hall also spreads over to the location of the former workshop.

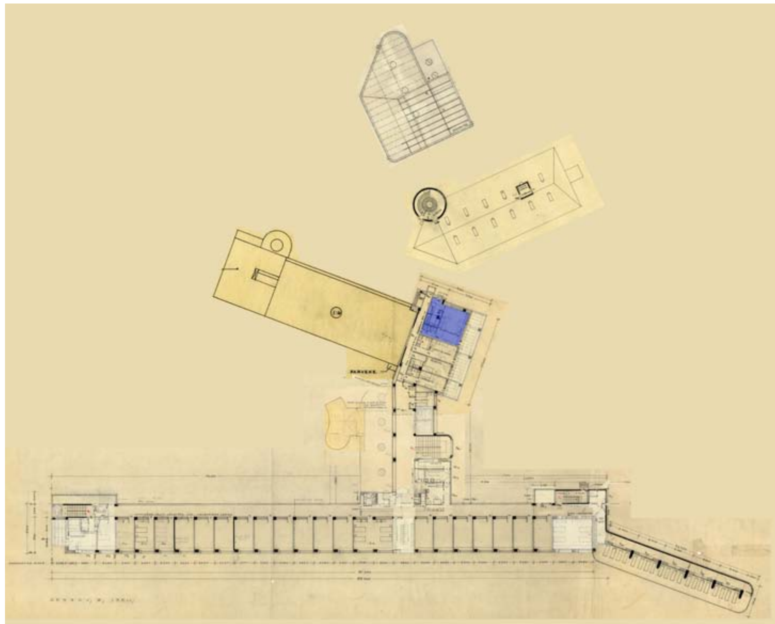
Workshop in original use (Paimio Hospital).



Former chief nurse's apartment, 2015 (AAM Sakari Mentu)

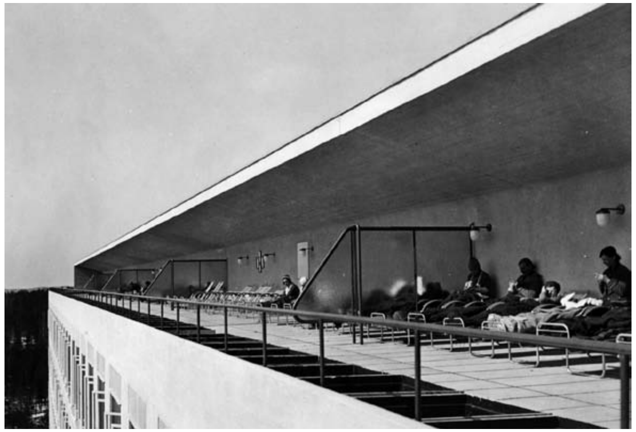
5th floor B-WING: FORMER HEAD NURSE'S APARTMENT / CONFERENCE ROOM

- **If need arises for changes to the former dwellings, they must aim for functional and spatial solutions corresponding to the residential stage and use corresponding materials and reduce the use of suspended ceilings.**
- The apartment at the end of the building was for the chief nurse, but subsequently was changed into a conference room. In the dwelling hierarchy, the chief nurse's apartment was one of the most impressive in the main building and it shared large terrace with the adjacent dwellings.
- The wet spaces were renewed and new ventilation was installed in the 1980s, and also the surface materials have been renewed. The present kitchen alcove was built in place of the bathing and washing facilities.
- The spatial layout of the apartment has been preserved, and also part of the original fixed furniture is still in place.
- The furniture originated mainly from the Kalevanniemi children's sanatorium, their values connected with the history of the tuberculosis district operations, though not directly linked to Paimio Sanatorium. Additionally, the space contains old individual pieces of Artek furniture and Artek lamps.
- Including the original residential spaces of the main building as a part of the tourism use is justifiable for the understanding of the original operations of the building. This function could justifiably be developed in some space in the main building that was originally in residential use (for example, the apartments of the ward nurses, chief nurse, and kitchen staff).



Roof terrace, 1930s (AAM 50-003-263 Aino/Alvar Aalto)

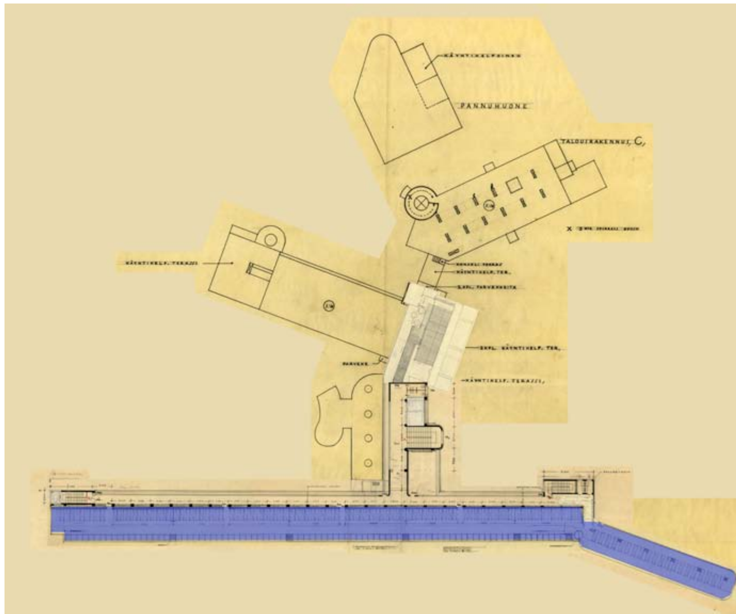
Roof terrace,1932 (AAM 50-003-267 Gustaf Welin)



Roof terrace, 1930s (AAM 50-003-252 Aino/Alvar Aalto)

6th floor A-WING: ROOF TERRACE

- **The openness of the roof terrace must be preserved. If spaces for ventilation equipment that were installed later are no longer required then they must be removed. Placing the technical spaces required by the lower floors on the roof terrace or adjacent to it must be avoided, and solutions should be aimed for that allow for transferring the existing technical spaces elsewhere. The return of the original wall lamps (presently in storage) must be examined. The surface material has been renewed several times. If surfaces are renewed, the appearance of the original concrete flagstones must be returned, and it is also justified to examine returning the original glass-steel dividing screens. It is possible (and necessary) to include the roof terrace in the guided tours for tourists.**
- The roof terrace, where patients would recline in chairs, is a central part of the original architectural totality of Paimio. It is an iconic space, and at the same time a place where one can observe the gardens and the sanatorium's relationship to the surrounding landscape.
- The terrace illustrates the earlier treatment methods for tuberculosis – it is particularly important in the case where the later additions to the sun balcony wing remain in place.




Roof terrace, 2015 (AAM Jonas Malmberg)

- The roof terrace was originally a place where those patients who were in a better condition could recline. On the other hand, it signifies the change in the treatment of tuberculosis. The plant boxes, in accordance with the original idea (the dimensions of the present boxes differ from the original ones), including the dwarf mountain pines, are part of the history (cf. the history of the treatment of tuberculosis and the use of pines, even as potted plants).
- The roof canopy was widened already in 1934. The original glass-steel screens have been removed. The floor has been renewed. From the 1970s onwards, spaces were reserved for the air-conditioning machinery, and suspended ceilings installed. The original lamps have been removed, as has the rail construction for patient rehabilitation which was added in the 1980s.
- The roof terrace is a key sight for visitors.

Roof terrace, 2015 (AAM Sakari Mentu)

The landscape of the Paimio hospital area was carefully studied by landscape architect Jere Saarikko in 2007. His master's thesis *Paimion sairaalan ympäristön historiaselvitys ja kunnostussuunnitelma* [Historical report and conservation plan for the Paimio hospital environment] (Saarikko 2007) focused on the surroundings of the buildings from the 1930s, as well as later housing and the Lemmenlampi area where the pump station is located. Saarikko's goal was to examine the current authenticity of this landscape, to document its present state, and to prepare a landscape conservation and management plan. This plan contained the following principles and guidelines, which have been partly followed since 2007. Those are to be taken in to action in the future.

CONSERVATION PRINCIPLES FOR THE DIFFERENT AREAS

The original features of the surroundings are to be emphasized. The general idea involves the contrast between pine forests and rather strictly separated gardens linked to the staff housing. The strengthened characters are as follows:

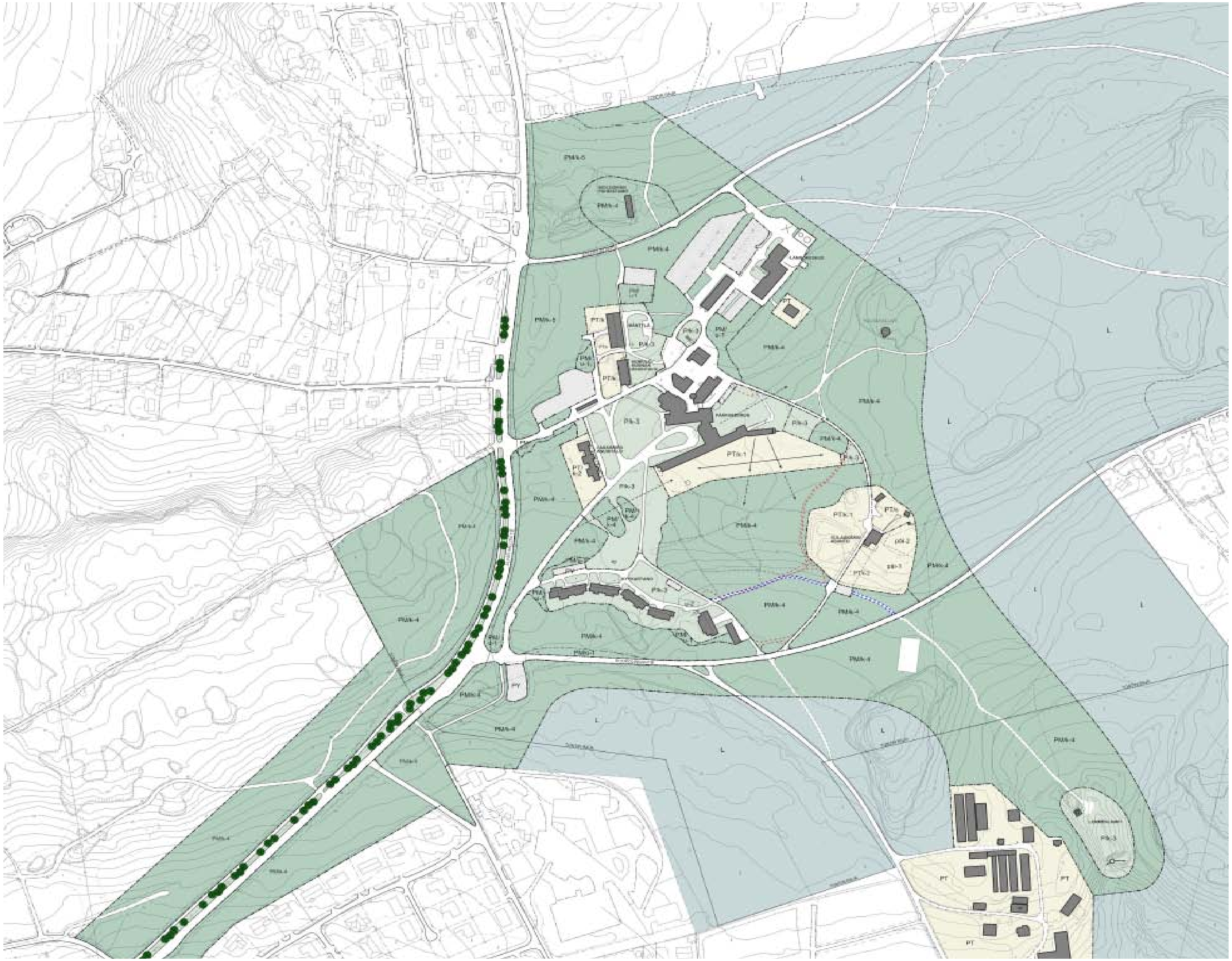
PINE FORESTS (PM/K-4 AND PM/K-5 IN THE LANDSCAPE MAP):

A park-like forest: the forest should be maintained so that the cultural values are secured. No new parking facilities or roads should be built. The vegetation is to be renewed in small areas so that large interventions can be avoided. In general, pine trees should be the main species of the forest and others, e.g. birches and firs, should be removed. Especially the rather large forest area south of the main building should be specially taken care of. Some firs should be removed near the original main entrance path.

In June 2015 many of the interventions suggested in 2007 were carried out. In addition, some planting of young pines should be done and possibly some weak ones could be harvested in order to get sufficient area for new pines.

PARKS (P-K/3 IN THE LANDSCAPE MAP):

A park-like area between the sanatorium buildings. The area is kept as a grass lawn. Pine trees should be the main species and many of the current deciduous trees are to be removed.



General principles for the maintainence of the Paimio hospital landscape (Saarikko 2007, 69).

In this case, too, in June 2015 many of the interventions suggested in 2007 were carried out. Nevertheless, some removals and opening of the views are to be done. The view eastwards from the main staircase of the main building has lost its special character, and should be returned. The area in the vicinity of the main building was originally different from the other parks, since it comprised different species, such as Douglas firs and climbers. This special character should be returned and, for instance, later added furniture could be removed.

GARDENS (PT/K-1–3 AND PT/PÄI1–2 IN LANDSCAPE MAP):

Garden-like areas where the appearance from the early stage of the sanatorium is to be retained or rebuilt. Early built features, such as pavements and benches, are to be preserved. The original serpentine route with its fountains should be rebuilt in its original location. The early flowers that were planted around the fountains have survived in the Lemmenlampi area, where they can be taken from. The gardens belonging to the original housing facilities are kept clearly separated from the forest.

The gardens belonging to the chief physician's house are currently used as a garden for the kindergarten. The present use should be fitted with the original layout. For example, new playground facilities should be placed in the area marked in the map with päi-2. The required fences should be such that they are in balance with the architecture of the buildings.

Some effort should be given to the Lemmenlampi area, so that its original openness and water element could be returned. Currently the area is in a state of neglect.

AGRICULTURAL AREAS (PT IN THE LANDSCAPE MAP):

The original greenhouses and agricultural areas should also be given some effort, to return their original status. Currently the area is in a state of neglect, and also the valuable buildings are in risk of deterioration.

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Maintenance serviceman Reijo Vihervirta checking the main building facade and its original clock after the clock's testing and maintenance (AAM Elina Riksman).

MAINTENANCE AND HOUSEKEEPING

Elina Riksman

THE PAIMIO SANATORIUM MAINTENANCE MODEL – AN IN-HOUSE MAINTENANCE UNIT

Both the management and implementation of the maintenance in Paimio Sanatorium (later Paimio hospital) has a long history. The first maintenance chief, Niilo Rintola, worked in Paimio from 1932 to 1967.[1] His successors have also worked in their positions for considerable periods of time. The maintenance of the Paimio hospital is currently run by an in-house unit that has a long experience in the field of maintenance work, but also a long experience in taking care of the Paimio hospital premises. The staff has a vast knowledge regarding the premises' technical features, the wear and tear of building parts, and both big and small repairs carried out. This knowledge has accumulated over several years and has been passed on to successors. Some of the maintenance staff has been in the service of Paimio hospital for more than three decades.

In many cases in Finland hospital-like premises are maintained by external maintenance companies. The difference between the Paimio maintenance model, with its in-house unit, and an external maintenance company is that the former's commitment and knowledge concerning the site is considerably deeper. This is indeed the conception that one gets when observing the in-house unit in its operations. They are personally present daily and involved continuously in the discussions and problem solving regarding the site.

In the case of Paimio hospital, this unusual maintenance model seems to be one of the most significant factors in the preservation of buildings and their atmosphere at the site. The hospital premises have been maintained systematically for decades. The current practice of brisk maintenance has its down sides when considered within the perspective of conservation principles. The Burra Charter[2] maxim "As much as necessary as little as possible" does not perhaps describe the maintenance habits of any modern hospital environment, however historically valuable or firmly preserved by preservation laws the site is. The tradition of preventing damages in the Paimio premises has materialised in some cases of over-repair; for instance, when original windows or other building parts have been replaced in the renovations carried out in previous decades. This is, of course, due to the heavy duty use of the hospital premises and environment and the ware of building parts in daily hospital use. One aspect of the current style of maintenance is the extensive use of old spare parts from different eras of the hospital.

1 Törrönen, 1983, p.59.
2 Australia ICOMOS, 2013.

These parts are stored in the Paimio hospital and used when necessary by the maintenance unit, as the staff has a good perception of the current state of parts available. This independent, self-imposed act is one aspect of preservation of the site. It is a positive feature in the repair-oriented maintenance practice as the use of the original spare parts has preserved the atmosphere of the interiors, although some of the changes and repairs have not been planned by an architect from Aalto's (or any other) office. The maintenance staff has also kept the original furniture in good condition and in use; for example, the dining hall chairs have gone through many scrapings and coats of paint. This of course means the loss of original surfaces, but on other hand this is the key method of retaining the wooden chairs in everyday hospital use still after 83 years, which in itself has major value within the context of authenticity.

Since the modern hospital use came to an end in Paimio in 2015, the needs and requirements of the premises have fundamentally shifted towards lighter and less wearing uses. The wear and tear of the site is, of course, in direct context with different uses. Therefore, the maintenance of the site should be able to flexibly take into account these changes of need and requirement of the different users without putting the valuable features of the site in risk of damage. Maintenance management can be seen in the core role of preservation of Paimio hospital. Therefore, the daily, monthly and yearly routine of maintenance should be further improved in collaboration between the in-house staff and conservation, restoration and housekeeping experts, and furthermore shaped into a detailed, structured and justifiable chart of the maintenance process. The functional, fully implemented maintenance plan is an asset to the whole organization. It brings added value and it benefits the owner by cutting long term maintenance costs, the tenant by making the use of the site more convenient, and those visiting the site as well as the surrounding community as the site is preserved in a manner that prevents the decline of the historical and cultural value of the site.

COMPOSING A PLAN

The maintenance of Paimio hospital requires a maintenance plan that acknowledges the distinction between repair, conservation, restoration and improvement. This distinction is of fundamental importance in the maintenance of cultural heritage sites.[3] In addition to the maintenance plan's aim of finding the best solution for technical, health, safety and accessibility problems on the site, the plan should aim to minimize the damage and loss of the culturally, historically, architecturally important features and fabric of the premises. *The Management Guidelines for World Cultural Heritage Sites* by Feilden and Jokilehto states:

3 Worthing and Bond, 2008.

"The Maintenance programme is aimed at keeping the cultural resources in a manner that will prevent the loss of any part of them. It concerns all practical and technical measures that should be taken to maintain the site in proper order. It is a continuous process, not a product."[4]

Before starting the planning of an actual maintenance plan, the primary principles regarding the care and conservation of the site should be established. It is vital to recognize the difference between repair and maintenance. The level of possible harm caused to the preserved fabric in each maintenance action should be identified. A hierarchy of intervention, from least harmful to most harmful, according to Worthing and Bond is:

1. The prevention of deterioration
2. Protective measures
3. Consolidation
4. Repair (Replacement)

According to this hierarchy, it is evident that the fourth point, the point of repair, can be considered as a failure of the previous three steps, prevention, protective measures and consolidation.[5]

It is important to consider the maintenance needs of all Paimio hospital area's buildings separately and one building part at a time. The condition and the supposed rotation of checking, care and maintenance should always be considered within the perspective of conservation issues:

- What is the minimum interference or action that prevents damage (prevention) or stops the deterioration (consolidation) of the object?
- Is interference necessary in the first place?
- The consideration of these actions also applies to all historical layers and periods of Paimio hospital's renovation history.
- Which era and historical layer of Paimio hospital's interior is pursued during possible conservation/restoration?

Any actions taken further than prevention or consolidation are actions that produce permanent damage to the present or original fabric of the site. These actions should always involve consultations with

4 Feilden and Jokilehto, 1998, p. 41.
5 Worthing and Bond, 2008, p. 153.

conservation experts. Therefore, all actions that have an impact on the aesthetics of the site can be labelled avoidable and should be given careful consideration.

The maintenance and repair-related actions that require a building permit are automatically reported to the National Board of Antiquities of Finland, but minor works, such as maintenance-type interior work, changes of fixtures and technical replacements, do not require permits. This is a grey area in conservation principles and their execution in maintenance. The maintenance plan is very important also in this context as it defines the processes and principles of work done independently by the in-house maintenance staff. The current unit executes a principle of originality and authenticity, but this cannot be ensured with future generations without proper guidelines.

The planning of maintenance in the Paimio hospital premises should start with the evaluation and analysis of the present state of the buildings, their technical and physical condition – a condition survey. The expertise of professional consultants of HVAC, architecture, building physics and conservation should be used in all fields of the analysis. Again, the in-house maintenance staff plays an important role in analyzing and evaluating the condition of their work environment, as they might have "tacit knowledge" of the site that is not stated in management records. The condition survey can be used as a basis for the future maintenance planning but it can also be used to reflect on the success of the previous maintenance plans.[6]

When maintenance planning starts, it would be advisable to interview as many servicemen and women as possible working in the Paimio hospital premises, and to take into account as many standpoints as possible. Problematic areas, spaces or functions occurring around the Paimio hospital site are familiar to the tenants. Also their perspective has a pivotal role when considering the improvement of maintenance practices and preventing damage due to the wrong use of premises. Housekeeping and kitchen staff, as well as the staff of the current tenants, can provide crucial advice for the planners. These interviews can also bring forth problems that have not occurred before in daily operations, problems that at first seem insignificant, but which can lead to major damage if not prevented in time. Also these interviews can lead to the planning and production of instructions regarding the chores of the housekeeping and maintenance staff that were not even taken into consideration by external consultants.

How to prioritize maintenance work is an important question. After the necessary functions, such as the weather-proofing of the structures, roofing, facades, windows and doors, and technical systems (HVAC, fire safety, etc.), are under control, the focus should shift to those minor details of the Paimio

6 Worthing and Bond, 2008. p.164

complex that define the architecture, atmosphere and nature of the site. These are the exterior and interior surfaces, the steps of stairs, colours, light fixtures, interior doors and windows, original preserved HVAC-fixtures and electric installations such as light switches, etc. that have not been lost in prior renovations, as well as original building parts such as door handles, handrails, coat racks, screens and furniture. All these features should be placed in their own categories of originality, their condition evaluated, and the proper level of use and care instructions determined. Also the timetable and rotation of maintenance, checking, cleaning, testing, etc., should be determined. This way, all features of different levels of importance and value of the site can be managed in their own required manner and the rotation of their maintenance collectively controlled.

The maintenance plan of Paimio hospital can be divided into three different time-scales:

- Long-term plan: an expression of policy, principles of management and conservation. 10 to 30 years.
- Medium-term plan: on an annual basis. What procedures should be executed on an annual basis? Tests, checks and maintenance of certain building parts and technical features.
- Short-term plan: daily, weekly and monthly tasks and "automatic" procedures.

The overall plan should also include scheduled but flexible routines that are annual and quinquennial.[7] With proactive maintenance planning of different time-scales, the emergency maintenance work (e.g. water damage due to leaking pipes) could be kept to a minimum. Maintenance work done in haste and unplanned always poses a great risk for the site. As these unpredictable problems occur in aged buildings, there should be a separate action plan for these situations, to prevent further damage and to contain control of the situation as quickly as possible.

INSTRUCTIONS FOR MAINTENANCE AND HOUSEKEEPING TEAMS

Just as it is important for the staff to know their individual tasks, it is also vital for them to comprehend the significance of the Paimio hospital site, its history and its importance at both the national and international level. These features of the site, as well as the uniqueness of the work environment, are important for the staff in fully appreciating the Paimio hospital site as a work place. This way, the magnitude of importance of the staff's daily work in keeping the site in a desirable condition can be transmitted.

7 Worthing and Bond, 2008. p.158

The members of staff who have worked in Paimio hospital for years, even decades, know the premises in detail. This knowledge should be passed on to their successors in a controlled manner. Therefore, interviews of staff and further documentation of this "tacit knowledge" should take place annually. This can be simply done in notes during informal discussions.

Housekeeping and maintenance teams should be able to refer to written instructions when it comes to the cleaning and care of original building parts and surfaces. The cleaning and maintenance of preserved delicate original light fixtures, building parts such as original door knobs, handles, railings, handrails, etc., should have their own "maintenance card", that would present the special features of the objects, such as its material, with cleaning instructions, spare-parts procedures, and contact details for a special maintenance company or conservator. These cards can also be made especially for different surfaces and materials, such as linoleum, rubber flooring, lacquered or painted wood, chrome, brass, painted iron, plastered walls indoors and outdoors and guides on graffiti removal. The choice of colour and type for paints and other substances should also be pre-listed for each building and building part. It is also important to tolerate patina. This idea has to be applied in general instructions for the housekeeping staff. The idea of "good" patina versus dirt is rather an abstract value, and it should be defined through examples at the site.

To prevent the loss of original building parts, all original parts should be identified and presented as a list for each building. For example, the apartments in the junior physicians' row house have their original window curtain fittings, cupboards, cabinets, and folding doors with original chrome knobs, which should be listed to prevent any damage, change or loss of parts from occurring. A simple sheet with a checklist would be helpful when planning maintenance work.

THE ROLE OF THE TENANT

It is vital for the tenant using the buildings to understand the significance and attributes of their work environment. They should be aware of the importance of the correct and proper use of the premises. The tenant should also become familiar with the process of informing the maintenance team immediately about problems or deteriorations they might encounter on the premises. Fast and fluent communication between the tenant and maintenance management is very important. The tenants should receive adequate information and instruction about the special features of Paimio hospital today, but also understand the historical context of the site.

As the interior of Paimio hospital has many original and priceless pieces of furniture and light fixtures, it is important that the tenant is aware of the rules and requests that define the use of the original furniture. The correct daily care of these items should be considered not only by the housekeeping team but also by the tenant. It would be advisable to attach furniture listings and care and use instructions to the lease contracts, in order to help with the communication and transmission of correct information.

GUIDELINES AND RECOMMENDATIONS CONCERNING THE FURNITURE AND LIGHTING

To ensure the preservation of the furniture, lighting fixtures and other objects in Paimio hospital, it is advisable to pursue the following recommendations of use and research:

- continuation of the inventory work of furniture and lighting fixtures (fixed Aalto furniture) and updates -> transference of data to the Alvar Aalto Museum
- research of furniture colours and surfaces (several overlapping paint layers have accumulated over time)
- continuation of research focused on furniture and lighting fixtures -> to secure access for researchers to artefacts and archival sources
- Lazaret Museum and Alvar Aalto Museum, jointly: defining the museum objects, possible exhibitions and reconstructions of interiors
- guidelines for the handling and cleaning of the objects (for users)
- conservation assessment, to ensure the preservation of the prioritized material
- further listing of objects that have not yet been included in the inventory, and their possible placement
- defining storage conditions (instructions for the maintenance unit)

Furniture from the chief physician's office on display at the Alvar Aalto Museum, 2016. (AAM doku 3074 Maija Holma)

- possible donations to the museum's collections
- dissemination of information related to the furniture, etc., for the future user/owner -.> evaluation

RECORDING OF MAINTENANCE

The recording of the ongoing maintenance is very important in built heritage sites. A proper recording of the processes and techniques, as well as the reasoning behind them, helps future users and owners to comprehend the actions made in the Paimio hospital site. These recordings help them achieve better maintenance management as they understand fully what changes have taken place.

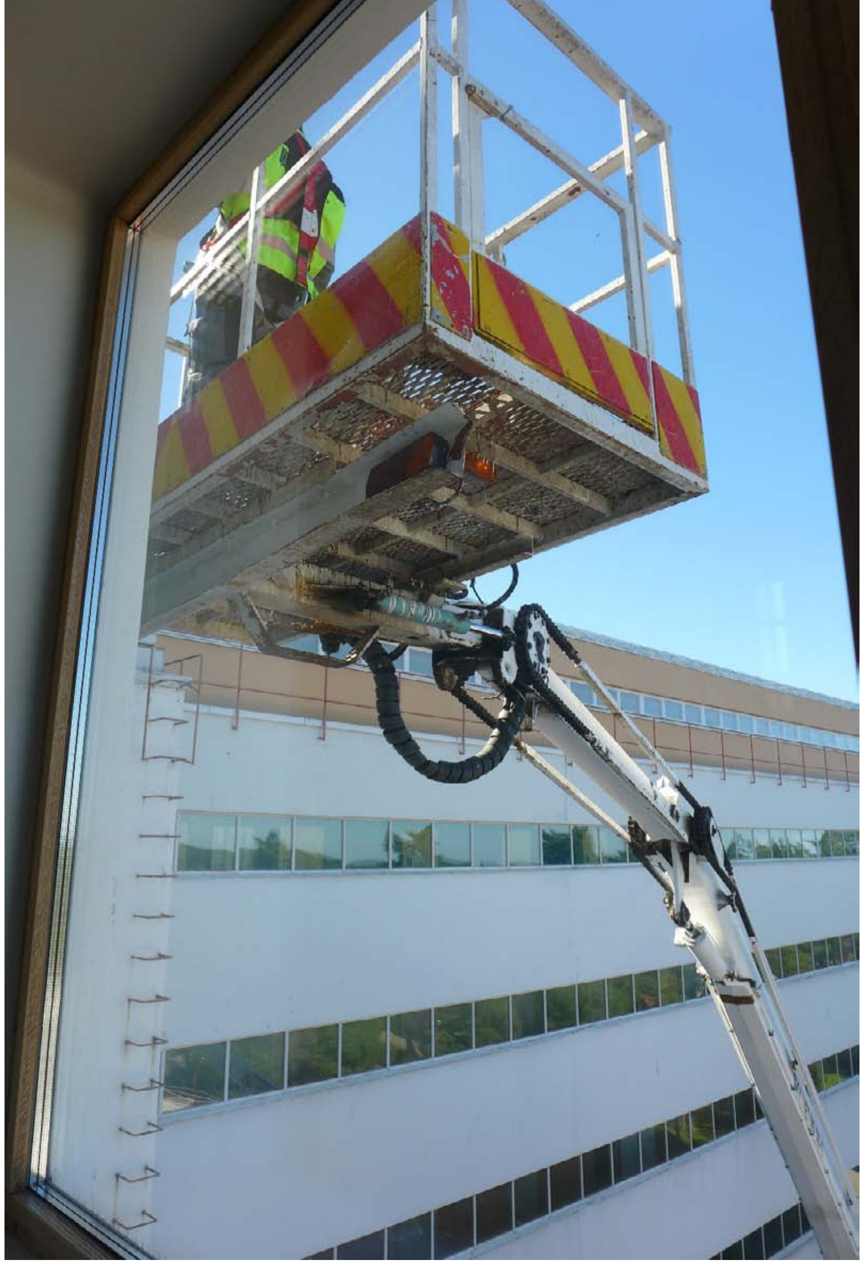
A recording of maintenance actions should answer the following questions, maybe in the form of a ready-made question sheet:

- why was this action taken, and were there any alternative solutions?
- what was done and how (what techniques)?
- where was it done?
- who planned it?
- who executed it?
- what materials were used?
- what did it cost?
- what is the next step in the schedule of maintenance?

Copies of photographs, plans and drawings should always be attached to these recordings.

According to Worthing and Bond, a careful recording of every action should be made because "*decisions made now, and the reasoning behind a decision, will also give future generations an insight into the conservation consciousness of current times.*"[8]

8 Worthing and Bond, 2008. p. 157.



Maintenance of windows of the 6th floor during summer 2015 (AAM Elina Riksman).

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An example of important instructions to be given for the staff of the kitchen services: the original Werner and Pfleiderer oven should be well preserved, and therefore its surroundings should not be used as storage space for spare kitchen appliances (AAM Elina Riksman).

PREREQUISITES FOR USE

TECHNICAL PROBLEMS AND SOLUTIONS

Timo Holopainen, Jonas Malmberg & Jukka Sainio

This chapter will concentrate on the problems and challenges of the current technical systems, examine various solutions, and give guidelines for further interventions, restoration and conservation. Both technically and architecturally, the installations for ventilation are a far more difficult question than those regarding sanitary, electrical equipment or heating. Thus the main focus of this study is given to ventilation, and particularly to that in A-wing. This chapter has been prepared and written by Jukka Sainio, Jonas Malmberg and Timo Holopainen.

HEATING

Most of the pipes and radiators were replaced in the 1970s and 1980s as well as during the more partial later renovations. Over the next few decades, the restoration will focus on the original panel radiators. Many of those are mounted on the walls (e.g. in the corridors and dining hall). The lifespan of those original radiators is short without any intervention.

The method of installing the radiators is unconventional and thus architectonically and technically interesting. The solution was described as being hygienic (i.e. easy to clean and the back side was protected from the gathering dust). One benefit was spatial, as the width of the corridor became fully open (and the movable beds had more space). A disadvantage, however, of this special mounting was that the efficiency of the radiator declined. The heat is passed into the room mostly by radiation as convection potential is limited. On the other hand, the outside wall is kept dry by the heat which increases the insulation capacity of the wall.

This mounting is not only exceptional and rare but also very elegant, and thus it is to be preserved where ever it is still in use. The solutions necessary for repairs are to be studied with different types of radiator panels.

The ceiling panel radiators were used originally at least in the patients' rooms and in the dining hall, which is a special, rare and even surprising feature among the building techniques of Paimio Sanatorium. There is only one surviving and fully working example of the original ceiling radiators, which is located in the museum room on the ground floor of A-wing. As a working example, it is an integral part of the exceptionally valuable, fully-working museum room entity. Also the preserved panels on the ceilings of the dining room are valuable parts of the interior. This architecturally important feature was preserved even as a disconnected example, which had been a laudable decision when seen from the unappreciated field of the history of technical installations.

In the future, the return of the ceiling panels ought to be studied, especially in the offices and meeting rooms and in those rooms whose use may require cooling. A contemporary ceiling unit is a good, noise-free cooling device, but which can operate as a heating device during the heating period. The technical risks that cooling and air-conditioning inevitably bear, have to be carefully taken in to account and the temperature of the cool water running in the pipes must always be kept much higher than the dew point of the room temperature.

SANITARY EQUIPMENT

The sanitary equipment has lost their original character as the result of normal wear, decay and refurbishments. There are not too many pieces to be preserved from the original installations. Besides the museum room, there are only a few examples of early sanitary porcelain or other such pieces, which are to be recognized and preserved in forthcoming interventions. All the interesting examples are to be found in technical spaces as well as in the basement of C-wing, which has, for example, an original kitchen sink.

The original kitchen sink on the ground floor of C-wing (AAM Malmberg).

VENTILATION SYSTEMS

This study has concentrated on the possible ventilation systems of A-wing. The number of equal-sized rooms, originally meant for patients, is large, which makes A-wing a crucial and interesting part in the future uses and possibilities of the entire site. On the other hand, B- and C-wings include a great variety of rooms, some even originally meant for various purposes, and which have over the 80 years of use become an even more complex system of individual solutions. So one single solution cannot be studied and without any idea of the future needs it is impossible to even approach the question. The basement and ground floor of B-wing have been set out for X-ray and policlinic uses and for various other needs of the former hospital during the 1980s. The calculated air flow in the current system is relatively high, and it is quite possible that lighter needs and more simple solutions will be used in the future uses.

B-wing contains many of the most valuable interiors inform the architectural and historical points of view: e.g. the dining hall, the day room and the library. The architectural disadvantages of the 1980's installations in those rooms are obvious. Thus future interventions are to be designed so that the opportunity to use the upper and lower spaces will be taken into account. All the interventions and their results must be carefully studied and evaluated before any actions are taken, and the evaluated area has to be larger than a specific room or floor, and the focus has to be on the above-mentioned valuable interiors.

A-WING

The ventilation machinery mostly from the 1970s serving the original A-wing has already reached the end of its technical and economic lifespan, which means that the renewal will soon take place.

The balancing and adjusting of the current system to meet any specific need is impossible. The modernization will focus on the treatment of the air: possibly cooling, removing the moisturizing unit, increasing the performance of the heat recovery unit, acquiring more energy-efficient fans, dividing the machinery into smaller units and increasing the possibilities of maintenance. Simultaneously, some of the architectural disadvantages of the current installations can be removed; for example, the partial suspended ceilings in the corridors and on the roof terrace built due to the large ducts as well as the huge ducts on the roof top.

The previously mentioned modernization will require far larger spaces than available in the current system. The air flow of the current machinery, even if it is slightly over calculated compared to current standards, can be taken as a starting point. This would retain the potential for multiple and various uses. The approximated floor area in today's standards for a contemporary machine of 15 m3/s flow (calculated both incoming and exhaust air flows) would be 120 m2, if the height of the room would be 3.5 m. Such spaces cannot be found in A-wing, unless large areas of the roof terrace are converted into a machine room. That kind of intervention in the original architecture would not be in balance with the current protection of the building. The chosen system should fit in the available spaces without the need to covert, for example, the former patients' rooms into technical spaces. Decreasing the calculated air flow would not result in a tremendous change in the required spaces.

A DECENTRALIZED SYSTEM OR MACHINES PER FLOOR

The ventilation solution can be based on decentralized units. Then some of the machinery could be located on the top floor and some in the basement. The required space for a machine serving 1-3 floors would be relatively large. The spaces in the basement and on the 6th floor are relatively shallow, which would result in even larger floor areas being taken over by the machinery. Also the sizes of vertical ducts would increase. A large duct would be necessary from the basement to the roof. The fresh air inlet for the machines located in the basement would be even more complicated.

The units could also be built on each floor. That would inevitably mean converting some of the patients' rooms or the former nurses' apartments into technical spaces. The amount of ducts, either in the corridor ceilings or in the patients' rooms, would increase and the necessary inlets would be difficult to resolve in the facades, not only architecturally but also technically. On the other hand, the units serving only one floor could be beneficial if the uses or users would vary from floor to floor.

SMALL UNITS ON THE TOP FLOOR

One potential option would be a system of several small units on the top floor instead of one large machine. Each small unit would include both fresh and exhaust air fans, efficient heat recovery systems and heating and cooling devices. The units could be installed on the 6th floor so that they would use the space originally used by the air ducts and today by the metal pipes of the machinery, while the additional space that would be needed could possibly be taken from the corridor. The corridor could be used as maintenance space. Also the additional space could be taken from the roof terrace, if that is seen as being less harmful. This option would allow for the removal of the disruptive partial ceilings on the top floor roof terrace.

Each unit would serve two, three or four rooms per floor on every floor. This would equivalently result in air flows of 0.4 dm3/s, 0.6 dm3/s or 0.8 dm3/s. The corridors would be served by similar units. As this option would divide the long A-wing in vertical sections, the required air flows could not vary extensively from floor to floor, which may result in some restrictions in potential uses. That could be solved to some extent by measuring the system for greater air flows than needed in minimum use. On the other hand, the size of the rooms in any case restricts potential uses; they would suit at least for accommodation, reception, patient or office use.

A SYSTEM RESEMBLING THE ORIGINAL

A partly restored option, which would resemble the original natural system of ventilation, could be achieved by means of mechanical exhaust fans. The fresh air would be drawn in via a radiator, including the necessary device: e.g. Purmo Air system. The radiator would heat the incoming air in the wintertime and filters can be used. The air would be taken in beneath the external metal window sill. In this option the heat recovery would take place in the exhaust fan and the heat would be used in radiators or heating water for domestic use.

The exhaust fans could be installed on the 6th floor beside the corridor in a similar way than the previously described system. The other option would be on the roof, where originally relatively large exhaust pipes were placed.

EVALUATING THE DESCRIBED SYSTEMS

In this chapter the described systems and their character are evaluated from architectural and technical viewpoints by listing them as simply positive or negative. The evaluation is not taken to the five-level method presented in the European Standard PrEN 16883, because that kind of detailed evaluation is impossible without knowing the specific needs of future uses or the goals of intervention. It will be necessary to deepen this analysis and evaluation as the criteria are set, and include the five-level method.

Small units on the top floor

Three rooms next to each other and on every floor; required total air flow 18 x 33 dm3/s = 600 dm3/s (fresh and exhaust flows). 13–14 units in A-wing.

+	-
units produced industrially	cannot be adjusted by floor for different uses
easy to maintain on the 6th floor without disturbing users	minor ducts needed inside rooms (in 1 room of 3 ducts serving the other rooms necessary)
effective heat recovery within each unit	large quantity of heating and cooling pipes
small amount of floor area needed	relatively large number of small units
vertical fresh air ducts at least partly placed within the original shafts	adjustable to different uses (adjustable vertically)
most of the ducts on the top floor balcony and ward corridors removed	
amount of the necessary roof top ducts small	

Unit per floor

Relatively large unit placed in a selected room on every floor.

+	-
each floor can be adjusted separately	ducts in the corridors increase
units produced industrially	relatively large number of units
effective heat recovery	large quantity of heating and cooling pipes
relatively small size of each technical space	patients' rooms or other spaces converted into technical spaces
most of the ducts on the roof terrace and roof are removed	fresh air is difficult to take in
no ducts in the rooms (if allowed in corridors)	

Decentralized units

In the basement one unit for three floors from ground to 2nd floor, and on the top floor unit for three floors from 3rd to 5th.

+	-
flexible for various uses	the amount of ducts in corridors remains the same
units produced industrially	difficult vertical ducts needed for basement unit (both fresh and exhaust air)
effective heat recovery	the amount of ducts on the roof increases
machinery located in secondary spaces such as the basement or attic	
small electricity consumption	
some ducts needed in the corridor may be replaced by vertical ducts in the old shaft	

System resembling the original

Mechanical exhaust and fresh air inlets located in the radiators. The units on the roof may resemble the original exhaust chimneys. The radiators able to pre-heat the fresh air.

+	-
no fresh air ducts needed	may result in limits to uses (no mechanical ventilation)
cooling possible with panel radiators	cooling by ceiling panels
no ducts on the roof, 6th floor roof terrace or corridors	inefficient heat recovery
simple exhaust machines	risk of draughts and low pressure
little maintenance required	new radiators
electricity consumption is very small	fresh-air inlets in window sills are complicated
resembles the original system and easily adjusted in the building	

Rose Cellar under construction (Sanatorium photo).

PAIMIO SANATORIUM, ROSE CELLAR

Sakari Mentu and Jonas Malmberg

PREMISES

In its current state the original mortuary "Rose Cellar" is a ruin. The wall surfaces of the interior are in a poor condition, and the demolition of the later built wall and floor surfaces has not been completed. The layer of soil covering the cellar vault has been removed and replaced by a temporary protective roofing. What distinguishes the Rose Cellar from a ruined ancient monument is its connection to the otherwise well-preserved site and the sufficient amount of information regarding the original structures and materials.

The Rose Cellar is an independent part of an internationally significant sanatorium complex. After restoration the Rose Cellar will not require any particular use beyond being a tourist site; the cellar will be restored solely on the basis of its architectural and landscape values. The objective of the restoration is both to improve the prerequisites for the building's preservation and to clarify its architectural character. Maintaining the current status is not a desirable option, and it has been omitted from the following assessment.

THE PREREQUISITES FOR THE IMPLEMENTATION OF THE RESTORATION PROJECT

The first preparatory stage for the restoration is to compile a building-historical report on the cellar; in the event that there is a lack of information about the original design and later alterations, the focus would shift towards landscape work, while repairs to the interiors would be limited to only the absolutely necessary ones.

Another essential pre-restoration planning measure is the analysis of the water-proofing that had been later applied by brush to the inside of the cellar. If the insulating material turns out to be creosote,

Mortuary building under construction (AAM 50-003-251).

which is a serious health hazard, and its removal from the walls or sealing it off from the room space proves unsuccessful, then in practice it would be necessary to leave the interior as a ruin, and focus instead on the landscaping outside the cellar.

The renovation of the Rose Cellar will involve building measures that have to be implemented regardless of the restoration solution. The drainage solutions include both the implementation of the waterproofing of the vault and a new surface water drainage system. Also essential for the preservation of the interior are those measures that keep the indoor air humidity at a tolerable level for the structures and surfaces. The scope of all technical systems must be kept to a minimum.

RESTORATION ALTERNATIVES

If the above conditions are achieved, it will be primarily a case of returning the original forms, materials and colours of the interior surfaces. Eino Kauria's mural will be conserved and complemented, the interior brick walls will be re-laid and their surfaces treated, and the exterior earthworks will be redone. The source material for the planning work should be as comprehensive and detailed as possible. If successful, the restoration of an interior close to the original will benefit cultural tourism in Paimio and the presentation of the sanatorium surroundings.

The Roce Cellar was abandoned in the late 1970s, photo taken in 1986 (AAM L776 Martti Kapanen).

Temporary shelter added in 2000s (AAM Mentu).

The original building material must not be damaged during the work, except for the above-mentioned wall surfaces, which are to be removed. Besides technical challenges, the most difficult part of the reconstructive restoration will be the choice of approach when restoring the cellar mural. On the wall are two paint layers in poor condition, about neither of which there is currently sufficient information. During the course of the work, the paintings should preferably be protected from physical damage, and more information should be found about the original situation. If such information is not discovered, the choice of action will be particularly difficult; later surfaces can not be removed without knowing the extent and condition of the painting beneath, the conservation of the present situation will be difficult, and the reconstruction of the later painting could be harmful to the layers of paint beneath.

In the absence of source material, it would in principle be possible to select a minimum intervention, based on the last documented appearance of the interior space. The wall mural would be complemented or repainted so that the earlier painting layers are protected by the new surface layer (if technically possible). The inner shell would be rebuilt, but the creosote substance would be removed or sealed in. The floor would be returned to its previous appearance and the brick floor would be retained beneath it. The original material would be preserved, but the end result would easily end up being rather uninteresting.

The third option, preservation as a ruin, may be chosen mainly out of necessity. If the discovery of harmful substances or the lack of information prevent even the most minimal restoration option, then the interior wall surfaces must be cleaned and the mural conserved as well as possible. The exterior will either be protected by a new roofing or covered with soil. The solution could be aesthetically interesting and illustrate the fragility of modern architecture. In terms of the architecture of the cellar and sanatorium surroundings as a whole, this would, however, feel like a defeat.

Kauria's mural is painted over (AAM Sakari Mentu).

Interior in 2015 (AAM Sakari Mentu).

RESTORATION TARGET

As explained the target of restoration is to complete the project which was started in 2000s but left unfinished. It will be primarily a case of returning the original forms, materials and colours of the interior surfaces. Some further information is still needed prior to any intervention. In order to obtain the required information one has to:

- compile a building-historical report and do the archive research to clarify the dating and identify the author of the current art work (not by Kauria)
- analyse the harmful substances used in previous intervention and study and compare alternatives of its' removal process
- design an improved drainage and carry out the technical design of the structure

If the mentioned actions do not reveal unexpected information, the interventions restoration project may be taken into action.

MANAGEMENT SYSTEM, STRUCTURES AND PRACTICES

Nina Heikkonen

The key management issues in a cultural heritage property like Paimio Sanatorium are closely related to the conservation policy and the implementation strategy for the protection and enhancement of the cultural significance of the site. In general, the contents of the CMP address the issues usually dealt separately in a historical survey, conservation plan and management plan. While the conservation management plan addresses the conservation principles through the architectural and cultural historic values, similarly the use value and other socio-economic values, such as economic, political, social or educational values, have to be considered as a basis for a functioning entity.[1]

Before creating the policies for the management system, structures and practices, it is recommended to carry out an analysis of the requirements, opportunities and barriers. A so-called SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis or similar tool might be a useful way to approach the subject. The issues to be addressed in the analysis could include, for example, the following:

- Cultural values vs. other values on or around the site (This may raise issues of trade-offs between the architectural and cultural values and other benefits, such as socio-economic ones)
- Requirements and aspirations of the owner (This may be seen as an opportunity or a constraint)
- Resources – financial, skills and knowledge (This also may be seen as an opportunity or a constraint)
- Physical and environmental issues (These can cause problems or challenges with, for example, overuse, vandalism, pollution and natural risks, such as corrosion, etc.)[2]
- Other noteworthy points to be analysed and considered concerning the management issues and the creation of the management system, structures and practices in a special property like Paimio Sanatorium:
- The understanding of the organisational needs of the owner and the tenant (functional, economical, etc.)
- Condition of the place (physical state, maintenance procedures and needs, etc.)

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1 Worthing and Bond 2008, 60.
2 Worthing and Bond 2008, 142-143.

- Management responsibilities and processes (clarity of the management and decision-making structure)
- Maintenance management (key role in a cultural heritage property)
- Health, safety and security (disabled access, energy, fire protection, etc.)
- Documentation (recording of decisions and actions)
- New uses (appropriateness of the use)
- Cooperation with stakeholders
- Cooperation with the local community
- Monitoring and reviewing the policies, strategies and actions (How are we doing?, Is there a need for change? What are the performance indicators to be developed and followed?)[3]

These issues can be stated as part of the CMP or in a separate management plan prepared for the site. A draft management plan was produced for Paimio Hospital in 2006 during the process of "Nomination of Paimio Hospital for Inclusion in the World Heritage List". The plan was specifically prepared as a required appendix for the nomination file. Also, because of the changed function of the site, many parts of the plan are no longer relevant. As mentioned in the prior list, the management policies, strategies and action should be reviewed at certain intervals, especially in the situations of changes in ownership, use or functions.

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Worthing, Derek, and Bond, Stephen (2008). Managing Built Heritage. The role of cultural significance. Blackwell Publishing, Oxford.

3 Worthing and Bond 2008, 143–152.

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WORLD HERITAGE

Tommi Lindh

Finland ratified the UNESCO 1972 Convention Concerning the Protection of the World Cultural and Natural Heritage in 1987. According to the Convention article 11, the World Heritage Committee shall establish, keep up to date and publish, under the title World Heritage List, a list of properties forming part of the cultural heritage and natural heritage, which it considers as having outstanding universal value. Seven sites from Finland have been included in the list so far. The sites are the Fortress of Suomenlinna (since 1991), Old Rauma (1991), Petäjävesi Old Church (1994), Verla Groundwood and Board Mill (1996), the Bronze Age Burial Site at Sammallahdenmäki (1999), Struve Geodetic Arc (2005) and the Kvarken Archipelago (2006).

In addition to this, Finland has six sites on its Tentative List. A Tentative List is an inventory of those properties which each State Party intends to consider for nomination. In 1990 four sites were named: the Carvings from historic time on the island of Gaddtarmen (Hauensuoli), the Holy place of worship of Ukonsaari by the Sami people at Inari, the large Stone Age ruin of Kastelli at Pattijoki, and the Rock paintings of Astuvansalmi at Ristiina. In 2004 two more sites were added to the Tentative List: the Paimio Sanatorium and the Saimaa-Pielinen Lake System. Out of these, only Paimio Sanatorium has been worked up to a nomination in 2005, but was withdrawn from the World Heritage Committee meeting in Christchurch 2007 due to a critical statement by the International ICOMOS organization.

In the presentation of the justification for inscription to the World Heritage List (2005), the following selection criteria for approval were mentioned:

> "*to represent a masterpiece of human creative genius*"
>
> "*to exhibit an important interchange of human values, over a span of time or within a cultural area of the world, on developments in architecture*"
>
> "*to be an outstanding example of a type of building*"

In the justifications for inscription, it was stated that the patients were the starting point for the design of Paimio. Aalto created a functional totality in which medical, psychological and social starting points converged with the latest technical solutions. As a whole, from the orientation of the sun balconies to the smallest technical details, the building aimed to serve the needs of the patients. Aalto's creative and experimental approach towards new technical solutions is evident in Paimio. The result is a Gesamtkunstwerk, which as a tool for healing achieves the ideals of Modernism in a unique way. Paimio received international attention and can be considered a representative example of pure Functionalism.

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A Conservation Management Plan is a document required for cultural heritage nominations by the UNESCO World Heritage Committee and ICOMOS. The Paimio Sanatorium CMP will, in addition to giving guidelines for future use and conservation of the site, also push forward a possible World Heritage nomination. The National Board of Antiquities has the responsibility for preparing cultural World Heritage nominations in Finland. According to the Finnish National World Heritage Strategy 2015–2025: "*When selecting sites for nomination, attention will be paid to under-represented thematic groups in accordance with the Global Strategy; these may include cultural landscapes, modern architectural sites and more extensive landscapes.*"[1]

1 *Our Common Heritage – For a National World Heritage Strategy 2015–2015*. Publications of the Ministry of Education and Culture, Finland 2015:15, p. 22.
http://www.minedu.fi/export/sites/default/OPM/Julkaisut/2015/liitteet/OKM15.pdf?lang=fi

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THE FUTURE OF THE SITE

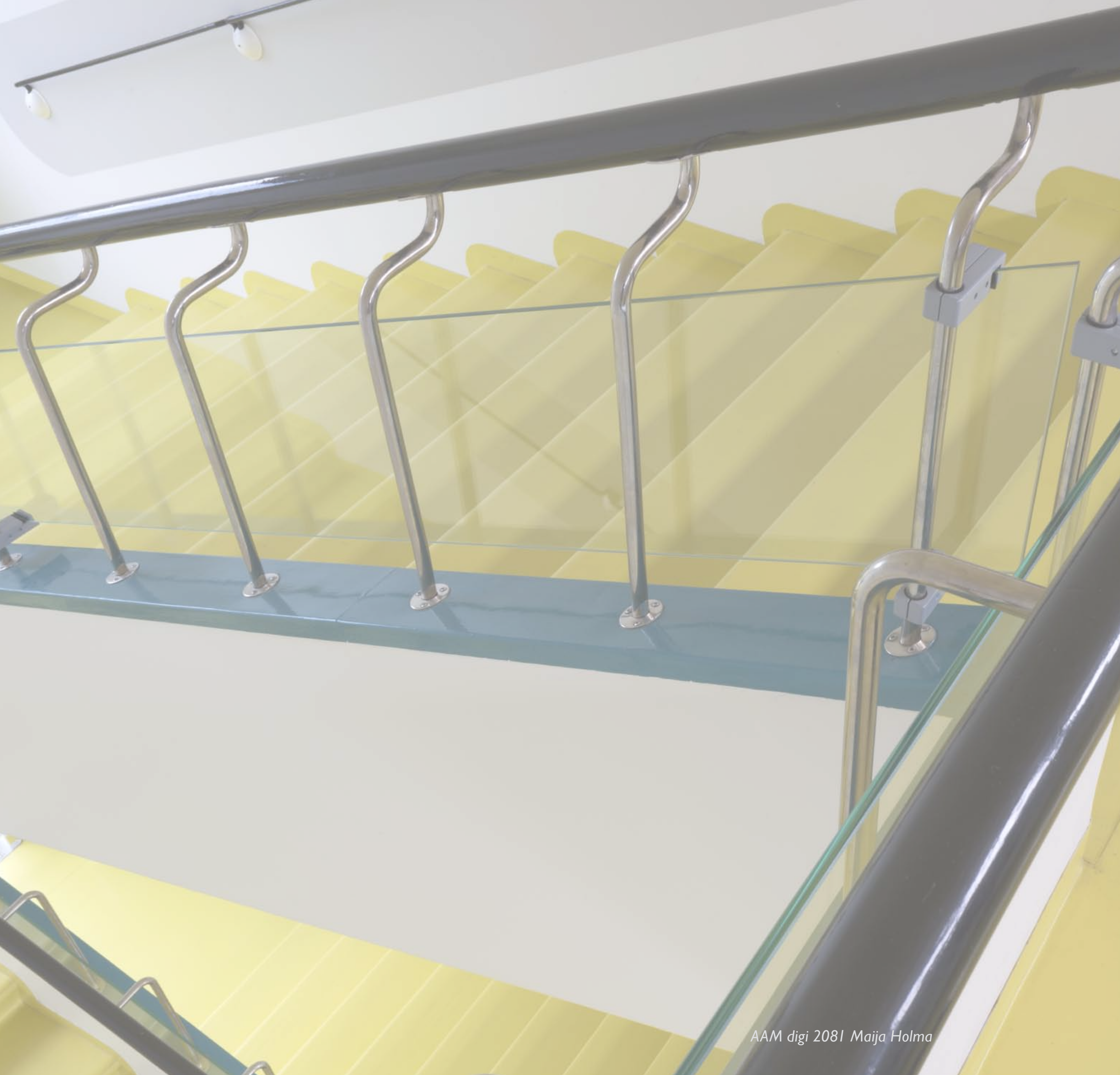
Tommi Lindh

The aspects brought up in this CMP are crucial for the future preservation of the Paimio Sanatorium site. In the Finnish natural and weather conditions, buildings of this sort have to be heated during the autumn, winter and spring months in order for them to retain their physical condition. The only way of achieving this is by having a suitable user for the premises. Even having part of the building without any use might become hazardous. We already see small signs of accelerated wear due to the lack of maintenance in the empty wards.

Another crucial point in the preservation of the buildings and site is to actually carry out the planned measures. This also has a connection to the use but is essentially a matter for the owner, and is dependent on the future funding of repairs. Following the CMP, we need to start working on the actual implementation of measures described in the report. The owner and the current user have to have a common understanding of the principles of use and maintenance as well as the significance of the property.

A more glamorous future for Paimio would entail its successful inclusion on the World Heritage List. There is still a lot of work to be done before a new nomination can be attempted. Nevertheless, this CMP helps a lot in that process. The owner must consider things such as setting up a visitor centre with the possibility of guided tours in the premises, accommodating architecture tourists and keeping the surroundings in a presentable state. The prime users have to be carefully taken into consideration when designing routes for tourists.

Paimio Sanatorium has been well preserved, much due to its continuous maintenance since 1933. We sincerely hope that it will continue to serve the greater public at least another 80 years.


AAM digi 2081 Maija Holma

PART V
APPENDICES

PAIMIO SANATORIUM COLOR RESEARCH 2015 *Elina Riksman*
Part 1/2 Main Building

PAIMIO SANATORIUM COLOR RESEARCH 2015 *Elina Riksman*
Part 2/2 Cief Physician's Villa, Sub Physicians' Row House Apartment, Staff Apartment House and Rose cellar – The Morgue

ALVAR AALTO FOUNDATION

PAIMIO SANATORIUM COLOR RESEARCH 2015

PART 1/2 Main Building

Elina Riksman

15.1.2016

The Getty Foundation

NATIONAL BOARD OF ANTIQUITIES

ALVAR AALTO MUSEO

Content of Part 1

1. Paimio Sanatorium Color Research

The Color Research

The Paimio Tuberculosis Sanatorium, designed by Alvar Aalto and built 1929-33 was the main subject of the color research executed during year 2015. This research was conducted as a part of the Conservation Management Plan (CMP) study that was simultaneously carried out by a group of researchers from Alvar Aalto Foundation. The purpose of this color research was to produce vital information for the CMP research group to outline the look of original interiors and to help to perceive the state of preservation of interiors. Also the intention of this research was to further the understanding of value and importance of different spaces, areas and rooms, and finally to enable the evaluation of these spaces.

The general view of the original interior coloring is the main idea of this research. This report presents the results and the conclusions of the color research, based on the data gathered in situ, in laboratory and in the archives of Alvar Aalto Museum, Hospital district of Southwest Finland and Lazaret Museum in Turku.

This research was funded partly by Getty Foundation as a part of the Keeping it Modern initiave and partly by the National Board of Antiquities of Finland.

The Original Color Scheme

The color scheme of Paimio Sanatorium was originally designed by Alvar Aalto together with artist Eino Kauria. Kauria was commissioned to work at Paimio sanatorium building site to lead the paint work and coordinate the colors used. Kauria arrived to the building site relatively late when the Staff apartment house was already built and others including the main building were well on their way. Kauria stayed in one of the Staff house's apartments with his wife and child during the building of other buildings. Alvar Aalto visited the site almost daily by car from Turku, according to Kauria, and the pair inspected the proceedings of interior work together[1]. Later work of Eino Kauria's interior color design in Finland include significant modern era landmarks of Helsinki as Lasipalatsi (1934-36) and Tilkka War Hospital (1936)[2].

The documents found in archives along the Conservation Management Plan research have provided vital information for the color research of Paimio Sanatorium. Documents as receipts of procurement, transcripts of meetings, original drawings, letters, notes, contracts, etcetera, have given an insight to the proceedings of the interior finishing work done at the site. Photographs taken of the buildings after they were finished give of course the most powerful evidence of the original state of the interiors.

Eino Kauria was commissioned to paint a large board presenting the finalized color scheme of the main building. The color board painted by Kauria is, according to an interview of Kauria from 1986, not a plan of colors for the building site's painters to use, but a final, executed result of the color scheme in the main building. [3] This color board was one of the main motives and definers of this research. One of the aims was to find the colors presented on Kauria's board in situ.

Former Color Researches

The main building has been researched in the year 2000 by Katja Aaltonen. This research includes researching the main building once more, updating the results of year 2000 color research of Aaltonen and as well the research of other important buildings of the original Paimio Sanatorium plan: the Chief Physician's villa, the row house apartment of Sub Physicians', the staff apartment building and the mortuary. In the main building this research concentrates also in parts of the building that Aaltonen's work excluded. The year 2000's

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[1] Interview of Eino Kauria by Teppo Jokinen of 0Alvar Aalto Museum, 30.9.1986 Helsinki.
[2] Makkonen Leena. Modernismia Helsingissä. Kirjapaino Uusimaa 2012.
[3] Ibid.

research has now been inspected in situ, to complete the research made now and to take samples and redefine the color codes defined by Aaltonen in year 2000. Many of her excavations on surfaces have been covered with paintwork during the last 15 years. Therefore it was not possible to relocate all of them. One purpose of this redefinition was to see how the exposed colors have reacted to air and light during the 15 years of their exposure to sunlight and moisture and dirt in the air. As well it is interesting to see how much the original oil paints had changed in color in daylight exposure by comparing Aaltonen's color code definitions to the ones made now.

Another color research in Paimio main building was made 2014 in the 1st floor of C-wing, the kitchen area, preceding renovations the same year. Therefore the c-wing was excluded from this 2015 research.

Confining the Research

The confinement of this color research was based on the CMP research group's evaluation of spaces in the main building, the importance and function of these spaces according the original architectural plan and as well the condition of these spaces. The confinement of this research was also influenced by the former two color researches, their expanse and findings. Comparing these former findings and their researchers' methods, this research was confined to address all floors of the main building but only on the *original building volume*. This research addresses the A-wing (The wards) and B- wing (Operative hospital functions in the ground floor and dining hall in the 1st floor) and the axis between the two aforesaid wings with the entrance hall and main staircase. The wings built later stages, attached to the main building of Paimio Sanatorium are not included in this research. This research addresses the interiors of Paimio main building: the walls and ceilings. The original linoleum and rubber flooring that have been almost entirely lost in renovation have been researched in documents such as original procurement receipts and photographs. The original mosaic concrete stairs have also been defined in situ. The exterior colors and materials are not included in this study.

Other interior color research subjects in the Paimio Sanatorium premises included in this research are the Chief Physician's villa, the Sub Physician's row house of three apartments and the two storey staff house. All these three buildings of residence were part of the original 1929-33 building stage. Also the Rose cellar, a morgue that was part of the original architectural overall plan was researched. All the other buildings are still in active use, except the Rose cellar. These buildings' research is presented in another report.

Research Methods

The method used at the site was mechanical peeling of layers. The use of chemical peeling like paint stripper gel was minimal and only used on the upmost layers in the excavation of the undermost layers, to avoid any discoloring of paint and filler layers. No heating was used in excavation for the same matter.

The excavations in the main building consisted 40 excavation points (exposing of layers), 300+ small excavation craters. Over 159 cross section samples were collected and analyzed. X-Ray Fluorescence scanning was performed on 15 selected points.

The color code system used in this research is the Natural Color System, NCS (Teknos paint factory, 2012 edition). The system was developed in Sweden 1960's and 1970's. It is the Swedish national standard color-order system that is based on the four unique hues: red, green, blue and yellow. These are combined with black and white.[4] The system is based on how the human eye sees color

Conclusion

The results of this color research differ from the present state of the main building in many ways. Probably the biggest difference between the present light, white washed state and the original look is shown in the gound floor of B-wing, the surgery wing, which was originally very brightly and imaginatively colored. This difference is of course due to the change of use as the ground floor of B-wing serves now as an office wing.

Johnston-Feller, Ruth (2001*). Color Science in examination of Museum objects*. The J. Paul Getty Trust, Los Angeles.

None of the original colors can be seen in the present look of the B-wing ground floor. However the Dining hall coloration as well as the colors of the Lounge nest to it are close to the original colors found during this research. The dining hall's original ceiling radiators, along with the surrounding ceiling had more earthy green tones compared to the hues they carry today. The third floor reading room is colored quite precisely in the same way as was originally thanks to the year 2000 well stated color research by Katja Aaltonen. Only difference is the flooring, stating back to 1990's or even 1970's, which does not in any way fit the original look and design of the reading room interior.

The wards of the A-wing gave mostly a consistent result when compared to the Eino Kauria color board (presented in chapter 2). The board shows three different colors for the main corridors of the wards, green, blue and ochre orange. All these hues were found as presumed original layers, but surprisingly also three ward corridors stated a bright yellow as the undermost layer. This finding was unexpected but well stated in both cross section sample and excavation *in situ*. The yellow somewhat certainly states the original paint layer, but it is unknown why these three floors (1st, 4th and 5th floors) have been painted first yellow, then with green, blue and ochre orange to form a consistency of color in each ward. An interview of the painter, artist Eino Kauria who was responsible for managing the paint work of Paimio Sanatorium, from year 1986 states that Aalto was not happy with the yellow flooring he had specially made for the entrance hall and main staircase of main building. He regretted the choice of color and complained about the matter to Kauria. The order however could not be cancelled. It is possible that this one bad choice of yellow color has something to do with the color choices in the wards' walls as well, although the wards had a different, almost black linoleum flooring. It is possible that the three wards had yellow walls, but Aalto and Kauria changed their minds amidst the paint work and changed the color plan to follow the three color system of ochre, green, blue, and ochre, green, blue. The basement floor ward corridor was painted with the same orangey ochre as the ground floor and 3rd floor.

The patients' rooms showed little information due to the total renovation of the 1970's. The ceilings were the best source of original color. The museum room, which is a patients' room left presumably in its 1970's state, presents some surfaces that showed layers of original color. The four ceilings of patients' rooms are stated in the Kauria color board. The only exactly same color as Kauria board has, was a vibrant light green. Other findings included a dark blue and a dark grey. These comparisons to these colors are not found in the Kauria color board. However the same green ceiling color can be found in the reading room ceiling. One of the greyish greens presented in the Kauria color board can be found in the original layer of the 1st floor lounge. The mixing of paints by hand was such a laborious job, that it seems obvious that a larger color patch was made and used in several spaces.

The entrance hall showed little layers as it has been scraped relatively clean in resent renovation. The original photography states that the ceiling might have had a significant hue, something different then pure white or cream white. The gloss is nonexistent and the look in photographs matt. The columns and the main door cheeks have high gloss finishes in white.

Both the mixing of paints at the building site and buying readymade industrial paints seem to have been the choice of Kauria and the painters. The original receipts and documentation of the building site state that the painting company *Marttisen maalaus Oy* from Turku bought readymade paints by the kilo with different serial numbers and color codes. They also bought large amounts of lacquer (a base for mixing paints), zinc white, lead white, ultramarine blue, crete, yellow ochre and "black" pigments, white spirit and boiled flax seed oil to mix paints at the building site.

The *Oy Wiklund Ab* hardware store's receipt does not state the producer of the paints ordered for the building site. It lists the names of the colors: *white, light green, blueish green, light yellow, light blue*. These same 4-5 colors were ordered in three different types of paint: *a base paint (to be sprayed), the enamel paint (acid resistant, to be sprayed) and enamel paint (normal, to be sprayed).* All these colors can be found in the original layers around the building, but the equivalence of the codes in a 1930's color chart has not been yet discovered. Some products, like flax seed oil, for Paimio building site were bought from the Tikkurila paint factory, which is still in operation in Vantaa, Finland. They run a small archive of paint charts and two charts stating back to 1938, but none of the charts carried the same color codes as the receipts of Paimio building site.

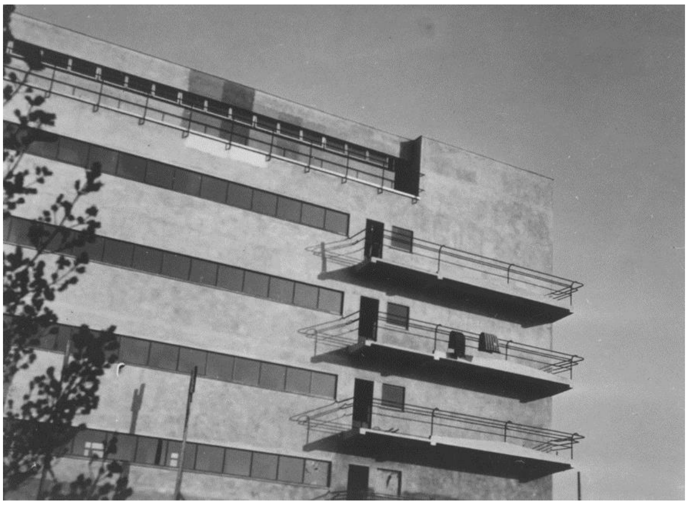
The Reliability of the Results

The later renovations have left their mark in a very noticeable way between the layers found: the light weight white filler used on wall and ceiling surfaces that probably states to the 1970's renovation and again in the 1990's renovation. These light weight modern fillers are present in almost all cross section samples and excavations *in situ* and they helped to recognize the real age of layers beneath these white fillers. As some excavation points have shown, the layers present 12-19 layers at most. The average amount of layers is under 10 layers. This of course varies between different spaces, due to their original function and level of usage. Some spaces have gone through several paint jobs, probably because of their detrition in daily hospital use. Some heavy duty surfaces like wards' corridor walls had the most paint layers. On the other hand it was obvious that in some spaces all of the surfaces had been sand blasted or scraped clean in former renovation and original surfaces lost for good. In these cases only 3 to 4 layers of paint and filler was found. Other methods for recognizing the age or the actual original layer was cross section samples. The samples showed clear differences between modern plastic filler paints and oil based paints with pigments and organic fillers like crete, zinc or barium sulphate. The samples were examined under microscope and photographed. The X-Ray Fluorescence research method gave further information about the actual consistency of the layers exposed. Those results are presented in chapter 24.

The paint types of original, undermost layers were determined *in situ* by testing their dissolution in solutions. For example the oil based paints reacted by dissolving in a solution of ammonia (NH_3, 12%), isopropanol alcohol (C_3H_8O) and distilled water.

Further Research

As the exterior has been excluded from this research it is the next natural step in the research of Paimio Sanatorium main building. The sight of the gleaming white facade of main entrance and A- and B-wings is broken by a warm light ochre line that covers the 6th floor exterior. The iron railings of balconies and terraces have always had a distinctive red or orange color. This applies also to the eaves of some windows. The photograph at the right shows some color testing on the 6th floor facade made during the building phase of the main building. This example provides one excellent starting point for the future research.



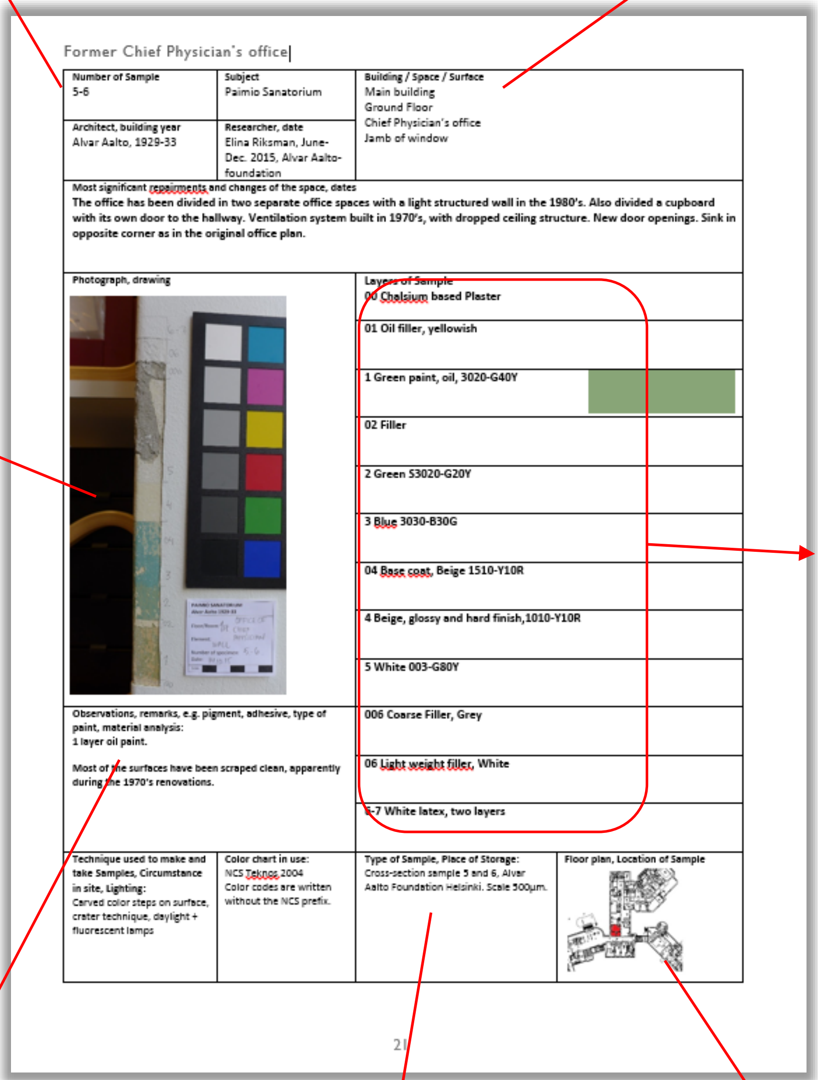
AAM. Sign. L2116

How to Read this Report

This report is divided in 7 floors of the main building. Every floor is presented one at a time with the floor plan that presents the points *in situ* where each cross section sample was taken or excavation of surface made. The chart used to present the color codes and findings of each research point is advised to be used in color research documentation by the Finnish National Board of Antiquities. The following page of the chart has additional information, original and present photography, cross section sample photography and conclusions of the space researched. These conclusions include information addressing the original (lost) flooring, the degree of gloss or other structure of the surfaces and information about the findings done in the archives. One spread of this report usually covers one point of research. All photographs by Elina Riksman or Alvar Aalto Museum Archives.

The number of the sample and/or excavation. This number can be found in the floor plan.

The place of sample and excavation point in the building.



Former Chief Physician's office

Number of Sample	Subject	Building / Space / Surface
5-6	Paimio Sanatorium	Main building Ground Floor Chief Physician's office Jamb of window
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

The office has been divided in two separate office spaces with a light structured wall in the 1980's. Also divided a cupboard with its own door to the hallway. Ventilation system built in 1970's, with dropped ceiling structure. New door openings. Sink in opposite corner as in the original office plan.

Photograph, drawing

Layers of Sample

- **00 Chalsium based Plaster**
- **01 Oil filler, yellowish**
- **1 Green paint, oil, 3020-G40Y**
- **02 Filler**
- **2 Green S3020-G20Y**
- **3 Blue 3030-B30G**
- **04 Base coat, Beige 1510-Y10R**
- **4 Beige, glossy and hard finish,1010-Y10R**
- **5 White 003-G80Y**
- **006 Coarse Filler, Grey**
- **06 Light weight filler, White**
- **6-7 White latex, two layers**

Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:
1 layer oil paint.

Most of the surfaces have been scraped clean, apparently during the 1970's renovations.

Technique used to make and take Samples, Circumstance in site, Lighting:	Color chart in use:	Type of Sample, Place of Storage:	Floor plan, Location of Sample
Carved color steps on surface, crater technique, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written without the NCS prefix.	Cross-section sample 5 and 6, Alvar Aalto Foundation Helsinki. Scale 500µm.	

21

Photograph of the excavation on surface

The layers of paint and fillers found in excavation. NCS color codes are presented for paint layers.

Information addressing the type of paint of the original paint layer.

The place of cross section sample number, the scale of the microscope photo. Tells also where the sample is stored.

A small floor plan to show in which room the research is made.

2. The Color Board of Eino Kauria

The color board painted by Eino Kauria is one of the main motives of this research. An interview of Eino Kauria from year 1986 tells that the board was a separately ordered paint work from Kauria. The board states the *results* of paint work in the main building of Paimio Sanatorium, right after it was completed in 1933.

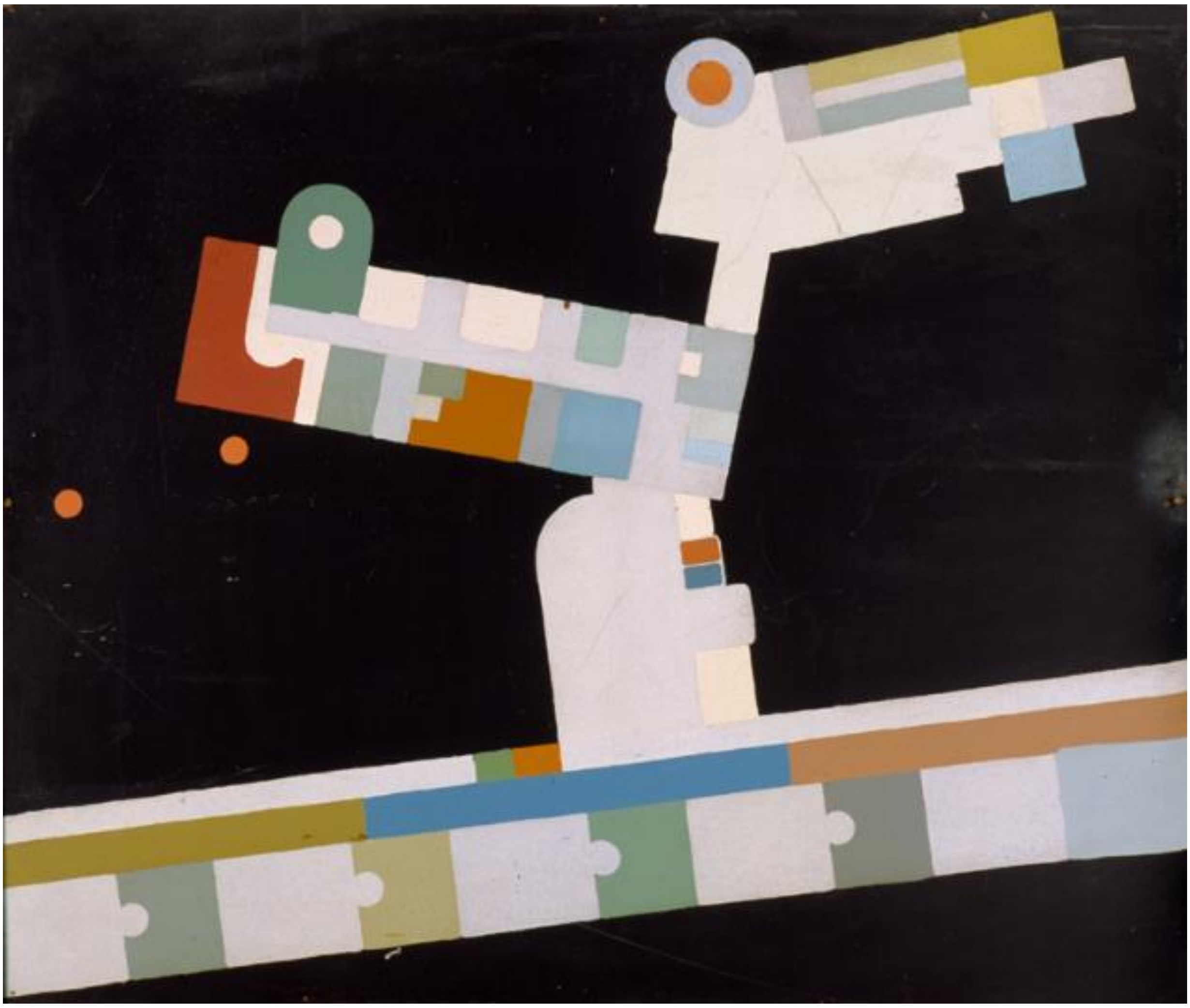
There are two boards existing. The other is located in Paimio hospital. It was found in the basement and hung up for the visiting tourist to see just a few years ago. It is relatively good condition. The second board is very similar to the first one and in the collections of Alvar Aalto Museum, in Jyväskylä. This second board is a bit more worn out then the Paimio hospital's version. It has different paint textures and the colors of paints are lighter. This board also has glossy finishes in selected areas. All these features indicate that this second board might be the original Kauria board and the one hanging in Paimio hospital could be a copy.

Both boards are painted with detail and care, using different types of brush strokes to produce distinct textures to present various rooms and areas. The second museum piece is maybe painted with a bit more care than the one in Paimio hospital. Both color schemes of these boards have been defined with NCS color codes. As said the second, museum piece is a lot lighter by its colors.

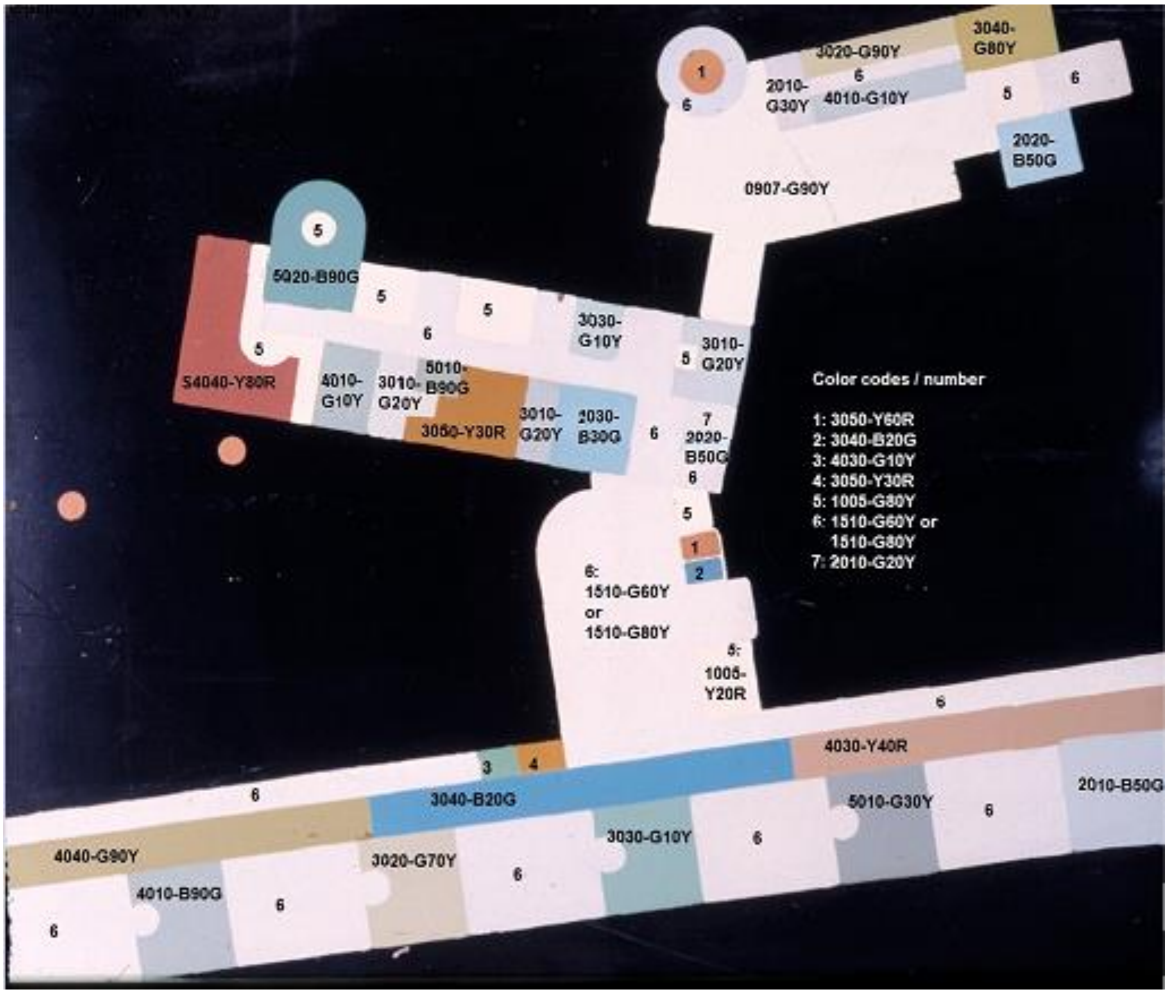
The board addresses the ground floor of B-wing (operational wing with the green round operation theatre). This wing has maybe the most interesting color scheme on the board, as this wing is one of the sections of main building that has gone through major changes. None of the colors presented here are visible today in B-wing, as it has been renovated into an office wing for staff. The red zone was the artificial sun treatment room, the green the operating theatre and orange X-ray room. The large light blue box in the right corner was the office of Chief Physician. The C-wing (the kitchen), at right upper corner of the board, presents the first floor. The wing is divided in different areas with color, to tell us which area is for baking, which for handling the meat. The freezers are for example marked with the light blue square. The A-wing with the wards' has the ward corridor divided in three color areas, marking different floors. The obvious patients' room colorings are also well stated, presenting different color options for ceilings.

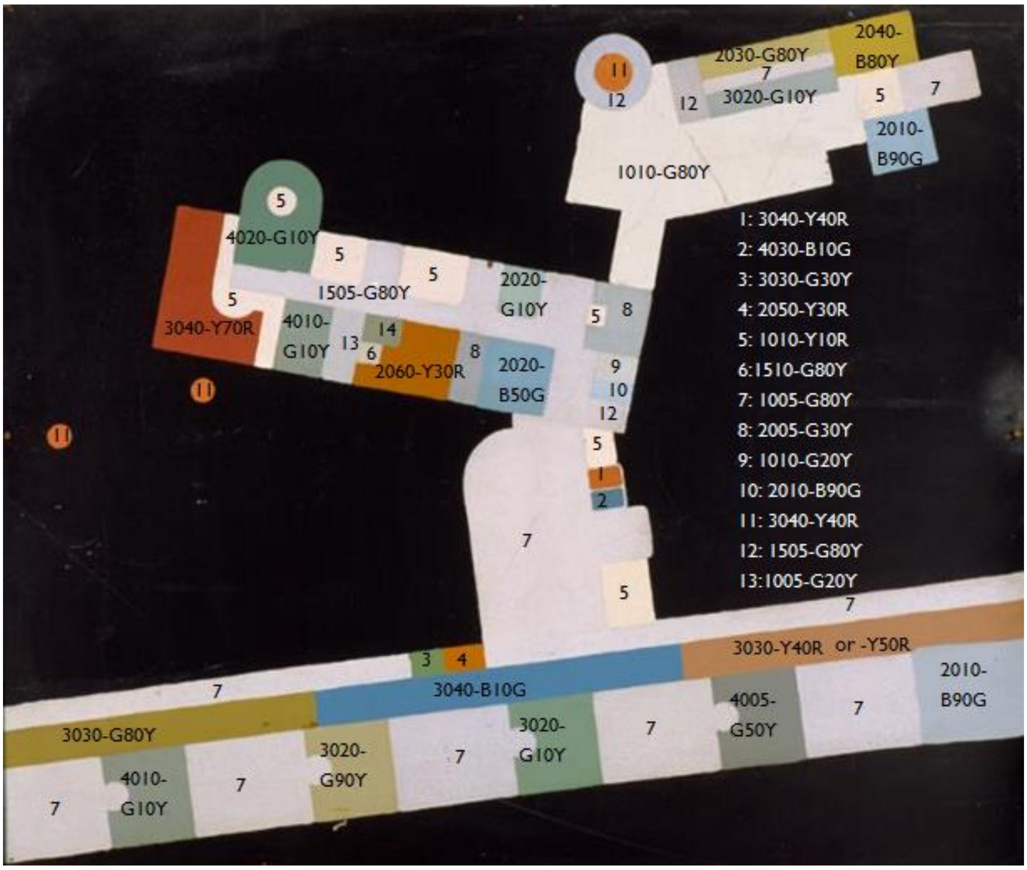
The two red dots put side the building resemble the courtyard light fixtures.

For the reader it is advisable to return to this chapter and refer to the Kauria color board when reading forward this report.



The color board painted by Kauria presents the finished color scheme of Paimio Sanatorium's main building. AAM- Sign.Av 78.

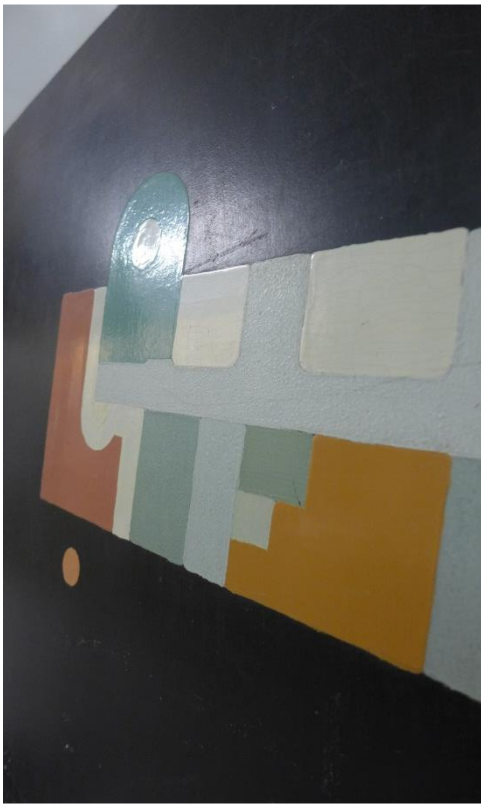




NCS color codes of the color board of Paimio hospital are presented above. This board is at the moment located in Paimio hospital's main building.

The second board's NCS codes are shown left. This board is presumably the original board painted by Kauria himself. It is in the collections of Alvar Aalto museum, Jyväskylä, Finland.

The different textures on the color board created by the brush strokes and technique. This pictures presents the textures of the board located in Paimio hospital.



The presumably original color board of Alvar Aalto Museum collections has high gloss and matt finishes.

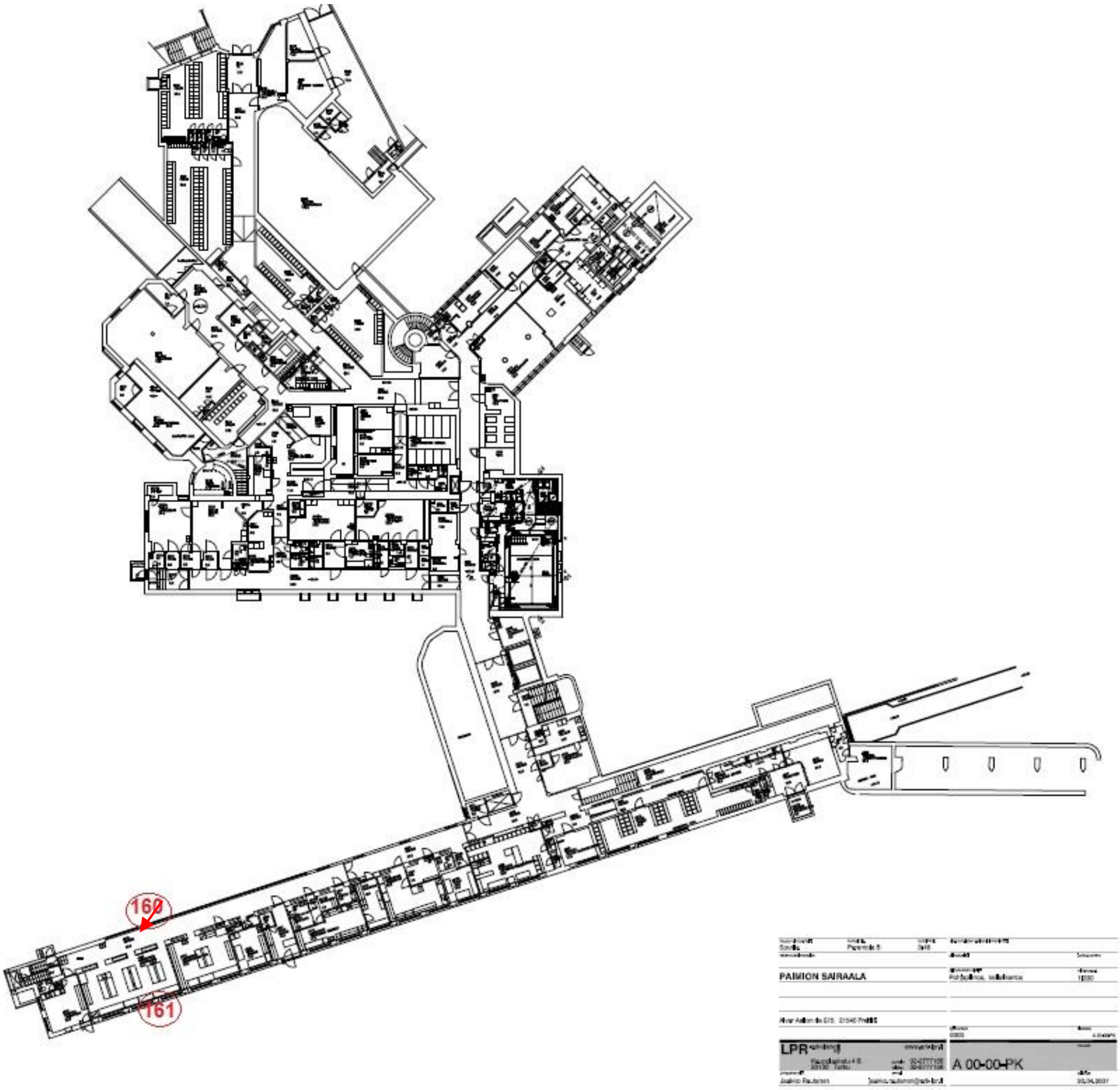
The Paimio main building in October 2015. The patient wards' vibrant colors gleam through windows in the evening light. Photograph by Sakari Mentu.

3. The Basement Floor - General view

The basement is a complex area with mainly technical and maintenance spaces, spaces with secondary functions. The A- wing how ever had a small isolation ward according to the original space plan. Later on, after the major changes took place in the main building, the isolation ward was turned into a laboratory and staff kitchen.

The main corridor of this ward wing and this isolation ward have two research points made in this floor.

The Cross Section Samples of the Basement Floor

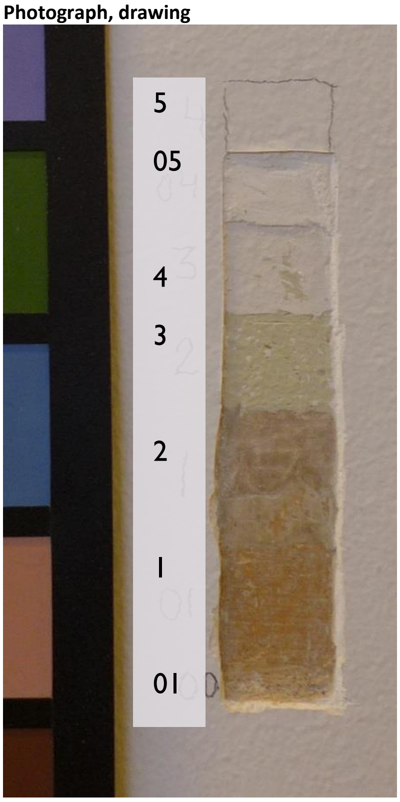


Number of Sample	**Subject**	**Building / Space / Surface**
160	Paimio Sanatorium	Main building Basement Ward Wing Hall way wall
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

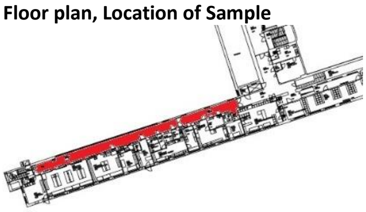
1970's ventilation system brought casing of the pipes and electric cords in the ceiling. Doors and their sizing has changed, broader painted wooden doors have replaced the original wooden doors with lacquered surfaces. The lighting and fixtures have also been replaced.

Photograph, drawing



Layers of Sample
00 Chalsium based Plaster
01 Oil Filler
1 Orange paint 3040-Y40R
2 Brown 4005-Y50R
3 Green 0907-G60Y
4 White 0300-N
05 Filler, white light weight
5 White latex

Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:

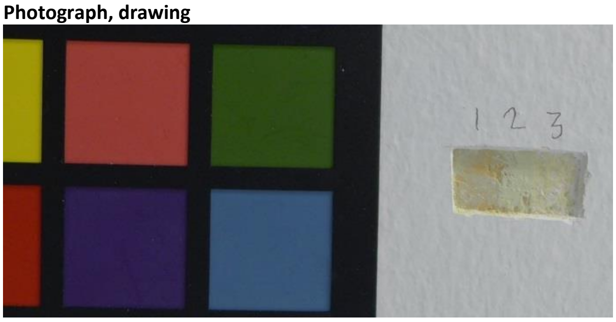
Technique used to make and take Samples, Circumstance in site, Lighting:	**Color chart in use:**	**Type of Sample, Place of Storage:**	**Floor plan, Location of Sample**
Carved color steps on surface, crater technique, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written without the NCS prefix.	No cross section sample.	

Number of Sample	Subject	Building / Space / Surface
161	Paimio Sanatorium	Main building Basement Isolation ward Wall with windows
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

1970's ventilation system brought casing of the pipes and electric cords in the ceiling. Doors and their sizing has changed, broader painted wooden doors have replaced the original wooden doors with lacquered surfaces. The lighting and fixtures have also been replaced.

Photograph, drawing



Layers of Sample

00 Chalsium based Plaster

(01 Oil filler, yellowish)

1 Blueish grey 2005-B20G

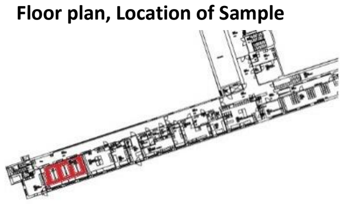
2 Green 1010-G40Y

3 Yellow 0510-Y

(04 White filler, light weight, not shown)

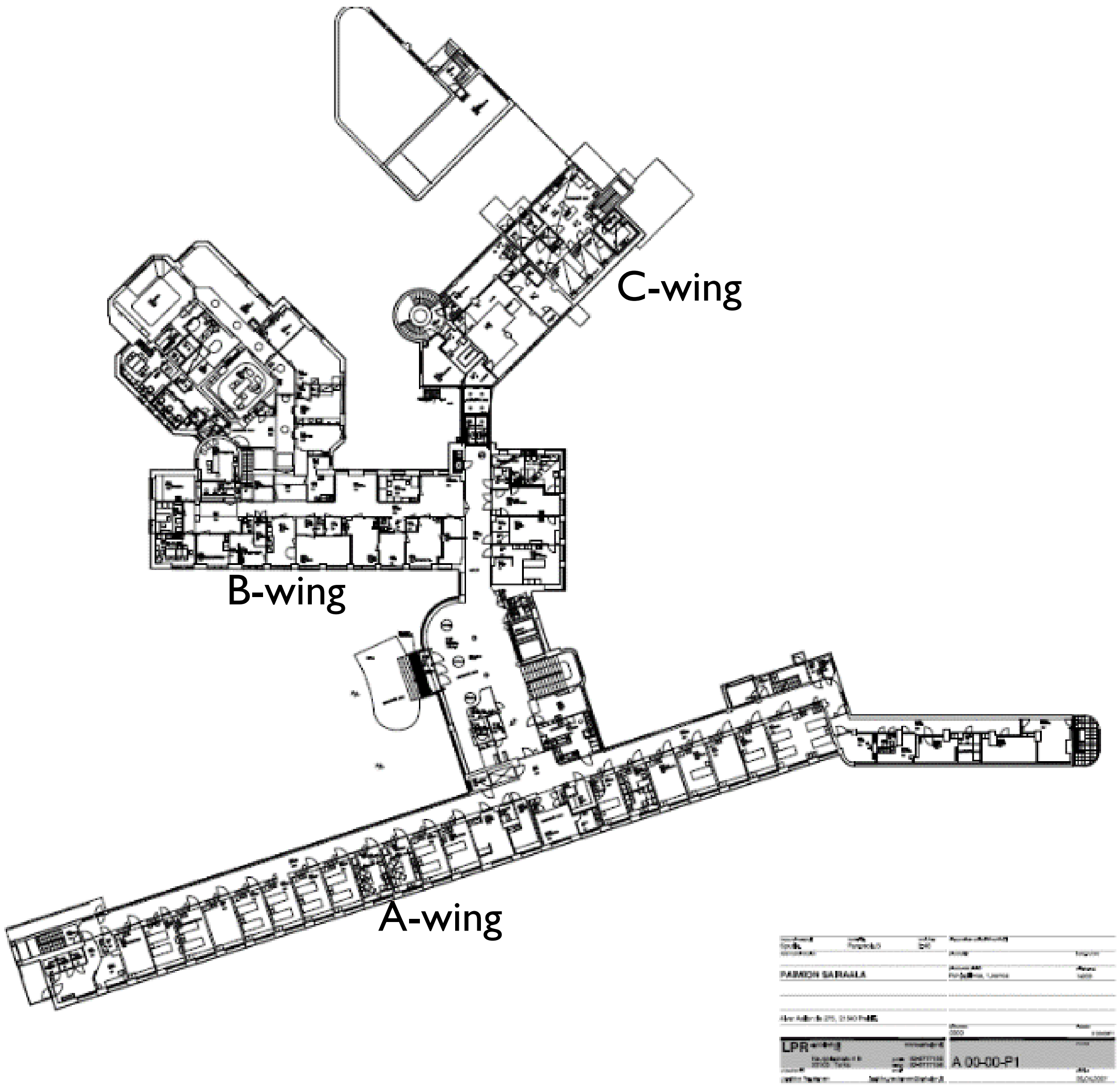
(4 White latex)

Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:

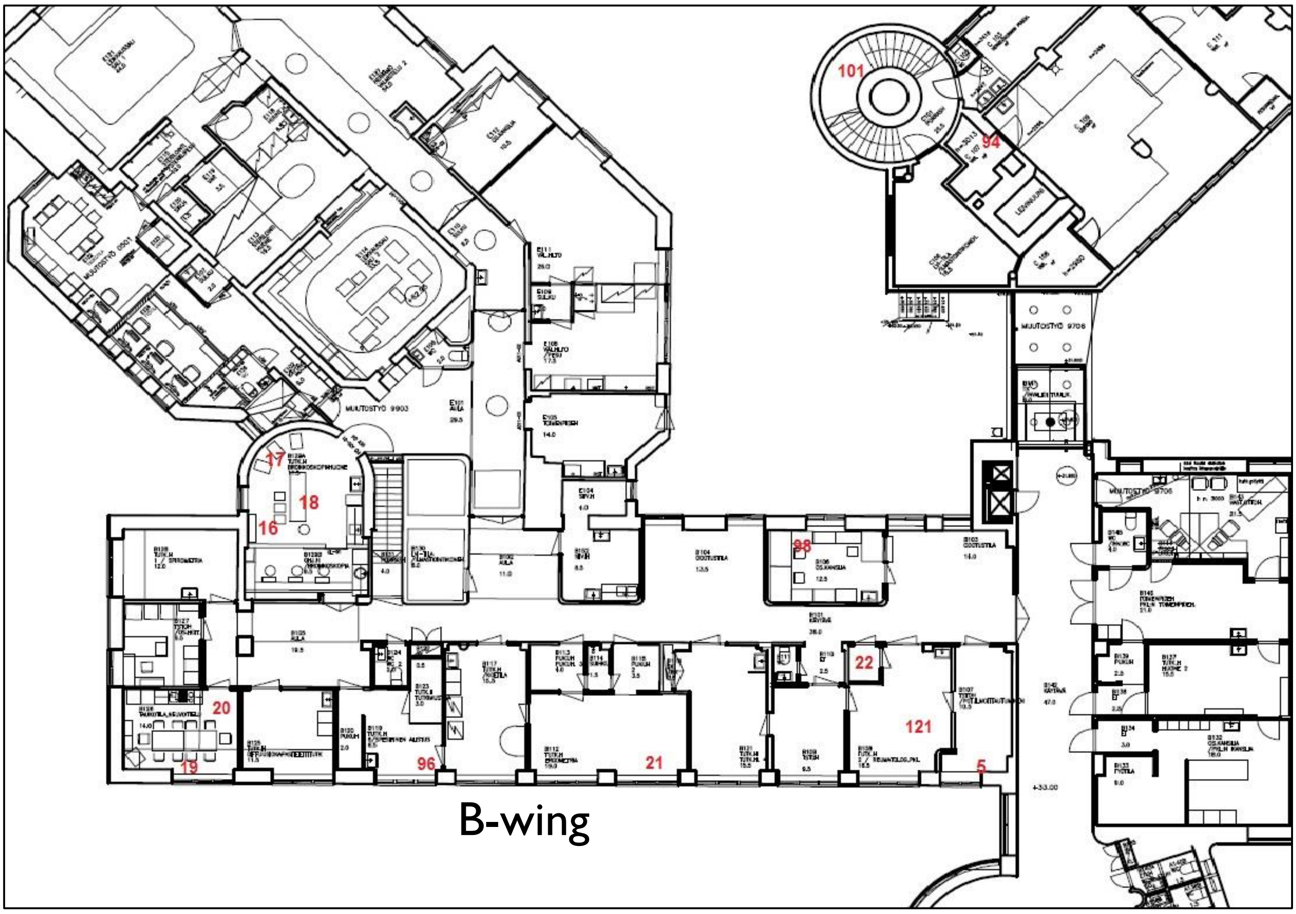
Technique used to make and take Samples, Circumstance in site, Lighting:	Color chart in use:	Type of Sample, Place of Storage:	Floor plan, Location of Sample
Carved color steps on surface, crater technique, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written without the NCS prefix.	No cross section sample.	

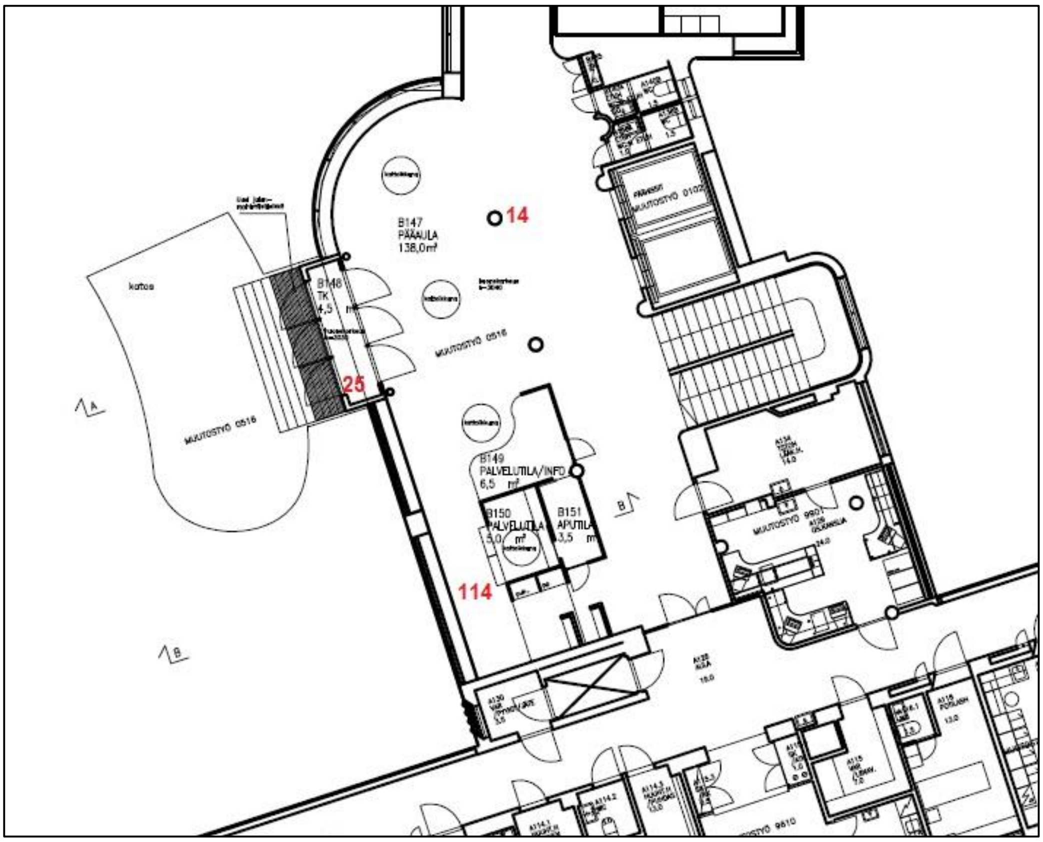
4. Ground Floor – A General View

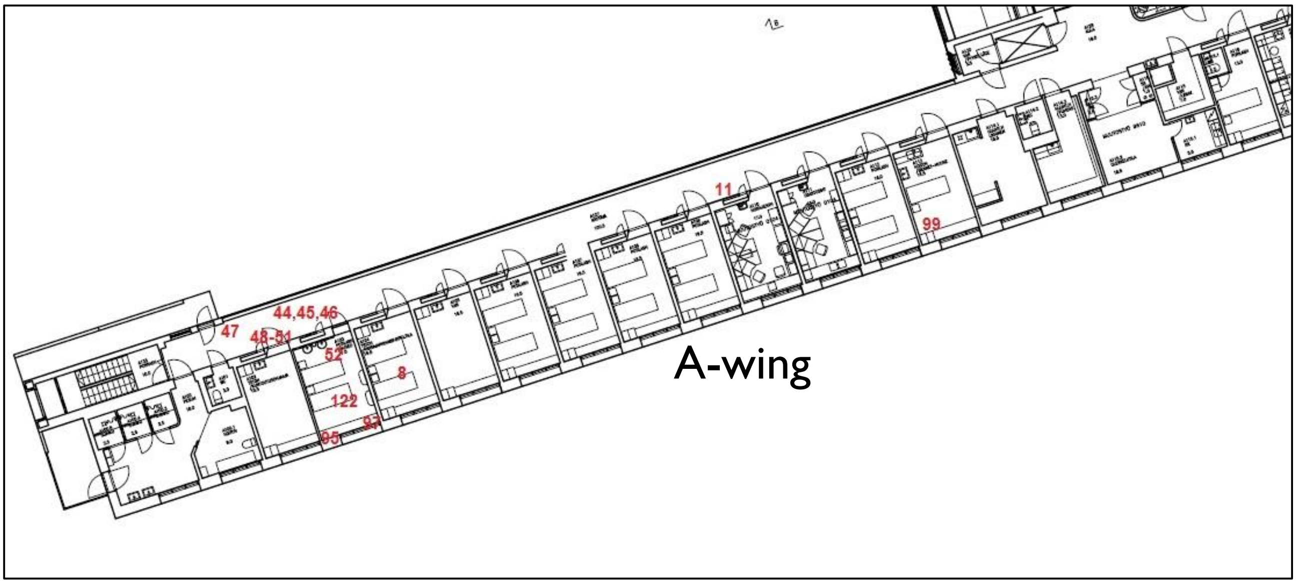
The ground floor of main building is the floor for main entrance. This is located in the courtyard and main doors point to west. Other functions besides the main lobby placed in the ground floor are surgery wing and the ward wing. Especially interesting according to the Kauria color board is the B- wing. on the north side of the building mass.



The Samples of Ground Floor

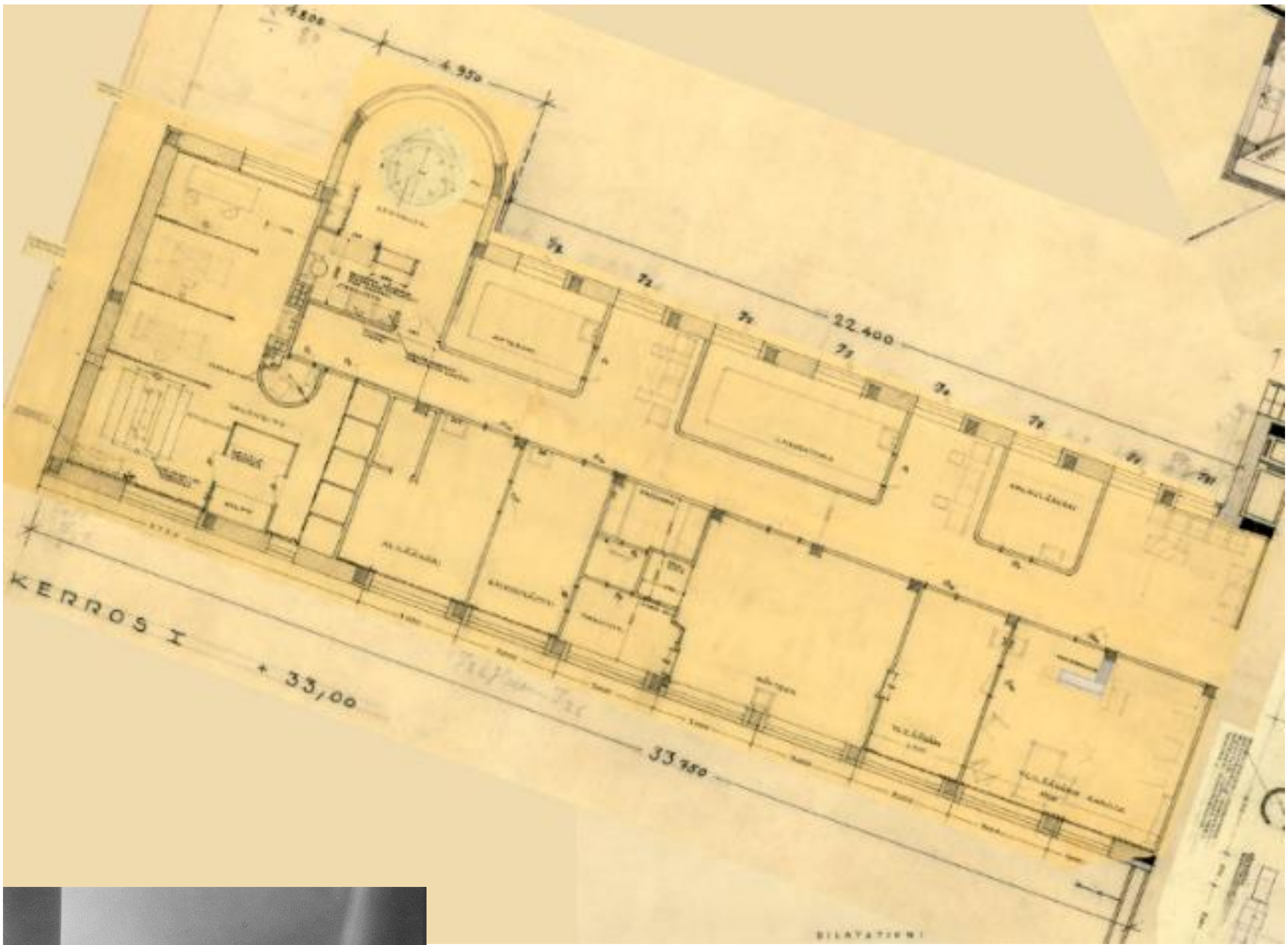



B147
PÄÄAULA
138,0m²
14
25
114
katos
MUUTOSTYÖ 0516
B149
PALVELUTILA/INFO
6,5 m²
B150
PALVELUTILA
5,0 m²
B151
APUTILA
3,5 m²

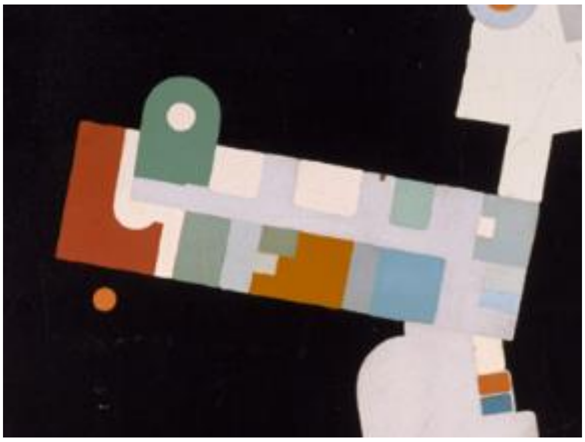

11
99
47
44,45,46
48-51
52
8
122
95
97
A-wing

5. Ground Floor B-wing

One of ground floor's most interesting areas is the wing B. This wing was not included in earlier color researches. The B wing originally accommodated the offices of Chief and Sub Physicians, X-ray room, Artificial Sun treatment room and other treatment and examinations rooms for patients, the Pharmacy and the Laboratory of the Sanatorium and of course the round shaped Operating theatre itself. The rooms of the wing are brightly colored in the fore mentioned Eino Kauria's color sample board. One interesting point of research in this wing was to see if these colors where truly found in the existing surfaces.



At the left: Main corridor of the B-wing 1933. AAM. Sign 50-003-334.. Above: The original plan. AAM. Sign.



Former Chief Physician's office

Number of Sample 5-6	**Subject** Paimio Sanatorium	**Building / Space / Surface** Main building Ground Floor Chief Physician's office Jamb of window
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

The office has been divided in two separate office spaces with a light structured wall in the 1980's. Also divided a cupboard with its own door to the hallway. Ventilation system built in 1970's, with dropped ceiling structure. New door openings. Sink in opposite corner as in the original office plan.

Photograph, drawing

Layers of Sample

00 Chalsium based Plaster

01 Oil filler, yellowish

1 Green paint, oil, 3020-G40Y

02 Filler

2 Green S3020-G20Y

3 Blue 3030-B30G

04 Base coat, Beige 1510-Y10R

4 Beige, glossy and hard finish,1010-Y10R

5 White 003-G80Y

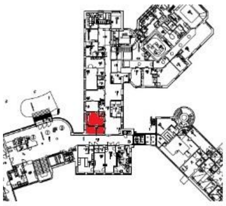
006 Coarse Filler, Grey

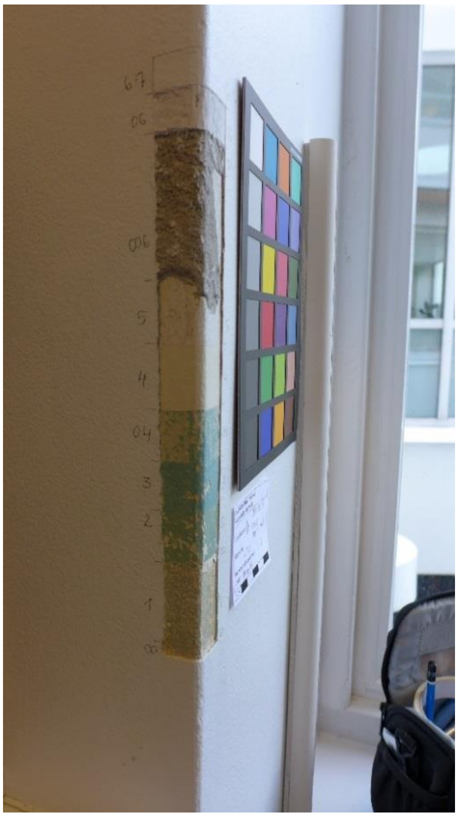
06 Light weight filler, White

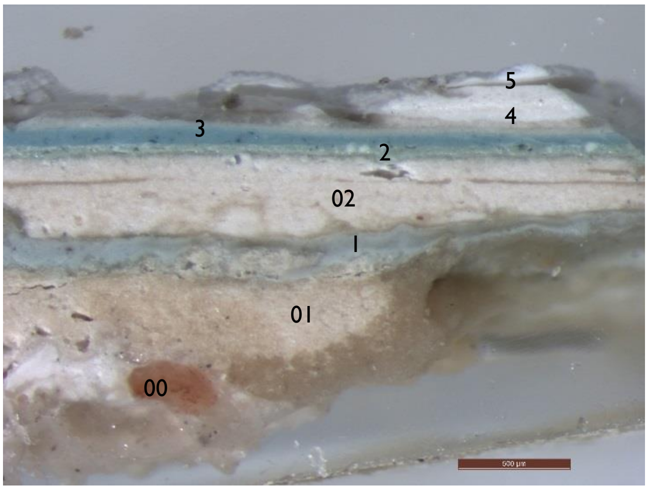
6-7 White latex, two layers

Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:
1 layer oil paint.

Most of the surfaces have been scraped clean, apparently during the 1970's renovations.

Technique used to make and take Samples, Circumstance in site, Lighting: Carved color steps on surface, crater technique, daylight + fluorescent lamps	**Color chart in use:** NCS Teknos 2004 Color codes are written without the NCS prefix.	**Type of Sample, Place of Storage:** Cross-section sample 5 and 6, Alvar Aalto Foundation Helsinki. Scale 500µm.	**Floor plan, Location of Sample** 





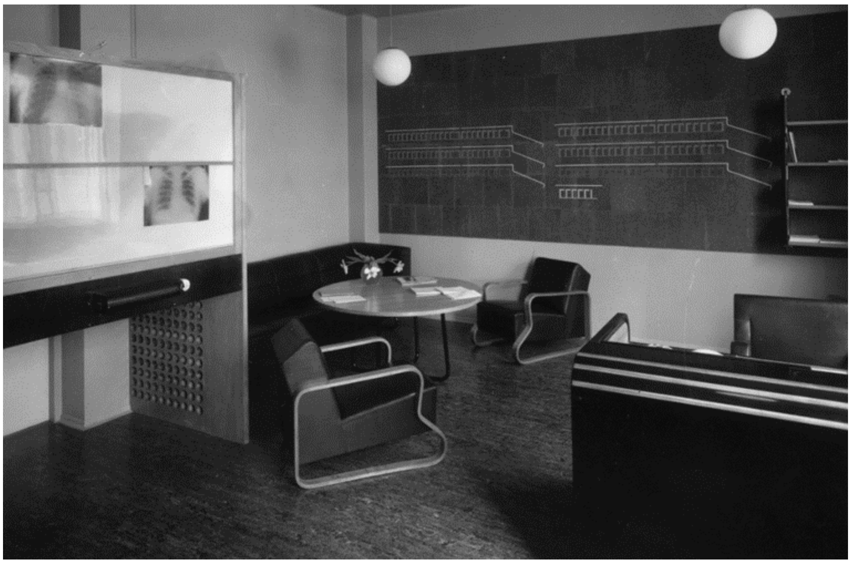
Sample no. 5 showed layers of blues and greens that are also be presented in surface excavations.
Scale 550µm.

Chief Physician's office's wall coloring in the window wall has originally been greyish green. It is highly possible that this color has turned yellow and been originally more blue as the cross section sample shows. This is not only because of paint's oily substance, but also due to that it is told that the Chief Physician was an extremely heavy smoker. Therefore due to the taring of walls and other surfaces, it is possible that the findings are shown considerably more yellow than the factual original shades.

The opposite side of this room showed some other colors. The undermost layer at the opposite side of the room was grey. The ceiling showed interesting layers, the probable original being greyish blue. It is possible that the Kauria color board was meant to mark the original blue ceiling of Chief Physician's office. Next few pages show excavations of paint layers carved to the ceiling (no. 121) and the pilaster (no. 22).

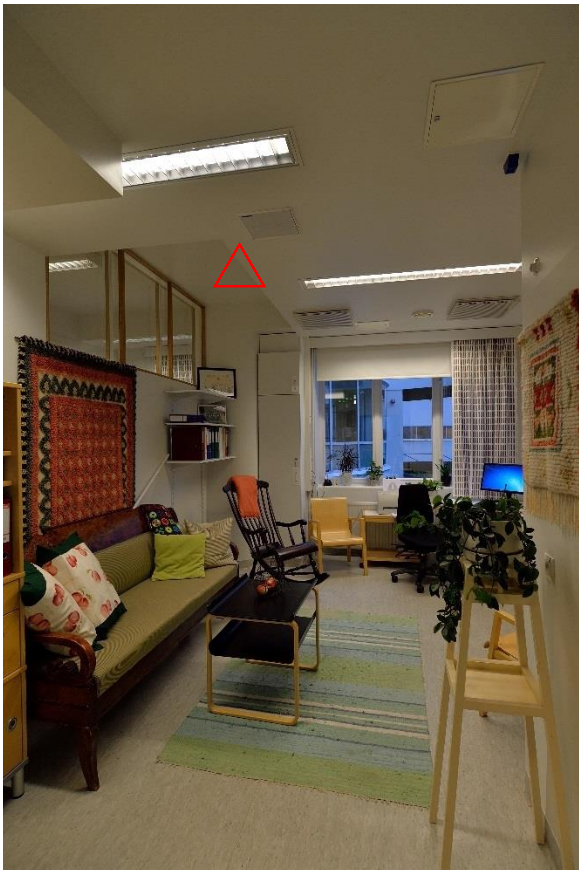
As the black and white photograph below shows, the floor of the office was covered with a linoleum flooring that had a heavy marmoleum pattern.

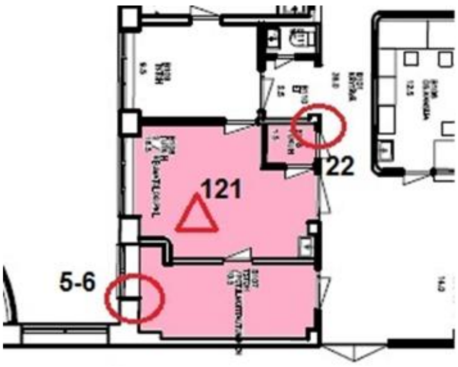
One interesting interior element also shown in the photograph below is the large panel hanging on the wall. It was made of cork according to some receipts found in the archives of the Hospital District of Southwest Finland. The painting resembling the six wards and the seventh isolation ward is painted by Eino Kauria. This was uncovered also in the archives from a receipt showing that Kauria was separately paid to do the paint job for the cork board. This board has not been found in the premises of Paimio Hospital or Hospital District of Southwest Finland.



Chief Physician's office. AAM Sign. 50-003-337.

The pilaster where sample 22 (see next page) was taken is behind the gentlemen in the picture. Notice the heavily patterned linoleum flooring. AAM Sign. 50-003-369.





Pink area resembles the size of the original office. At left: A view from the door of the other half of the divided space today. The triangle marks the spot where the ceiling excavation was made.

Number of Sample	**Subject**	**Building / Space / Surface**
22	Paimio Sanatorium	Main building Ground floor Former Chief Physician’s office (now: offices) Pilaster in the corner of the room
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

The office has been divided in two separate office spaces with a light structured wall in 1980’s. Also divided a cupboard with its own door. Ventilation system built in 1970’s, with dropped ceiling structure. New door openings. Sink in opposite corner as in the original office plan.

Photograph, drawing

Layers of Sample

00 Chalsium based Plaster

0 Oil based filler

1 Grey paint, oil 2005-B80G

2 Green paint, oil 3030-G10Y

3 Grey paint, between 2005-B20G and 3005-B20G

4 Grayish green3010-G70Y

5 Glossy, hard paint, Beige 1010-Y10R

6 White paint 0603-G80Y

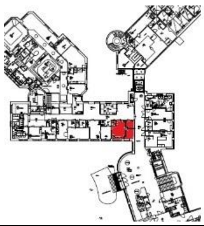
7 White latex paint

08 White, light weight filler

8 White latex

Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:
1 Öljymaali

Most of the surfaces have been stripped down, apparently during the 1970’s big renovations.
One of the pilasters showed good amount of paint layers in crater excavation of surfaces.

Technique used to make and take Samples, Circumstance in site, Lighting:	**Color chart in use:**	**Type of Sample, Place of Storage:**	**Floor plan, Location of Sample**
Carved color steps on surface, crater excavation technique, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written without the NCS prefix.	Cross-section sample 22, Alvar Aalto Foundation Helsinki	

Number of Sample	Subject	Building / Space / Surface
121	Paimio Sanatorium	Main building Ground Chief Physician’s office (now offices) Ceiling
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

The office has been divided in two separate office spaces with a light structured wall with windows in 1980’s. Also divided a cupboard with its own door. Ventilation system built in 1970’s, with dropped ceiling structure, but not covering the whole ceiling, leaving parts of it bare. New door openings.

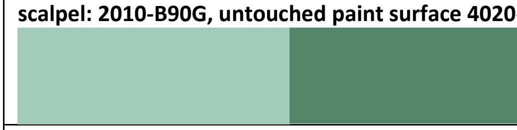
Photograph, drawing

Layers of Sample

00 Chalsium based Plaster

0 Oil based filler

1 Light turquoise/blue paint, surface scratched with scalpel: 2010-B90G, untouched paint surface 4020-G10Y



02 Filler

2 Turquoise-green paint, 4020-B90G

3-4 Light Beige paint layers 1010-Y10R

5 Beige paint 1005-Y20R

6 White

Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:
1

Technique used to make and take Samples, Circumstance in site, Lighting:	Color chart in use:	Type of Sample, Place of Storage:	Floor plan, Location of Sample
Carved color steps on surface, crater technique, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written without the NCS prefix.	Cross-section sample 121, Alvar Aalto Foundation Helsinki	

Artificial Sun Treatment Room

Number of Sample	Subject	Building / Space / Surface
19	Paimio Sanatorium	Main building Ground Floor Artificial sun treatment room (now: kitchen of staff) Jamb of window, wall
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

Former light treatment room has been divided in three office spaces. Kitchen, used by the staff from1970's. Ventilation system built in 1970's, with dropped ceiling structure. New door opening.

Photograph, drawing

Layers of Sample

00 Plaster

0 Filler

1 Greyish blue oil paint, 3020-B50G

02 Beige filler

2 Dark Beige 2030-Y10R

03 Light filler / base coat 2010-Y10R

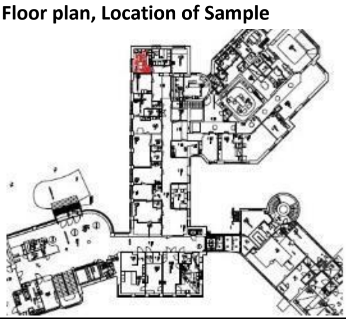
4 Beige 0510-Y10R

05 Filler, light weight, white

5 Grey Latex 2000-N

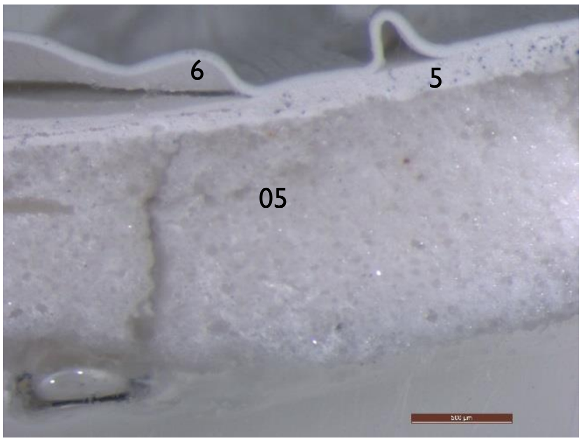
6 White Latex

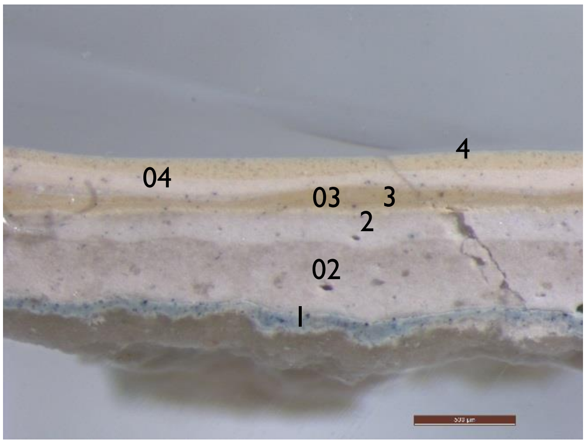
Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:
1st Layer Oilpaint
Small crater type excavations were made in the room.

Technique used to make and take Samples, Circumstance in site, Lighting:	Color chart in use:	Type of Sample, Place of Storage:	Floor plan, Location of Sample
Carved color steps on surface, crater technique, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written withouapeat the NCS prefix.	Cross-section sample 19, Alvar Aalto Foundation Helsinki. Scale 500µm.	

The artificial sun treatment room has originally had red linoleum flooring. This is stated in a document that states calculations addressing procurement of the original flooring. Unfortunately only few rooms and floorings are mentioned by the name and color. The rest are marked down only with a color code given by the flooring company. Alvar Aalto Foundation has some flooring samples from the 1930's in its collections but these sample charts do not state the exact same color codes found in the document with the procurement calculation.

The Kauria color board shows deep red color in the area of the artificial sun treatment room. This might be due to, not the ceiling, not walls, but the color of the floor. Although the black and white photograph below presents the ceiling as a very dark glossy surface. The red color often appears dark or almost black on old black and white photographs.The ceiling of the former sun treatment room showed no traces of red or orange paints of any shade.





AAM. Sign. 50-003-356

X-ray Room

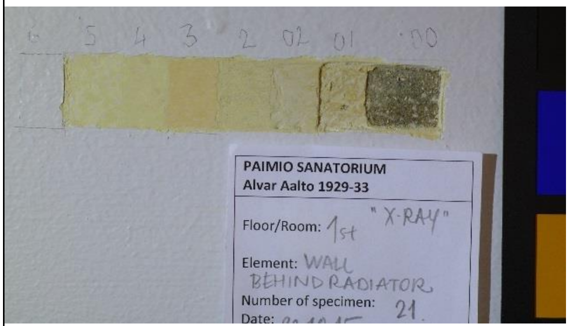
Number of Sample	Subject	Building / Space / Surface
21	Paimio Sanatorium	Main building Ground Floor X-ray room (now: offices) Under window. wall + the ventilation valve

Architect, building year	Researcher, date
Alvar Aalto, 1929-33	Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation

Most significant repairments and changes of the space, dates

Former X-ray room has been divided in one office and two cupboard spaces. Ventilation system built in 1970's, with dropped ceiling structure. The ceiling has been sand buffed, only raw concrete surface is visible over the dropped ceiling structure. New door openings.

Photograph, drawing



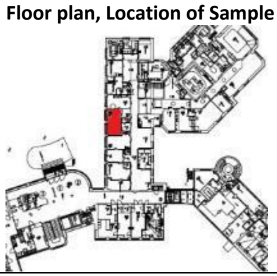
(Sample includes already existing hole in surface.)

First sample. Layers of Sample of Wall behind radiator
00 Plaster
0 Filler
1 (Base coat?) Beige 1515-Y10R
2 Dark Beige paint 0520-Y30R
3 Light yellow paint 1015-Y
4 Light yellow 0507-Y
5 White

Second sample: Colors on Ventilation valve
00 Iron valve
01 White base coat
1 Orange 3060-Y30R
2 Yellow 1510-Y10R
3 White latex

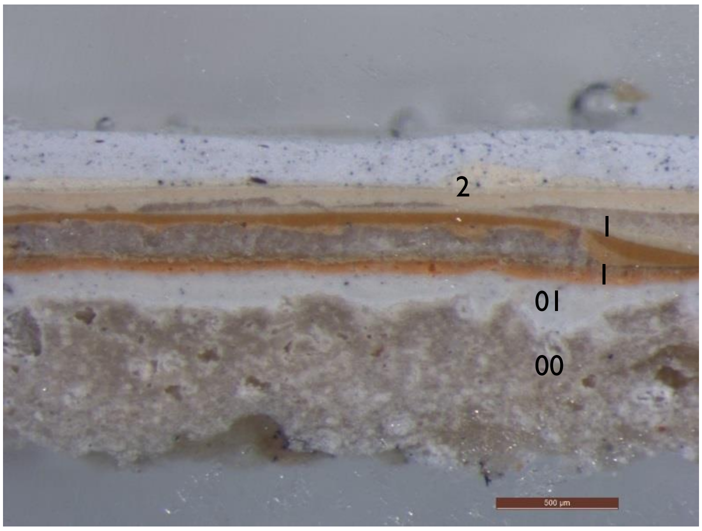
Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:
1 Öljymaali

As the space has clearly been sand buffed (ceiling especially)

Technique used to make and take Samples, Circumstance in site, Lighting:	Color chart in use:	Type of Sample, Place of Storage:	Floor plan, Location of Sample
Carved color steps on surface, crater technique, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written without the NCS prefix.	Cross-section sample 22, Alvar Aalto Foundation Helsinki. Scale 500µm.	

The X-ray room's original look. The orange color was found under the window (at the left in the picture). AAM Sign.50-003-371.

X-ray room's wall coloring was bright orange, just as the Kauria color board insinuates. It is possible that more than one color was used, as the photo above shows differences of gloss and darkness of surfaces. Ceiling has apparently been treated with glossy, enamel-type oil paint. If there was a certain function for this unusual color of orange due to X-ray technique i.e. is not known.



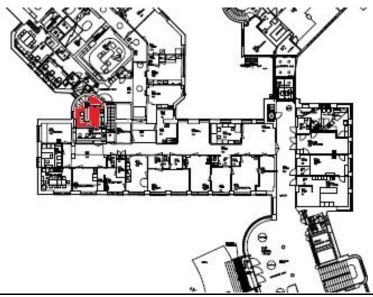
The cross section sample no.22 taken from the wall shows the orange layers.

Operation Theatre

Number of Sample	Subject	Building / Space / Surface
	Paimio Sanatorium	Main building Ground Floor Operation theatre Ceiling window
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

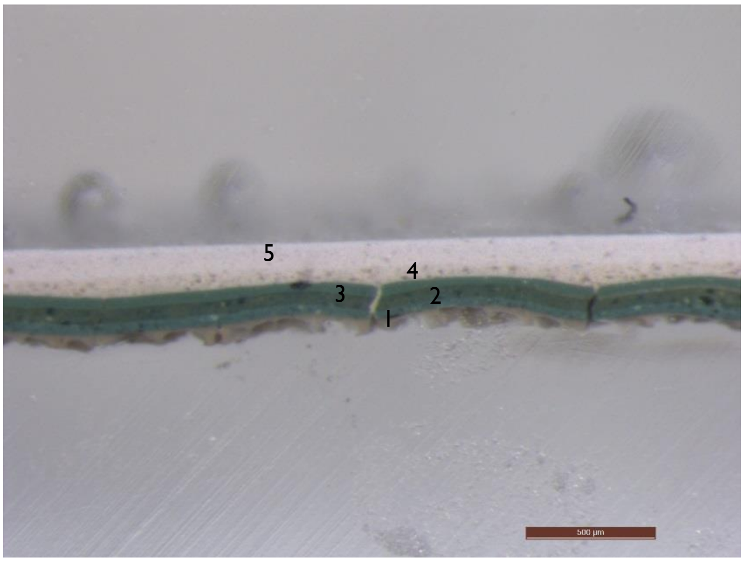
Most significant repairments and changes of the space, dates
Former operation theatre is being used as an archive by the present tenant.

Photograph, drawing	First sample. Layers of Sample of Wall behind radiator
	**00 Metal**
	01 base coat
	1 Green 3040-B90G
	2 Green
	3 Light yellow
	4 White
	5
Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:	

Technique used to make and take Samples, Circumstance in site, Lighting:	Color chart in use:	Type of Sample, Place of Storage:	Floor plan, Location of Sample
Carved color step on surface, crater technique, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written without the NCS prefix.	No sample	

The operation theatre has had the classic "surgical" green paint as its three first layers. This green is shown in the original ceiling window, the walls, and the original round radiator in the back part of the theatre. The window wall on the left side of the room (not showing) had white and cream white layers.

AAM. Signum 50-003-376



Sample 17 shows the undermost layers of green. The first layer seems to be a blueis, teal kind green.

6. Ground Floor - Entrance Hall

The main lobby of Paimio Sanatorium has gone through several changes. One of the major changes is the change from original front desk to a curved glass cubicle 1958. The change was designed by Alvar Aalto's office. The two elevators have been renewed. The original elevators stood side by side, the structure was a see-trough glass-walled shaft. It has been said in a patient statement that one of the elevators was colored red. This was maybe to mark the line of passage for different types of users. All the traces of these color coded elevator cars have been lost during the renovations. The elevator's original technical space at the roof in 6^{th} floor does neither give any hints of color. The Kauria color board marks the elevators bright red and bright blue. The samples and small excavations made in the main hall gave little new information to the facts one can see in the coeval photographs taken after the completing of main building. The ceiling is relatively lightly colored, as the pilasters stand out white and glossy. The main doors seem dark and the cheeks of the doors are light and glossy, as nowadays these cheeks are painted black.

Main hall with the original flooring and front desk. No draught lobby was built at this stage. Below is the current status of the Main lobby. Notice how the light does not pass through the Ground floor ward through the ward doors due to some change, leaving the back part of the lobby dark. AAM Sign. 50-005-308.

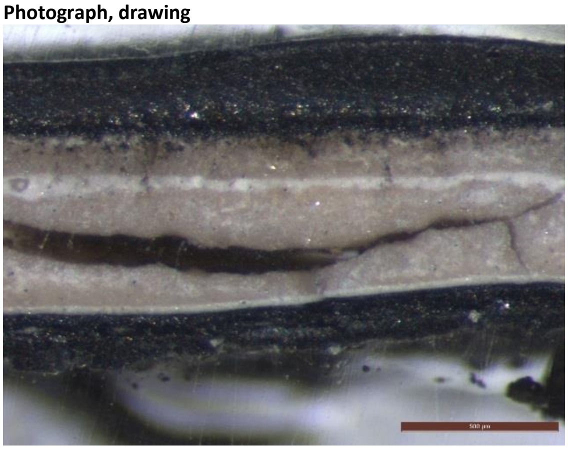
Draught Lobby

Number of Sample	Subject	Building / Space / Surface
25	Paimio Sanatorium	Main building Ground Floor Entrance hall Draught lobby (between outer and inner main doors)
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

Draught lobby was built 1958 as the inner doors were added. At the same time the front desk was replaced.

Photograph, drawing



Layers of Sample

00 Plaster

0 Filler

1 Black paint

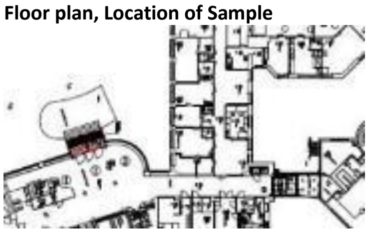
2 Light beige or white

3 Thick filler

4 Black paint

5 Black paint

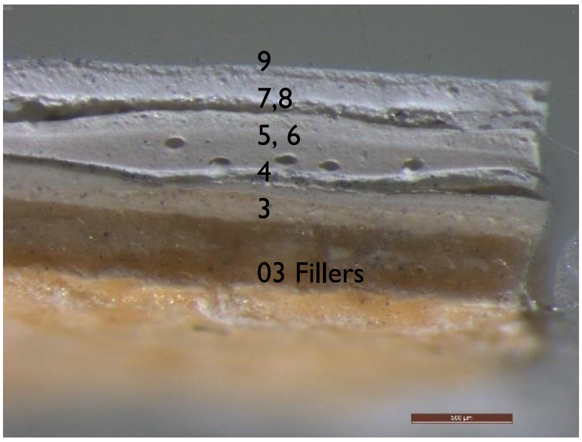
Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis

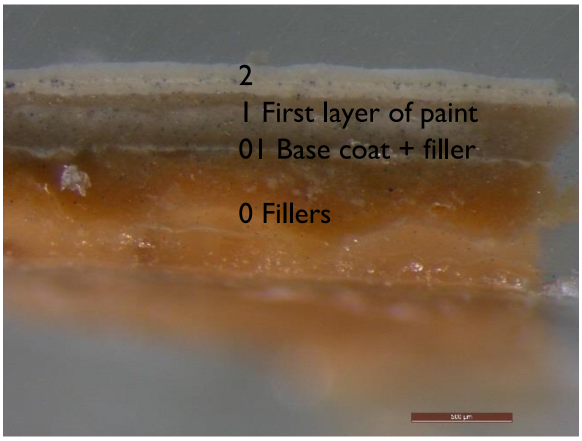
Technique used to make and take Samples, Circumstance in site, Lighting:	Color chart in use:	Type of Sample, Place of Storage:	Floor plan, Location of Sample
Carved color steps on surface, crater technique, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written without the NCS prefix.	Cross-section sample 25. Alvar Aalto Foundation Helsinki. Scale 500µm.	

The entrance hall and drought lobby today.

Entrance Hall's Ceiling, Sample 114

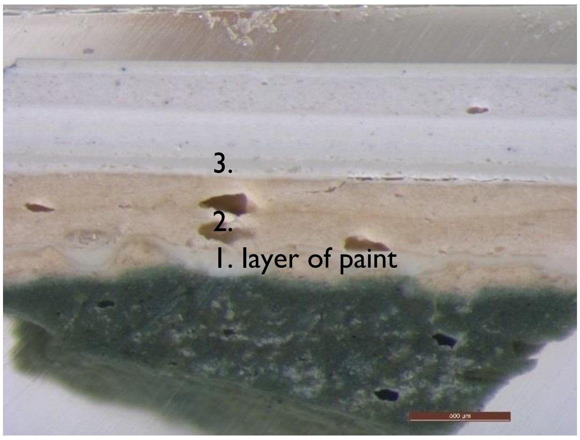
The ceiling of the hall showed only light color shades so no actual excavation was done. The ceiling has always been painted with light shades like white and beige. This is shown on the cross section sample no.114 seen below. The sample was broken in half: above is the surface and the latter the bottom.





The Column in the entrance hall, Sample 14

The original pilasters of the hall were originally glossy and colored with a light shade. This is their look also today. Below is the cross section sample no. 14 taken from the left pilaster (from the main doors). It shows light beige and white layers of fillers and paints and a first layer of green filler. The receipts found in the archives of Hospital District of Southwest Finland tell about a certain "Yedda" brand enamel paint that was bought for the building site of Paimio hospital. Objects like these columns where possible subjects for the use of these kinds of heavy duty paints like Yedda enamel paint.



7. First Floor Ward – A Wing

Each ward from the ground floor to fifth have all had their own distinguished coloring. Three colors were divided between six floors, the first being orangey ochre. The first floor wing's ochre wall is the ward-long wall that is the background for the doors leading to the rooms for patients. These walls are colored in vibrant tones through the whole patient wing, from first to the sixth floor. The Seventh floor and the Basement floor have been neutrally colored. The opposite wall with the windows was colored with whites and window sills treated with a glossy finish. The original doors leading to patient rooms were lacquered showing the pattern of wood. They have been replaced with broader doors. Originally the floors were covered with green linoleum.

One of the wards (probably sixth according to the view from window). The wall with doors was painted in rich a tone and the outer wall in neutral color of off white. Below is a view today from the sixth floor ward to the opposite direction. Notice the built in structure in the ceiling for the purpose of hiding ventilation systems and electricity cords, dating to the 1970's. AAM. Sign. 50-003-328

The ceiling of the corridor has originally been white but as seen in the picture above, there is was a diagonal molding in the corner of the colored wall and ceiling. This molding was painted with the same color as the wall. In Eino Kauria's color board the wards are marked with three colors, ochre, blue and green.

Ward, Main Hallway

Number of Sample 11	**Subject** Paimio Sanatorium	**Building / Space / Surface** Main building 1st Floor A-wing, ward's main corridor Wall with doors
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

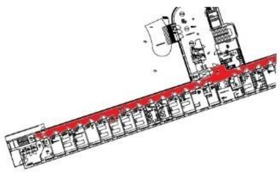
Most significant repairments and changes of the space, dates
1970's ventilation system brought casing of the pipes and electric cords in the ceiling. Doors and their sizing has changed, broader painted wooden doors have replaced the original wooden doors with lacquered surfaces. The lighting and fixtures have also been replaced.

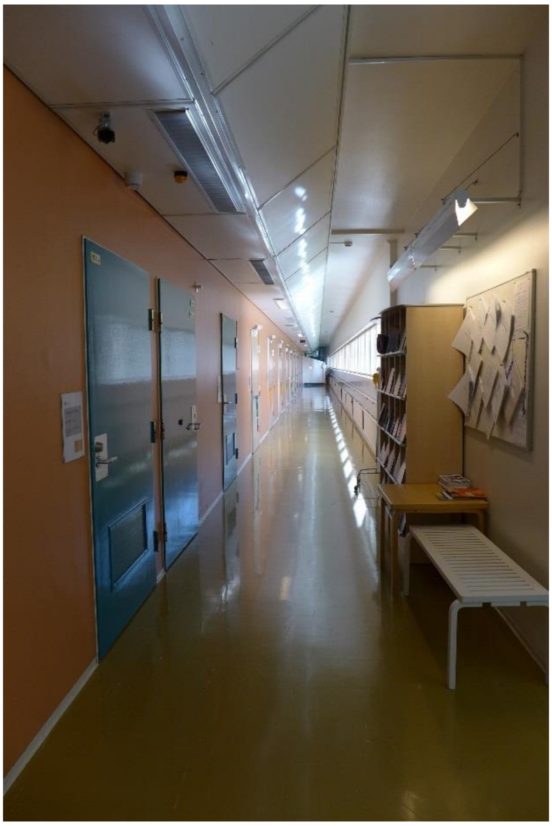
Photograph, drawing

Layers of Sample

- **00 Plaster**
- **01 Beige filler**
- **1 Ochre S2050-Y30R**
- **2 -3 Reddish browns 3020 – Y40R**
- **4 Brown 3030-Y20R**
- **5 Reddish dark brown 4020-Y60R**
- **6 Brown 4030-Y30R**
- **07 White light weight filler**
- **7 Red 3020-Y60R**
- **8 Orangey red 2040-Y60R (nearest possible shade)**

Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:
1st layer is oil based paint.

Technique used to make and take Samples, Circumstance in site, Lighting: Carved color steps on surface, crater technique, daylight + fluorescent lamps	**Color chart in use:** NCS Teknos 2004 Color codes are written without the NCS prefix.	**Type of Sample, Place of Storage:** Cross-section sample 11, Alvar Aalto Foundation Helsinki. Scale 1mm.	**Floor plan, Location of Sample** 



The main hall way of ground floor ward is today painted with somewhat the same tone as it originally was according to the findings. The ceilings have been white and the flooring dark linoleum with light colored heavy pattern. The doors were originally veneered and lacquered.

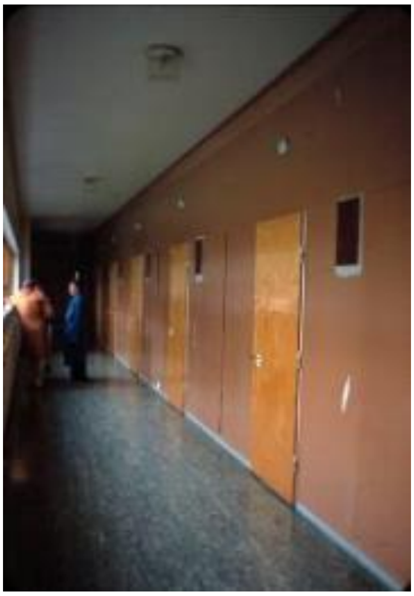
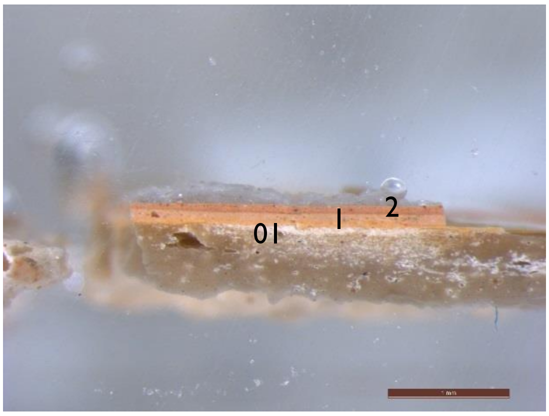


Photo: Av 5375_26. The status of one of the wards before the 1970's renovation. Notice the color and pattern of the linoleum flooring.

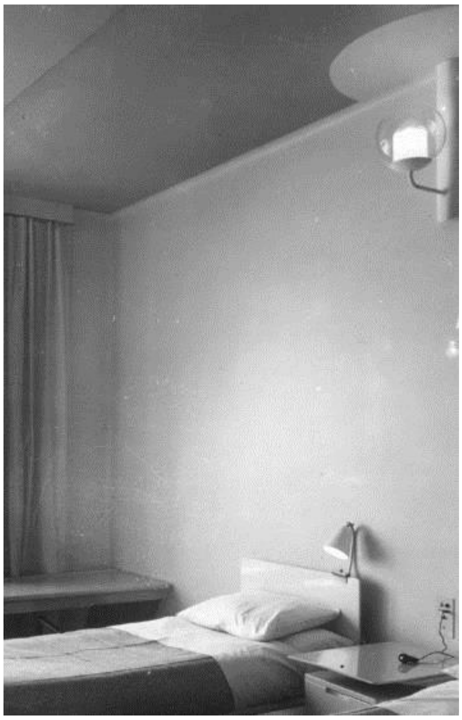


The cross section sample no. 11 taken from this ochre wall, broke into three parts. The bottom picture of this sample shows the undermost plaster, the middle one shows the original base filler as a brown layer, the white base coat and the first two orange paint layers. The surface is presented in the top picture where a light weight white filler layer is visible.

8. Ground Floor Patients' Room

The patients' rooms have gone through many changes during past centuries, mostly because of developing hospital technology and changing standard of care. The patients' rooms' all wall surfaces have been changed to plastered, painted surfaces as originally the left wall of the room was covered with Enso card board treatment with its own recognizable pattern. The ceiling has lost its unusual original heating system, the ceiling radiator. The ceilings are now smooth and painted in vibrant green color. The door way and door itself have been changed to a broader model to allow the patient bed rolling trough. All HVAC-systems have been modernized as well. The furniture has been changed, leaving only the table board by the window in some rooms. Luckily some original furniture has been stored in the hospital storages and is there to be researched in the future. Flooring of the room was originally linoleum. The color of it is not known. The Kauria color board marks four different colors for the ceilings. The Kauria board shows the round white area in the ceiling marking the spot for the lamp, seen below in the white and black picture.

The walls of patients' rooms today throughout the wards show very few paint layers, only two or three layers including the modern light weight fillers. No excavations, except forsmall were made on these walls and samples were taken only from the window wall that showed light colored results like whites and beige paints.



AAM. Sign. 50-003-

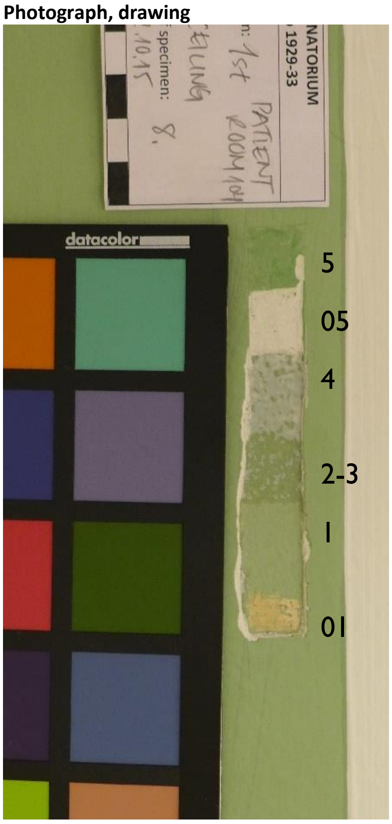
Patients’ Room Ceiling

Number of Sample	Subject	Building / Space / Surface
8	Paimio Sanatorium	Main building Ground Floor Patients’ room, 4th from West Ceiling
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

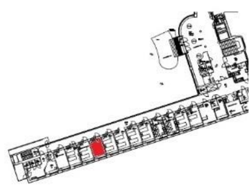
Patient rooms have been fully renovated during 1970’s as the hospital technique (i.e. different types of gases) and all of the surfaces, HVAC-technique and furniture were redone. Original ceiling radiators were removed and ceilings painted, but not hidden under dropped ceiling structures. Wallcoverings and flooring were replaced. Original furniture was removed.

Photograph, drawing

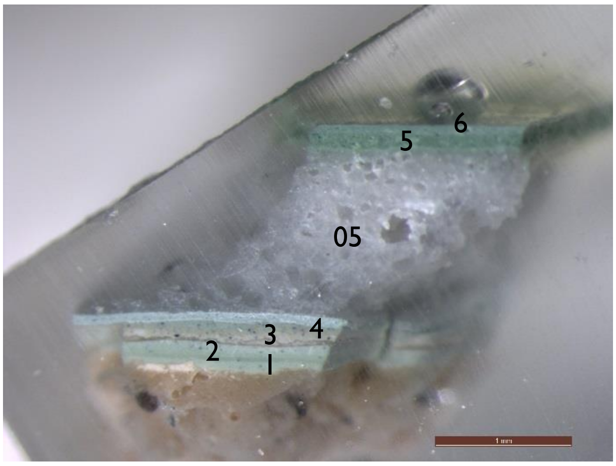


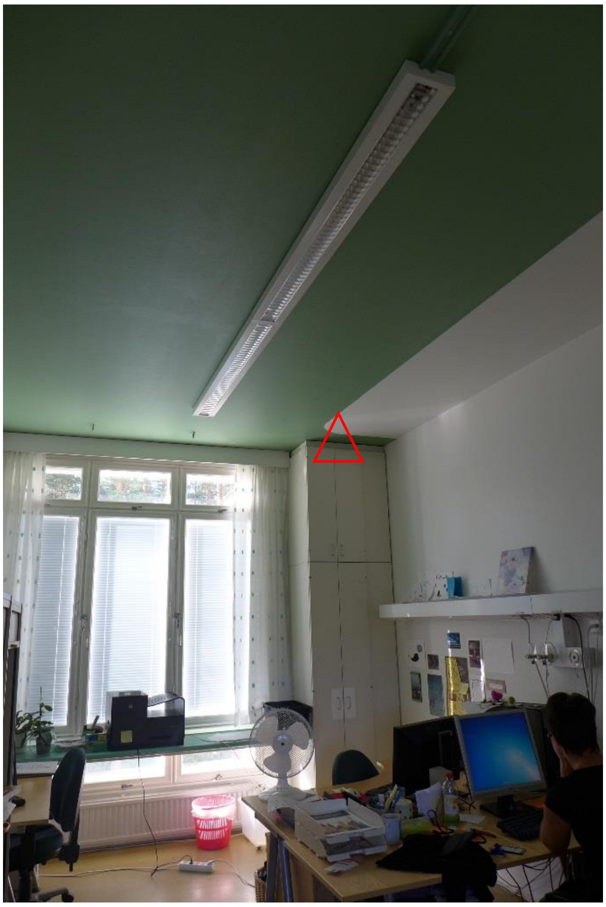
Layers of Sample
00
01 Yellowish filler
1 Green 2020G10Y
2-3 Green 4010-G10Y
4 Light blue 2020-B60G
05 White light weight filler
5 Green 4040-G10Y
6 Green 2020-G10Y

Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:

Technique used to make and take Samples, Circumstance in site, Lighting:	Color chart in use:	Type of Sample, Place of Storage:	Floor plan, Location of Sample
Carved color steps on surface, crater technique, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written without the NCS prefix.	Cross-section sample 8, Alvar Aalto Foundation Helsinki. Scale 1mm.	

The Ground floor ward's patient room's ceilings have had a light green original coloring. The green is shown in the cross section sample no. 8 below.





9. Ground Floor - Museum Room

The museum room has been built in one of the ground floor ward's patients' room. The room is a 1970's interpretation of an original patients' room interior with its furniture and the original heating system in the ceiling. The coloring of the room seems not to be factual original coloration when compared to the excavations of surfaces made in the year 2000 color research by Katja Aaltonen.

One of the patients' rooms of the upper floors. AAM.Sign. 50-003-360.

Number of Sample	Subject	Building / Space / Surface
52	Paimio Sanatorium	Main building Ground Floor A wing Museum room (former patient room left untouched in the 1970's renovation) Jamb of door (cheek of door)
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

Patients' rooms have been fully renovated during 1970's but this Museum room was left to resemble the original 1930's look of a patient room. No hospital technique (i.e. different types of gases) or surfaces, HVAC-technique or furniture were redone. Original ceiling radiator was left (still functioning) and ceiling painted. Wallcoverings and flooring were left as they were, a Enso-cardboard covering on one wall and linoleum flooring. Original furniture and light fixtures were put to place.

Photograph, drawing

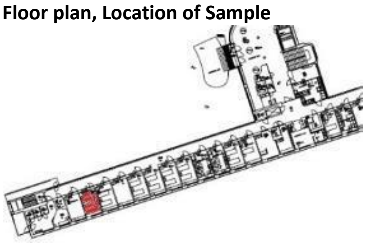
THIS EXCAVATION WAS MADE DURING ANOTHER RESEARCH YEAR 2000 (Katja Aaltonen).

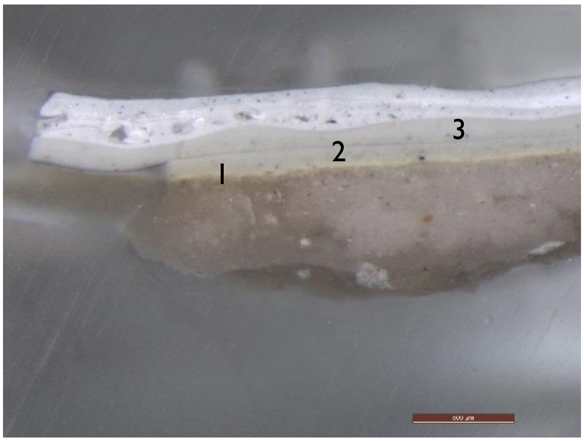
Layers of Sample

Layers of Sample
00 Plaster
0 Filler
01 Yellow paint, base coat?
1 Grey paint S1005-G75Y
2 White paint S0505-G60Y
3 White S0601-Y21R
4 S0500-N

Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:

1 Öljymaali

Technique used to make and take Samples, Circumstance in site, Lighting:	Color chart in use:	Type of Sample, Place of Storage:	Floor plan, Location of Sample
Carved color steps on surface, crater technique, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written without the NCS prefix.	Cross-section sample 52, Alvar Aalto Foundation Helsinki. Scale 500µm.	

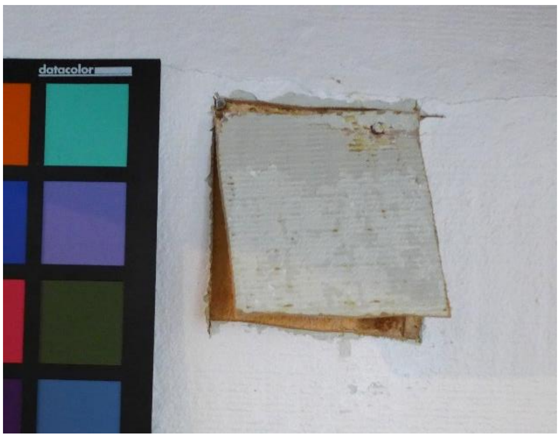


The cross section sample no. 52 from the cheek of the door way of museum room is showing little paint layers and all of them white or beige. The excavation was made on the jamb of the door by Katja Aaltonen already in year 2000. The cross section sample was taken for this report 2015.

The Enso Card Board Wall Treatment

Enso card board was a Finnish wall treatment that was easy to apply and which gave instantly smooth paintable surfaces. It had its own distinctive texture that can be seen in the pictures below. The museum room wall's card board is the last fragment of Enso board in Paimio. Katja Aaltonen made an excavation on the wall board of museum room during the year 2000 research to define the original colors of the wall.

The undermost color was S1005-G30Y, a greenish grey.



Enso card board fragment excavated in Museum room in the year 2000 research.

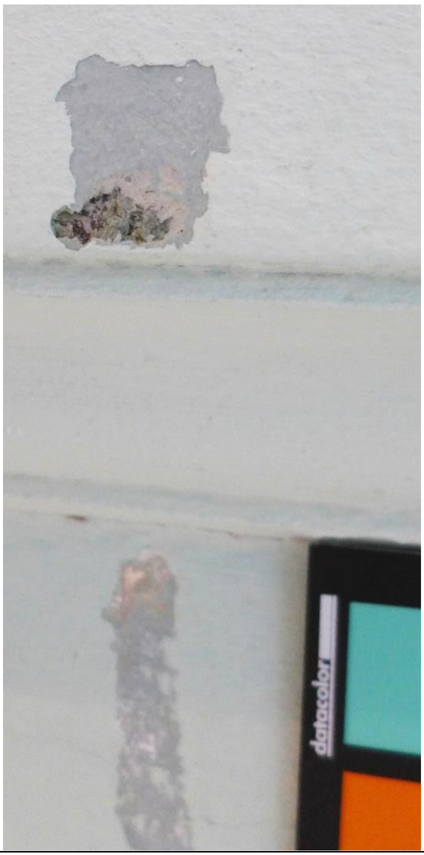
Enso card board advertisement-type photograph taken during the Paimio Sanatorium building project. AAM Sign. 50-003-345.

Museum Room Ceiling

Number of Sample	**Subject** Paimio Sanatorium	**Building / Space / Surface** Main building Ground Floor A-wing Museum room (former patients' room left untouched in the 1970's renovation) Ceiling + Radiator
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

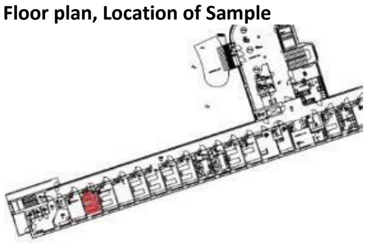
Most significant repairments and changes of the space, dates

Patient rooms have been fully renovated during 1970's but this Museum room was left to resemble the original 1930's look of a patient room. No hospital technique (i.e. different types of gases) or surfaces, HVAC-technique or furniture were redone. Original ceiling radiator was left (still functioning) and ceiling painted. Wallcoverings and flooring were left as they were, a Enso-cardboard covering on one wall and linoleum flooring. Original furniture and light fixtures were put to place.



Layers of Sample
00 Plaster
01 base coat
1 Green S3010-G40Y
2 Green S4010-B70G
3 Light pink
4 Grey
5 Light green

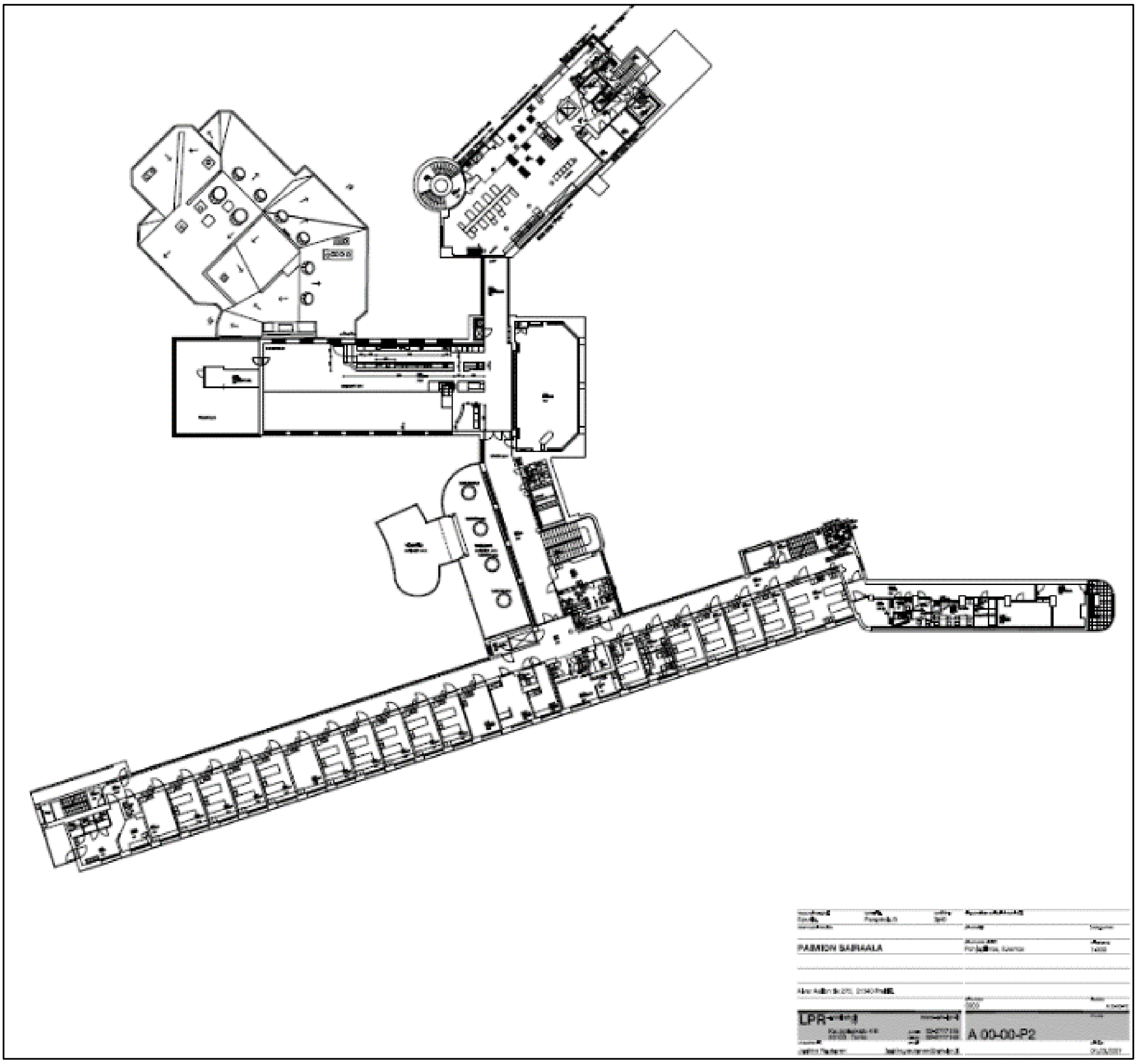
Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:

Technique used to make and take Samples, Circumstance in site, Lighting:	**Color chart in use:**	**Type of Sample, Place of Storage:**	**Floor plan, Location of Sample**
Carved color steps on surface, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written without the NCS prefix.	-	

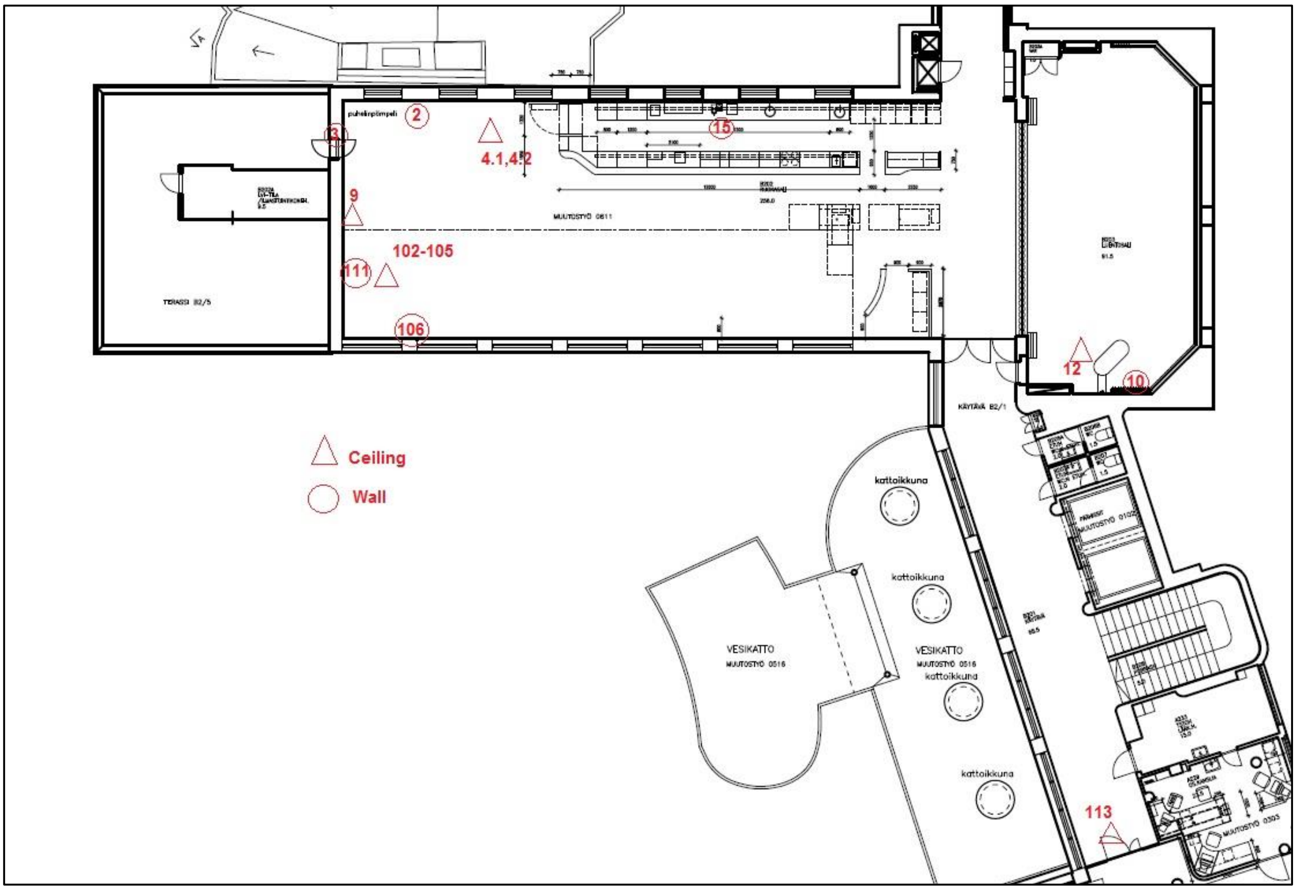
10. 1st Floor – A General View

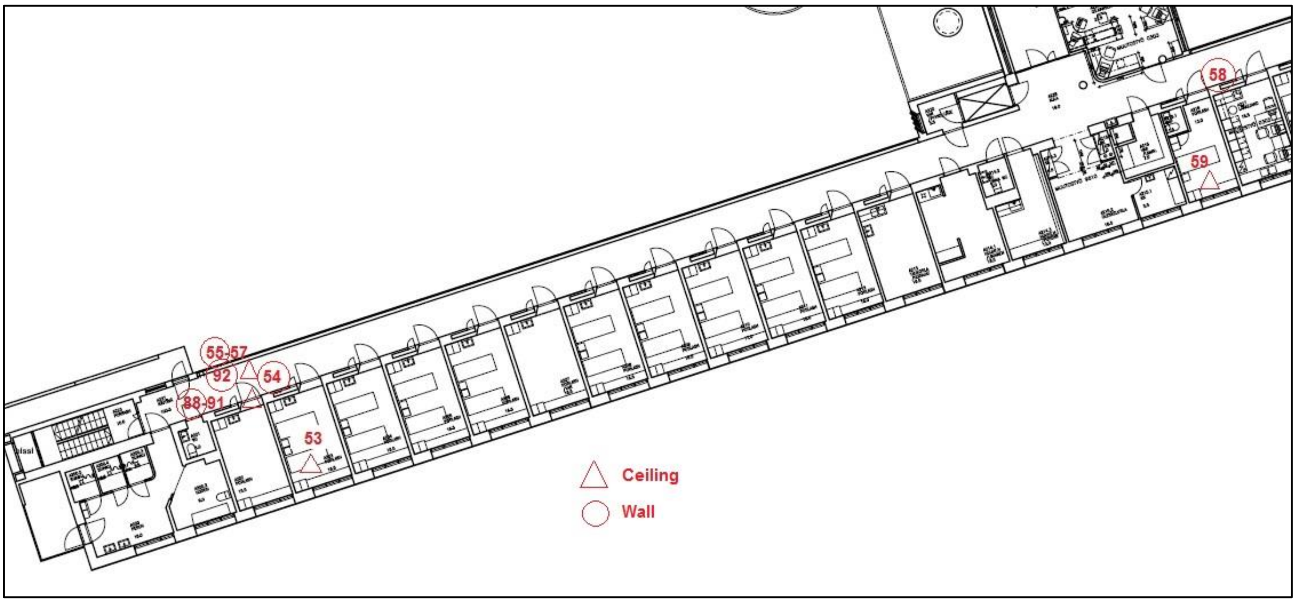
The first floor has many interesting spaces such as the dining hall and the lounge next to it. The dining hall is one of the most valued interiors in Paimio main building as it has kept its atmosphere, furniture and some of its coloring through years of changes in the hospital.

The first floor ward is similar to the first floor by its division and type of spaces and surfaces, but the general look is different compared to 1st floor due to the green wall of the ward hall way.



First Floor Samples





11. The Dining Hall

The Dining hall space is vertically divided in two heights, as the half of the hall has a lowered ceiling with original ceiling radiators and the other half of it rises to almost 6 meter heights. The lowered ceiling is now brightly colored with glossy paint treatment, just as it was originally, according to the black and white photographs. Gold painted convex domes adorn the dropped ceiling with round lamps hanging from them. The high ceiling is painted matt white with supporting beams breaking it into sections.

The low wall under the radiators has originally been white or light beige in color. That is also the color of the vertical beams, columns that divide the large windows on the opposite wall. Windows have original steel case frames that have probably been sandblasted in past renovations as they bore just three layers of paint, base included. The original furniture, the dining tables and chairs are still in everyday use, thanks to the rigorous maintenance work of the Paimio Hospital maintenance staff. The chairs have originally been treated black.

The flooring of the hall was rubber with heavy a pattern with a look familiar from marmoleum floors.

At the left the dining hall. AAM. Sign.50-003-339. Below at the left ceiling with ceiling radiators. AAM- Sign. 50-003-397. Below right a Christmas celebration in the dining hall in the 1970's. The original floor color is visible in the picture. AAM.

Ceiling Radiator's Lining

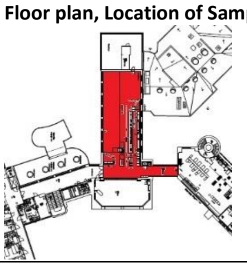
Number of Sample 4.1	**Subject** Paimio Sanatorium	**Building / Space / Surface** Main building 1st Floor Dining hall Ceiling radiator, dark color rim lining the radiator
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

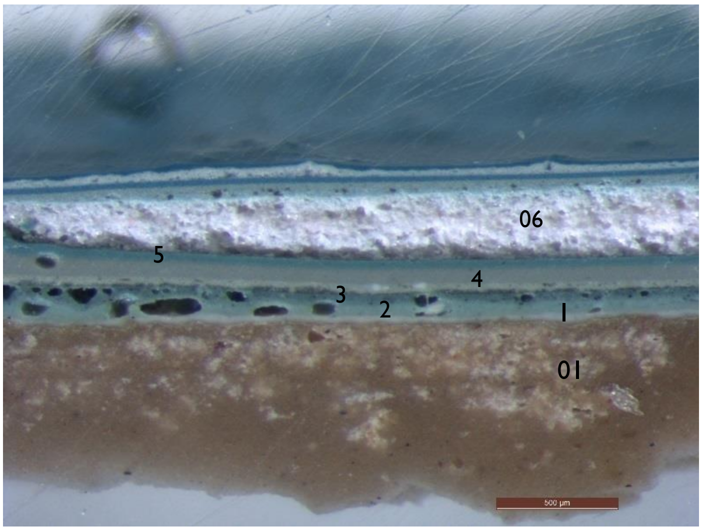
Most significant repairments and changes of the space, dates

The counter desk for distributing food 1970's. Vinyl flooring 1970's. Window frames have been treated (sandblasted?) during 1948 renovation (repair and paint instructions dating 1948).

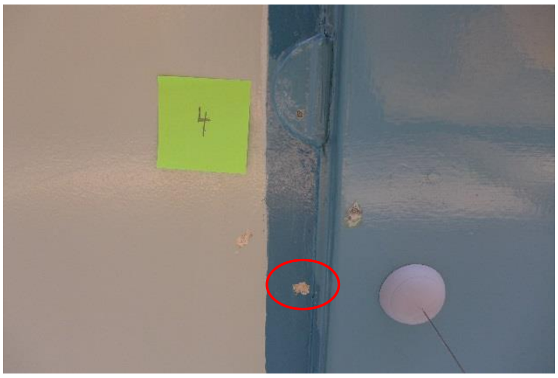
Photograph, drawing	Layers of Sample
	**00 Iron (Radiator)**
	01 Filler
	1 Dark green paint 6020-G10Y or 6020-G
	2
	3
	4

Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:

Technique used to make and take Samples, Circumstance in site, Lighting:	**Color chart in use:**	**Type of Sample, Place of Storage:**	**Floor plan, Location of Sample**
Carved excavations on surface, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written without the NCS prefix.	Cross section sample 4.1. Alvar Aalto Foundation, Helsinki. Scale 500µm.	



Cross section sample no. 4.1. from the dark color rim surrounding the ceiling radiators.



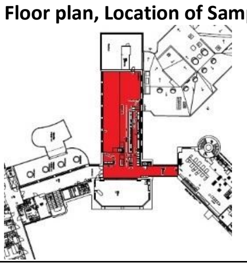
Ceiling Radiator

Number of Sample	Subject	Building / Space / Surface
-	Paimio Sanatorium	Main building 1st Floor Dining hall Ceiling radiator
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

The counter desk for distributing food 1970's. Vinyl flooring 1970's. Window frames have been treated (sandblasted?) during 1948 renovation (repair and paint instructions dating 1948).

Photograph, drawing	Layers of Sample
	**00 Iron (Radiator)**
	01 Filler
	1 Dark green paint 6020-G10Y or 6020-G
	2 Light green paint 2030-G30Y (or white base coat that has had colorization from the 3rd layer?)
	3 Dark Green 7010-G10Y
	4
Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:	

Technique used to make and take Samples, Circumstance in site, Lighting:	Color chart in use:	Type of Sample, Place of Storage:	Floor plan, Location of Sample
Carved excavations on surface, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written without the NCS prefix.	-	

Dropped Ceiling

Number of Sample 4.1	**Subject** Paimio Sanatorium	**Building / Space / Surface** Main building 1st Floor Dining hall General coloring of the dropped ceiling
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

The counter desk for distributing food 1970's. Vinyl flooring 1970's. Window frames have been treated (sandblasted?) during 1948 renovation (repair and paint instructions dating 1948).

Photograph, drawing

Layers of Sample

00 Plaster

01 Filler

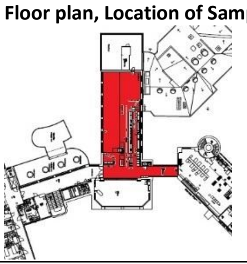
1 Greyish green paint 4010-G50Y

2 Light green paint 2030-G30Y (or white base coat that has had colorization from the 3rd layer?)

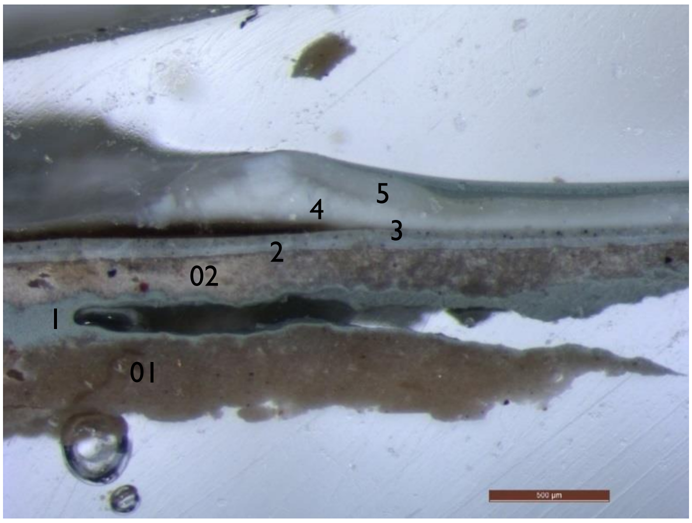
3 Dark Green 7010-G10Y

4

Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:

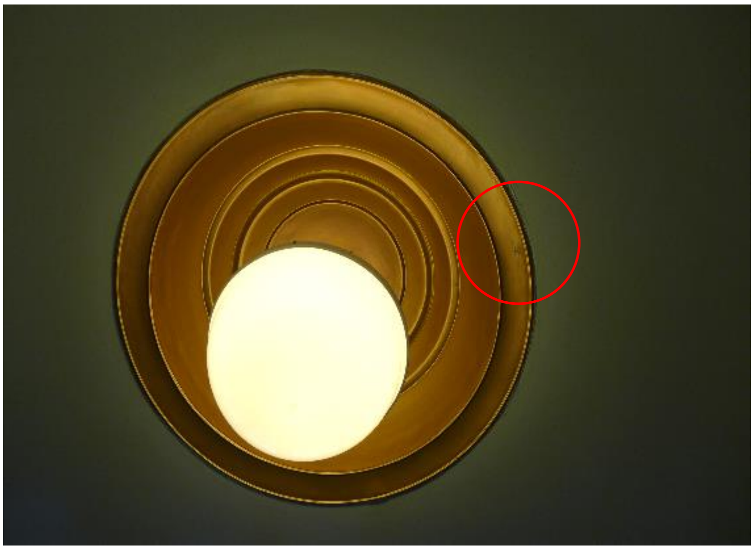
Technique used to make and take Samples, Circumstance in site, Lighting:	**Color chart in use:**	**Type of Sample, Place of Storage:**	**Floor plan, Location of Sample**
Carved excavations on surface, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written without the NCS prefix.	Cross section sample 4.1. Alvar Aalto foundation. Scale 500µm.	

The cross section sample no. 4.1 show few layers as the first paint layer on the sample is light green. The original high gloss finish of the ceiling is shown below.



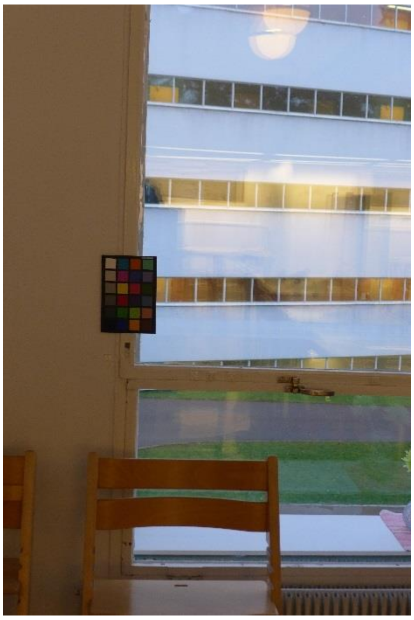
Lamp Domes of the Dining Hall

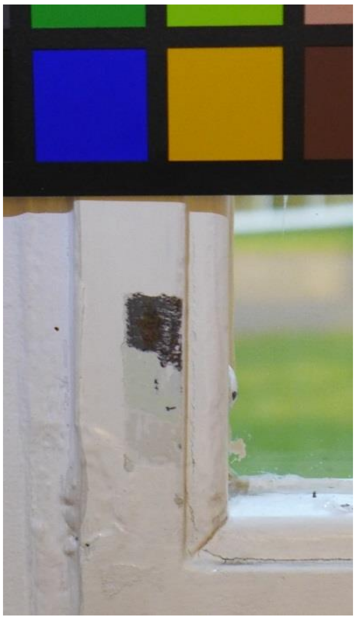
The golden lamp domes of the dining hall have been painted with gold paint. Domes have only three layers and two of them gold paint. One dome already had an excavation spot from the year 2000 color research. These results were confirmed with new small research spot.



The Window Frames of Dining Hall

The iron window frames have apparently been sanded clean in the 1948 renovation. This is a shown in the written order given to the painters at the time. It is highly possible that the window frames have been sand blasted again some times after 1948 renovation, due to their material, iron. The excavation from year 2000 showed only three layers + the newest white paint, the bottom one being base coat for metallic materials.



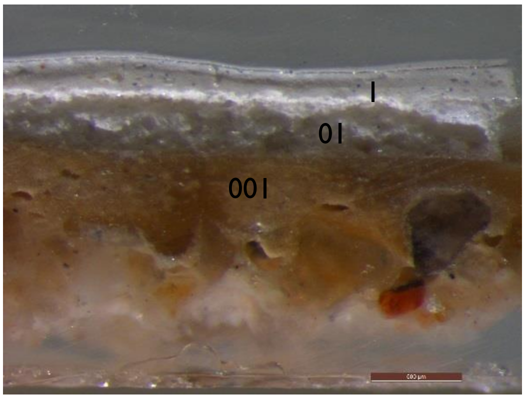


The Walls of Dining Hall

The small craters excavated and the cross section samples showed that the walls have had a neutral coloring through its history. The year 2000 color researcher Katja Aaltonen had made one large excavation on the north wall (the low wall under dropped ceiling). This excavation has deteriorated during 15 years so corfirmations were therefore made. The excavation shows neutral tones of white, beige and light green color.

The Dining Hall Ceiling, Samples 102, 104, 105

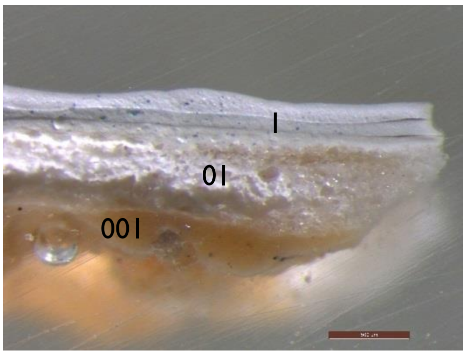
The high section of the dining hall ceiling rises to almost 6 meters and is divided with supporting concrete beams. The black and white photos stating the original coloring, show that there has not been any other original coloring then white. To see if the beams had had any other coloring in any other point in history, cross section samples were taken from the ceiling and its beams. No such results were found in the three cross section samples



The sample 105 taken from the bottom of a supporting beam shows that the bottom yellow filler layer is covered with modern looking light weight white filler. It tells that the ceiling has probably been stripped from previous paint layers in recent decades.

The East Wall of the Dining Hall, Sample 103

The eastern wall showed same results as the sample 105 above. The bottom layer of sample 103, shown below, is modern light weight white filler that indicates recent striping of surfaces. All other layers are latex paints, due to their texture.



12. 1st Floor -The Lounge

The Lounge was divided from the dining hall by a curtain door that was easy to fold open. The bright lighting of the lounge comes from the big windows that cover most of the west side wall.

The black and white photograph below show the slight difference of color in the flooring between dining hall and lounge. As the dining hall floor is black, is the lounge flooring green. The ceiling of the lounge seems to be treated with the same glossy paint as the dining hall, but with a lighter shade. However the ceiling has been renovated some times, since it has a heavy layer of modern light weight filler. The color of the west side wall with the windows has probably always been rather light as only white and beige colors showed in the cross section sample of that wall. This is also something hinted by photographs.

AAM. Sign. 50-003-419

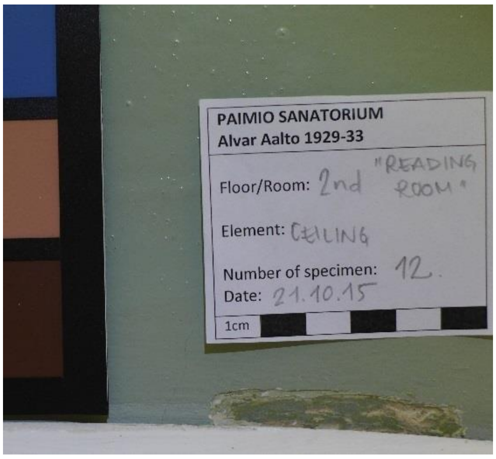
The Lounge’s Ceiling

Number of Sample	Subject	Building / Space / Surface
12	Paimio Sanatorium	Main building 1st Floor Lounge Ceiling
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

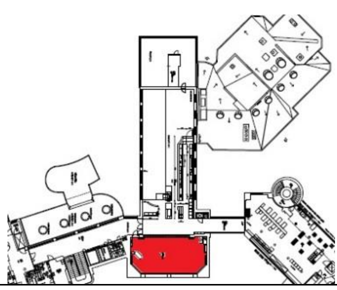
1970’s ventilation system brought casing of the pipes and electric cords in the ceiling. Doors and their sizing has changed. A new desk and speaker’s podium for lecturer has been installed 1980’s.

Photograph, drawing

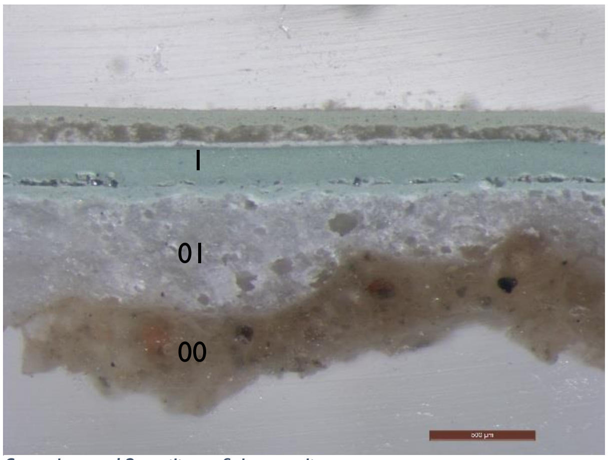


Layers of Sample
00 plaster
0 1 Filler
1 Green 5010-G30Y or 4010-G30Y

Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:
1 Öljymaali

Technique used to make and take Samples, Circumstance in site, Lighting:	Color chart in use:	Type of Sample, Place of Storage:	Floor plan, Location of Sample
Carved color steps on surface, crater technique, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written without the NCS prefix.	Cross-section sample 12. Alvar Aalto Foundation Helsinki. Scale 500µm.	

The sample 12 from the ceiling of lounge shows only layers that have probably been made since 1970's renovations. It was still possible to find some older layers in some parts of the ceiling, close to the ventilation system installed in the 1970's renovation. The original glossy finish is seen in the black and white picture below.



Sample no. 12, ceiling of the reading room.

The Lounge's Window Frame

The iron frames showed only few layers, and as the dining hall windows, these windows have also been stripped from paint during and after 1948 renovation. The excavation was made in the year 2000 color research by K.Aaltonen.

The Lounge's West Wall

The wall with windows showed a bottom layer of yellow oil based filler and beige (yellowed white) paint as the under most paint treatment. See next page.

Lounge's Wall by the Windows

Number of Sample
10

Subject
Paimio Sanatorium

Building / Space / Surface
Main building
1st Floor
Lounge
Wall by the windows pointing to west

Architect, building year
Alvar Aalto, 1929-33

Researcher, date
Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation

Most significant repairments and changes of the space, dates
.1970's ventilation system brought casing of the pipes and electric cords in the ceiling. Doors and their sizing has changed. A new desk and speaker's podium for lecturer has been installed 1980's.

Photograph, drawing

Layers of Sample
00 plaster
01-1 yellow filler, 2040-Y10R
02 filler
2 Oil Paint Light green, made with a hacker technique 1510-G60Y
3 White paint

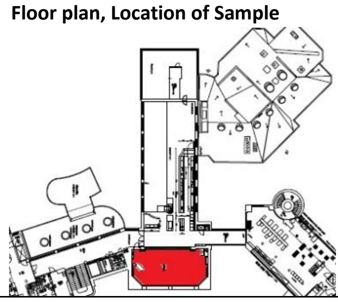
Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:

Technique used to make and take Samples, Circumstance in site, Lighting:
Carved color steps on surface, crater technique, daylight + fluorescent lamps

Color chart in use:
NCS Teknos 2004
Color codes are written without the NCS prefix.

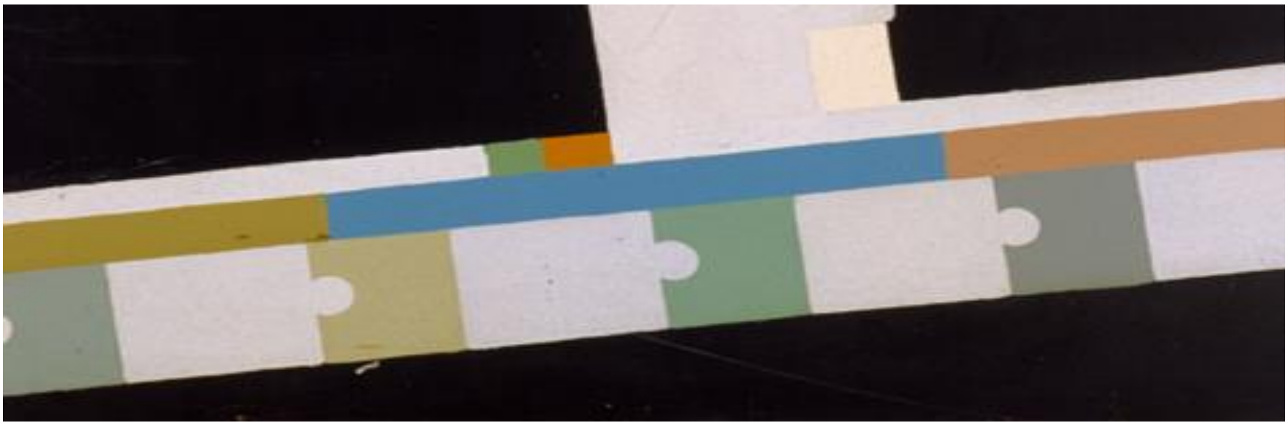
Type of Sample, Place of Storage:
Cross-section sample 10, Alvar Aalto Foundation Helsinki

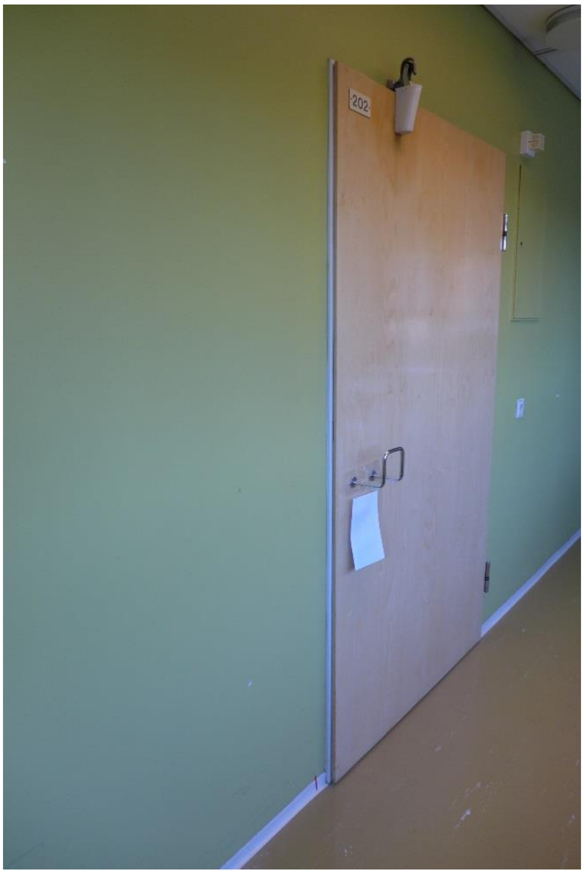
Floor plan, Location of Sample



13. 1st Floor Ward

The 1st floor ward in the A-wing is similar to the ground floor by its division and type of spaces and surfaces, but the general look is different compared to ground floor due to the green wall of the ward hall way. The patient room ceiling also have a different original coloring compared to the first floor rooms. This floor has grey ceilings patient rooms.





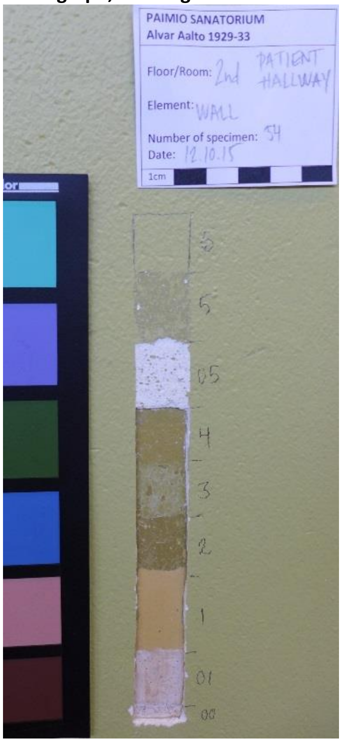
Main Hall Way

Number of Sample	Subject	Building / Space / Surface
54	Paimio Sanatorium	Main building 1st Floor Ward, main corridor Wall (wall with doors leading to patient rooms)
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

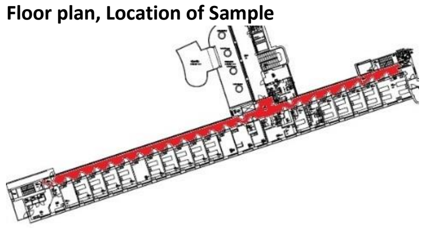
1970's ventilation system brought casing of the pipes and electric cords in the ceiling. Doors and their sizing has changed, broader painted wooden doors have replaced the original wooden doors with lacquered surfaces. The lighting and fixtures have also been replaced.

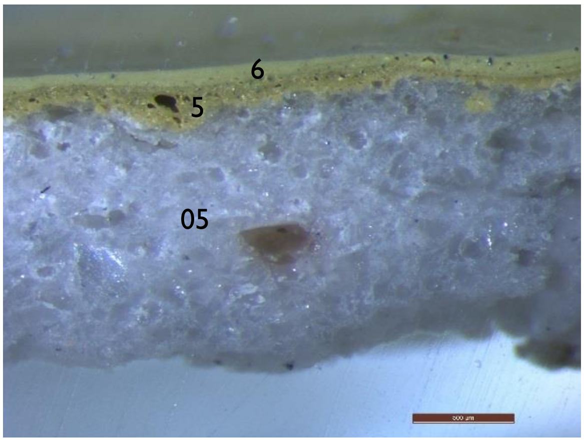
Photograph, drawing

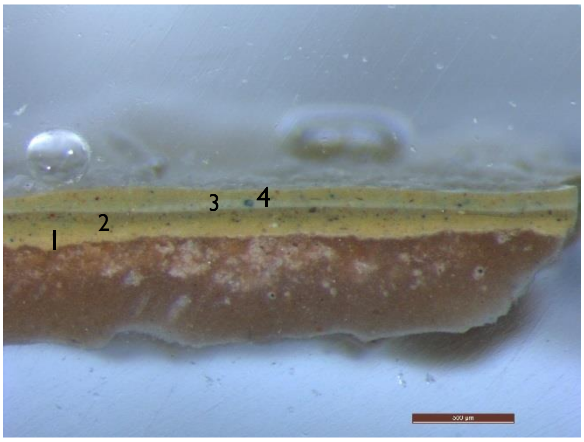


Layers of Sample
00 Plaster
01 Filler
1 Yellow paint, oil. 2010-Y20R
2 Dark green 4030-G70Y
3 Green/blue 3010-G50Y
4 Green 3030-Y10R
05 Filler
5 Green 4020-G70Y
6 Green 2030-G70Y

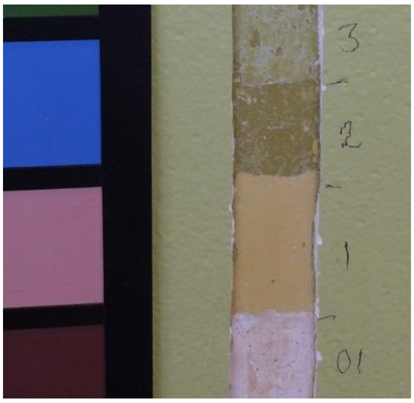
Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:
1st layer oil paint.

Technique used to make and take Samples, Circumstance in site, Lighting:	Color chart in use:	Type of Sample, Place of Storage:	Floor plan, Location of Sample
Carved color steps on surface, crater technique, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written without the NCS prefix.	Cross-section sample 54, Alvar Aalto Foundation Helsinki. Scale 500 µm.	





The sample no. 54 was broken in two parts. The top layers are seen at the picture above and bottom layers below with the original yellow paint. The results are not in line with the Kauria color board that states three different colors that were used one by one in the hall way of each ward. This same yellow undermost layer was also found in other ward hall ways. This indicates that the yellow was first experimented with in the ward hall ways and possibly then painted over with green, blue and ochre colors. As the Kauria interview from the year 1986 tells, Alvar Aalto did not eventually like the look of the yellow flooring he had specially made for the main building's main lobby, hallways and staircases. At that point of Aalto's skepticism it was not possible to cancel the large order of the yellow flooring. This gives one the idea that maybe the same doubt went through Aalto's mind with the main colors of the wards. This is of course only speculation. The found paint layers themselves state that the original first layer of paint truly is this bright sunny yellow.



North Wall

Number of Sample	Subject	Building / Space / Surface
-	Paimio Sanatorium	Main building 1st Floor A wing, main corridor Wall with windows, to north
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

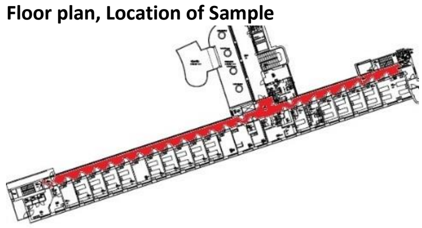
1970's ventilation system brought casing of the pipes and electric cords in the ceiling. Doors and their sizing has changed, broader painted wooden doors have replaced the original wooden doors with lacquered surfaces. The lighting and fixtures have also been replaced.

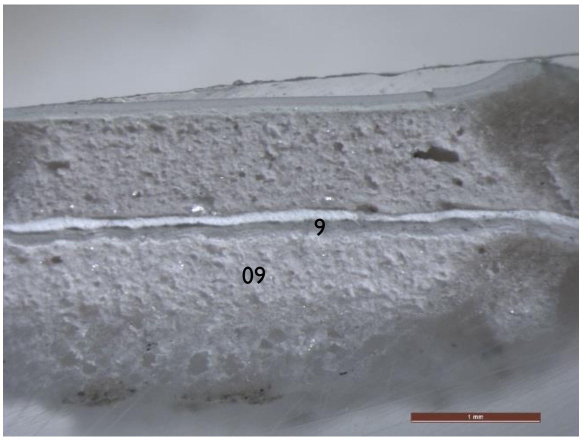
Photograph, drawing

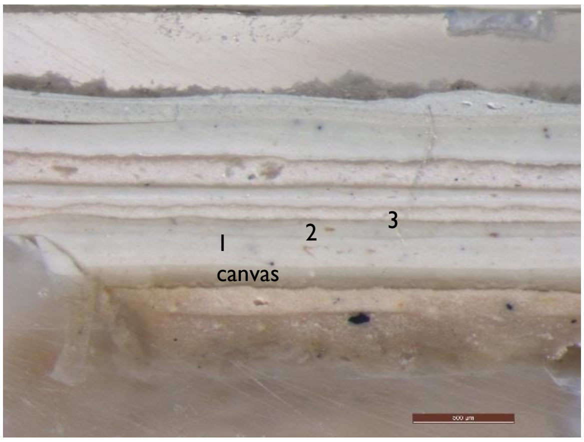
Layers of Sample

Layers of Sample
000 Plaster
0001 Filler
001 Consolidating cotton canvas with oil filler
01 Yellow filler
1 Greenish grey 1005-G50Y
2 Greenish grey 1010-G70Y
3 Grey 2005-G60Y
4 -5 White 0603-G40Y and green 1510-G60Y?
6-7 Green?
8 Light blue 2010-G50Y
09 Filler **9 White 0300-N**
010 Filler **10 Light green 1005-G20Y**
11 White 0300-N
12 White 0502-Y
13 White 1002-Y

Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:
1st layer oil paint.

Technique used to make and take Samples, Circumstance in site, Lighting:	Color chart in use:	Type of Sample, Place of Storage:	Floor plan, Location of Sample
Carved color steps on surface, crater technique, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written without the NCS prefix.	Cross-section sample, Alvar Aalto Foundation Helsinki	





The Findings of the ward’s north wall with windows were the same at every ward from 1st-6th, and the excavation was made in the second floor. The sample no. 15 broke in to two parts: picture above shows the surface, and the one underneath the shows multiple white or other light colored layers that indicates that the wards’ window walls were always kept in a neural tone.

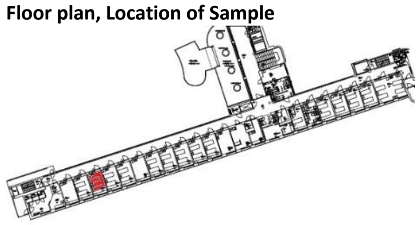
Patient Room Ceiling

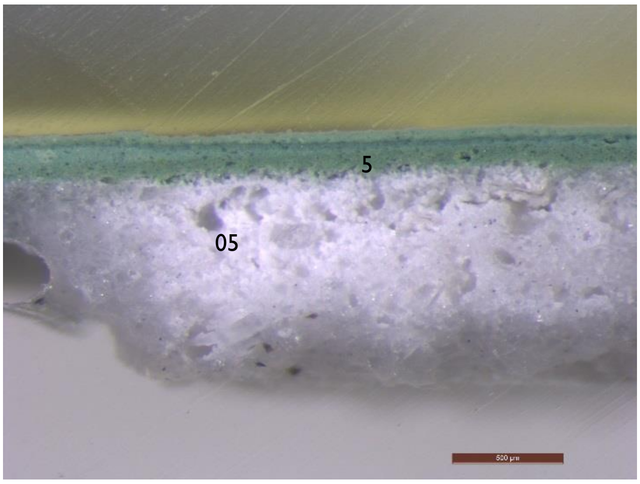
Number of Sample	Subject	Building / Space / Surface
53	Paimio Sanatorium	Main building 1st Floor Patients' room 203 Ceiling
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

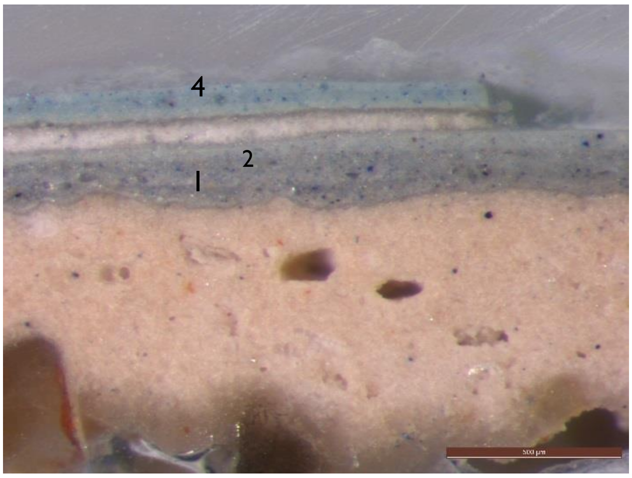
Patient rooms have been fully renovated during 1970's as the hospital technique (i.e. different types of gases, electricity) and all of the surfaces, HVAC-technique and furniture were redone. Original ceiling radiators were removed and ceilings painted (but not hidden under dropped ceiling structures). Wallcoverings and flooring were replaced. Original furniture was removed.

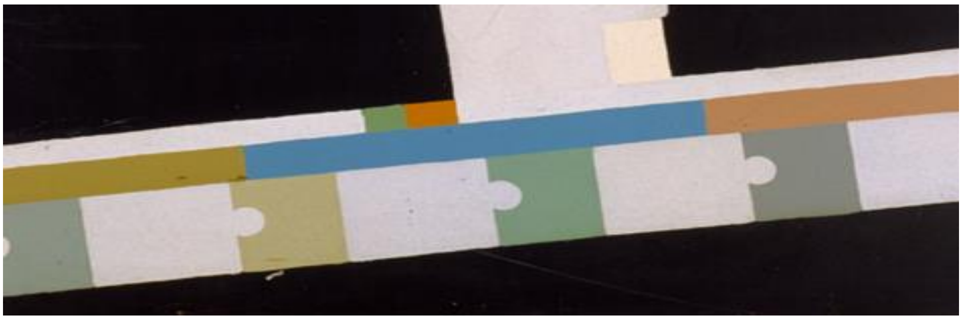
Photograph, drawing	Layers of Sample
	**00**
	01 Filler
	1 Grey 6502-G
	2 Grey 3005-G50Y
	3 Blue? Not possible to define
	4 Blue 4010-B70G
	05 White filler
	5 Green 4010-G10Y or -G30Y
	6 Green 4010-G10Y or -G30Y
Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:	

Technique used to make and take Samples, Circumstance in site, Lighting:	Color chart in use:	Type of Sample, Place of Storage:	Floor plan, Location of Sample
Carved color steps on surface, crater technique, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written without the NCS prefix.	Cross-section sample 53, Alvar Aalto Foundation Helsinki. Scale 500 µm.	



The ceiling of the patient room 203 has an original layer of grey paint that is also found in the Kauria color board. The sample no. 53 was broken in half. It shows more layers that was possible to excavate in situ. The bottom layers are shown in the picture below and the surface with thick white light weight filler in the picture above.

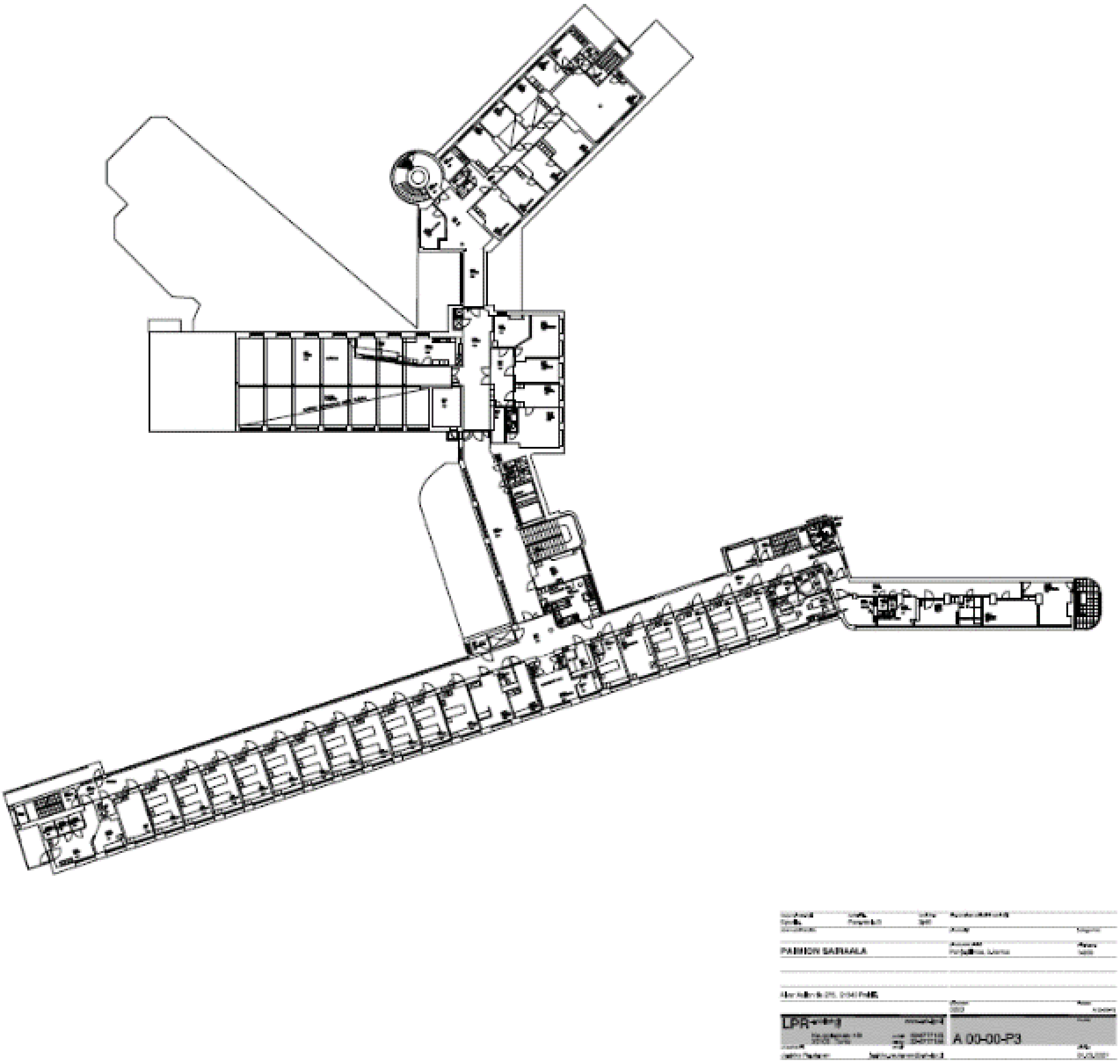




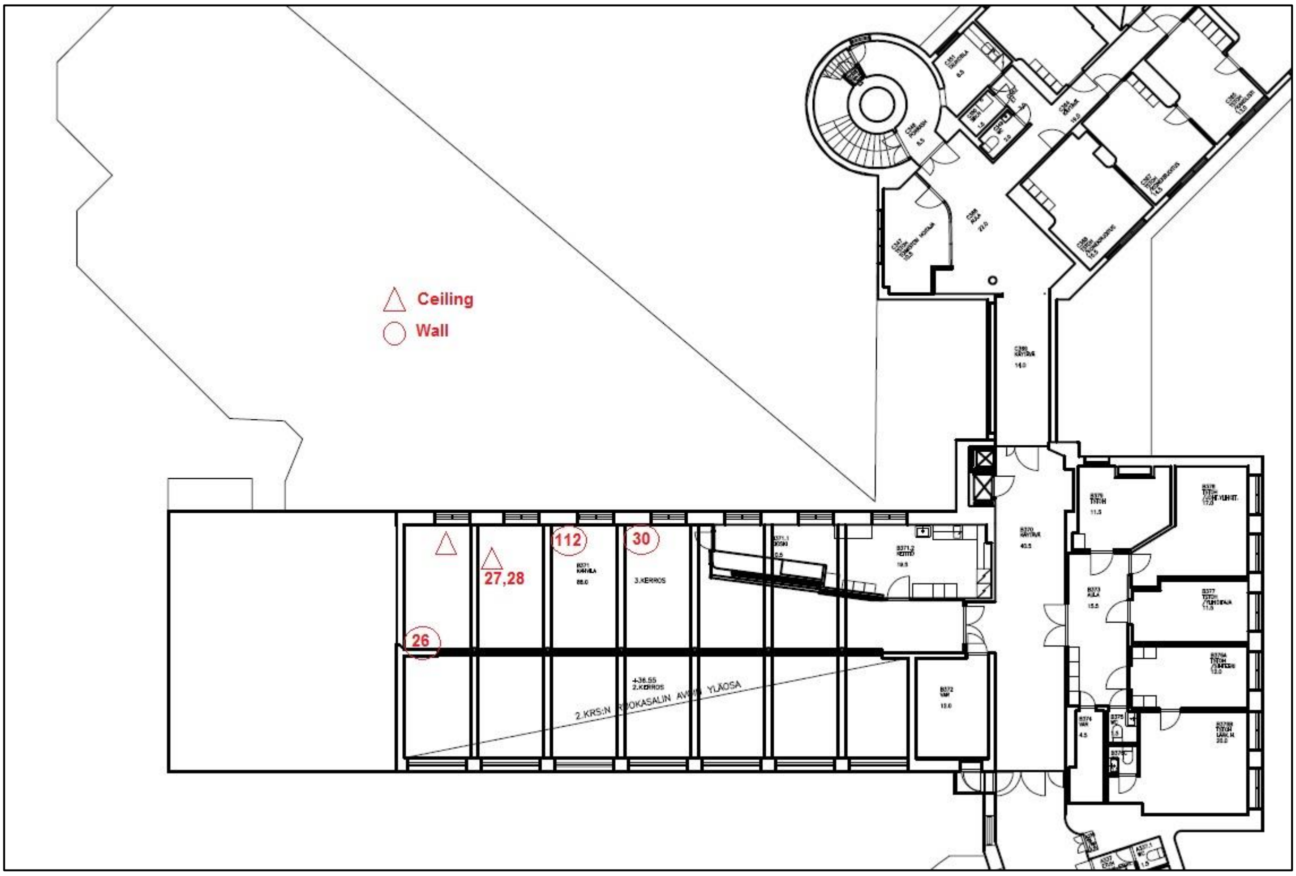
14. 2nd Floor – General view

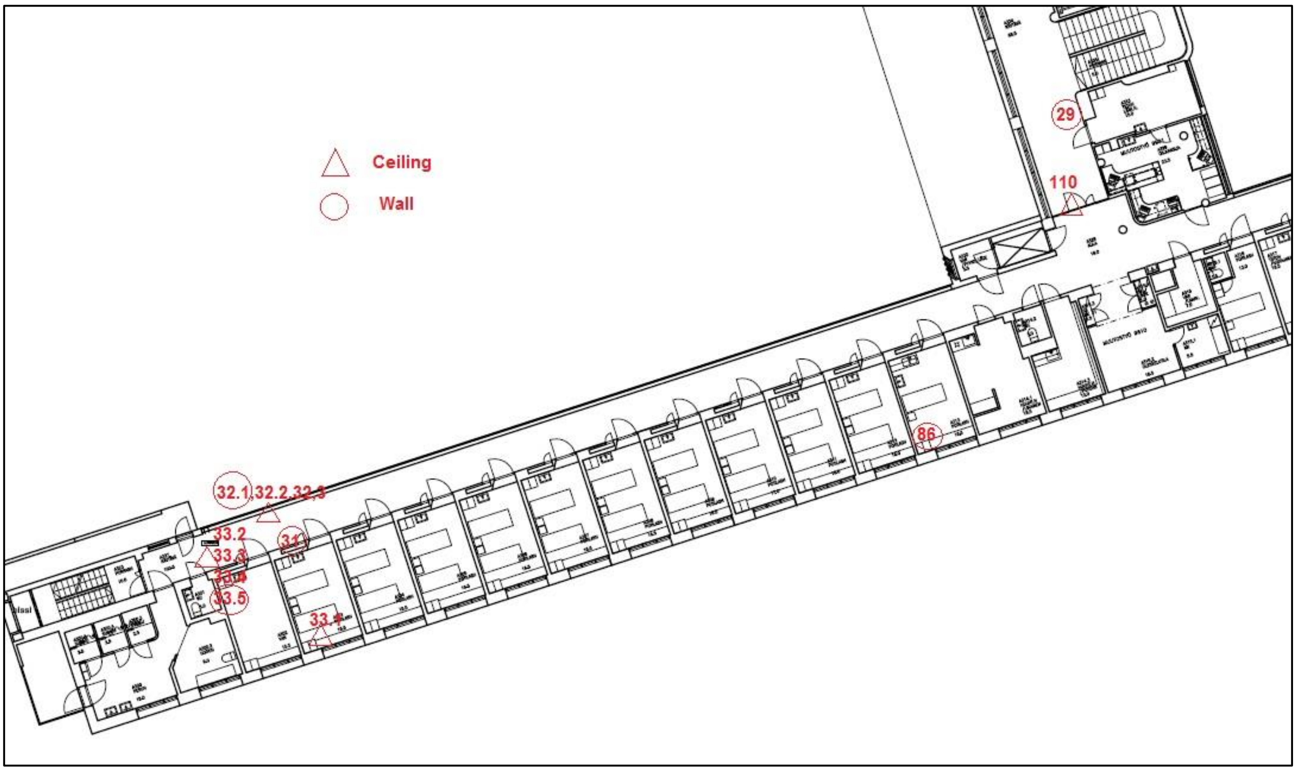
The interesting sections of original floor plan of 2nd floor is the library, a glassed balcony like space that is positioned above the low part of the 2nd floor dining room. The space has functioned also as a cafeteria for the patients.

The 3rd floor ward's main hall carries deep blue as its primary color when the first floor ward had ochre and second green or yellow.



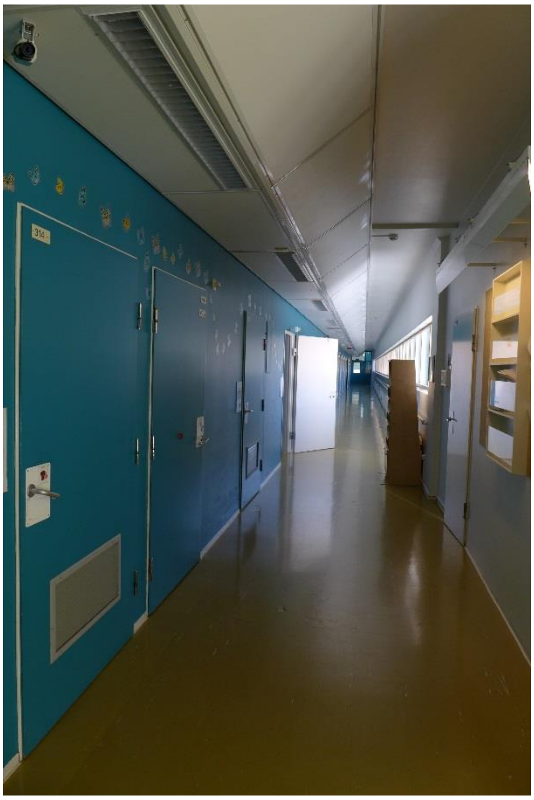
The Samples of 2nd Floor

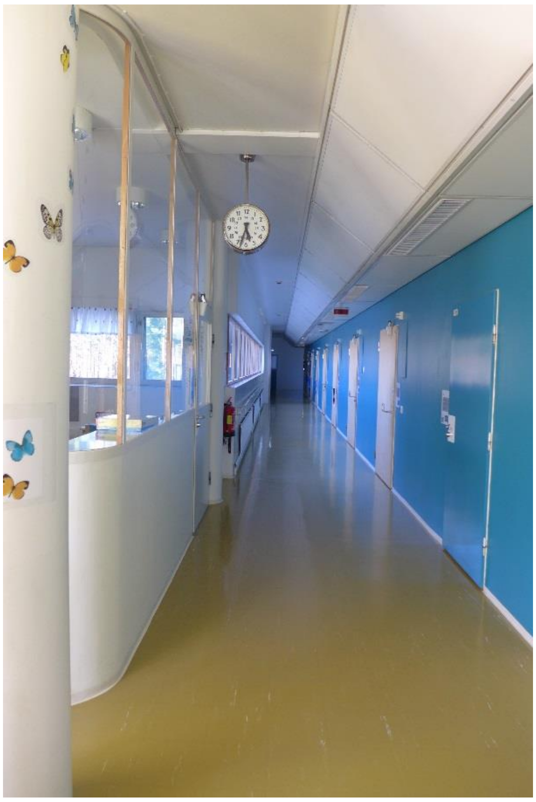




15. 2nd Floor Ward

The 2nd floor ward's main corridor carries deep blue as a primary color.





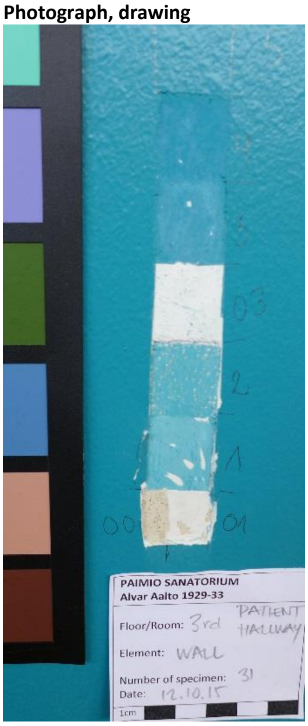
Ward, Main Corridor

Number of Sample	**Subject**	**Building / Space / Surface**
31	Paimio Sanatorium	Main building 2nd Floor Patient wing, main hallway Wall (the wall with the doors to patient rooms)
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

1970's ventilation system brought casing of the pipes and electric cords in the ceiling. Doors and their sizing has changed, broader painted wooden doors have replaced the original wooden doors with lacquered surfaces. The lighting and fixtures have also been replaced.

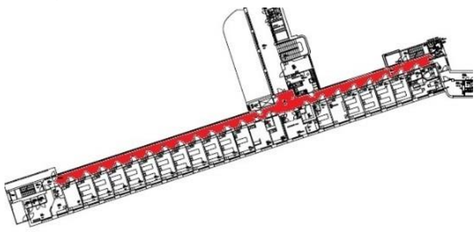
Photograph, drawing

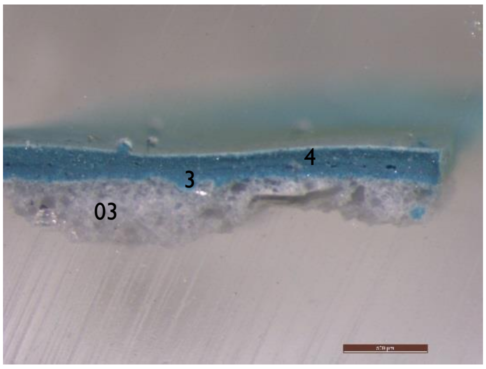


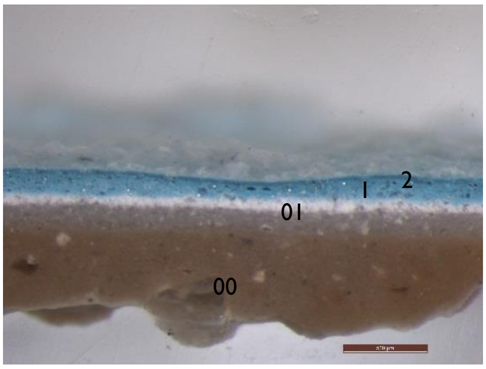
Layers of Sample

00 Plaster
01 white light weight filler
1 Blue 2040-B20G
2 Two shades: 3040-B30G, 3040-B20G
03 White filler
3 Blue 4040-B10G
4 Two shades: 4040-B10G, 4050-B
5 Blue 4040-B30G

Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:

Technique used to make and take Samples, Circumstance in site, Lighting:	**Color chart in use:**	**Type of Sample, Place of Storage:**	**Floor plan, Location of Sample**
Carved color steps on surface, crater technique, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written without the NCS prefix.	Cross-section sample 31, Alvar Aalto Foundation Helsinki. Scale 500 µm.	





The ward's main corridors colored wall shows less layers than other ward corridors have shown. The bottom one found stated a blue color. The sample no. 31 broke in to two parts: the surface is seen in the picture above, and the bottom layers below. The undermost layer is white, porous, light weight filler that obviously is not the original 1930's oil filler used, but a layer from later renovation.

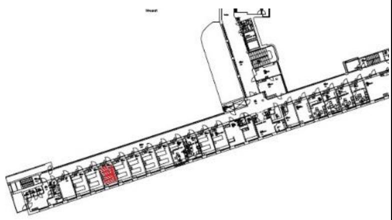
Patient Room Ceiling

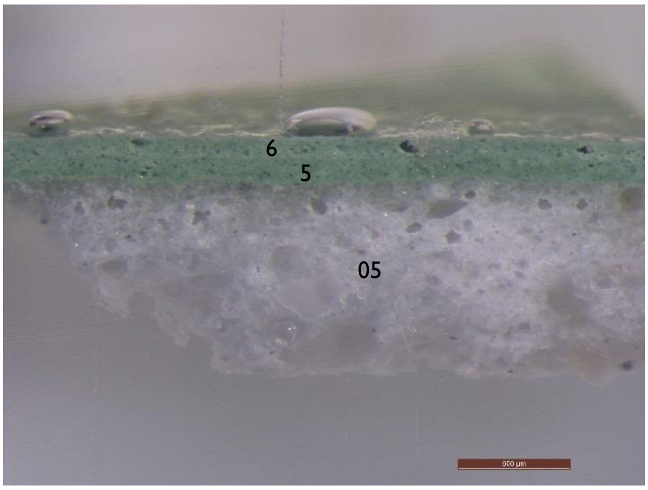
Number of Sample	Subject	Building / Space / Surface
33.1	Paimio Sanatorium	Main building t Floor 2nd Floor Patient room Ceiling
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

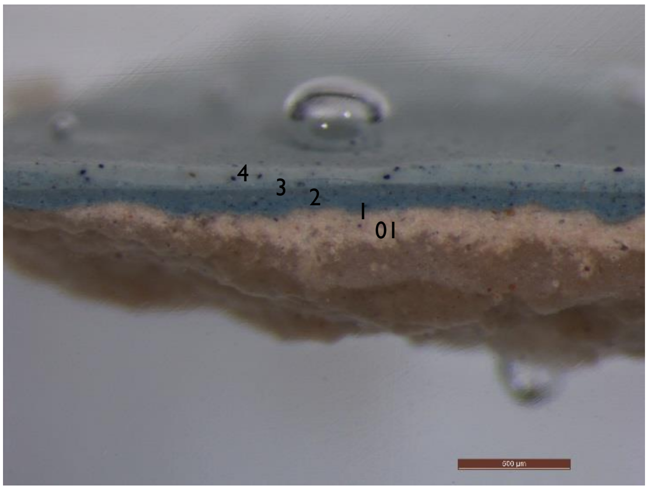
Patient rooms have been fully renovated during 1970's as the hospital technique (i.e. different types of gases, electricity) and all of the surfaces, HVAC-technique and furniture were redone. Original ceiling radiators were removed and ceilings painted (but not hidden under dropped ceiling structures). Wallcoverings and flooring were replaced. Original furniture was removed.

Photograph, drawing	Layers of Sample
	**00 Plaster**
	01 Filler, yellow oil based
	1 Blue 5020-B10G
	2 Blueish grey 4010-B30G
	3 Grey 3010-G10Y
	4 Light grey 2005-G
	05 Filler white light weight
	5 Green 2020-G10Y
Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis: **1oil paint**	

Technique used to make and take Samples, Circumstance in site, Lighting:	Color chart in use:	Type of Sample, Place of Storage:	Floor plan, Location of Sample
Carved color steps on surface, crater technique, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written without the NCS prefix.	Cross-section sample, 33.1. Alvar Aalto Foundation Helsinki. Scale 500µm.	



The patients' room ceilings of 2nd floor ward have blue undermost layers that can be seen in the sample no. 33.1 bottom layers, in the picture below.



16. 2nd Floor Reading room

Today the reading room has rich colors that originate to the year 2000 color research and renovations done after. The ceiling has supporting beams. The south wall is glass framed with iron. The big windows facing east are also iron framed and they bare a vibrant petrol blue. The north wall is neutrally colored with smaller windows. The thin iron columns line the glass wall giving to the dining hall. They are ow, as they were before, painted-bright red. The 1970's renovation brought dropped ceiling structures on the north side of the room, to cover the

ventilation system installed.

North Wall

Number of Sample 112.	**Subject** Paimio Sanatorium	**Building / Space / Surface** Main building t Floor 3rd Floor Reading room North wall
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

HVAC-remodeling in the 1970's renovation brought the dropped ceiling structures that hide ventilation pipes and electric cords. Original rubber flooring has been changed to a vinyl floor.

Photograph, drawing

Layers of Sample

00 Plaster

01 0505-Y30R light beige

1 Beige 1005-Y20R

02-2 Black 9000-N and 0505-Y30R (?)

03 White base coat 1002-Y50R

3 Light green (hecker technique, oil) 1005-G50Y

4 Light yellow 0507-Y

5 Beige (hacker technique) 0907-G90Y

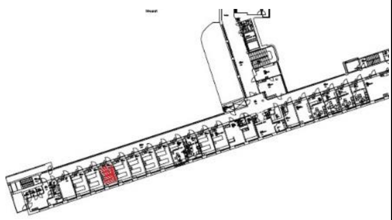
6 Light grey 1500-N

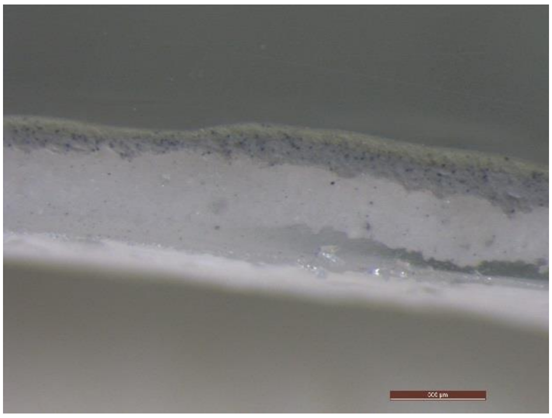
7 White

8 Green 3010-G20Y

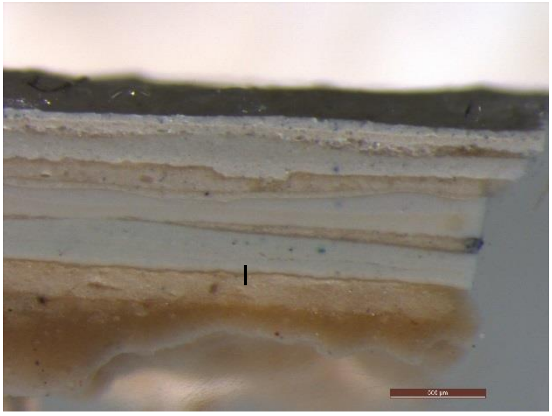
9. Yellow 1010-G90Y

Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:
1oil paint

Technique used to make and take Samples, Circumstance in site, Lighting: Carved color steps on surface, crater technique, daylight + fluorescent lamps	**Color chart in use:** NCS Teknos 2004 Color codes are written without the NCS prefix.	**Type of Sample, Place of Storage:** Cross-section sample, Alvar Aalto Foundation Helsinki	**Floor plan, Location of Sample** 



The cross section samples no. 112 show only neutral colors.



Cross section sample 112 presented in two parts..

The Coloring of HVAC Pipes

The warm water pipe sticking from the wall is a pipe for bleeding the air in the original radiator system below, in the ceiling of the Dining hall. This pipe is the only piece of evidence found that shows in reality the fact that originally at least some of the HVAC system's pipes in Paimio main building were color coded. This small air bleeding pipe shows bright red paint underneith the other layers.

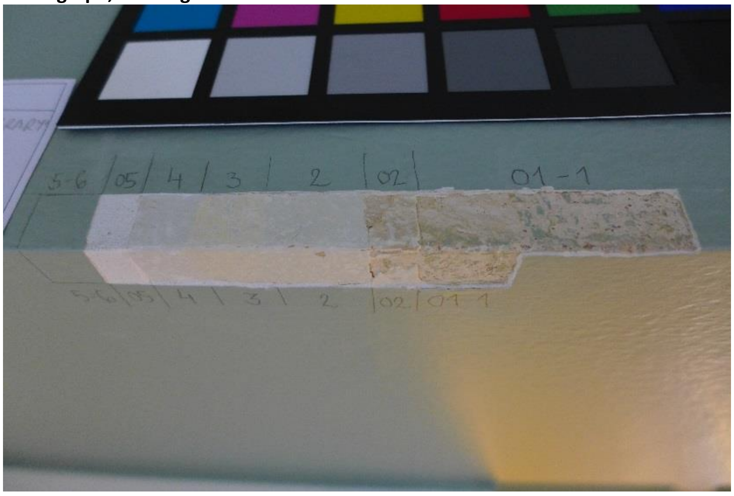
Ceiling Beams

Number of Sample	Subject	Building / Space / Surface
28	Paimio Sanatorium	Main building t Floor 2nd Floor Reading room Ceiling beams, cheek and bottom surface
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

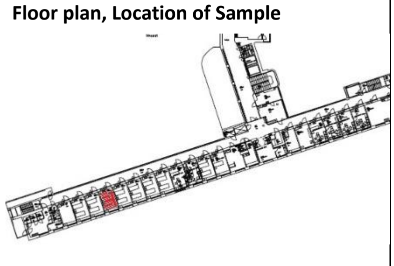
HVAC-remodeling in the 1970's renovation brought the dropped ceiling structures that hide ventilation pipes and electric cords. Original rubber flooring has been changed to a vinyl floor.

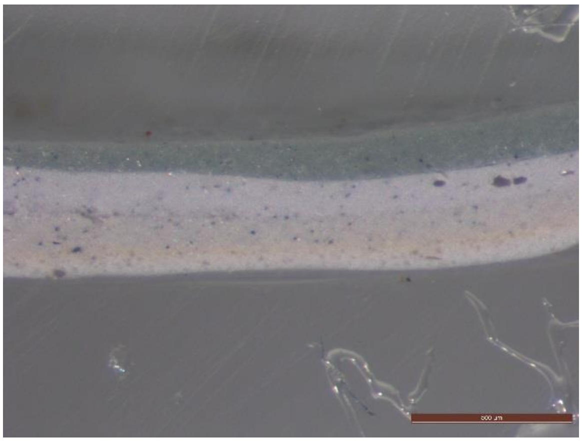
Photograph, drawing



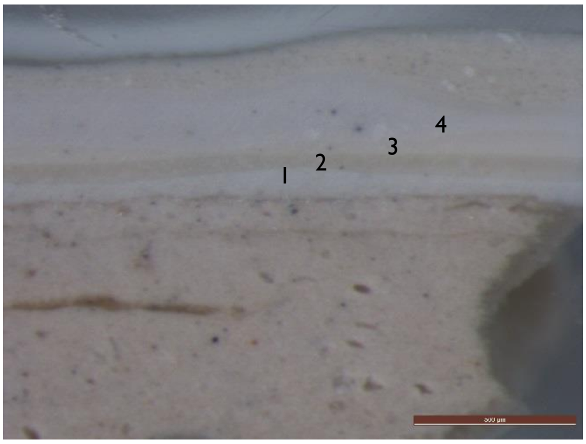
Layers of Sample
00 Plaster
01Filler
1 Green 2020-G10Y
02 Filler
2 Light grey 1005-B80Y
3Yellow 0510-Y10R
4 Grey 1502-Y
05 White light weight filler
5-6 Green 3010-G20Y

Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:
It was not possible to specify the type of paint of 1st layer.

Technique used to make and take Samples, Circumstance in site, Lighting:	Color chart in use:	Type of Sample, Place of Storage:	Floor plan, Location of Sample
Carved color steps on surface, crater technique, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written without the NCS prefix.	Cross-section sample 28, Alvar Aalto Foundation Helsinki. Scale 500µm.	



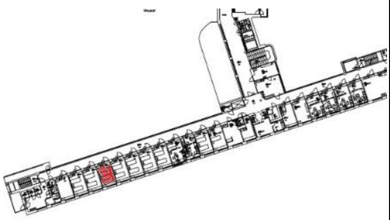
The cross section sample no. 28 from the ceiling beams of reading room show no trace of green original color layer. The excavation how ever showed the green original color. The sample was broken in two parts, the undermost half is presented in the picture below.



Cross section sample 28 presented in two parts..

Iron Frame Windows Giving to West

<table>
<tr><td>Number of Sample</td><td>Subject
Paimio Sanatorium</td><td colspan="2" rowspan="2">Building / Space / Surface
Main building t Floor
2nd Floor
Reading room
Iron windows (to west)</td></tr>
<tr><td>Architect, building year
Alvar Aalto, 1929-33</td><td>Researcher, date
Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation</td></tr>
<tr><td colspan="4">Most significant repairments and changes of the space, dates
HVAC-remodeling in the 1970’s renovation brought the dropped ceiling structures that hide ventilation pipes and electric cords. Original rubber flooring has been changed to a vinyl floor.</td></tr>
<tr><td colspan="2" rowspan="9">Photograph, drawing
</td><td colspan="2">Layers of Sample
00 Iron</td></tr>
<tr><td colspan="2">01 base coat, light beige</td></tr>
<tr><td colspan="2">1 Blue 3030-B30G</td></tr>
<tr><td colspan="2">2 Blue 3040-B10G</td></tr>
<tr><td colspan="2">3 Light blue 2020-B30G</td></tr>
<tr><td colspan="2">4 Blue 3050-B30G</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td colspan="2"></td></tr>
<tr><td colspan="2"></td></tr>
<tr><td colspan="2" rowspan="3">Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:</td><td colspan="2"></td></tr>
<tr><td colspan="2"></td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>Technique used to make and take Samples, Circumstance in site, Lighting:
Carved color steps on surface, crater technique, daylight + fluorescent lamps</td><td>Color chart in use:

NCS Teknos 2004
Color codes are written without the NCS prefix.</td><td>Type of Sample, Place of Storage:
No sample.</td><td>Floor plan, Location of Sample
</td></tr>
</table>

Columns

Number of Sample	Subject	Building / Space / Surface
	Paimio Sanatorium	Main building t Floor 3rd Floor reading room Columns lining the windows giving to south and dining hall
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

HVAC-remodeling in the 1970's renovation brought the dropped ceiling structures that hide ventilation pipes and electric cords. Original rubber flooring has been changed to a vinyl floor.

Photograph, drawing

Layers of Sample

00 Iron

1 Red 1580-Y80R

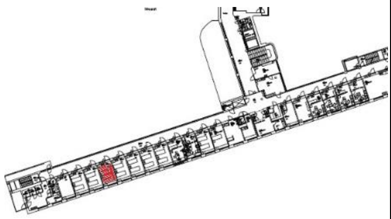
2 Yellow 1040-Y

2 Blueish grey 4010-B30G

3 Red 3030-R

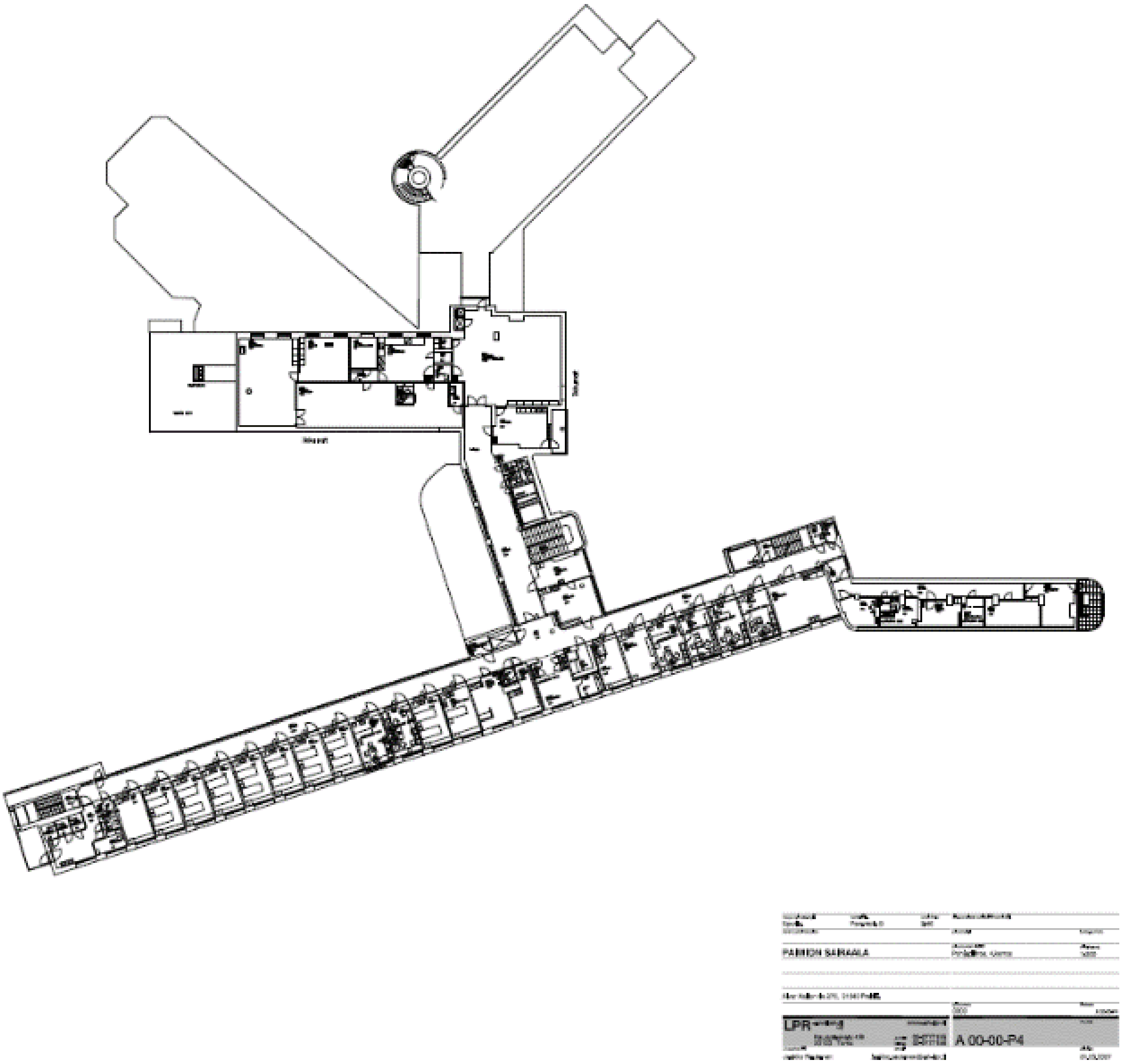
4 Red 2770-Y80R

Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:
XRF-Analysis made. See Appendix.

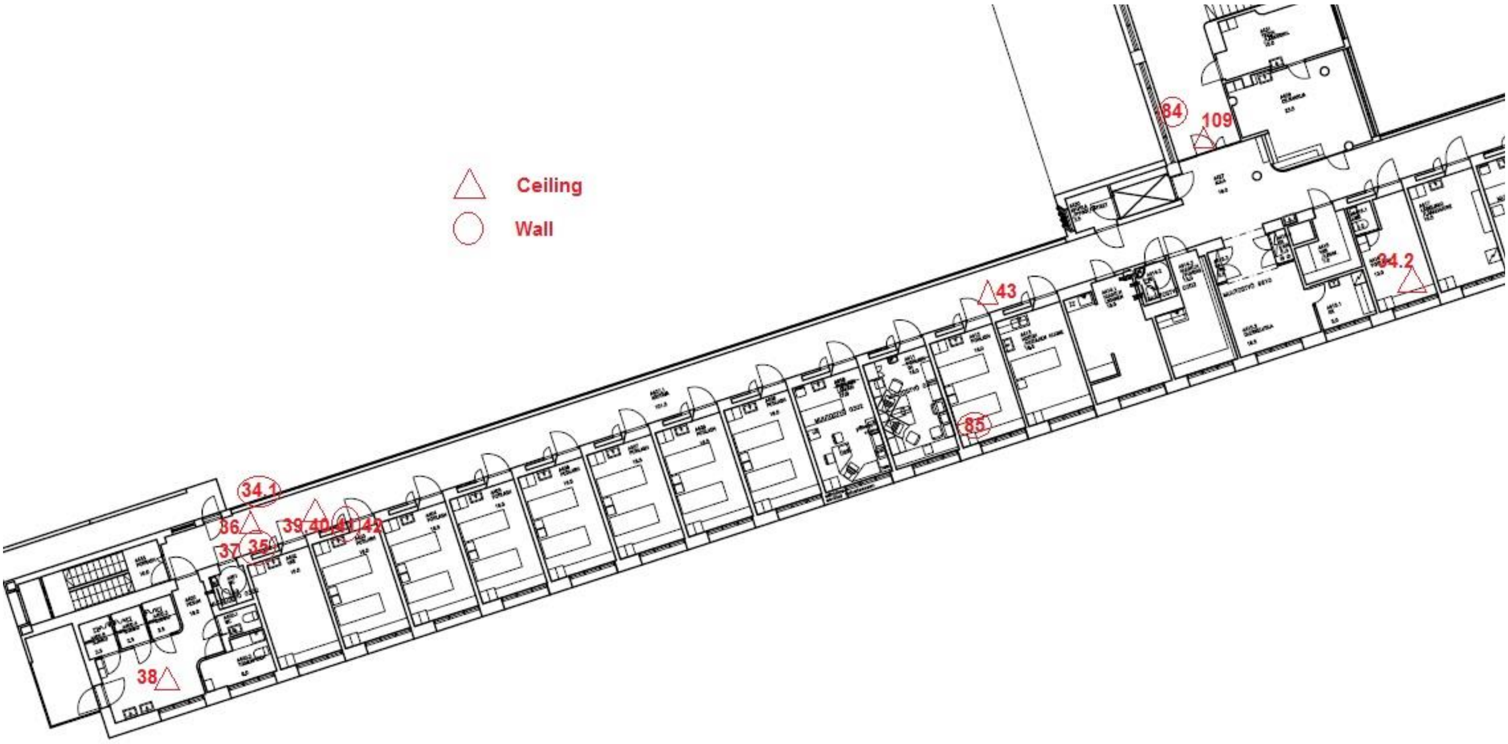
Technique used to make and take Samples, Circumstance in site, Lighting:	Color chart in use:	Type of Sample, Place of Storage:	Floor plan, Location of Sample
Carved color steps on surface, crater technique, daylight + fluorescent lamps RXF-Analysis, X-ray Fluorecence	NCS Teknos 2004 Color codes are written without the NCS prefix.	No sample.	

17. 3rd Floor – General View

On the third floor this color research concentrates on the patient wing, the ward. The main stair case leading to the lobby areas in each floor is and has been colored in neutral white and beige tones. The samples taken from the ceiling of the space (picture right) stated that same result: white ceiling paint layers.



The Samples of 3rd Floor



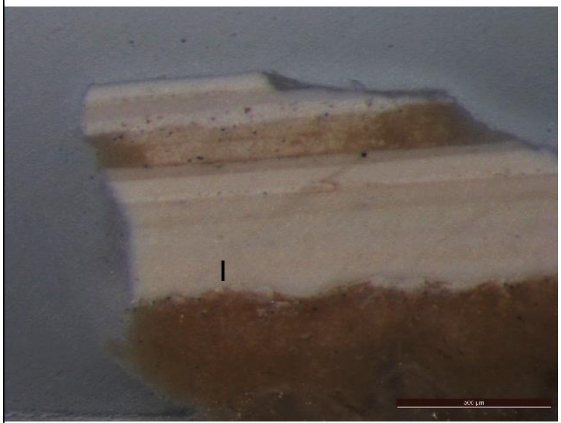
3rd Floor, Main Corridor

Number of Sample	Subject	Building / Space / Surface
84	Paimio Sanatorium	Main building 3rd Floor Main hall Wall under window
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

Main hall around main stair has had a few changes. The flooring has been changed from the original yellow rubber flooring to new material. The last change of flooring was made in the 1990's. Walls have been painted. Window sills are now painted with glossy paint to accentuate and easy maintaining. No dropped ceiling structures have been installed, ceilings of main hall have only been painted during many renovations. The window sills have few layers and probably they have been stripped from original layers at some point of renovation history.

Photograph, drawing

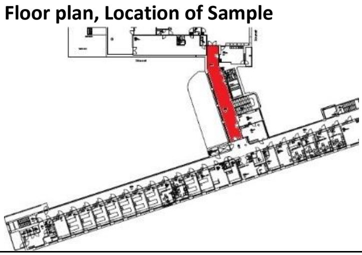


Layers of Sample
00

0 Filler

1-12 White and beige paints

Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:

Technique used to make and take Samples, Circumstance in site, Lighting:	Color chart in use:	Type of Sample, Place of Storage:	Floor plan, Location of Sample
Carved color steps on surface, crater technique, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written without the NCS prefix.	Cross-section sample 84, Alvar Aalto Foundation Helsinki. Scale 500 µm.	

The main corridors trough out the main building had the same coloring. The sample no. 84 shows the general situation of the walls surrounding corridors, a palette of neutral tones trough decades, as the undermost layers are white.

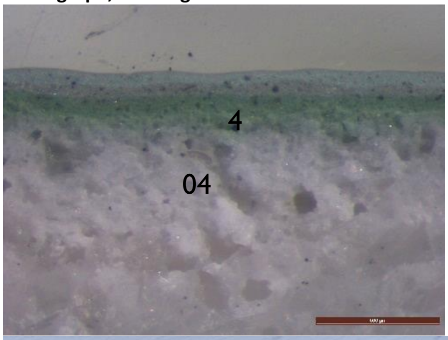
3rd Floor Patients' Room, Ceiling

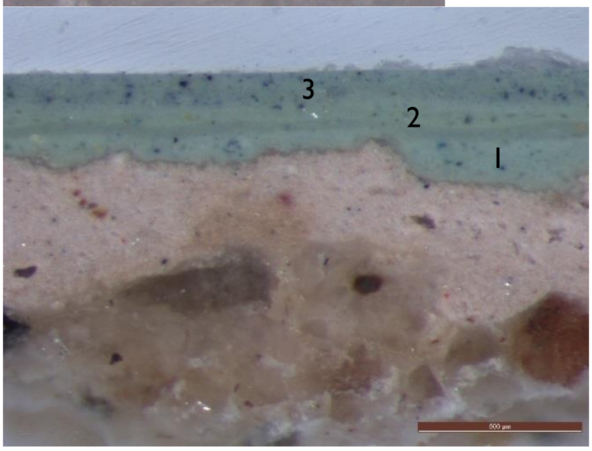
Number of Sample	Subject	Building / Space / Surface
34.2	Paimio Sanatorium	Main building 3rd Floor Patients' room (opposite to nurses office) room 416 Ceiling
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

Patients' rooms have been fully renovated during 1970's as the hospital technique (i.e. different types of gases, electricity) and all of the surfaces, HVAC-technique and furniture were redone. Original ceiling radiators were removed and ceilings painted (but not hidden under dropped ceiling structures). Wallcoverings and flooring were replaced. Original furniture was removed.

Photograph, drawing

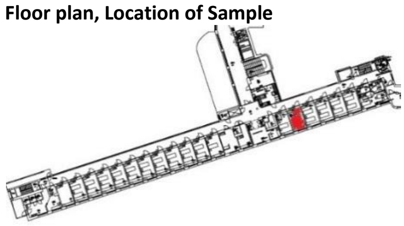




Layers of Sample

Layers of Sample	
00	
01 Filler **1 Light green 2020-G30Y**	
2 Dark green 3020-G10Y	
3 Green	
04 White light weight filler	
4 Green	
5-6 Green 2010-G	

Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:

Technique used to make and take Samples, Circumstance in site, Lighting:	Color chart in use:	Type of Sample, Place of Storage:	Floor plan, Location of Sample
Carved color steps on surface, crater technique, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written without the NCS prefix.	Cross-section sample 34.2. Alvar Aalto Foundation Helsinki. Scale 500 µm.	

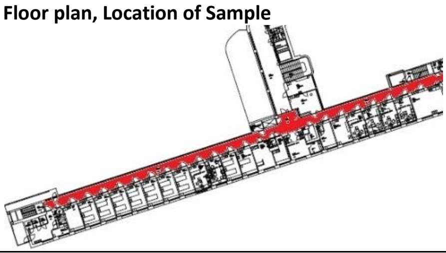
Patient Ward, Main Hallway

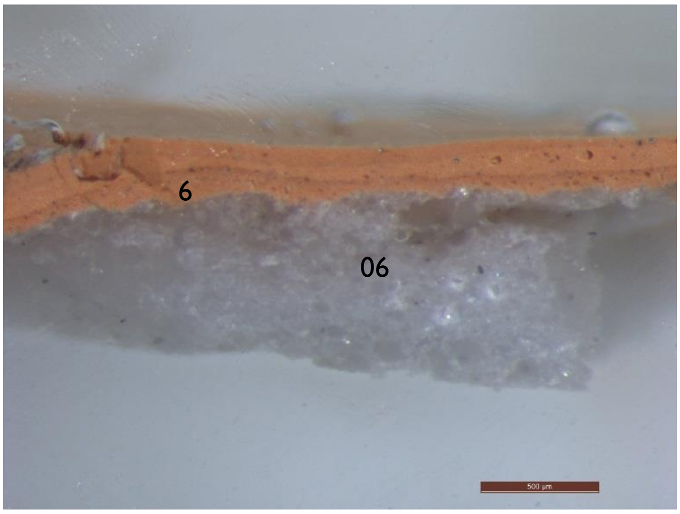
Number of Sample	Subject	Building / Space / Surface
35	Paimio Sanatorium	Main building 4^{th} Floor Patient wing, main hallway Wall (the wall with doors leading to patient rooms)
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

1970's ventilation system brought casing of the pipes and electric cords in the ceiling. Doors and their sizing has changed, broader painted wooden doors have replaced the original wooden doors with lacquered surfaces. The lighting and fixtures have also been replaced.

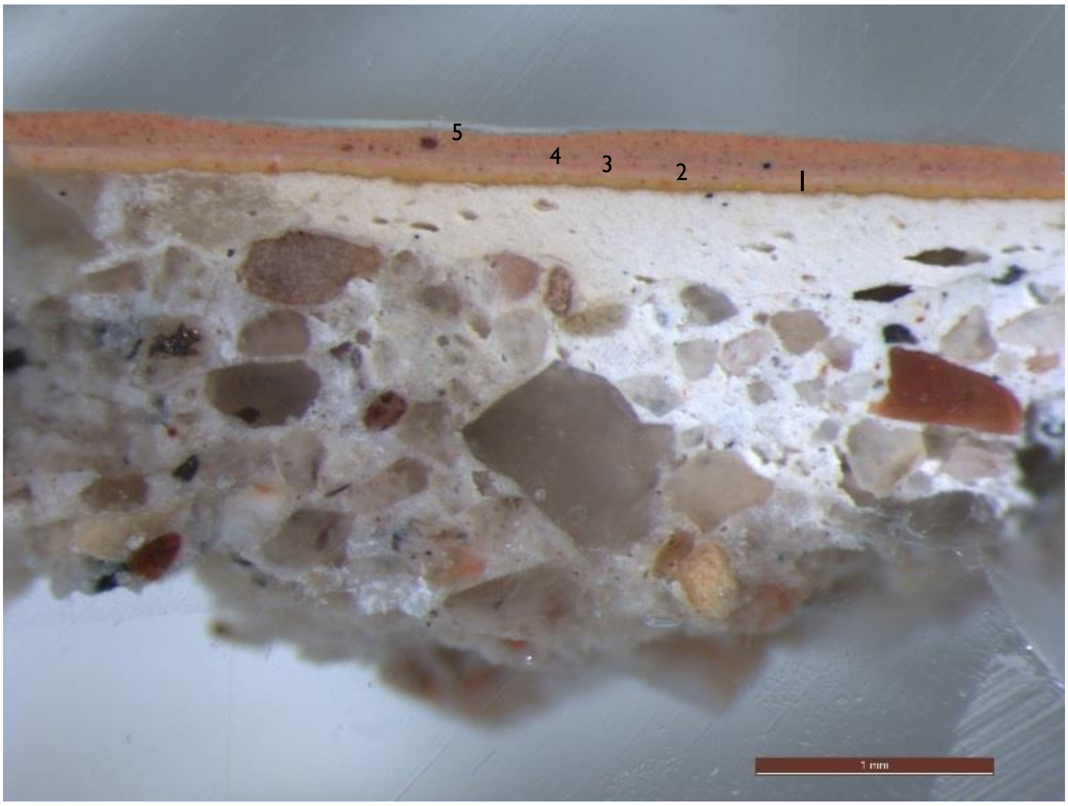
Photograph, drawing	Layers of Sample
	**00 Plaster**
	01Filler
	1 Orange, ochre 2040-Y30R
	2-3 Brown 3020-Y30R
	4 Red 3030-Y50R
	5 Ochre 3030-Y50R
	06 White light weight filler
	6 Red 3040-Y60R
	7 Red 2030-Y40r or 2030-Y50R
Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis: **1st layer: Oil paint**	

Technique used to make and take Samples, Circumstance in site, Lighting:	Color chart in use:	Type of Sample, Place of Storage:	Floor plan, Location of Sample
Carved color steps on surface, crater technique, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written without the NCS prefix.	Cross-section sample 35. Alvar Aalto Foundation Helsinki.	



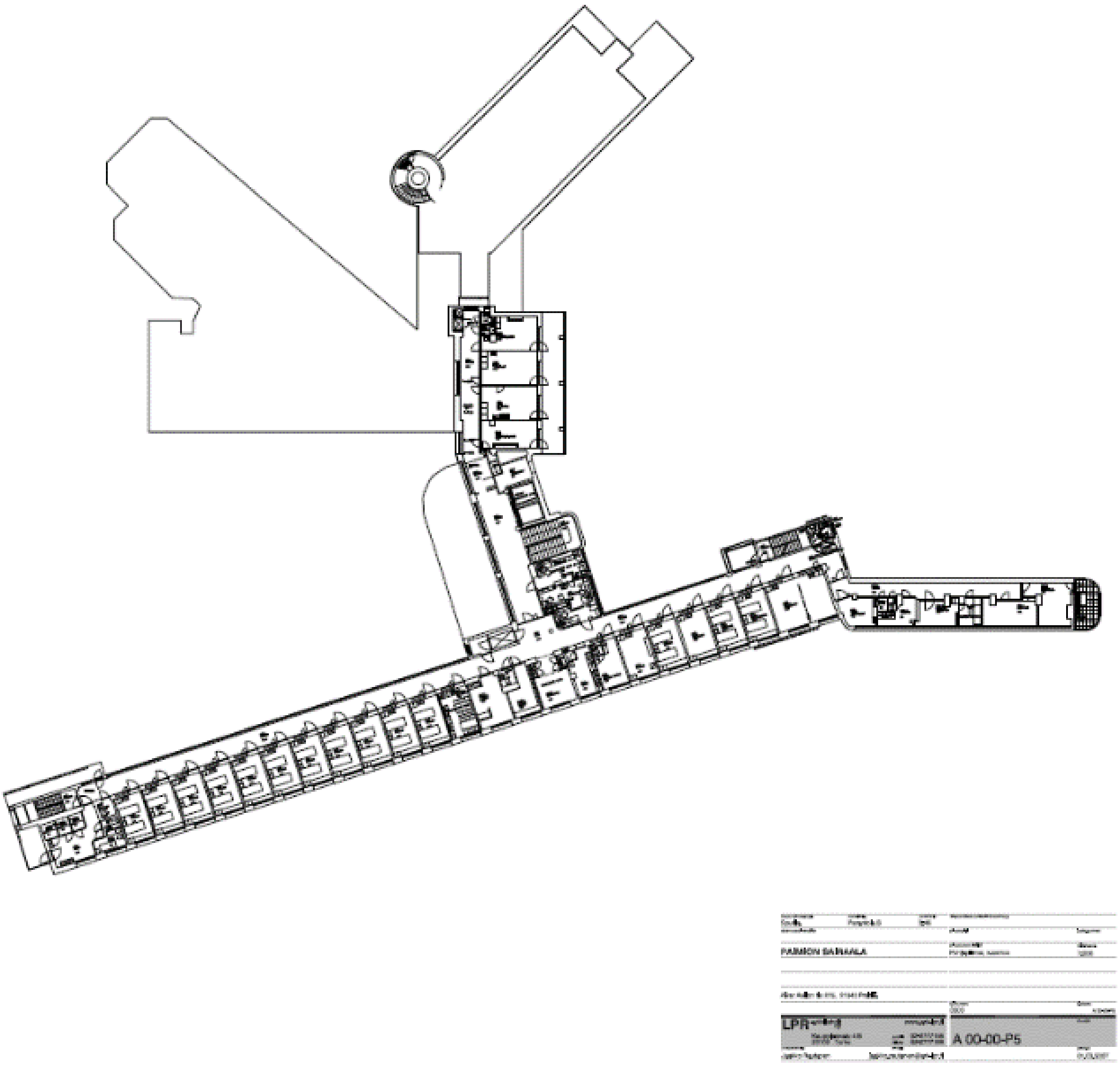
The sample no. 35 broke in two parts: the picture below shows the undermost layers.

The ward of 4th floor has had the same coloring as the first floor ward also originally had.

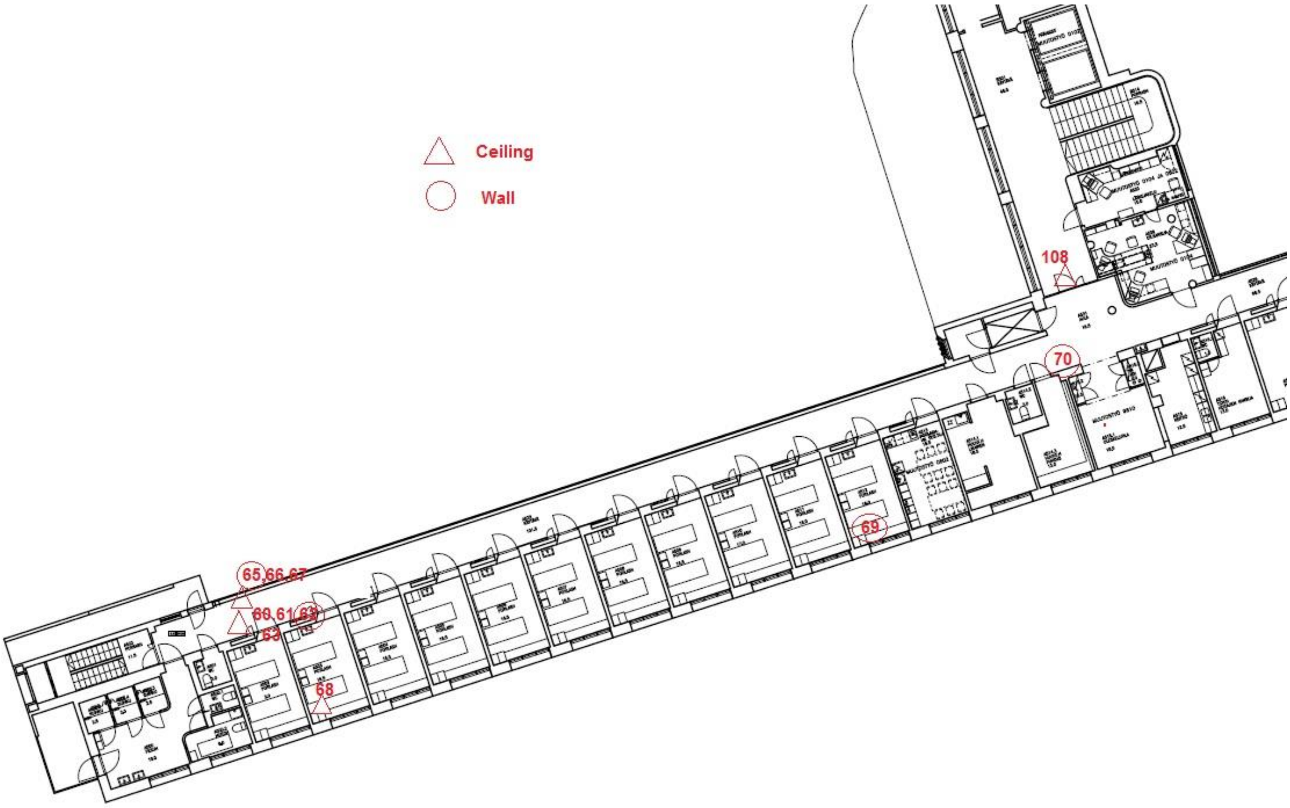


18. 4th Floor – General view

The fourth floor has some offices and small apartments in its north end wing. These apartments were not included in this research. On the fourth floor the research concentrated on the patient ward. The main color of the 4th ward is blue. The surprising discovery in fourth floor ward was the same as in the first floor. The undermost original color was not blue, but yellow. The same yellow was found in the bottom layer of first floor ward walls. This again confuses the rhythm that otherwise is possible to find in all of the six floors, and seen in the wards today. See second floor ward for further details.



The Samples of 4th Floor

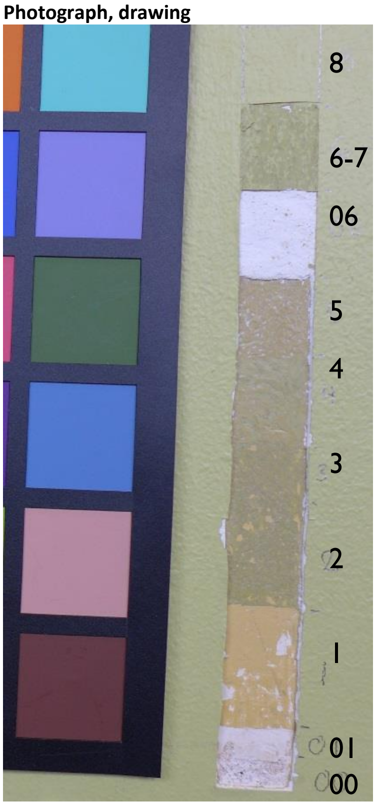


Number of Sample	Subject	Building / Space / Surface
64	Paimio Sanatorium	Main building 4th Floor A wing, main corridor Wall (wall with doors leading to patient rooms)
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

1970's ventilation system brought casing of the pipes and electric cords in the ceiling. Doors and their sizing has changed, broader painted wooden doors have replaced the original wooden doors with lacquered surfaces. The lighting and fixtures have also been replaced.

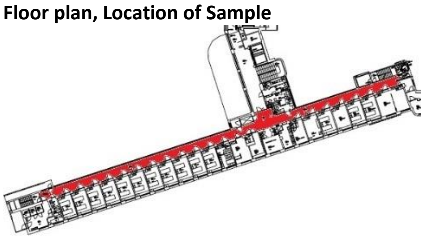
Photograph, drawing

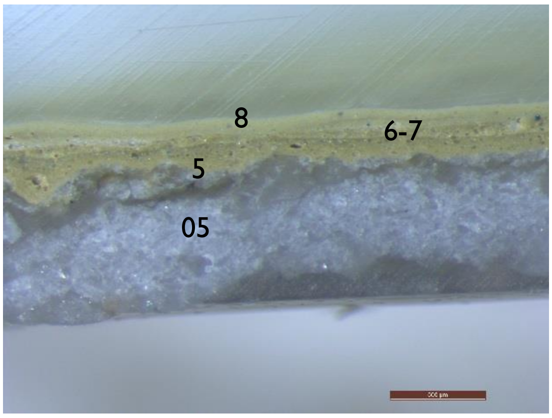


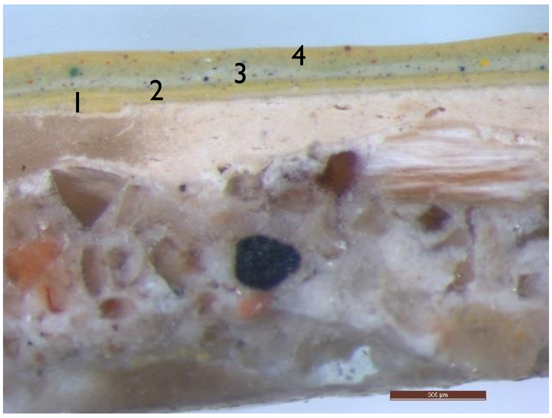
Layers of Sample

Layers of Sample
00 plaster
0 Filler
1 Yellow 2040-Y10R
2 Dark Green 5020-G70Y
3 Green 2050-Y
4 Green 4020-G70Y
5 Brown 3040-Y
06 White light weight filler
6 -7 Green 4030-70Y and 5020-G70Y
8 Green 2030-G80Y

Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:
1st layer Oil paint

Technique used to make and take Samples, Circumstance in site, Lighting:	Color chart in use:	Type of Sample, Place of Storage:	Floor plan, Location of Sample
Carved color steps on surface, crater technique, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written without the NCS prefix.	Cross-section sample 64.Alvar Aalto Foundation Helsinki. Scale 500 µm.	





The sample no. 64 broke in two parts: the undermost layers are seen in the picture below. It shows original undermost the oil paints with colors of yellow and green.

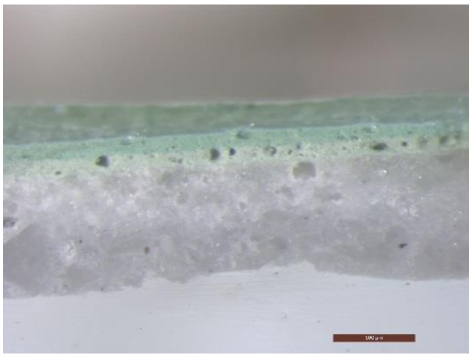
Patien Room Ceiling, 4th Floor

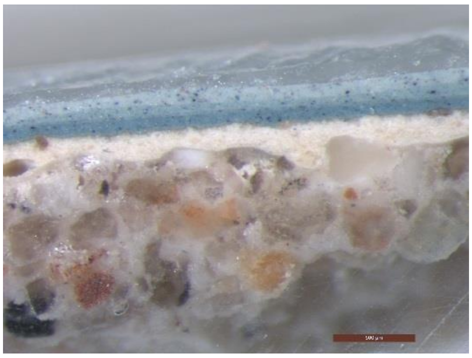
Number of Sample	Subject	Building / Space / Surface
68	Paimio Sanatorium	Main building 4th Floor Patients' room Ceiling
Architect, building year	**Researcher, date**	
Alvar Aalto, 1929-33	Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

Patients' rooms have been fully renovated during 1970's as the hospital technique (i.e. different types of gases, electricity) and all of the surfaces, HVAC-technique and furniture were redone. Original ceiling radiators were removed and ceilings painted (but not hidden under dropped ceiling structures). Wallcoverings and flooring were replaced. Original furniture was removed.

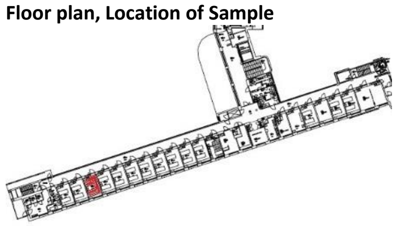
Photograph, drawing





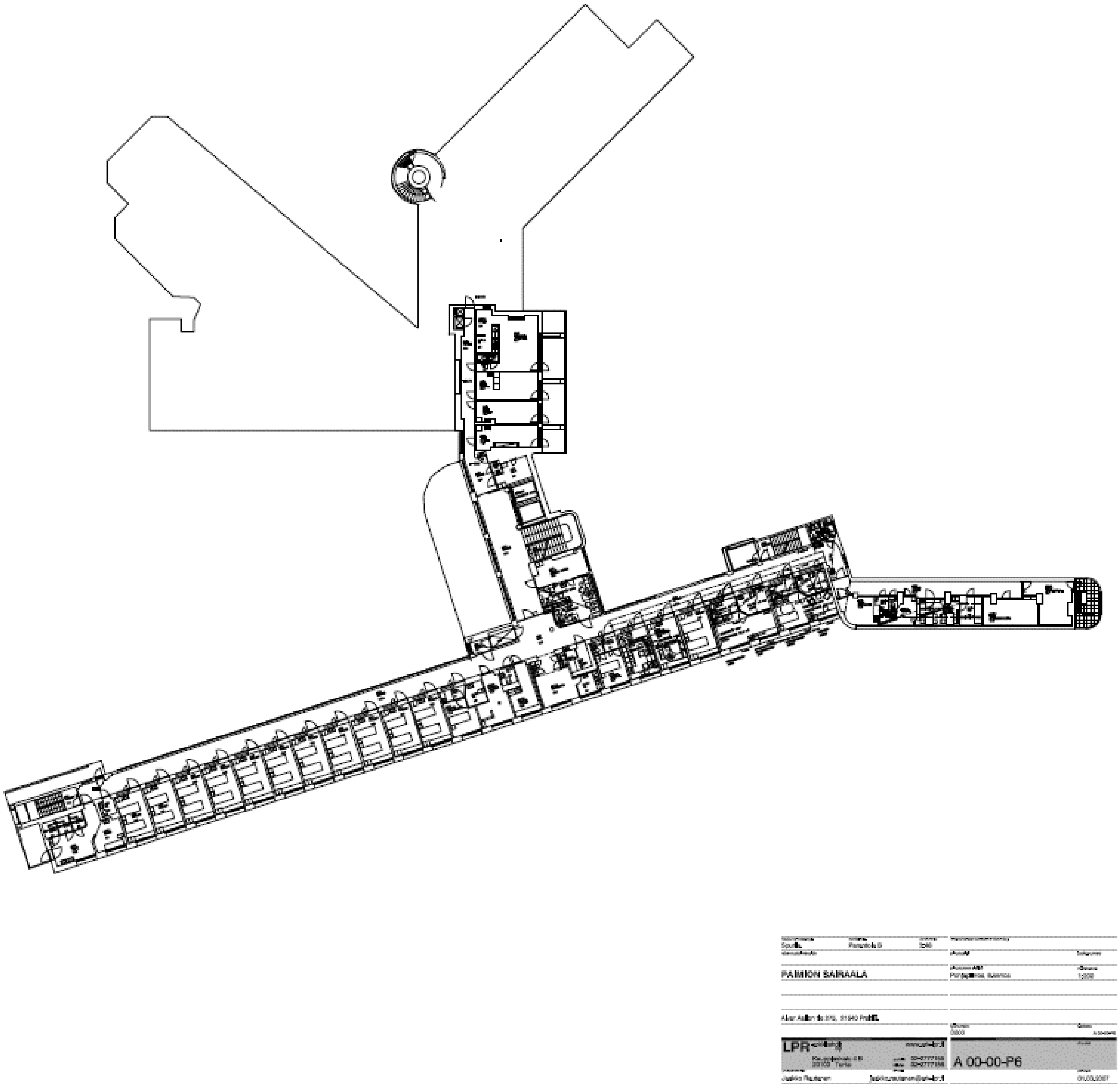
Layers of Sample	
00	
0	
1	
2	
3	
4	
6	
7	
8	
9	
10	

Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:
1 Öljymaali

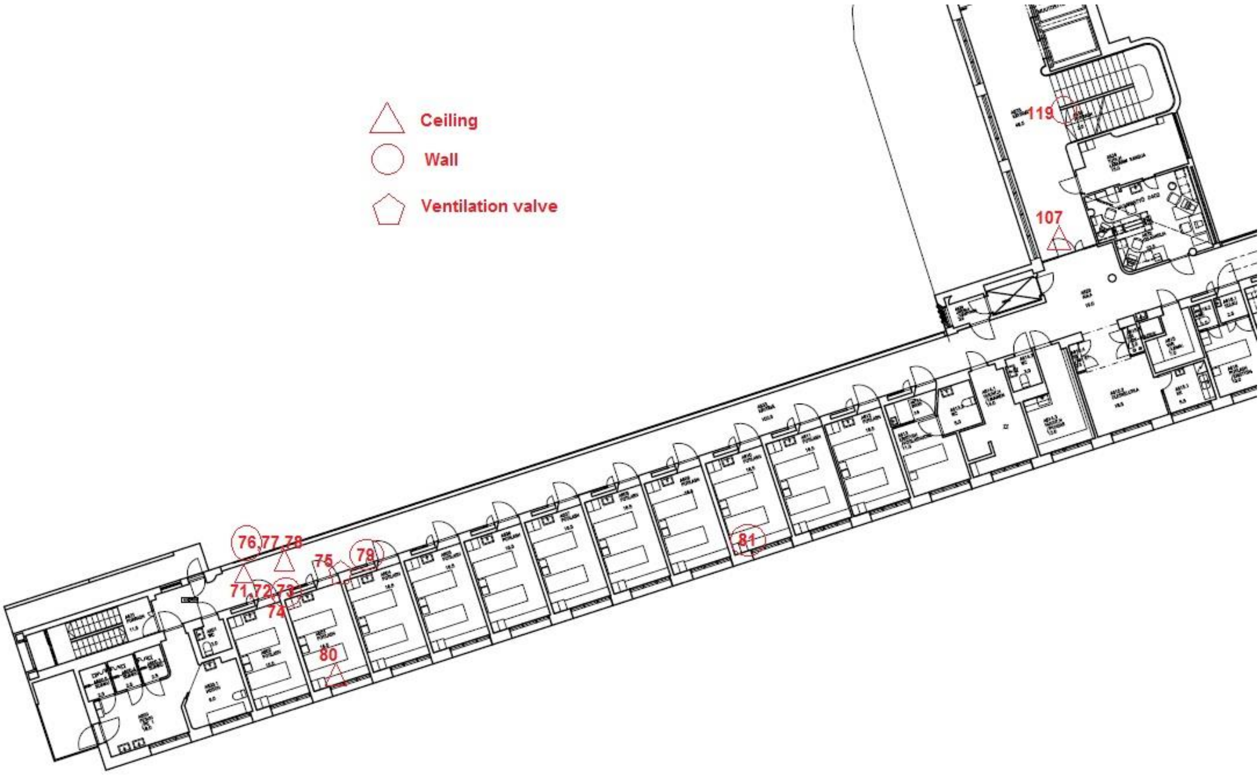
Technique used to make and take Samples, Circumstance in site, Lighting:	Color chart in use:	Type of Sample, Place of Storage:	Floor plan, Location of Sample
Carved color steps on surface, crater technique, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written without the NCS prefix.	Cross-section sample, Alvar Aalto Foundation Helsinki	

19.5th Floor – General view

Just as the fourth floor, the fifth also has apartments in the north wing. These were excluded from this research. The ward on sixth floor has blue as its main color. The other blue ward was the 2nd floor ward.



The Samples of 5th Floor



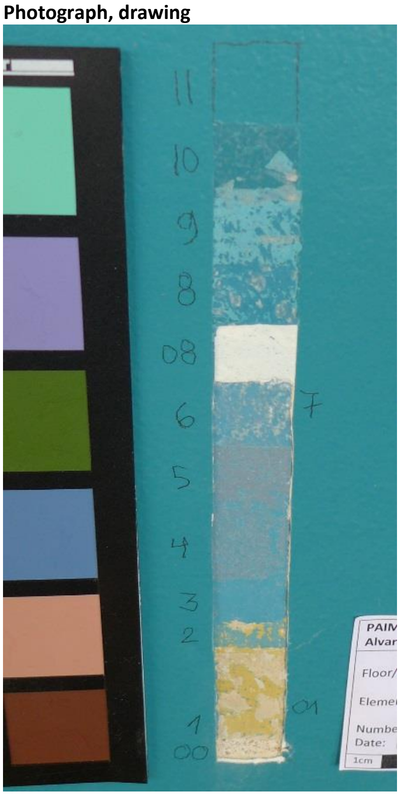
Patient Wing, Main Corridor

Subject Paimio Sanatorium 79	**Building / Space / Surface** Main building 5th Floor Patient wing, main corridor Wall (wall with doors leading to patient rooms)
Researcher, date Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

Patient rooms have been fully renovated during 1970's as the hospital technique (i.e. different types of gases, electricity) and all of the surfaces, HVAC-technique and furniture were redone. Original ceiling radiators were removed and ceilings painted (but not hidden under dropped ceiling structures). Wallcoverings and flooring were replaced. Original furniture was removed.

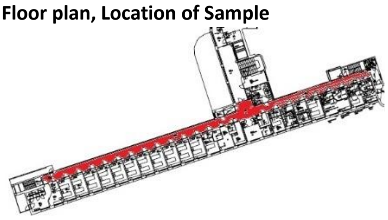
Photograph, drawing

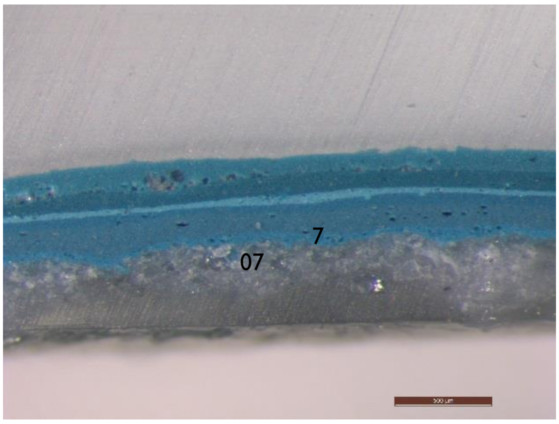


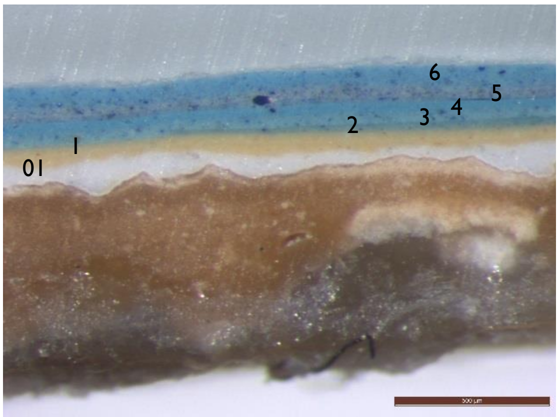
Layers of Sample
00
01 Filler
1 Yellow, oil paint, 1040-Y10R
2 Blue 3030-B10G
3 Blue 3040-B10G
4 Blue 4020-B10G
5 Violet blue 4020-R80B
6 Blue 2050-B
7 Blue 4030-B10G
08 Filler, white light weight
9 Light blue 1040- B20G
10 Petrol Blue 4550-B20G
11 Blue 3050-B30G

Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:
1st layer: Oil paint

Color chart in use: NCS Teknos 2004 Color codes are written without the NCS prefix.	**Type of Sample, Place of Storage:** Cross-section sample 79, Alvar Aalto Foundation Helsinki. Scale 500 µm.	**Floor plan, Location of Sample**







Sample 79 presented in two parts.

The sample no. 79 was broken into two parts, the undermost layers shown here below. The cross section sample clearly shows a rather thick yellow paint layer that has been painted on white filler. This same undermost yellow layer is also found in the ward walls in 2nd and 5th floors. See second floor ward wall for further details addressing the yellow paint.

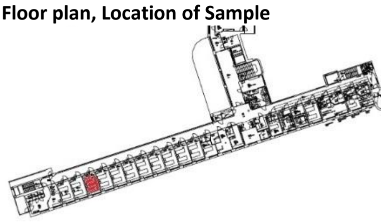
5th Floor Patients' Room Ceiling

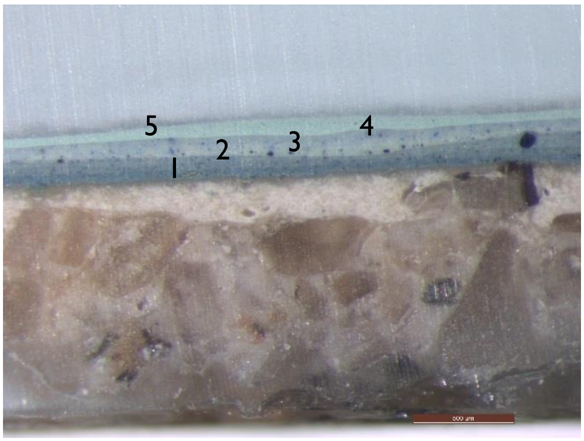
Number of Sample	**Subject**	**Building / Space / Surface**
80	Paimio Sanatorium	Main building 5th Floor Patients' room Ceiling
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

Patients' rooms have been fully renovated during 1970's as the hospital technique (i.e. different types of gases, electricity) and all of the surfaces, HVAC-technique and furniture were redone. Original ceiling radiators were removed and ceilings painted (but not hidden under dropped ceiling structures). Wallcoverings and flooring were replaced. Original furniture was removed.

Photograph, drawing	**Layers of Sample**
	00
	01 Filler
	1 Grey 6502-G
	2 Grey 3005-G50Y
	3 Blue 4010-B70G
	4
	05 White filler
	5 4010G-10 Y Green
	6 Green 4010-G30Y
Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:	

Technique used to make and take Samples, Circumstance in site, Lighting:	**Color chart in use:**	**Type of Sample, Place of Storage:**	**Floor plan, Location of Sample**
Carved color steps on surface, crater technique, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written without the NCS prefix.	Cross-section sample 80. Alvar Aalto Foundation Helsinki. Scale 500 µm.	



The sample no. 80 shows the layers of 6th floor patient room ceiling. The colors are the same as in 1st floor patient rooms, with greyish blue undermost layers.

The black and white photograph below states the interior of sixth floor ward after the completion of main building in 1933. The flooring is heavy patterned rubber.

Ward corridor of 5th floor presents the original look and confining of color. Notice the corners of walls and ceiling, the original radiators, laquared doors and linoleum flooring. AAM. Sign. 50-003-328.

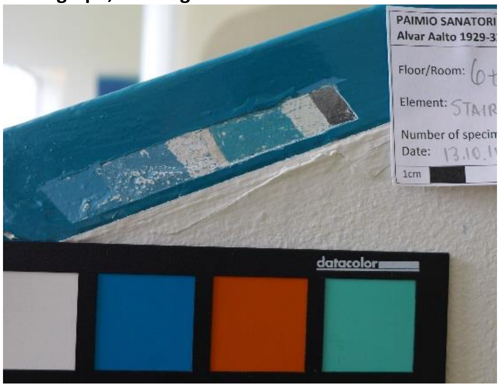
5th floor, Main Staircase, Handle

Number of Sample	Subject	Building / Space / Surface
80	Paimio Sanatorium	Main building 5th Floor Main staircase, handrail Ceiling
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

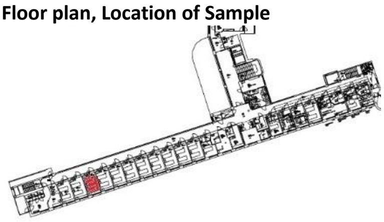
Patient rooms have been fully renovated during 1970's as the hospital technique (i.e. different types of gases, electricity) and all of the surfaces, HVAC-technique and furniture were redone. Original ceiling radiators were removed and ceilings painted (but not hidden under dropped ceiling structures). Wallcoverings and flooring were replaced. Original furniture was removed.

Photograph, drawing



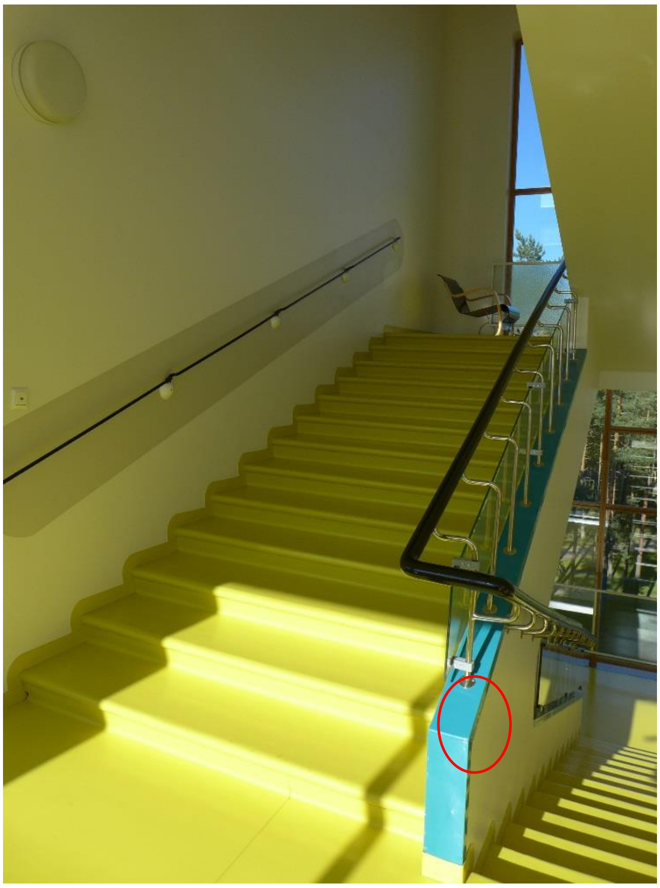
Layers of Sample
00 Iron
1 White 0502-Y
2 Blue 3040-B20G
3 White
4 White
5 Blue 4030-B10G
6 Blue 3040-B10G
7 Blue 4040-B30G

Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:
1st layer not determined.

Technique used to make and take Samples, Circumstance in site, Lighting:	Color chart in use:	Type of Sample, Place of Storage:	Floor plan, Location of Sample
Carved color steps on surface, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written without the NCS prefix.	No sample.	

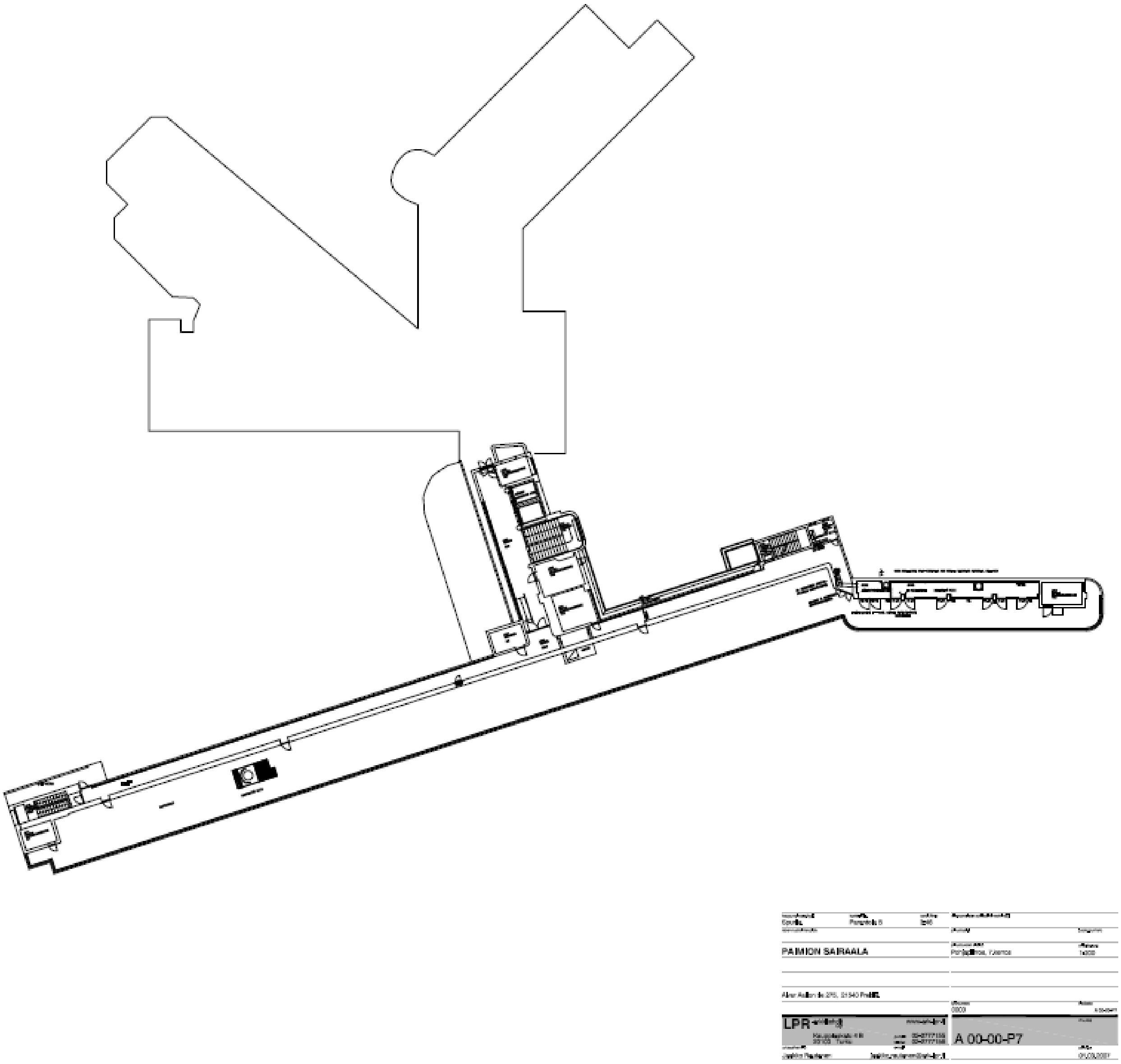
The excavation was made in the middle barrier of the main stair case. The exact spot is marked in the picture below.

AAM. Sign. 50-003-321a.

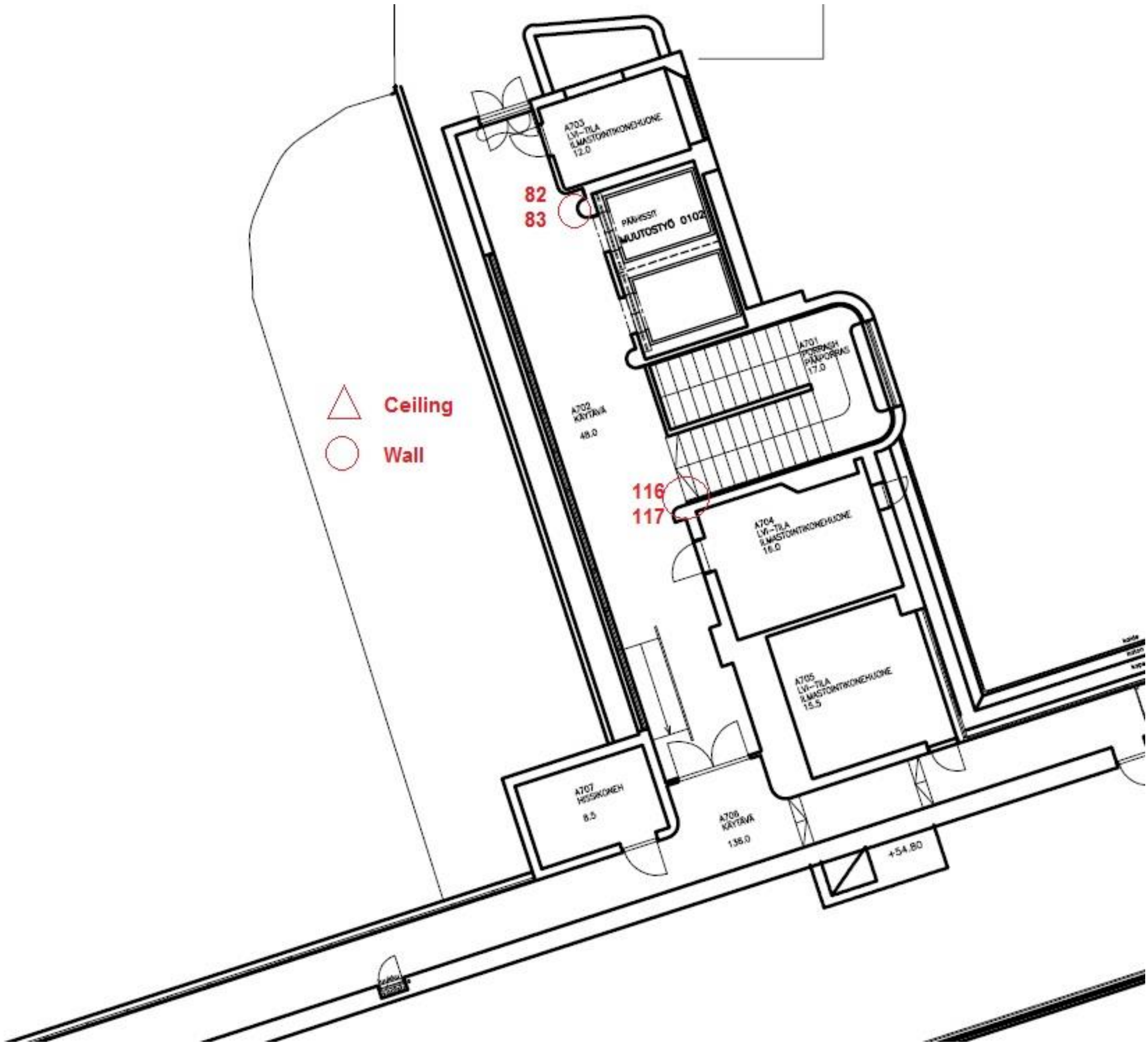


20. 6th Floor- A General View

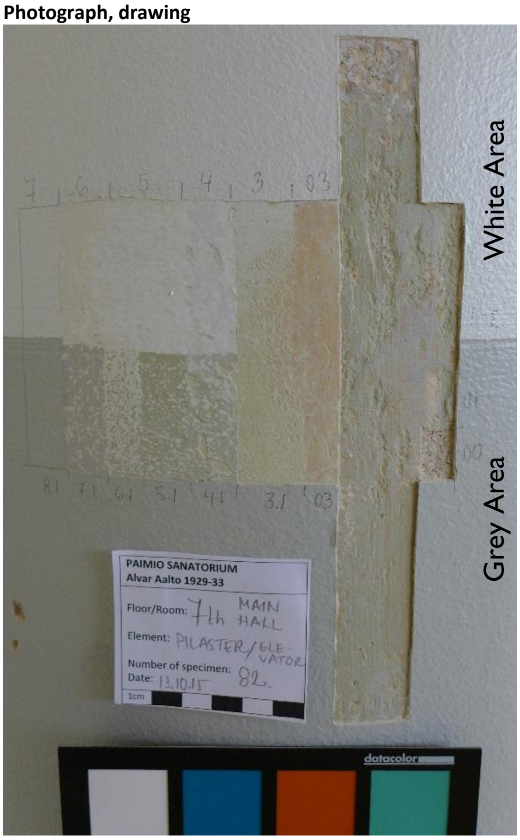
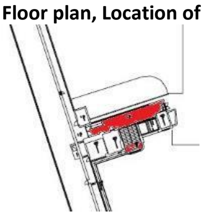
The sixth floor has access to the top floor balconies facing south and to the roof giving to north. The corridors leading to the balconies above the 5th floor ward showed white layers of paint, it was not researched more retentively. The research concentrated in the main hall and stair case of the seventh floor.

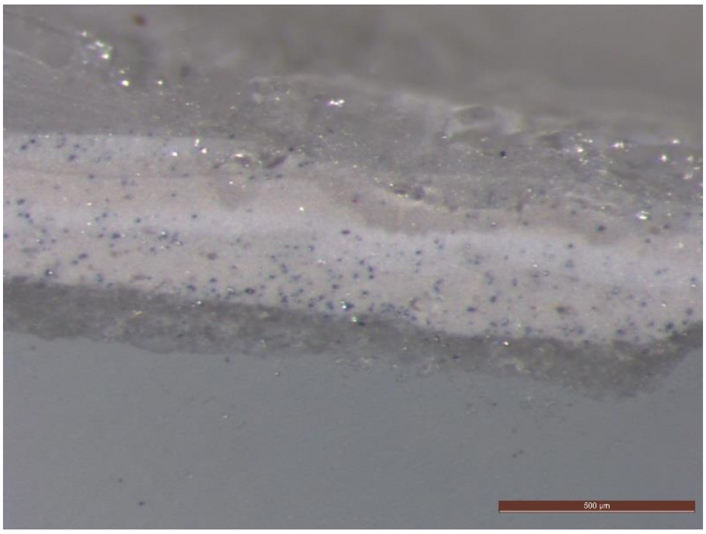


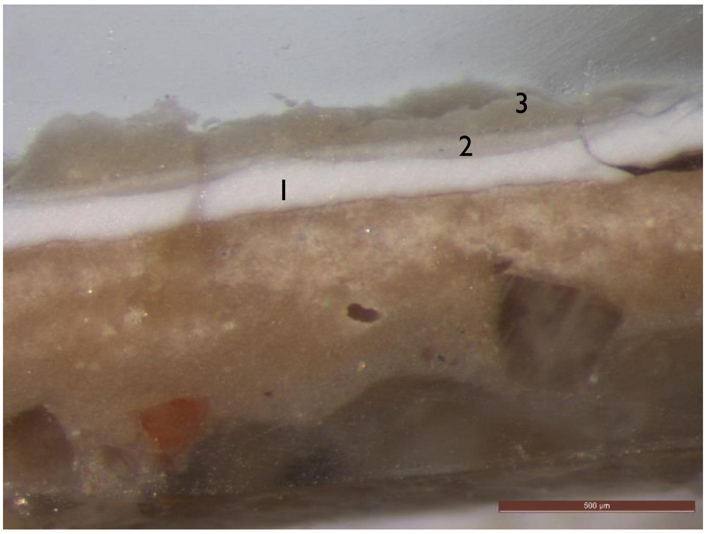
The Samples of 7th Floor



Main Staircase, Pilasters Next to the Elevators

<table>
<tr><td>Number of Sample
82, 83</td><td>Subject
Paimio Sanatorium</td><td colspan="2" rowspan="2">Building / Space / Surface
Main building
6th Floor
Main staircase
Pilaster next to the elevators, an area of grey paint in a white painted pilaster.</td></tr>
<tr><td>Architect, building year
Alvar Aalto, 1929-33</td><td>Researcher, date
Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation</td></tr>
<tr><td colspan="4">Most significant repairments and changes of the space, dates
Main stair has had a few changes. The flooring has been changed from the original yellow rubber flooring to new material. The last change of flooring was made only in the 1990's. Walls have been painted. The main stair's middle handrail has had a recent change as clear screens were attached between railings to protect visiting children. Hand railings are original on both sides of stairs. No dropped ceiling structures have been installed, ceilings of main stairway have only been painted during many renovations.</td></tr>
<tr><td colspan="2" rowspan="10">Photograph, drawing

</td><td colspan="2">Layers of Sample, WHITE AREA
00 plaster
01 Filler</td></tr>
<tr><td colspan="2">1-2 Grey 2002-B, Green 3005-G80Y</td></tr>
<tr><td colspan="2">03 Filler
3 White 0500-N</td></tr>
<tr><td colspan="2">4 Grey 1002-H</td></tr>
<tr><td colspan="2">5 White 0300-N</td></tr>
<tr><td colspan="2">6 Beige 0804-Y10R</td></tr>
<tr><td colspan="2">7White</td></tr>
<tr><td colspan="2">Layers of sample. GREY AREA.
00 to 2 same layers as above
03Filler
3.1.Yellow , enamel-kind, 1005-G80Y</td></tr>
<tr><td colspan="2">4.1 Grey 1005-N</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td colspan="2" rowspan="4">Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:</td><td colspan="2">5.1 Grey 3005-G80Y</td></tr>
<tr><td colspan="2">6.1 White 0804-Y10R</td></tr>
<tr><td colspan="2">7.1 Grey 2005-R80B</td></tr>
<tr><td colspan="2">8.1 Grey 2005-B</td></tr>
<tr><td>Technique used to make and take Samples, Circumstance in site, Lighting:
Carved color steps on surface, crater technique, daylight + fluorescent lamps</td><td>Color chart in use:
NCS Teknos 2004
Color codes are written without the NCS prefix.</td><td>Type of Sample, Place of Storage:
Cross-section samples 82 and 83, Alvar Aalto Foundation Helsinki. Scale 500µm.</td><td>Floor plan, Location of Sample
</td></tr>
</table>





The cross section samples no. 82 and 83 gave a poor result. Neither gave the information needed. Excavation work gave better results. All things considered the grey area and its' original size researched on the pilaster was not thoroughly determinated.

Main Staircase, Wall Behind Stair Handrail

Number of Sample
117

Subject
Paimio Sanatorium

Building / Space / Surface
Main building
6th Floor
Main staircase
Wall, an area of grey paint on white painted wall.

Architect, building year
Alvar Aalto, 1929-33

Researcher, date
Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation

Most significant repairments and changes of the space, dates
Main stair has had a few changes. The flooring has been changed from the original yellow rubber flooring to new material. The last change of flooring was made only in the 1990's. Walls have been painted. The main stair's middle handrail has had a recent change as clear screens were attached between railings to protect visiting children. Hand railings are original on both sides of stairs. No dropped ceiling structures have been installed, ceilings of main stairway have only been painted during many renovations.

Photograph, drawing

Layers of Sample, WHITE AREA
00 Plaster

02 Filler

2.1 White 1002-G50Y

3.1 White 1002-Y50R

4.1 White 0300N

Layers of sample. GREY AREA
00 laster

1 Grey 2005-G80Y or 3005-G80Y

02 Filler
2 White 0500-N

3 Grey 1502-Y50R

4 Grey 1502-Y

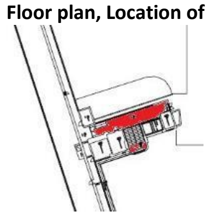
Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:
Grey undermost paint: oil paint.

Technique used to make and take Samples, Circumstance in site, Lighting:
Carved color steps on surface, crater technique, daylight + fluorescent lamps

Color chart in use:
NCS Teknos 2004
Color codes are written without the NCS prefix.

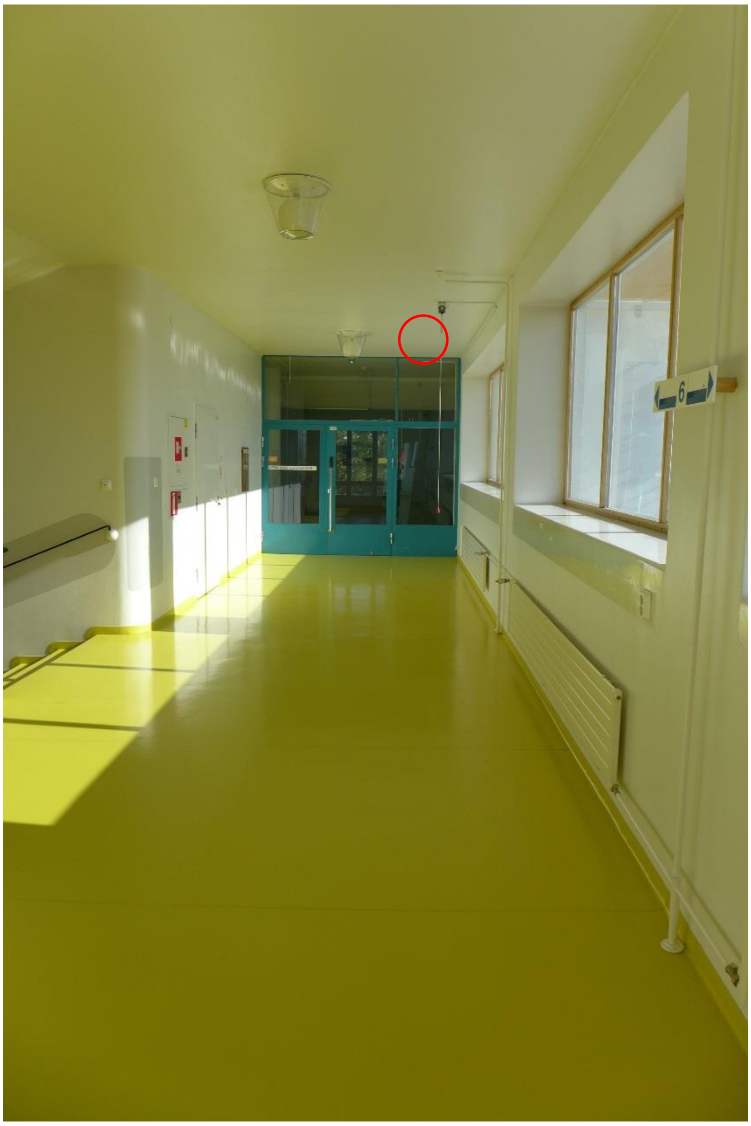
Type of Sample, Place of Storage:
No sample.

Floor plan, Location of Sample

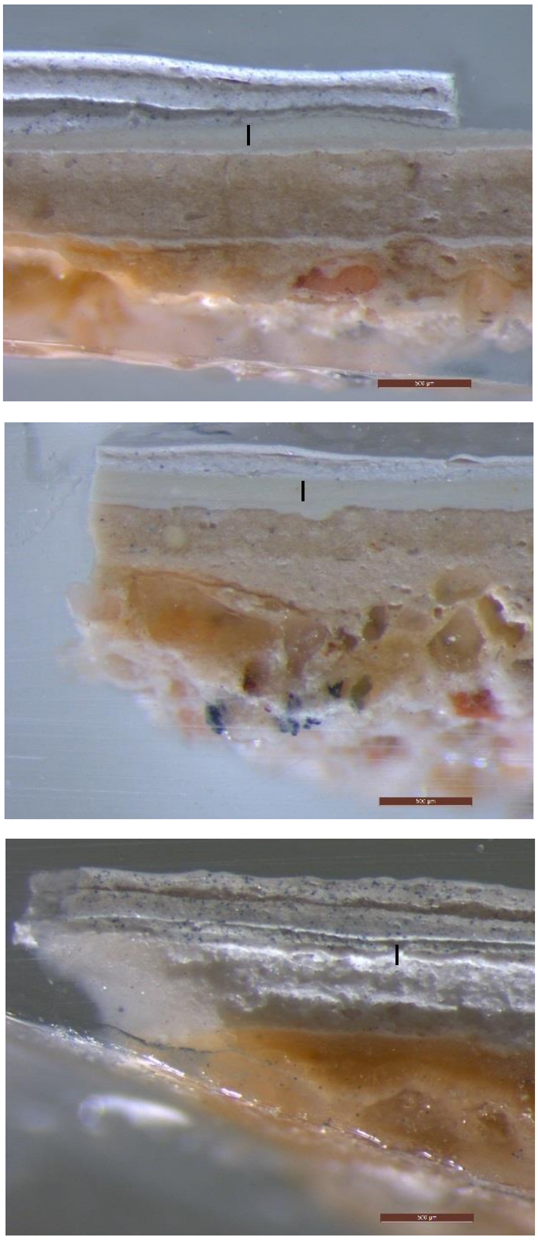


21. The Main Staircase Ceilings from Ground to 5th Floor

The ceilings of main staircase corridors were researched throughout the floors from ground floor to 5th by taking cross section samples. All samples showed white and beige neutral colors. Below are three exsamples from the cross section samples taken from the ceilings of main halls in each floor.



The fifth floor main staircase. The spot were cross section sample was taken.



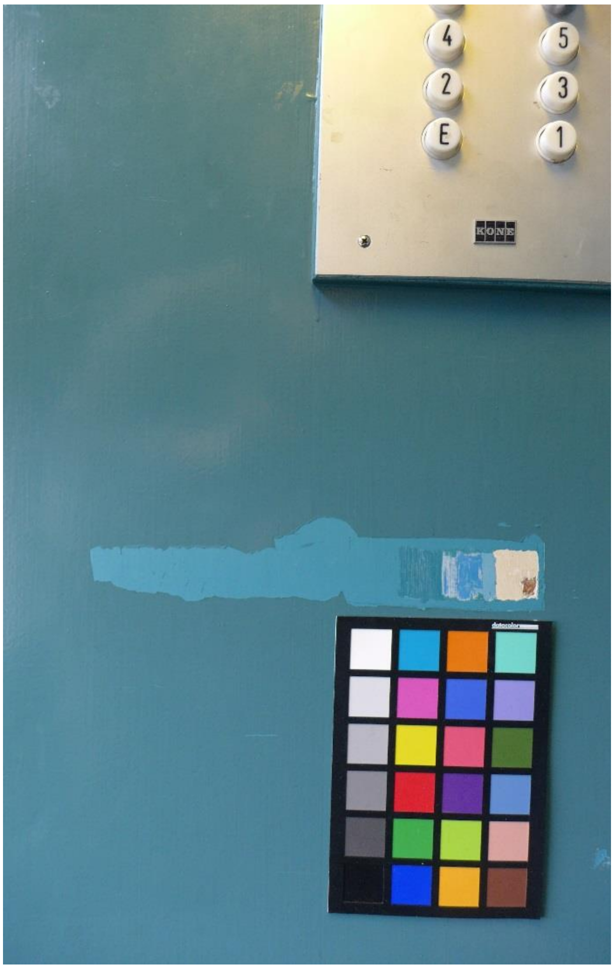
Above are three samples from ceilings of main hallways in 2nd, 3rd and 4th floor. All together six samples was taken from 6 floors.

22. The West Staircase and Elevator

The original elevator in the west end of the ward wing is still in its place. The Elevator car and technique are well preserved and fully functioning. The elevator is still in use, if not daily, but by the tourist groups that visit the main building. They ride it down from the scenery balconies down to the first floor ward. The elevator shafts west wall is mainly glass, hence the nickname Scenic elevator.

The elevator car and the staircase surrounding it, rising from cellar floor to the seventh floor, was included in the year 2000 color research. In this 2015 research the aim was to define also the front door and its' surroundings coloring, in every half floor where the elevator stops. The results gathered there were linked to the "three color system" that Kauria originally used when painting the ward hall ways. These same three colors, blue, green and ochre, were found in the doorways of elevator shaft. For example the color of 1^{st} floor ward hallway was ochre. This same color was found in the elevator doorway between 1^{st} and 2^{nd} floor. The 2^{nd} floor ward color green was found in the elevator doorway between second and third floor, et cetera. The layers were few, which points to the fact that also these metallic surfaces of elevator doorways were stripped from original paints during renovation of past decades.

Original look of the elevator. AAM. Sign. 50-003-



An excavation of the year 2000 color research shows the vibrant blues and teals used in the painting of the elevator car.

Elevator Car

Number of Sample	Subject	Building / Space / Surface
	Paimio Sanatorium	Main building The west elevator of wards The elevator car walls RESEARCH POINT MADE IN YEAR 2000 COLOR RESEARCH
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

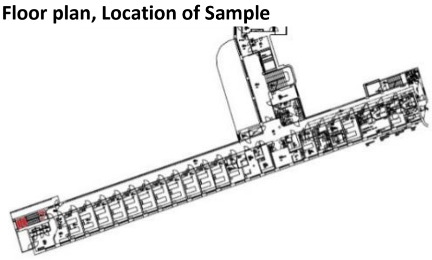
The elevator car is original. The ceiling light fixture of the elevator has been changed at some point. The front wall surrounding of every floor elevator door was originally made of glass. It was been changed to metal board. The button board inside the car has also been changed.

Photograph, drawing

Layers of Sample

00	
0	
1 White 1010-Y10R, base coat	
2 Blue 2030-B10G	
3 Blue 3040-B10G	
4 White base coat	
5 Teal blue	
6 Teal blue	
7	
8	
9	
10	

Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:

Technique used to make and take Samples, Circumstance in site, Lighting:	Color chart in use:	Type of Sample, Place of Storage:	Floor plan, Location of Sample
Carved color steps on surface, made 2000 by Katja Aaltonen, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written without the NCS prefix.	-	

Number of Sample	**Subject** Paimio Sanatorium	**Building / Space / Surface** Main building 3rd Floor Ward The West Staircase The handrail, metallic base RESEARCH POINT MADE IN YEAR 2000 COLOR RESEARCH
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

The elevator car is original. The ceiling light fixture of the elevator has been changed at some point. The front wall surrounding of every floor elevator door was originally made of glass. It was been changed to metal board. The button board inside the car has also been changed.

Photograph, drawing

Layers of Sample

00 Metal

0

01 White 1010-Y30R, base coat

1 Blue 3040-B30G

2 Blue 2020-B30G

4 Blue 3040-B10G

5 Blue 3020-B10G

6 Blue teal 4040-B40G

7

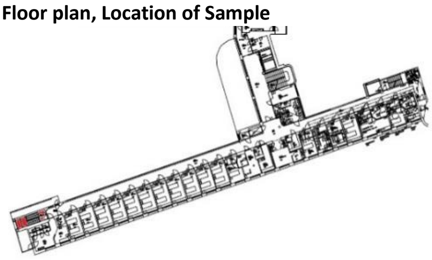
8

9

10

Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:

-

Technique used to make and take Samples, Circumstance in site, Lighting:	**Color chart in use:**	**Type of Sample, Place of Storage:**	**Floor plan, Location of Sample**
Carved color steps on surface, made 2000 by Katja Aaltonen, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written without the NCS prefix.	-	

23. The Flooring

The Original Yellow

The flooring of Paimio main building has gone through several changes. The original, significant material and color in the entrance hall and the main staircase was thick yellow rubber flooring. These floorings have been lost in renovations, except for one small fragment left inside the 4th floor main staircase cleaning cupboard. This piece of flooring has naturally lost the original vibrancy of the yellow hue. Still the yellow of the flooring is relatively bright. The NCS Color codes of the fragment are

NCS S1050-G90Y or 1050-Y.

The yellow flooring was originally specially made, a hue that was not available in catalogs. In an interview from 1986 Eino Kauria tells that soon after the order for the yellow flooring was made, Aalto had some grave second thoughts about the color yellow. At that point it was impossible to cancel the order. According to Kauria, Aalto himself stated that the chosen yellow color was a mistake.

The original fragment of yellow flooring in comparison to the renewed flooring surrounding the cupboard.

Other Floor Fragments

Other flooring fragments beside the original yellow, found in Paimio main building, have no resembles to the marmoleum patterned linoleum floorings seen in the photographs that present the original state of the dining hall, lounge or ward corridors. This brown linoleum at the middle, left, found in a drought lobby of a balcony in second floor main building, has somewhat heavy but straight pattern, and it is presumably a later linoleum from 1940's or 1950's. The same flooring, in a better condition is found in the second floor of former engine room for the cinematography technique.

The two floor samples seen below were found inside old cupboards in the hospital's staff building from the 1950's (by architect Lauri Sipilä). The fragments have been used for covering the cupboard shelves. The red sample shows some resembles to the original 1930's type of linoleum with marmoleum pattern. Green flooring sample covering another cupboard shows a slightly more modern pattern and material. The green fragment is probably from the 1950's.

The linoleum type flooring was also used to protect some heavy duty furniture like the original shoe shelves that were originally situated in the entrance hall. The flooring matt seems to have a pattern typical in 1940's so it has likely been installed during the 1948 renovation to cover up some detrition of the shelves. This flooring has not been found in any other location in the main building nor in the other buildings in the hospital area. nor shown in any photographs found.

Museum Room Flooring Today

The deep brown linoleum flooring of the ground floor museum room showed at the left, is probably not the original flooring of a patient room as it is in such good, resilient condition and shows vibrant uniform color throughout the room. The color code of this flooring is something between the two NCS color codes

NCS S 6020-Y50R and 6020 Y60R.

The Original Mosaic Concrete Stairs

The few original surfaces in Paimio main building are the mosaic concrete the two staircases in both ends of the A-wing, the wards and in the staircase of the central heating chimney attached to the C-wing or the kitchen wing.

The mosaic concrete steps of these stairs were pre-produced modules and they were installed on site. The color of all three stairs was the same: the base concrete mixture had a deep color of green with 3mm to 15mm sized white stone grains. The NCS color codes for the green are

6020-G30Y or 5020-G20Y.

The stairs climbing around the chimney of C-wing.

The staircase in the east end of the wards.

The staircase with panoramic lift, in the west end of the wards.

24. The Ceilings

In common areas like the entrance hall or the lounge or smaller spaces like laboratories, artificial sun treatment room and X-ray room had ceilings with high gloss finishes. The finishes are well presented in the black and white photographs of the original state of main building. A glossy finish was a common sight in the functionalism era buildings and Paimio was no exception. It was used not only on ceilings but on columns, window sills and walls were high durability or easy maintenance was required. This was also the case in Paimio, on all building parts mentioned before.

A vast number of the spaces today have a dropped ceiling structure to cover HVAC-systems installed during 1970's renovation (mainly ventilation pipes but also later electrical installations have been fitted inside these structures). These structures cover the whole original ceiling or just parts of it. In some rare cases the original ceiling was still left as a fragment above these structures, but mainly the ceilings had only new, few layers as the original surface had been sand blasted off, or otherwise removed in earlier renovation. The problem of the glossy paint surfaces produced on calcium plastering was that they had the tendency to detach from the ceiling as it is visible in the picture below.

Ceilings in main building had some noteworthy hues like light greens and light blues as the obvious whites and cream hues used mainly in common areas.

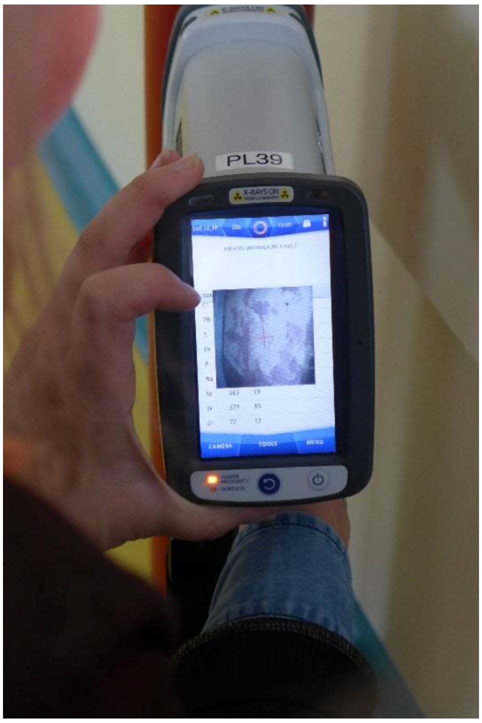
An original ceiling fragment in one of the 4th floor toilets, above the dropped ceiling structure hiding the 1970's and later HVAC-installations. The gloss of this fragment is not as distinctive as it probably has been in more important spaces like entrance hall or lounge in the first floor.

25. X-Ray Fluorescence

The X-ray Fluorescence (XRF) measurements were made in selected research points in the reading room of second floor and in the museum room of ground floor. Mainly first layers were measured to achieve data from the assumed first and original layers of paint. The aim was to gather data from paints to find out if these materials contained toxic elements as Leed (Pb) or Arsen (As).

Leed was expectedly present in red paints but also in white paints as Leed white was commonly used in base coats. Arsen, nor the environmentally dangerous heavy metal Vanadium (V) were present in data measured from surfaces. Also the data gathered provides information about the pigments used in paints, as Calcium (Ca) of chalk used as a filler in paints or in Calcium lime plaster, Titanium (Ti) that is used in Titanium white pigment, or Zink (Zn) of Zink white pigment that was heavily present in many measuring points. The XRF method provides data also under the surface measured. This gives us data through all layers present in the measuring point. Some concentration of Barium (Ba) was also measured. Barium is used in the production of white pigment.

The conservation students from Metropolia University of Applied Sciences measure Reading room columns with the guidance of chemist and lecturer Krista Hackzell (in front).



X-Ray Fluorescence Measurement Results

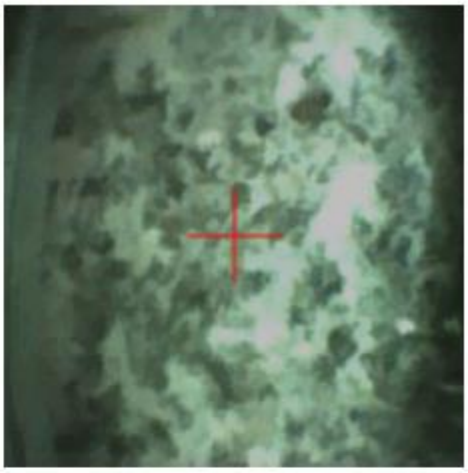
Reading room, window sill of north wall, first and undermost layer of paint

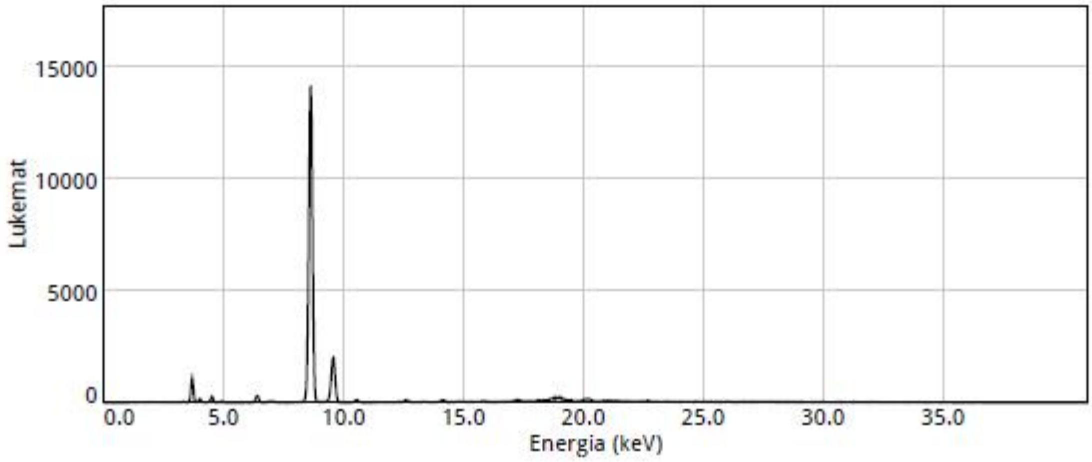
SAMPLE NAME	CLASS (element)	DATE	TIME	DURATION
Nimi kirjasto ikkunalauta krs 1	Luokka Soil_LE_FP	Päivämäärä 7.9.2015	Kellonaika 14.51.05	Kesto 20,5 s

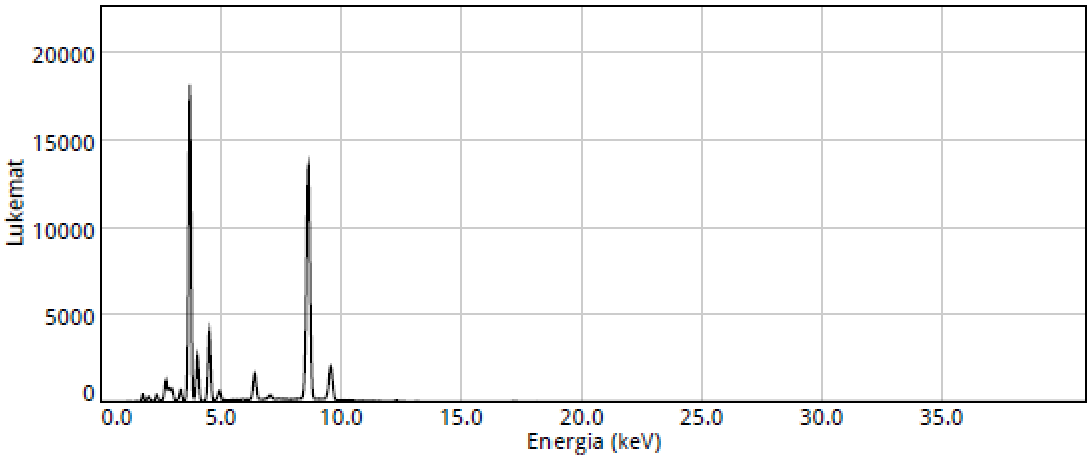
CHEM. ELEMENTS FOUND

Alkuaine	Ca ppm 286249	Zn ppm 161677	Si ppm 56836	Ti ppm 53049	K ppm 15246	Cl ppm 14857	Al ppm 10736	S ppm 9657
±	850	455	1432	338	268	276	2366	262
Alkuaine	Fe ppm 9135	P ppm 8041	Pb ppm 1483	Ba ppm 1320	Sr ppm 432	Co ppm 266	Zr ppm 111	Rb ppm 102
±	197	432	80	421	24	57	24	20

Vertailunäyte:







Reading room, window sill of north wall, second layer

Nimi	Luokka	Päivämäärä	Kellonaika	Kesto
kirjasto ikkunalauta krs 2	Soil_LE_FP	7.9.2015	14.55.49	20,6 s

Alkuaine	Ca ppm	Zn ppm	Ti ppm	Mg ppm	Si ppm	Cl ppm	Pb ppm	S ppm
	361693	106987	83676	38131	13923	8778	7169	5775
±	742	306	352	10685	718	172	113	167
Alkuaine	Fe ppm	P ppm	Ba ppm	Sr ppm	W ppm	Zr ppm		
	2169	2087	1213	588	373	72		
±	92	259	296	18	85	16		

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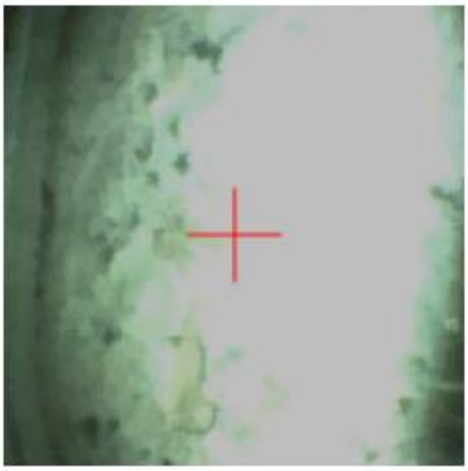

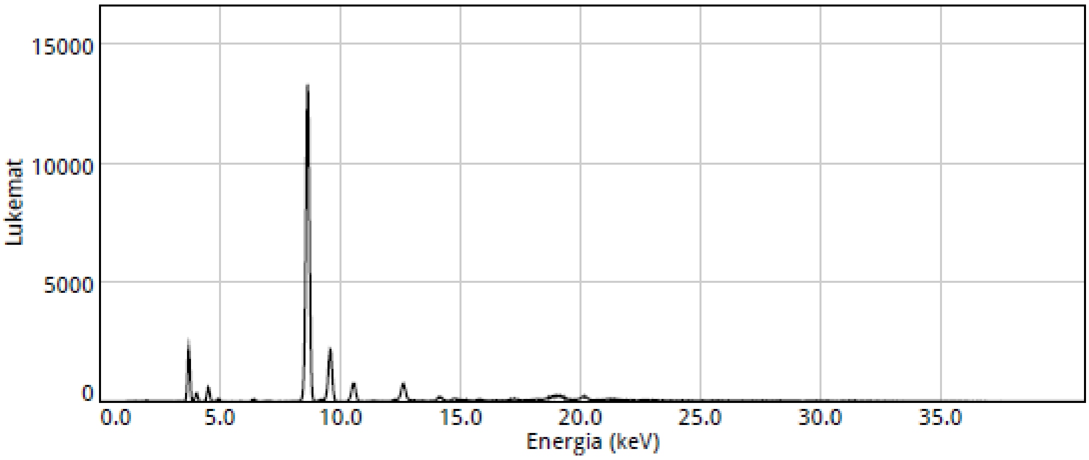

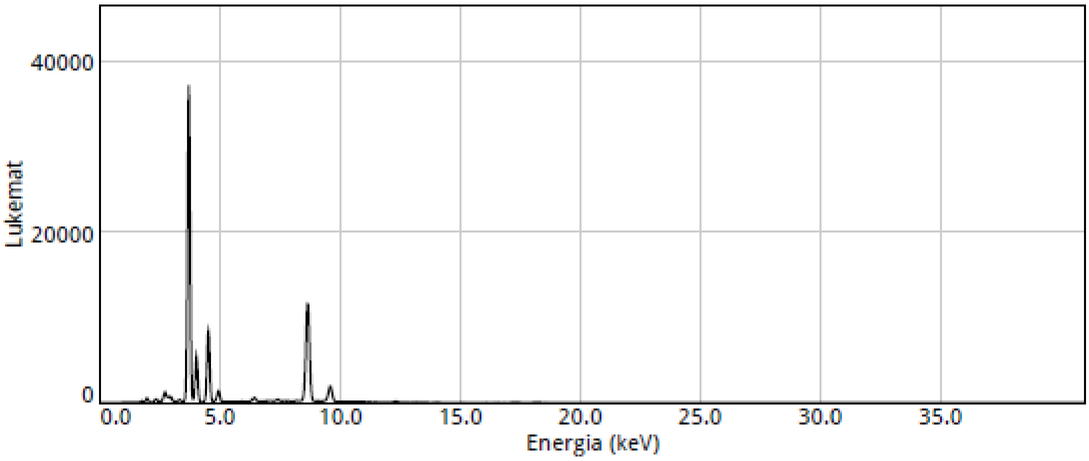

Reading room, red iron columns, second layer,yellow

Nimi	Luokka	Päivämäärä	Kellonaika	Kesto
kirjasto punainen 3 krs keltainen	Soil_LE_FP	7.9.2015	15.01.54	20,5 s

Alkuaine	Zn ppm 367139	S ppm 74520	Ti ppm 51650	Pb ppm 50192	Si ppm 44216	Ba ppm 26752	Cl ppm 22110
±	717	738	285	490	1735	888	440
Alkuaine	Ca ppm 19428	Fe ppm 14786	V ppm 13557	Cr ppm 4658	Sr ppm 4304	Mn ppm 950	Ta ppm 636
±	267	231	1177	1191	70	172	130
Alkuaine	Co ppm 415						
±	72						

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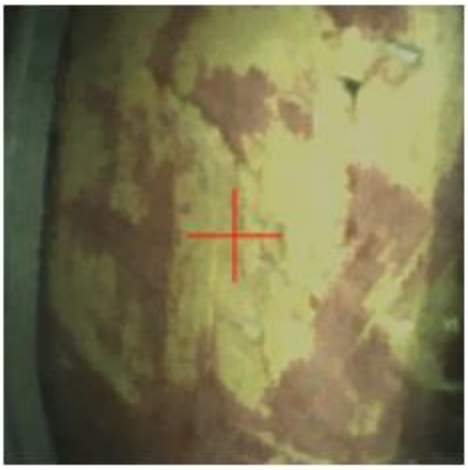
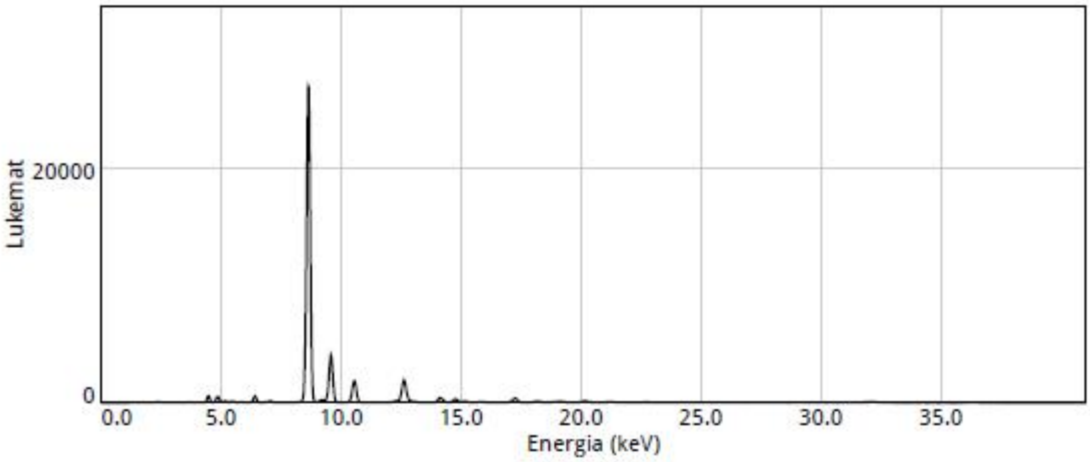
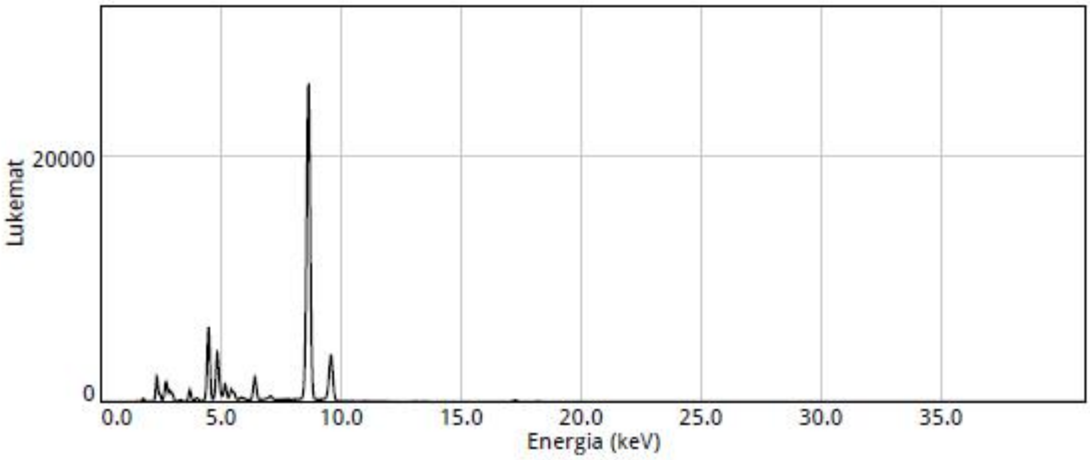




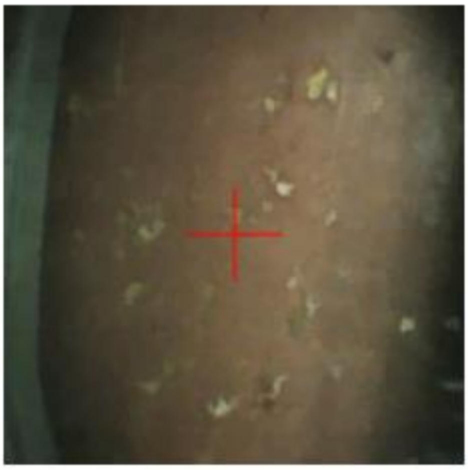


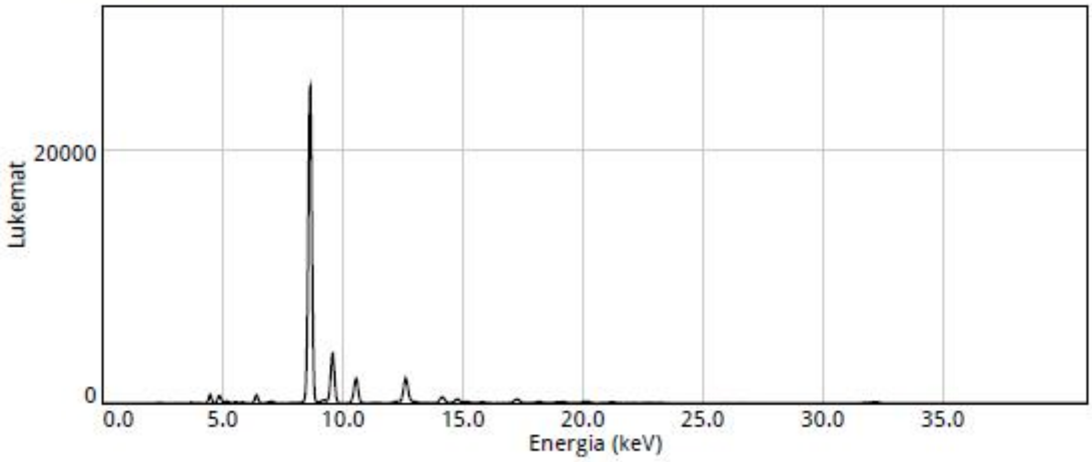
Reading room, red iron columns, third layer,red

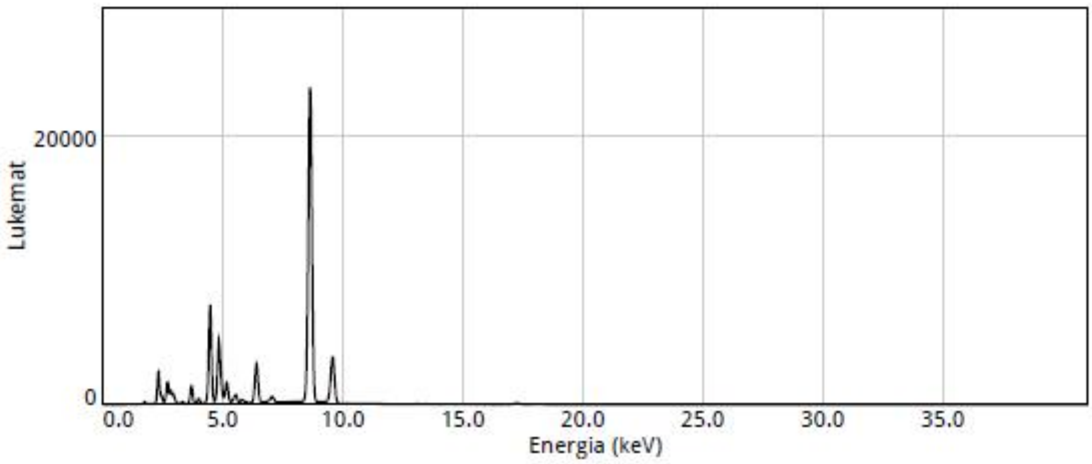
Nimi	Luokka	Päivämäärä	Kellonaika	Kesto
kirjasto punainen 3 krs punainen	Soil_LE_FP	7.9.2015	15.06.03	20,5 s

Alkuaine	Zn ppm	S ppm	Ti ppm	Pb ppm	Si ppm	Ba ppm	Ca ppm
	343118	90489	57583	50054	34118	31350	29420
±	692	782	304	475	1496	907	323
Alkuaine	Cl ppm	Fe ppm	V ppm	Sr ppm	Mn ppm	Ta ppm	Co ppm
	28197	17650	14593	4985	1332	629	260
±	471	254	1276	72	169	143	70

Vertailunäyte:







Reading room, railing of glasswall giving to dining hall, third layer

Nimi	Luokka	Päivämäärä	Kellonaika	Kesto
kaide 3 krs kirjasto	Soil_LE_FP	7.9.2015	15.12.03	20,5 s

Alkuaine	Zn ppm	Ti ppm	Ca ppm	Cl ppm	S ppm	Si ppm	Ba ppm	W ppm
	330976	194133	90351	14909	4654	4548	3091	1250
±	671	508	441	283	225	932	677	162

Alkuaine	Fe ppm	Pb ppm	Ta ppm	Co ppm	Sr ppm
	1129	870	714	391	288
±	85	352	126	58	41

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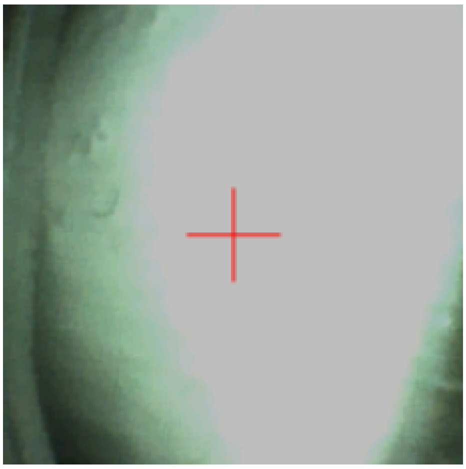

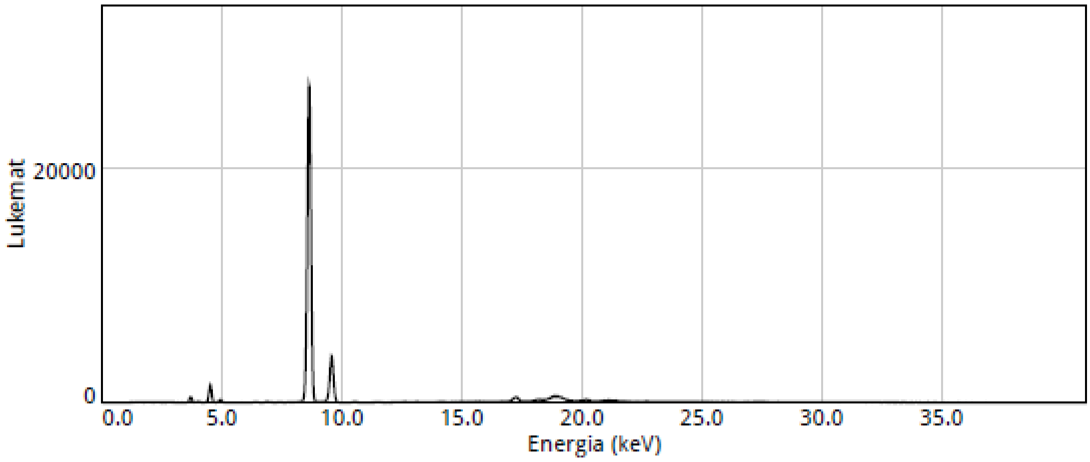

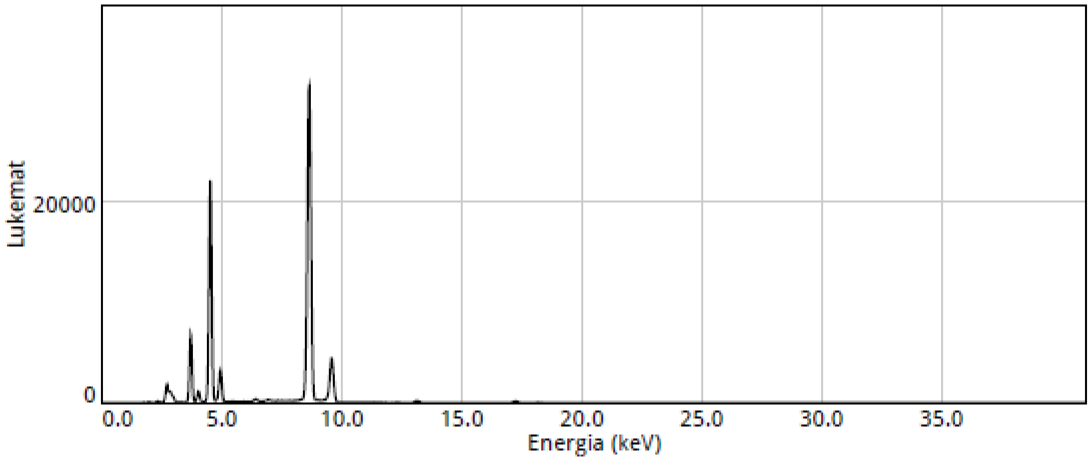

Museum room, space divider (furniture), first layer of paint

Nimi	Luokka	Päivämäärä	Kellonaika	Kesto
museohuone 1. sermi	Soil_LE_FP	7.9.2015	16.01.25	20,5 s

Alkuaine	Zn ppm	Cl ppm	Ca ppm	S ppm	Pb ppm	Ba ppm	Ti ppm	Si ppm
	591641	52249	24055	22754	13941	7204	7148	4915
±	1026	686	322	536	1922	1541	130	1427
Alkuaine	W ppm	V ppm	Fe ppm	Ta ppm	Sr ppm			
	2845	1751	1476	1336	862			
±	261	484	91	188	79			

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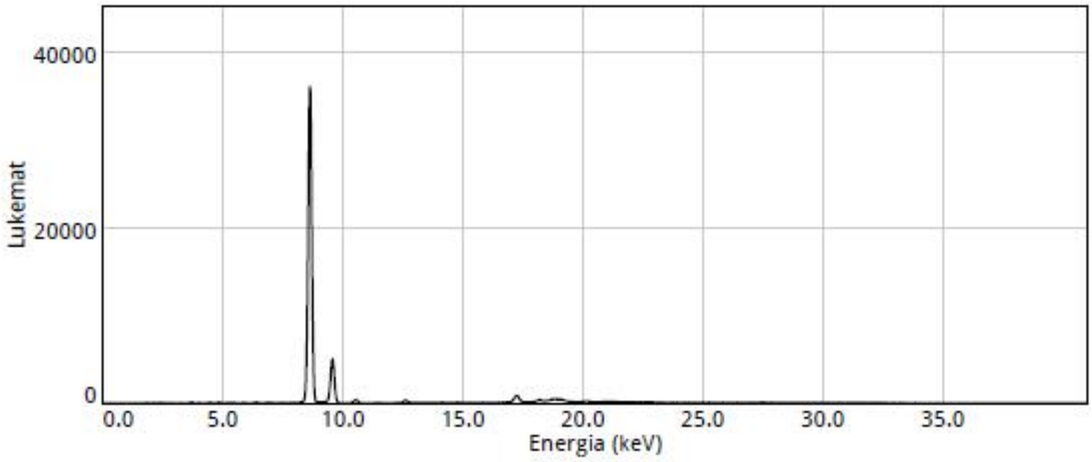

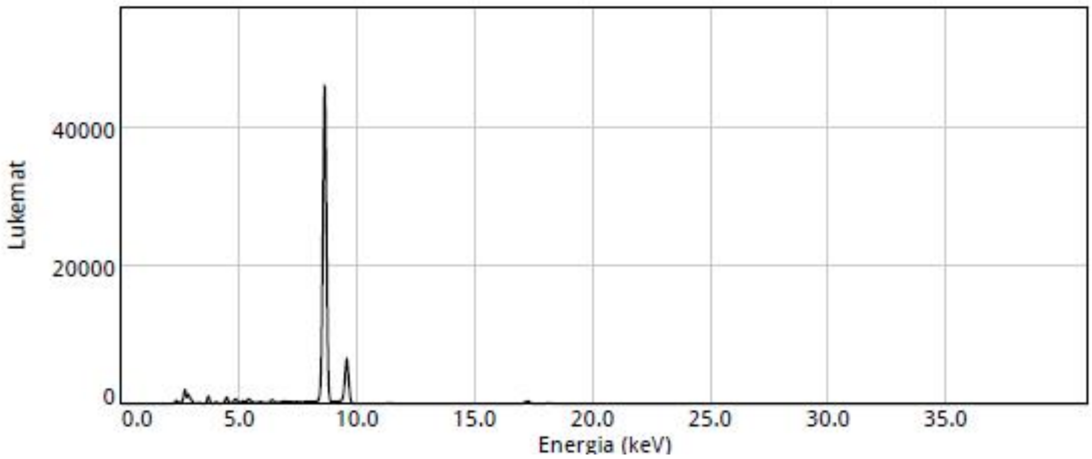

Museum room, the cheek of door, undermost layer

Nimi	Luokka	Päivämäärä	Kellonaika	Kesto
museohuone 1. smyygi 0	Soil_LE_FP	7.9.2015	16.05.44	20,5 s

Alkuaine	Ca ppm	Zn ppm	S ppm	Ti ppm	Cl ppm	Si ppm	K ppm	V ppm
	448485	94237	27419	24356	21314	9736	7765	6691
±	981	336	327	252	273	700	190	1066

Alkuaine	Al ppm	Ba ppm	Pb ppm	Sr ppm	Fe ppm
	6224	3548	3288	2103	1647
±	1942	406	93	33	110

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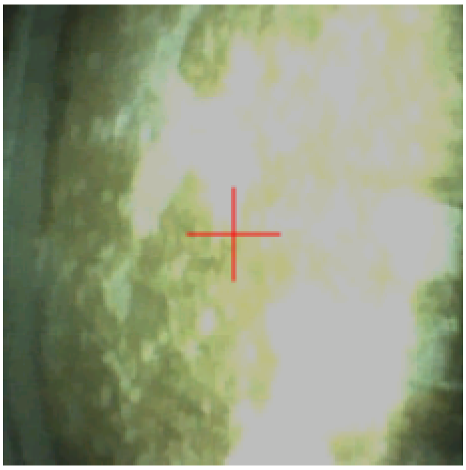
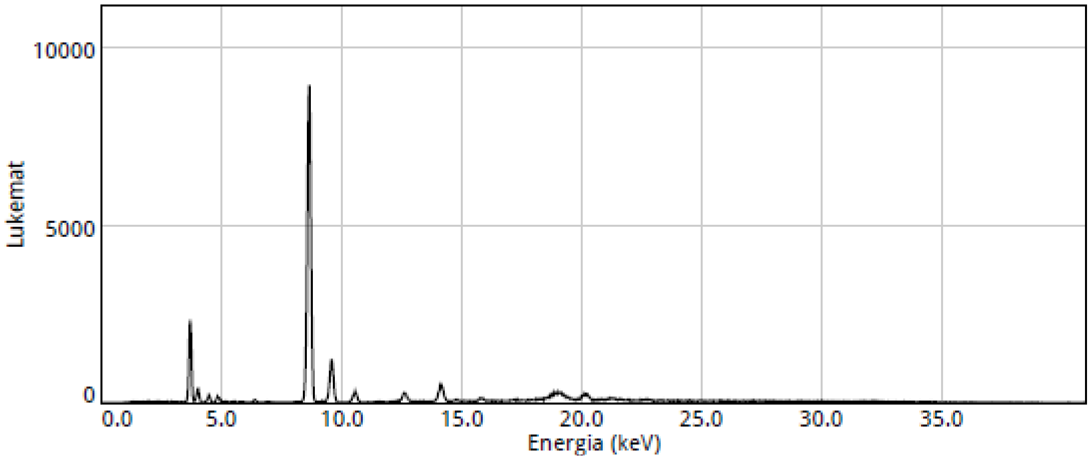
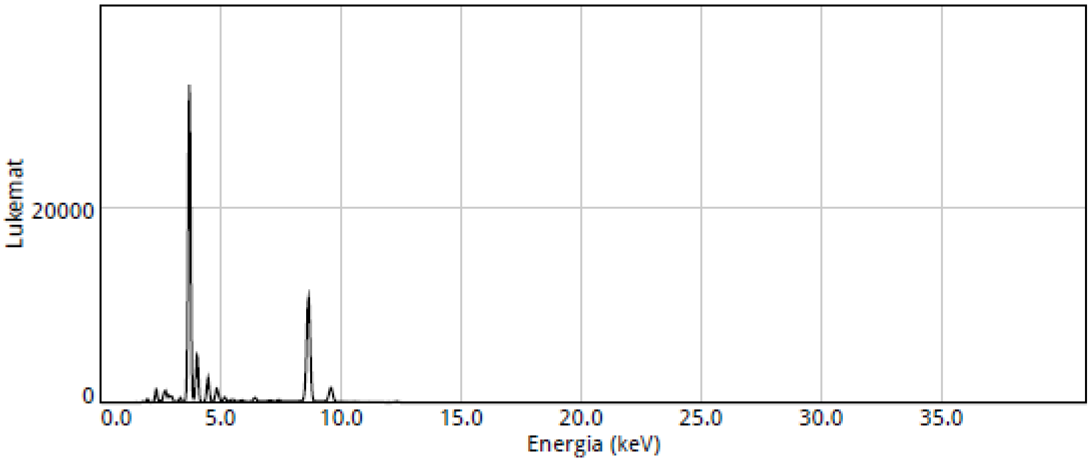




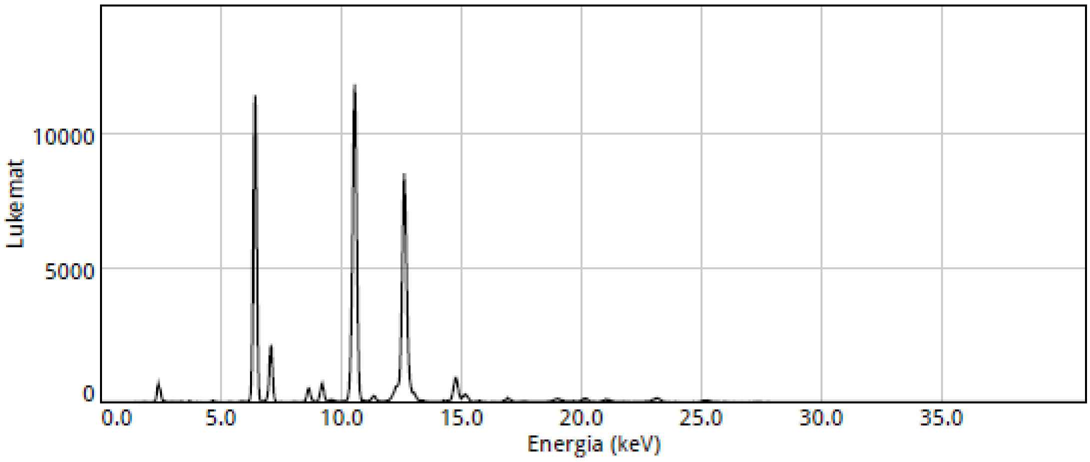


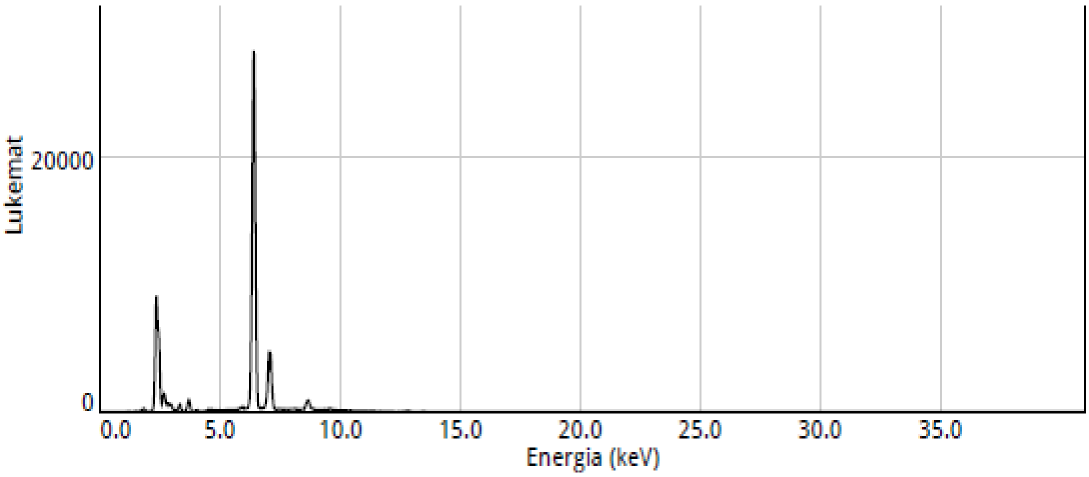
Museum room, jamb of door, undermost layer

Nimi	Luokka	Päivämäärä	Kellonaika	Kesto
museohuone 1. karmi 0	Soil_LE_FP	7.9.2015	16.09.19	20,6 s

Alkuaine	Fe ppm	S ppm	Pb ppm	Mg ppm	Cl ppm	Si ppm	Al ppm
	227355	214687	103671	54941	47720	28100	11194
±	713	814	427	7833	455	788	1440
Alkuaine	Ca ppm	K ppm	Zn ppm	P ppm	Ti ppm	Mn ppm	Cd ppm
	10175	8522	4561	1702	899	723	703
±	181	233	71	222	54	96	69
Alkuaine	Tl ppm	Se ppm	Rb ppm	Zr ppm			
	602	234	115	76			
±	49	21	17	18			

Vertailunäyte:

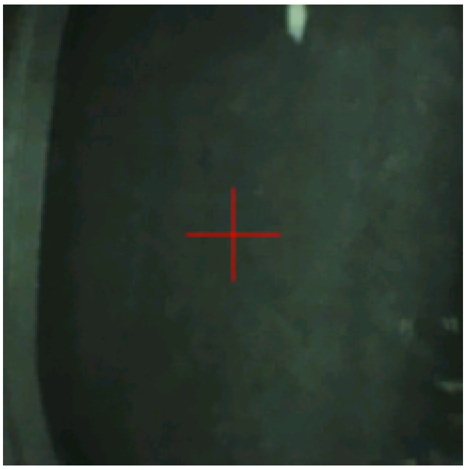


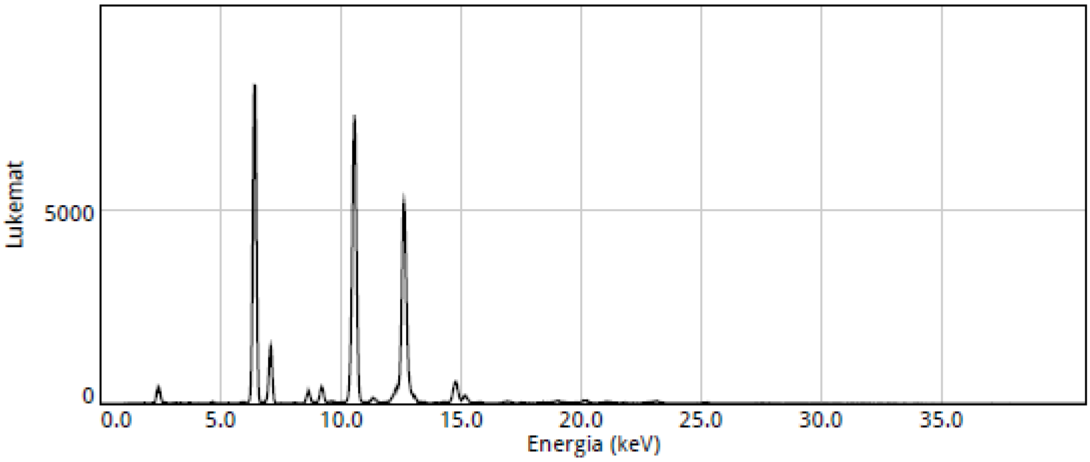


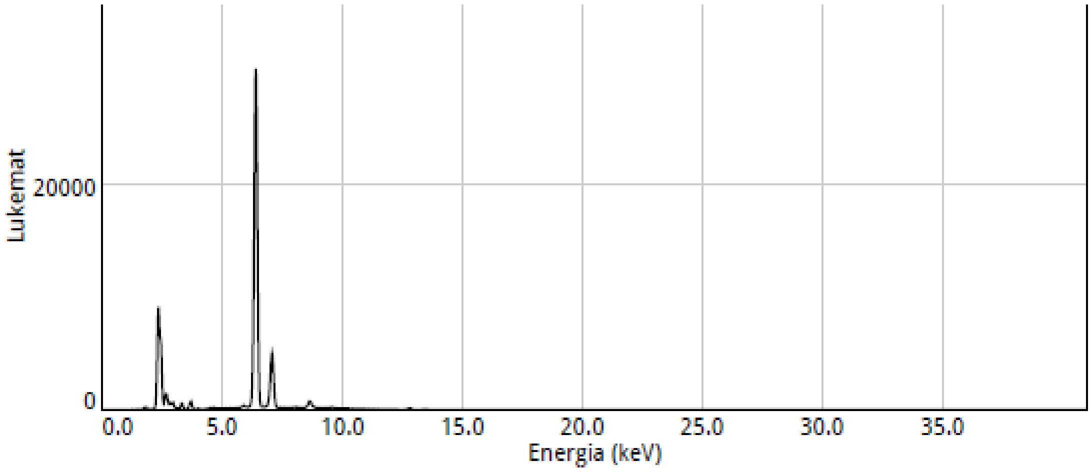
Museum room, jamb of door, first layer. Notice element class used in measurement: Alloy_LE_FP

Nimi	Luokka	Päivämäärä	Kellonaika	Kesto
museohuone 1. karmi 1	Alloy_LE_FP	7.9.2015	16.12.26	20,5 s

Alkuaine	Fe %	Pb %	Si %	Zn %	Ir %	Mn %	Se %
	53,14	42,73	2,28	1,15	0,48	0,18	0,04
±	0,215	0,153	0,113	0,026	0,030	0,026	0,010
Vertailunäyte:							





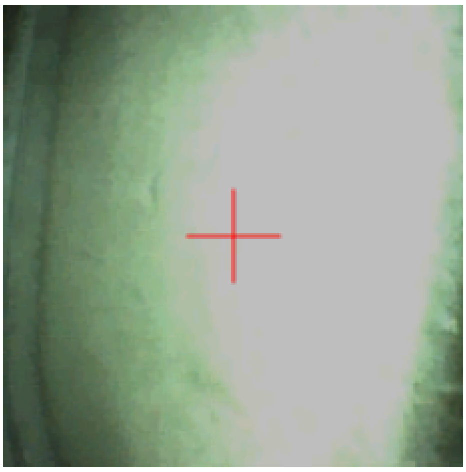


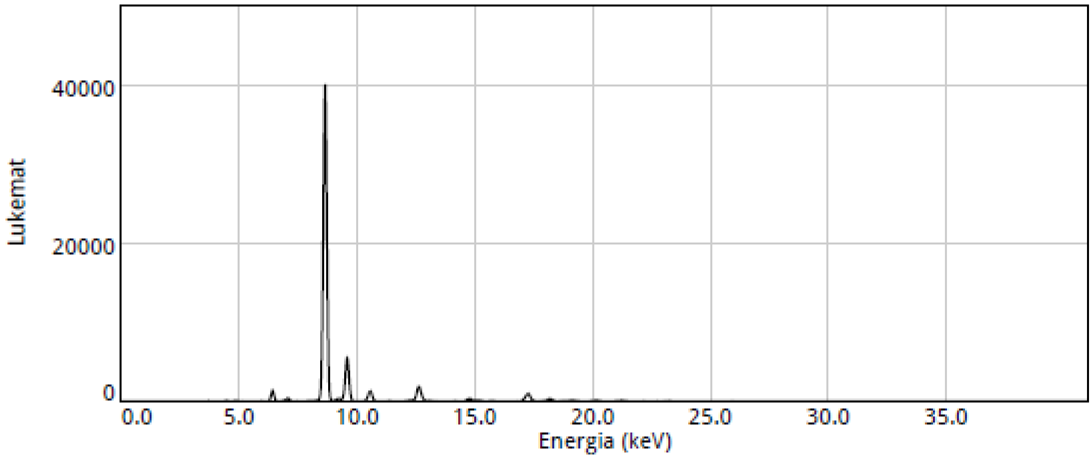
Museum room, jamb of door, 1st layer

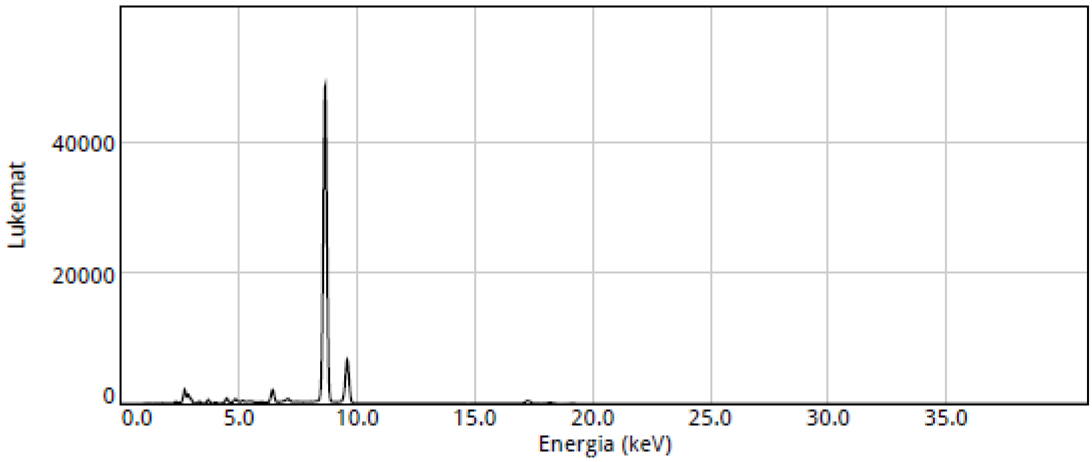
Nimi	Luokka	Päivämäärä	Kellonaika	Kesto
museohuone 1. karmi 1	Soil_LE_FP	7.9.2015	16.14.01	20,6 s

Alkuaine	Zn ppm 543240	Cl ppm 58974	Pb ppm 52808	Fe ppm 27566	S ppm 10401	K ppm 8482	Ca ppm 8475
±	881	611	574	270	328	265	207
Alkuaine	Ba ppm 6885	Si ppm 6760	Ti ppm 5320	V ppm 2256	Ta ppm 1535	Cd ppm 1219	Co ppm 722
±	661	1096	104	486	156	147	72
Alkuaine	Mn ppm 412	Sr ppm 138					
±	113	42					

Vertailunäyte:





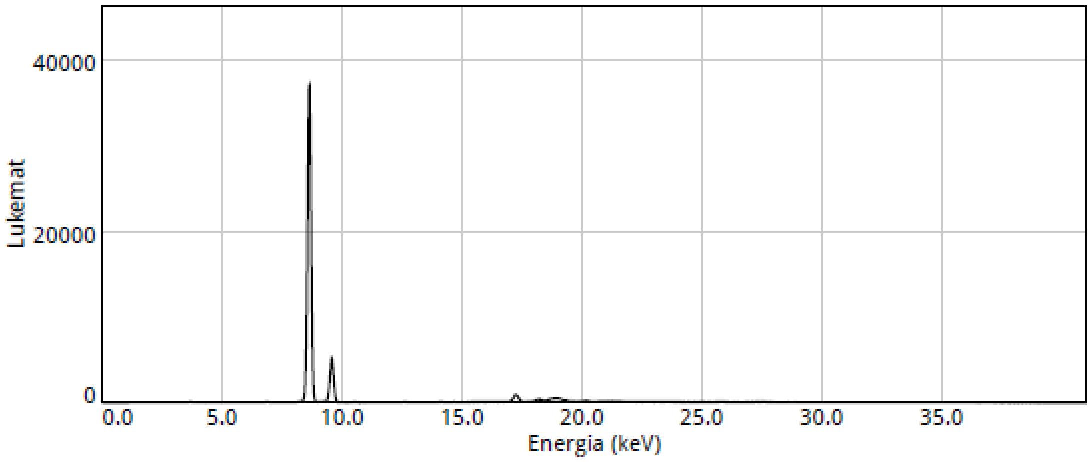


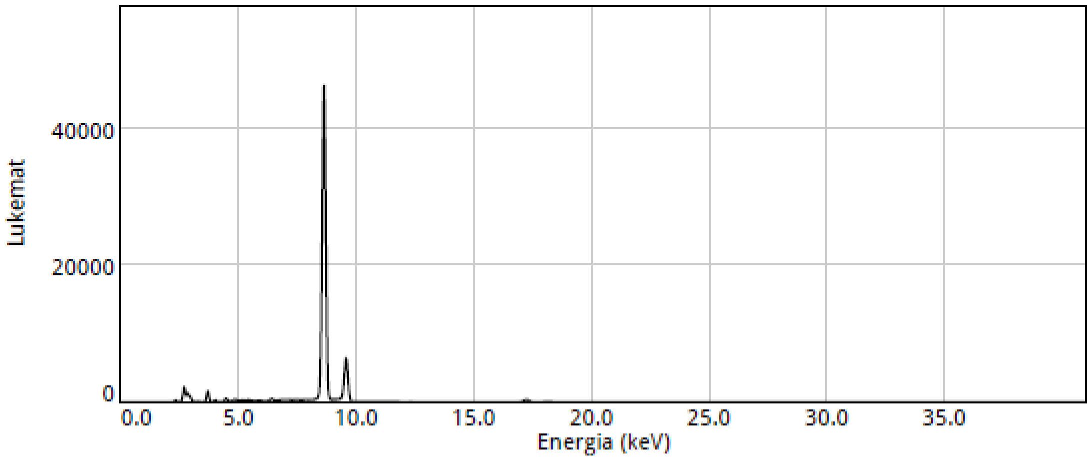
Museum room, closet door, 1st layer

Nimi	Luokka	Päivämäärä	Kellonaika	Kesto
museohuone 1. kaappi 1	Soil_LE_FP	7.9.2015	16.18.10	20,5 s

Alkuaine	Zn ppm	Cl ppm	Ca ppm	S ppm	W ppm	Ti ppm	Pb ppm
	624000	50891	32227	10120	4109	4067	2584
±	1083	727	374	467	289	122	237
Alkuaine	Ta ppm	Fe ppm	Sr ppm	Mn ppm			
	1645	647	607	334			
±	200	82	89	98			

Vertailunäyte:



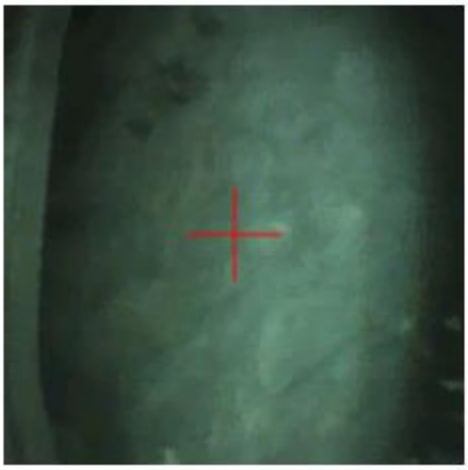


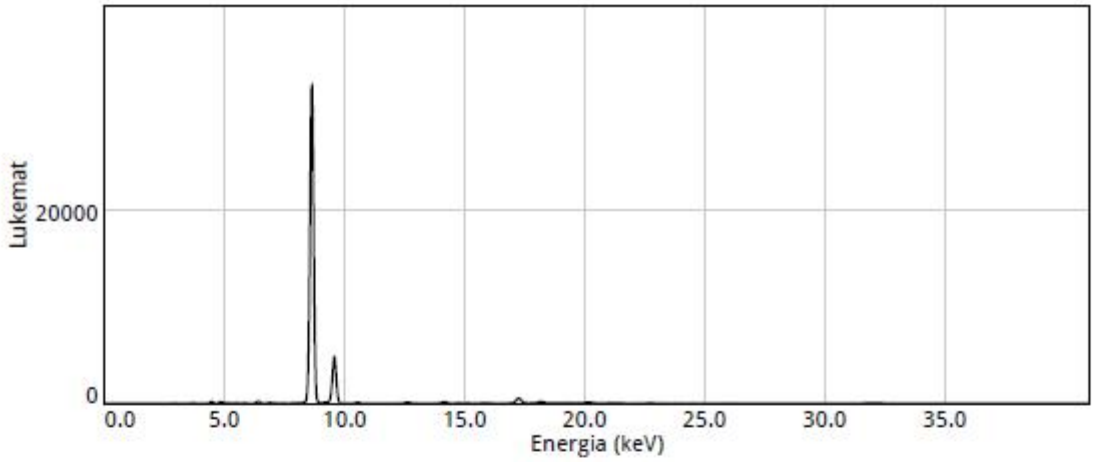
Museum room ceiling, 1st layer

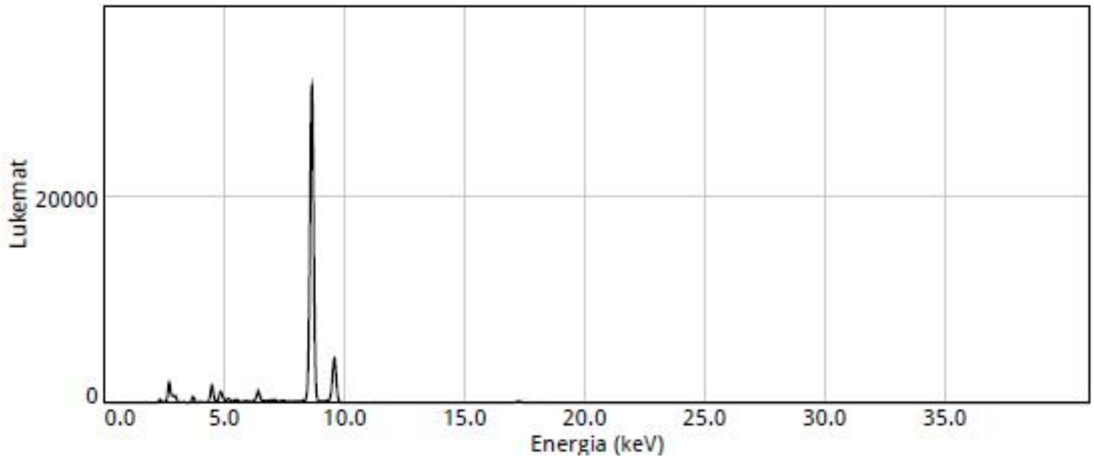
Nimi	Luokka	Päivämäärä	Kellonaika	Kesto
museohuone 1. katto	Soil_LE_FP	7.9.2015	16.26.28	20,5 s

Alkuaine	Zn ppm	Cl ppm	Ba ppm	S ppm	Ti ppm	Ca ppm	Si ppm
	582971	34232	29276	17420	16870	14597	8163
±	1062	640	1181	557	207	278	1613
Alkuaine	Fe ppm	V ppm	Pb ppm	Sr ppm	Ta ppm	Mn ppm	Co ppm
	5186	4506	3912	2409	1005	418	199
±	141	727	228	76	172	115	56
Alkuaine	Ni ppm						
	132						
±	37						

Vertailunäyte:





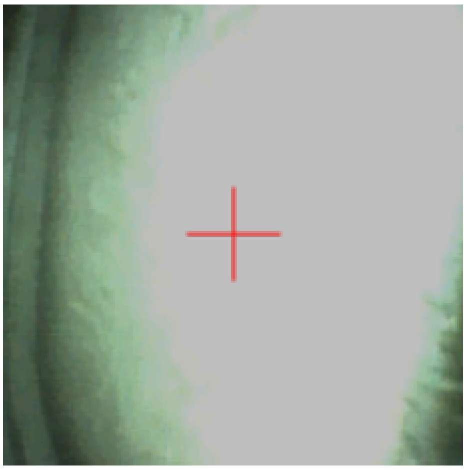


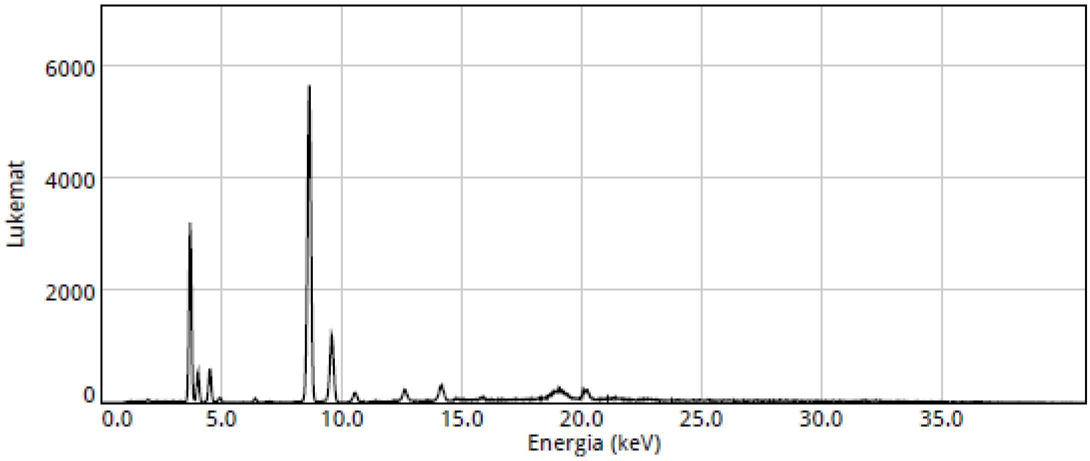
Museum room, wall with window, 1st layer

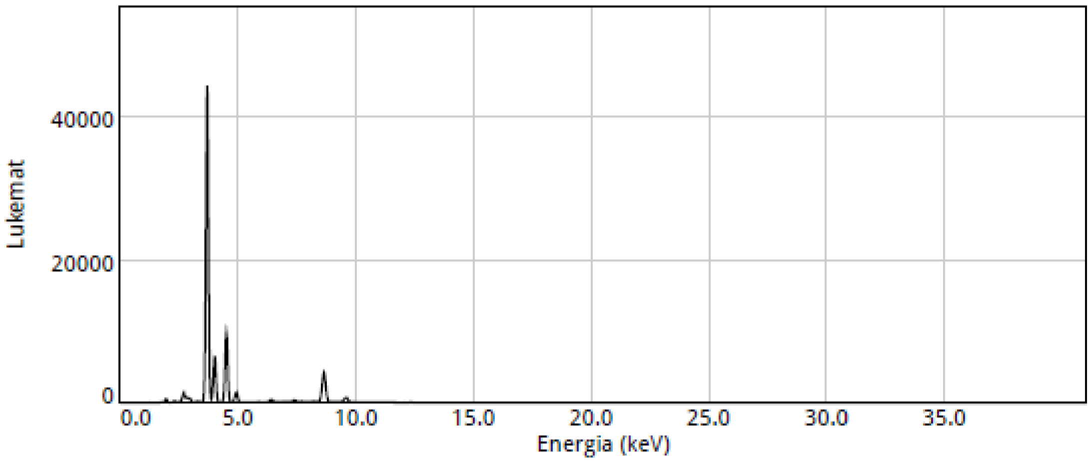
Nimi	Luokka	Päivämäärä	Kellonaika	Kesto
ikkunaseina 1. valk	Soil_LE_FP	7.9.2015	16.30.47	20,5 s

Alkuaine	Ca ppm	Ti ppm	Mg ppm	Zn ppm	Cl ppm	Si ppm	S ppm	Ba ppm
	396502	97401	59539	41927	9305	6737	3268	1510
±	745	381	9367	185	155	535	123	205
Alkuaine	Pb ppm	Fe ppm	Sr ppm					
	1307	1194	714					
±	46	72	16					

Vertailunäyte:







ALVAR AALTO FOUNDATION

PAIMIO SANATORIUM COLOR RESEARCH 2015

PART 2/2
Chief Physician's Villa, Sub Physicians' Row House Apartment, Staff Apartment House and Rose cellar – the Morgue

Elina Riksman

28.1.2016

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Content of Part 2

Engineer Yrjö Tuominen standing in front of the unfinished Staff apartment building. Alvar Aalto Museum. Signum L2216

1. Paimio Sanatorium Color Research

The Color Research

The Paimio Tuberculosis Sanatorium, designed by Alvar Aalto and built 1929-33 was the main subject of the color research executed during year 2015. This research was conducted as a part of the Conservation Management Plan (CMP) study that was simultaneously carried out by a group of researchers from Alvar Aalto Foundation. The purpose of this color research was to produce vital information for the CMP research group to outline the look of original interiors and to help to perceive the state of preservation of interiors Also the intention of this research was to further the understanding of value and importance of different spaces, areas and rooms, and finally to enable the evaluation of these spaces.

The general view of the original interior coloring is the main idea of this research. This report presents the results and the conclusions of the color research, based on the data gathered in situ, in laboratory and in the archives of Alvar Aalto Museum, Hospital district of Southwest Finland and Lasaretti Hospital Museum.

This research was funded partly by Getty Foundation as a part of the Keeping it Modern initiave and partly by the National Board of Antiquities of Finland.

The Original Color Scheme

The color scheme of Paimio Sanatorium was originally designed by Alvar Aalto together with artist Eino Kauria. Kauria was commissioned to work at Paimio sanatorium building site to lead the paint work and coordinate the colors used. Kauria arrived to the building site relatively late, in June 1932, when the Staff apartment house was already built and others including the main building were well on their way. Kauria stayed in one of the Staff house's apartments with his wife and child during the building of other buildings. Alvar Aalto visited the site almost daily by car from Turku, according to Kauria, and the pair inspected the proceedings of interior work together[1]. Later work of Eino Kauria's interior color design in Finland include significant modern era landmarks of Helsinki as Lasipalatsi (1934-36) and Tilkka War Hospital (1936)[2].

The documents found in archives along the Conservation Management Plan research have provided vital information for the color research of Paimio Sanatorium. Documents as receipts of procurement, transcripts of meetings, original drawings, letters, notes, contracts, etcetera, have given an insight to the proceedings of the interior finishing work done at the site. Photographs taken of the buildings after they were finished give of course the most powerful evidence of the original state of the interiors.

Eino Kauria was commissioned to paint a large board presenting the finalized color scheme of the Main building. The Color board painted by Kauria is, according to an interview of Kauria from 1986, not a plan of colors for the building site's painters to use, but a final, executed result of the color scheme in the main building.[3] As the color board addressed only the main building, it had only comparative significance for this part of the research.

Former Color Researches

This report addresses the research of the Chief Physician's villa, the row house apartment of Sub Physicians', the staff apartment building and the morgue, *Rose cellar*. These buildings have not been, in the light of the information gathered for this report, color or paint researched before.

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[1] Interview of Eino Kauria by Teppo Jokinen of Alvar Aalto Museum, 30.9.1986 Helsinki.
[2] Makkonen Leena (2012). *Modernismia Helsingissä*. Kirjapaino Uusimaa. Internet publication: http://www.hel.fi/hel2/ksv/julkaisut/kirjat/ModHKI_fi.pdf
[3] Ibid.

The main building has been researched in the year 2000 by Katja Aaltonen. Another color research in Paimio main building was made 2014 in the 1st floor of C-wing, the kitchen area, by Silja Selonen, preceding renovations the same year. No cross section samples have been taken during the previous researches.

Confining the Research

The interior color research subjects of this report are the Chief Physician's villa, the Sub Physician's row house of three apartments and the two storey staff house. All these three buildings of residence were part of the original 1929-33 building stage. Other buildings of the Paimio hospital premises are not included in this research as this Also the Rose cellar, a morgue that was part of the original architectural overall plan was researched. All the other buildings are still in active use, except for the Rose cellar. The exterior colors and materials are not included in this study.

The original linoleum and rubber flooring that have been almost entirely lost in renovation have been researched in documents such as original procurement receipts and photographs. The documents however do not state procurement information addressing other than main building of the sanatorium.

Research Methods

The method used at the sites was mechanical peeling of layers. The use of chemical peeling like paint stripper gel was minimal and only used on the upmost layers in the excavation, to avoid any discoloring of paint and filler layers. No heating was used in excavation for the same matter.

The excavations in the Chief Physician's villa consisted of many excavation points where the layers were verified by small carved craters and a loop. Through the villa some 50 craters were excavated, and few interesting findings lead to the conclusion of making actual larger excavations to identify the colors of original layers. Cross section samples were collected and analyzed. This same method of research was used in the Sub Physicians' row house apartment. The Staff apartment house was colored mostly in white and cream layers or original layers had been lost during renovation. Therefor no larger excavation were made in the staff building, but craters were made and cross section samples gathered.

The color code system used in this research is the Natural Color System, NCS (Teknos paint factory, 2012 edition). The system was developed in Sweden 1960's and 1970's. It is the Swedish national standard color-order system that is based on the four unique hues: red, green, blue and yellow. These are combined with black and white.[4] The system is based on how the human eye sees color.

The Rose cellar

The Rose cellar, the original morgue of the Sanatorium, has the most distinctive history in the standpoint of color research out of the compilation of buildings presented in this report. The Rose cellar is a round, domed, delicate concrete structure that has two separate rooms inside. The rooms are divided by a wall that carries a large mural. The condition of the Rose cellar is poor due to some serious water damage of the outer shell structure of the dome. The dome has originally been covered with soil with roses growing upon it, hence the name, Rose cellar. The interior is partly deteriorated including the mural, due to high humidity and minus degrees during winter season. The Rose cellar has been through some demolition work during 2005 as some damage control had to be done due to the drying process of the structures.

Conclusion

The Chief Physician's house had a lightly colored, mainly white ceilings. The library and the lobby had the most distinctive colors of this building. The lobby's brown – orange walls have given the space a very distinctive look and the library's light blue walls the same atmosphere as the Chief Physician's office in the Main building. Living and dining room have hade white walls, a rather light interior with white ceilings as well.

Johnston-Feller, Ruth (2001*). Color Science in examination of Museum objects*. The J. Paul Getty Trust, Los Angeles.

The chief physicians' row house's middle apartment had strong green lobby, a green living room with white ceilings. The dining room had no such strong color as other parts of the ground floor. Dining room's ceiling was white. The kitchen wall gave this same result, white.

The Staff apartment house has gone through a major renovation during the 1980's. This is visible in the layers of cross section samples and craters excavated in surfaces. They show thick layers of modern, porous white or grey fillers. All former family apartment and studio apartment surfaces had white original paint layers. The main stairway between ground and first floor have been light blue.

The Rose cellar interior's general color has been light grey. The mural wall dividing the space has three layers of paint, three different murals and they all seem to have the same, or slightly differing pattern/design. The undermost layer has been confirmed to be the original Eino Kauria painting as an interview of Kauria addresses the mural and its painting technique. This is also stated in a receipt that was found during archive work of CMP-research.

Both the mixing of paints at the building site and buying readymade industrial paints seem to have been the choice of Kauria and the painters. The original receipts and documentation of the building site state that the painting company *Marttisen maalaus Oy* from Turku bought readymade paints by the kilo with different serial numbers and color codes. They also bought large amounts of lacquer (a base for mixing paints), zinc white, lead white, ultramarine blue, crete, yellow ochre and "black" pigments, white spirit and boiled flax seed oil to mix paints at the building site.

The *Oy Wiklund Ab* hardware store's receipt does not state the producer of the paints ordered for the building site. It lists the names of the colors: *white, light green, blueish green, light yellow, light blue*. These same 4-5 colors were ordered in three different types of paint: *a base paint (to be sprayed), the enamel paint (acid resistant, to be sprayed) and enamel paint (normal, to be sprayed).* All these colors can be found in the original layers around the building, but the equivalence of the codes in a 1930's color chart has not been yet discovered. Some products, like flax seed oil, for Paimio building site were bought from the Tikkurila paint factory, which is still in operation in Vantaa, Finland. They run a small archive of paint charts and two charts stating back to 1938, but none of the charts carried the same color codes as the receipts of Paimio building site.

The staff apartment house was already completed when Eino Kauria arrived at the building site of Paimio Sanatorium in June 1932. His efforts in the field of Paimio Sanatorium color scheme do not therefore apply to Staff apartments.

The Reliability of the Results

The later renovations have left their mark in a very noticeable way between the layers found: the light weight white filler used on wall and ceiling surfaces that probably states to the 1970's renovation and again in the 1990's renovation. Especially in the Staff apartment house had samples with heavy layers of grey light weight filler that is probably from the 1980's renovation period. These light weight modern fillers are present in almost all cross section samples and excavations *in situ* and they helped to recognize the real age of layers beneath these white fillers. As some excavation points have shown, the samples present 11 layers at most. The average amount of layers is 6 layers. This of course varies between different spaces and buildings, due to their original or changed function and level of usage. Some buildings have gone through several paint jobs, probably because of their detrition in daily housing use. Some heavy duty surfaces like corridor or stairway walls had the most paint layers. On the other hand it was obvious that in some spaces all of the surfaces had been sand blasted or scraped clean in former renovation and original surfaces lost for good. In these cases only 3 to 4 layers of paint and filler was found. Other methods for recognizing the age or the actual original layer was cross section samples. The samples showed clear differences between modern plastic filler paints and oil based paints with pigments and organic fillers like crete, zinc or barium sulphate. The samples were examined under microscope and photographed. The X-Ray Fluorescence research method was not used in the buildings presented in this report. XRF-measuring could be one relevant future research method in selected, important spaces. On particular space for further research is the Rose cellar.

Further Research

A natural next step of the Paimio Sanatorium color research would be the exterior color research, as it has been excluded from this research. Further research should also address the furniture and fixed furniture of the housing buildings. This future research should cover the doors, windows, original cupboards and kitchen cabinets. These can be found 2016 in both Chief Physician's villa and in the middle apartment of Sub Physicians' row house, but not from the Staff apartment house.

The Rose cellar should be taken under more detailed and precise examination when further restoration and conservation planning starts, as the mural found in the cellar has layers that have complex origin and as the mural in general is in poor condition. Although the mural has now been examined by viewing and by hand to find the vacuous areas and lagoons, it should be examined, measured and scanned again to make the final conclusions of its state and level of deterioration. The conditions of the cellar are not stabilized. Therefore humidity and sub-zero degrees still have their effect on surfaces and structures. The cellar is a small but significant part of Aalto's original Paimio Sanatorium plan. It had a silent, bystander role, but it must have played a very central role in all of the Sanatorium staff's and patients' subconsciousness.

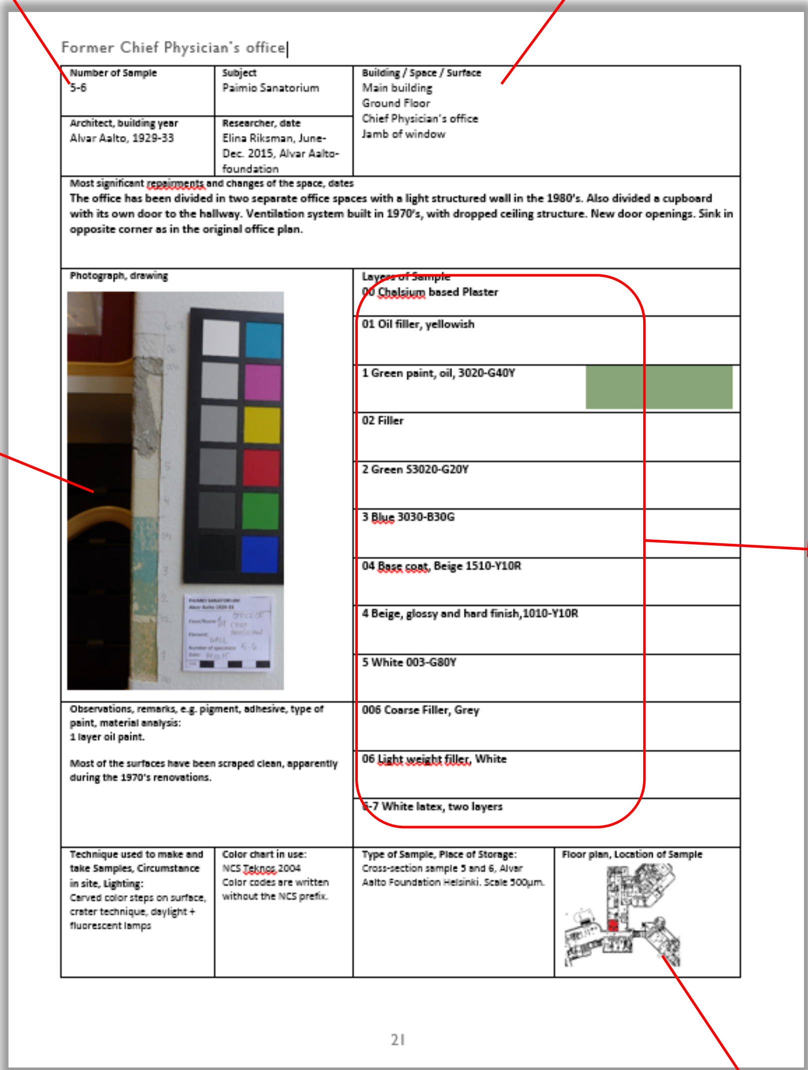
How to Read this Report

This report is divided in four sections according to the four research subjects. Every building is presented one at a time with the floor plan that presents the research points *in situ*, the point where each cross section sample was taken or excavation of surface made. The chart used to present the color codes and findings of each research point is advised to be used in color research documentation by the Finnish National Board of Antiquities. The page following the chart has additional information, original and present photography, cross section sample photography and conclusions of the space researched. These conclusions include information addressing the original (now lost) flooring, the degree of gloss or other structure of the surfaces and information about the findings done in the archives.

The number of the sample, this number can be found in the floor plan.

The place of sample and excavation point in the building.

Photograph of the excavation on surface.



Former Chief Physician's office

Number of Sample 5-6	**Subject** Paimio Sanatorium	**Building / Space / Surface** Main building Ground Floor Chief Physician's office Jamb of window
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates
The office has been divided in two separate office spaces with a light structured wall in the 1980's. Also divided a cupboard with its own door to the hallway. Ventilation system built in 1970's, with dropped ceiling structure. New door openings. Sink in opposite corner as in the original office plan.

Photograph, drawing

Layers of Sample

- **00 Chalsium based Plaster**
- **01 Oil filler, yellowish**
- **1 Green paint, oil, 3020-G40Y**
- **02 Filler**
- **2 Green S3020-G20Y**
- **3 Blue 3030-B30G**
- **04 Base coat, Beige 1510-Y10R**
- **4 Beige, glossy and hard finish,1010-Y10R**
- **5 White 003-G80Y**
- **006 Coarse Filler, Grey**
- **06 Light weight filler, White**
- **6-7 White latex, two layers**

Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:
1 layer oil paint.

Most of the surfaces have been scraped clean, apparently during the 1970's renovations.

Technique used to make and take Samples, Circumstance in site, Lighting: Carved color steps on surface, crater technique, daylight + fluorescent lamps	**Color chart in use:** NCS Teknos 2004 Color codes are written without the NCS prefix.	**Type of Sample, Place of Storage:** Cross-section sample 5 and 6, Alvar Aalto Foundation Helsinki. Scale 500µm.	**Floor plan, Location of Sample**

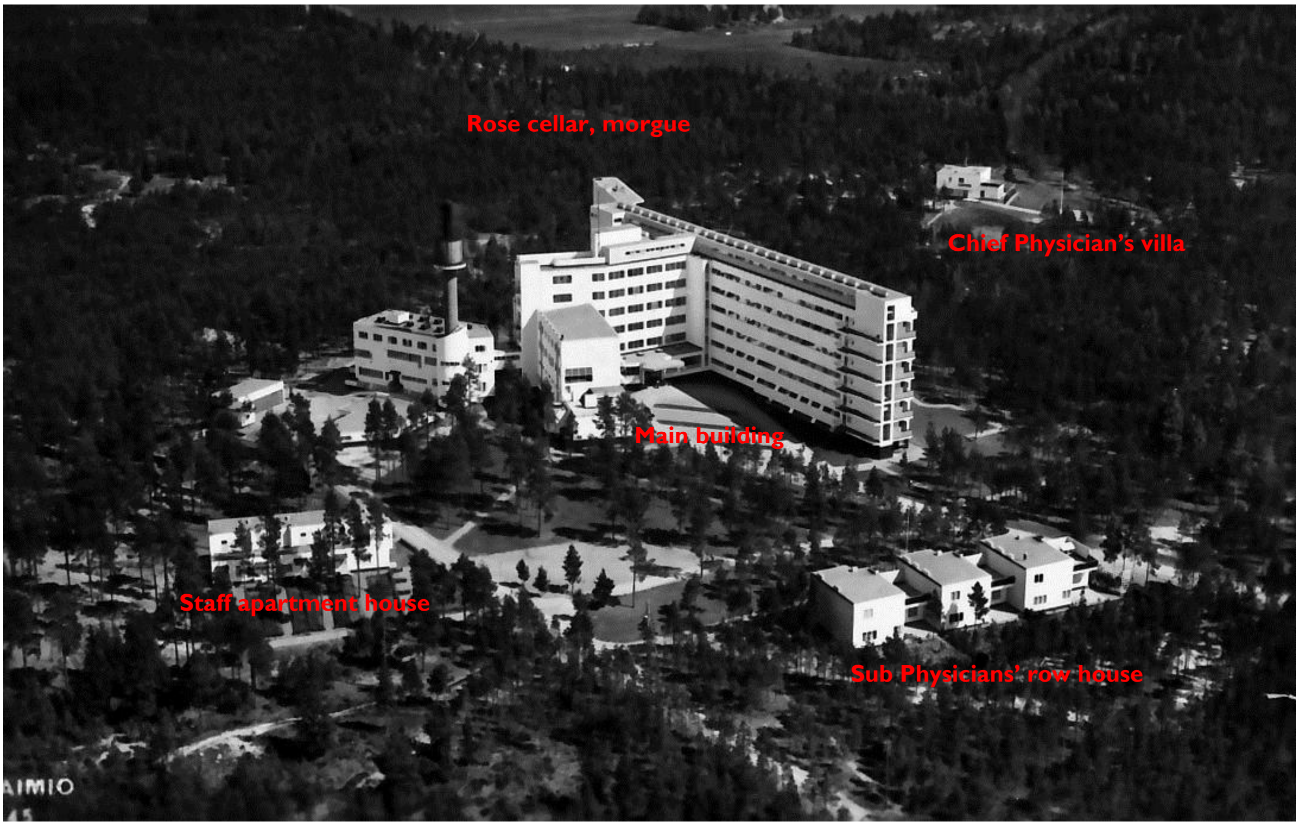
21

The layers of paints and fillers found in excavation. NCS color codes are presented for paint layers.

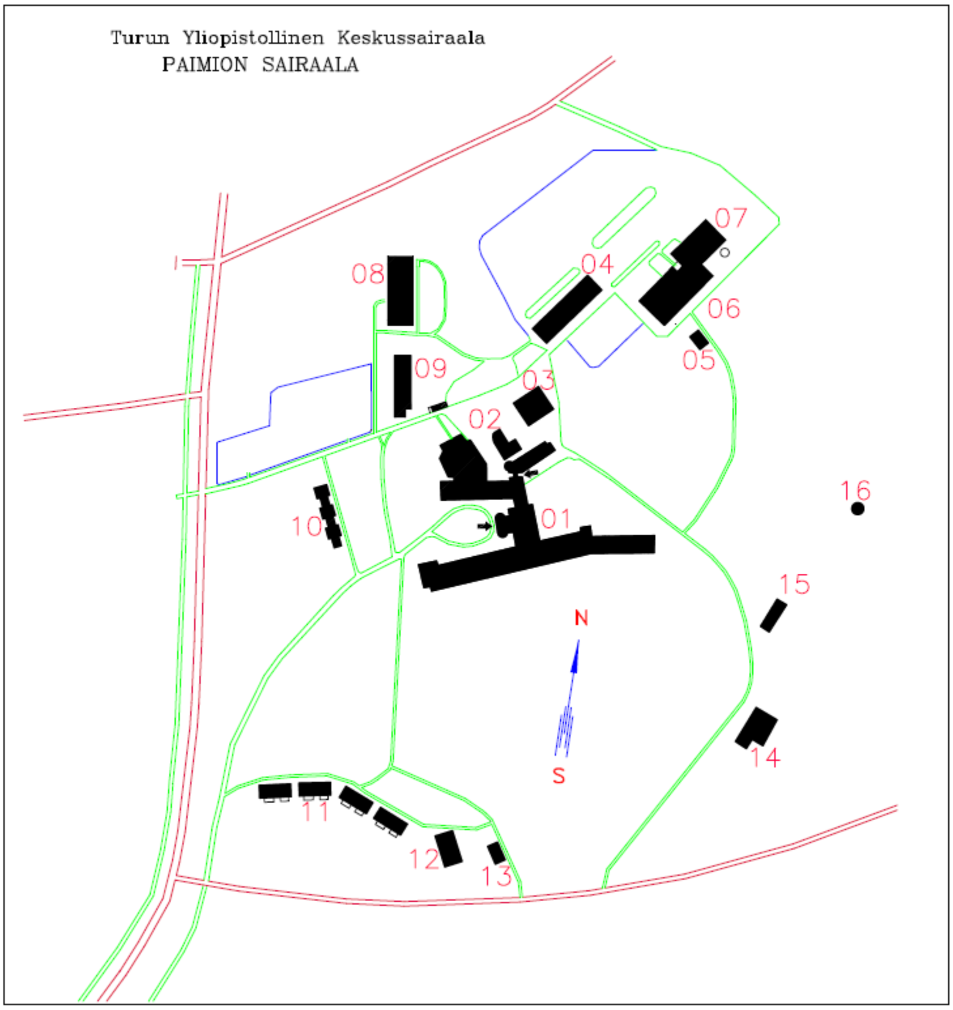
A small floor plan to show in which room the research is made.

2. The Areal Plan of Paimio Sanatorium

The areal plan of Paimio Sanatorium included three buildings for staff housing: the villa of Chief Physician, a row house of three apartments for Sub Physicians and a two floor Staff apartment building with convertible family apartments downstairs and studio apartments upstairs. Besides these apartment buildings, the area had a heating plant, garage, greenhouses and a biological purification plant. This color research addresses only the original apartment buildings. The picture below shows the original areal state of Paimio Sanatorium premises. The next page areal map shows the buildings and premises as they are today.



Original areal plan of Paimio Sanatorium and The Subjects of this Color Research. AAM, Sign.a26-21.



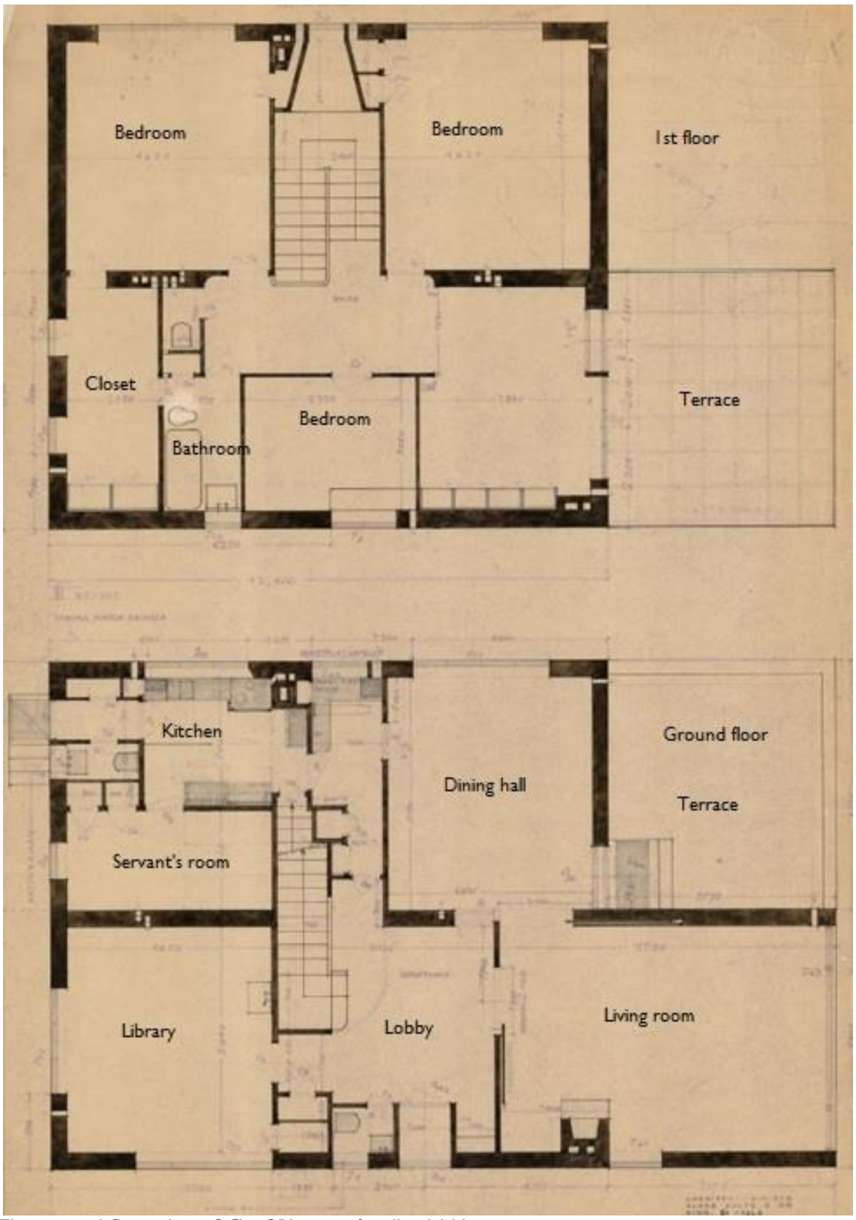
LPR-Arkkitehdit Oy, 2004.

The Area plan of Paimio Hospital 2004 by Architectural Office *LPR-Arkkitehdit Oy*

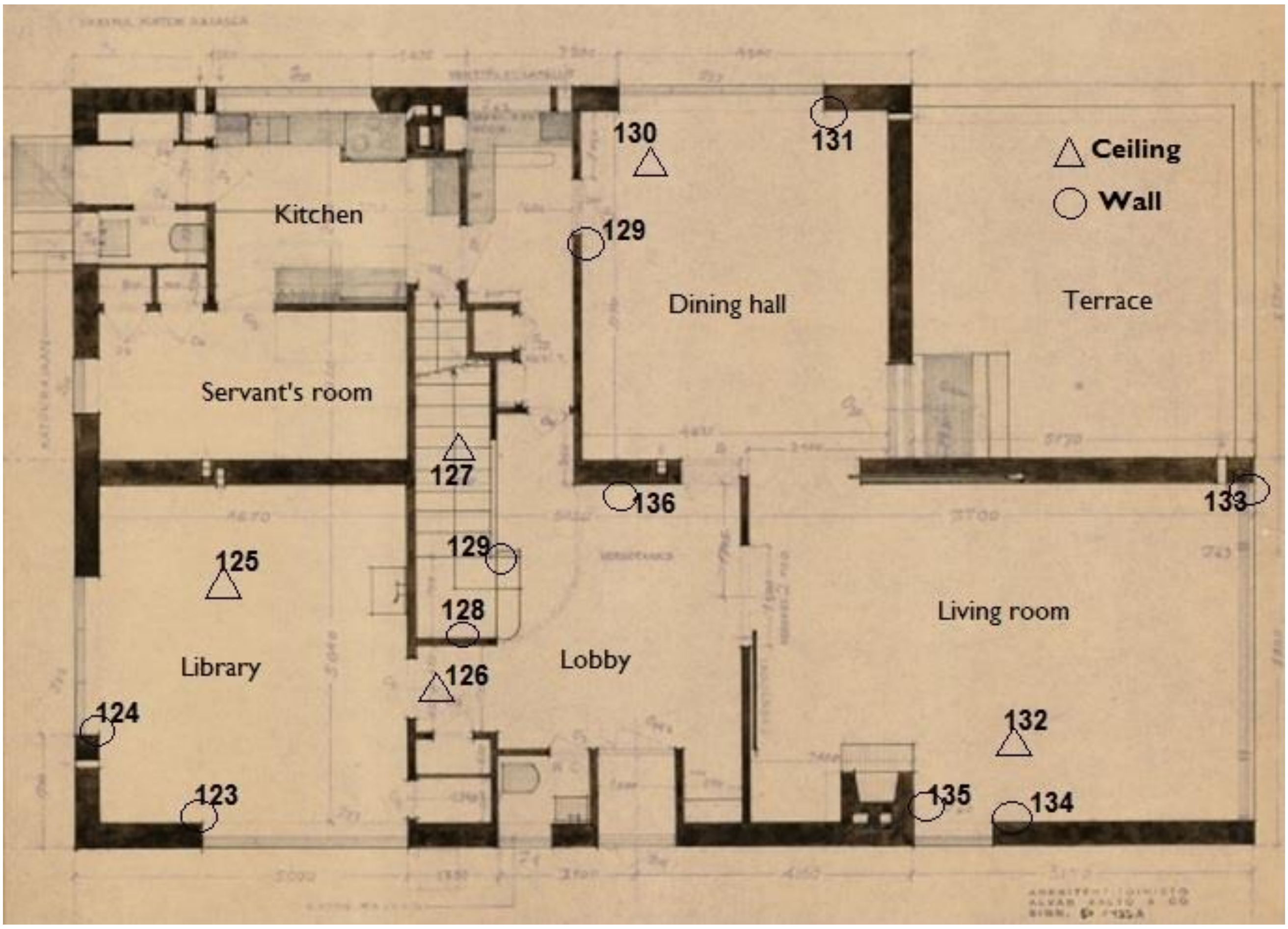
01 Main building
02 Heating station
03 Garrage
04 Storage house
05 A wooden private house
06 Storage house "K"
07 Heating station
08 Apartment Building "Mäntylä"
09 Former Staff aparment building
10 Former Sub physicians' row house
11 Aparment row house "Adder manor" B-E
12 Apartment row house "Adder manor" A
13 Car shelter
14 Former Chief Physician's villa
15 Car shelter
16 Rose cellar, former morgue

3. Chief Physician's Villa

The Villa stands in solitude in the west part of the hospital premises. It has two floors and a large balcony on the first floor. The villa has been renovated and turned in to a kindergarten the 1970's after the chief physician no longer inhabited the house. Very few changes has been made in the original floor plan. The ground floor has access to the garden that now serves as a playground. This research addresses the ground floor of the house. It was the public part of the villa. The downstairs has a large lobby and a former library which now serves as the kitchen of the kindergarten. Ground floor also has the former living room and dining hall that are now play rooms for the children, and finally the former kitchen and servant room that now serve combined as an entrance and dressing room for the children coming from the garden's playground. Upstairs today has some play rooms and office space for the kindergarten staff. Originally upstairs was the private part of the house with bedrooms, walking closet and bathroom. The renovation of kindergarten has brought some HVAC fixtures like ventilation system in the ceilings and sinks in the lobby for the children to wash their hands in. Dining hall and living room have acoustic boards glued to their ceilings.



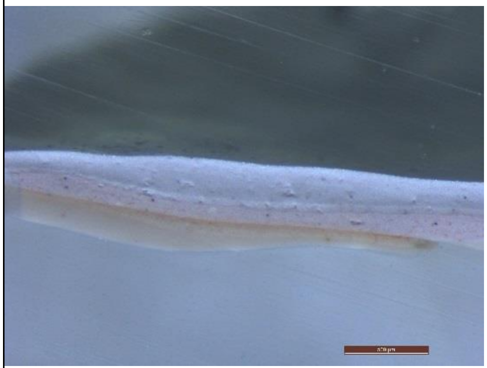
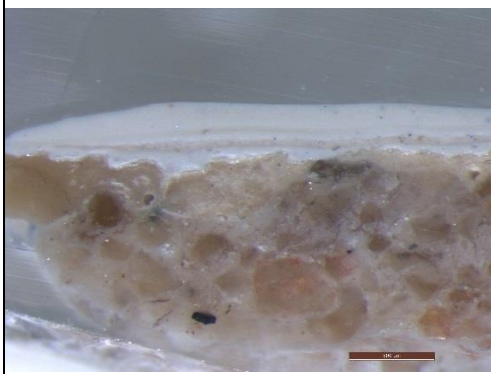
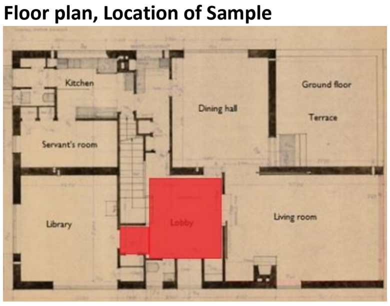
The original floor plan of Chief Physician's villa. AAM



The cross section samples taken from the Chief Physician's villa's ground floor. AAM

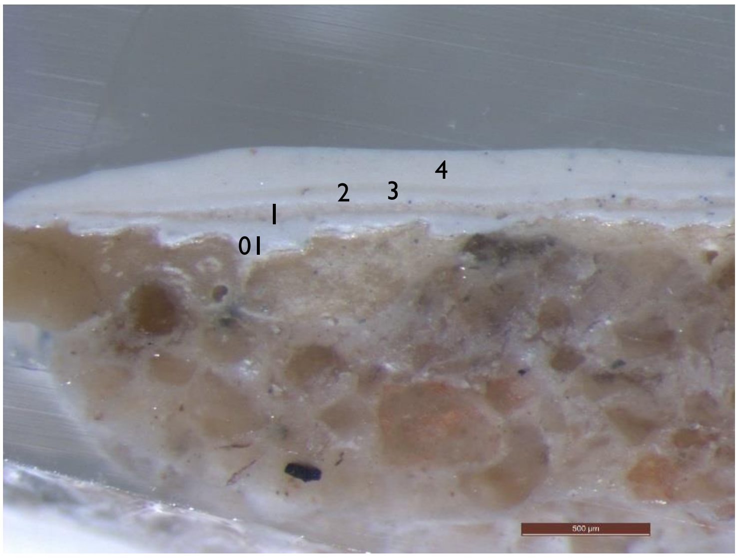
The villa soon after its completing. AAM. Sign. 50-003-466

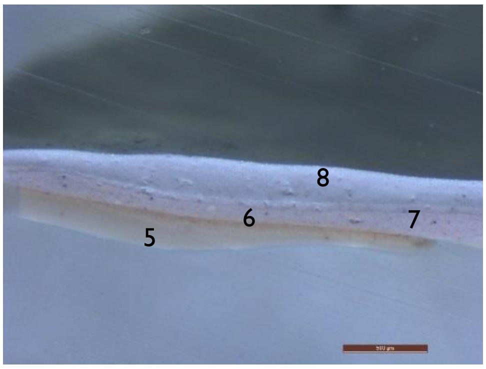
The Lobby ceiling

<table>
<tr><td>Number of Sample
126</td><td>Subject
Paimio Sanatorium</td><td colspan="2" rowspan="2">Building / Space / Surface
Chief Physician’s villa
Ground floor
Lobby
Ceiling</td></tr>
<tr><td>Architect, building year
Alvar Aalto, 1929-33</td><td>Researcher, date
Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation</td></tr>
<tr><td colspan="4">Most significant repairments and changes of the space, dates</td></tr>
<tr><td colspan="2" rowspan="8">Photograph, drawing

</td><td colspan="2">Layers of Sample
00 Plaster</td></tr>
<tr><td colspan="2">01 Filler</td></tr>
<tr><td colspan="2">1 White paint</td></tr>
<tr><td colspan="2">2 White paint</td></tr>
<tr><td colspan="2">3 White paint</td></tr>
<tr><td colspan="2">4 White paint</td></tr>
<tr><td colspan="2">5 Light green ?</td></tr>
<tr><td colspan="2">6 Light yellow</td></tr>
<tr><td colspan="2" rowspan="4">Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:
No excavation was made on the ceiling surface .</td><td colspan="2">7 White paint (with a hint of red)</td></tr>
<tr><td colspan="2">8 White paint</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>Technique used to make and take Samples, Circumstance in site, Lighting:
crater technique, daylight + fluorescent lamps</td><td>Color chart in use:
NCS Teknos 2004
Color codes are written without the NCS prefix.</td><td>Type of Sample, Place of Storage:
Sample number 126. Scale 1mm. Storage Alvar Aalto Foundation, Helsinki.</td><td>Floor plan, Location of Sample

</td></tr>
</table>

7The ceiling of the lobby has always been painted white according to the cross section sample 126.

Sample 126 was taken from the lobby ceiling.





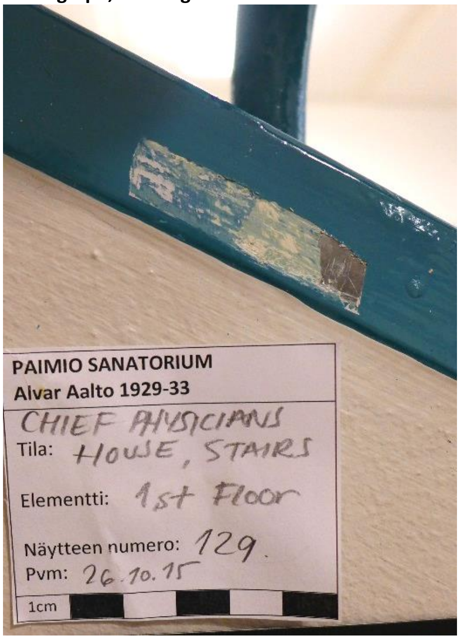
Cross section sample 126 shows white undermost paint layer. The samples broke into two pieces presented in the pictures above. Scale 500µm.

Stairway handrail

Number of Sample 129	**Subject** Paimio Sanatorium	**Building / Space / Surface** Chief Physician's villa Ground floor Lobby Stairway handrail, metal base
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

Photograph, drawing



Layers of Sample

00 Metal

01 Base coat, white

1 Light Blue paint 2020-B70G

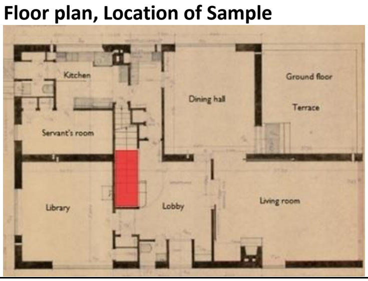
2 Turquoise3030-B50G

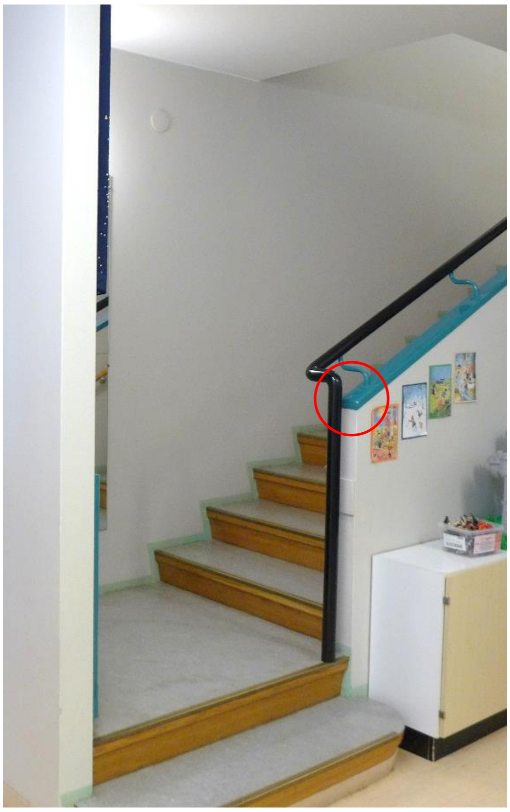
3 Blue 3050-B10G

04 White base coat
4 White

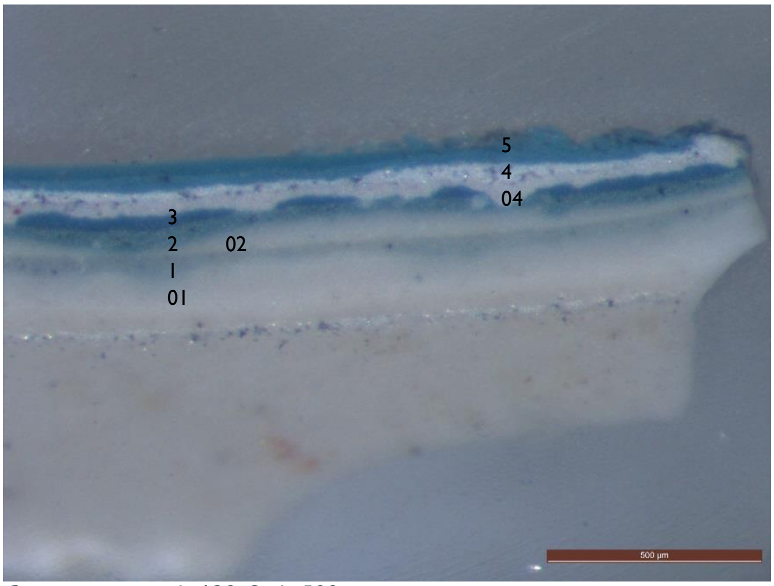
5 Turquoise 3050-B30G

Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:
-

Technique used to make and take Samples, Circumstance in site, Lighting:	**Color chart in use:**	**Type of Sample, Place of Storage:**	**Floor plan, Location of Sample**
Cross section sample, crater technique, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written without the NCS prefix.	Sample number 129. Scale 500µm. Alvar Aalto Foundation, Helsinki.	



The cross section sample 129 showed the light blue original paint coat of the hand railing. The black wooden hand rail had three black layers of paint, original being also black.



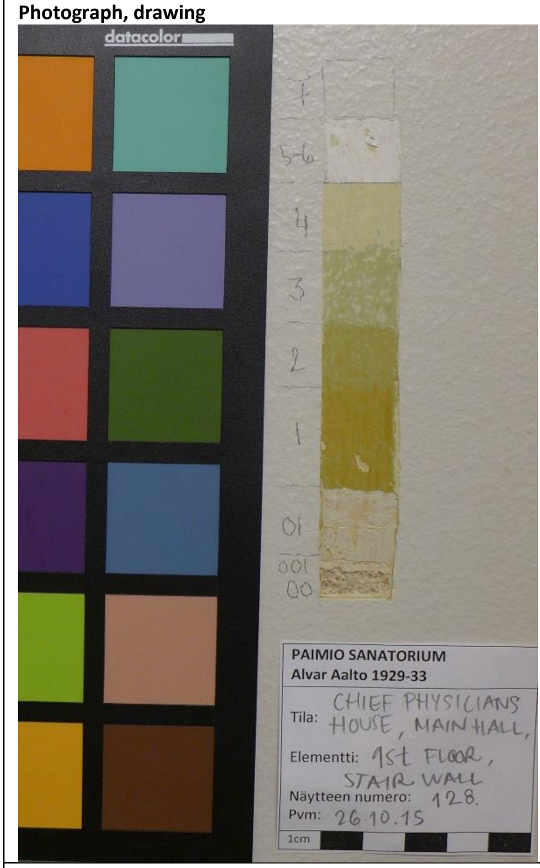
Cross section sample 129. Scale 500µm.

Stairway wall

Number of Sample	Subject	Building / Space / Surface
128	Paimio Sanatorium	Sub Physicians' row house, middle apartment Ground floor Lobby Stairway wall
Architect, building year	**Researcher, date**	
Alvar Aalto, 1929-33	Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

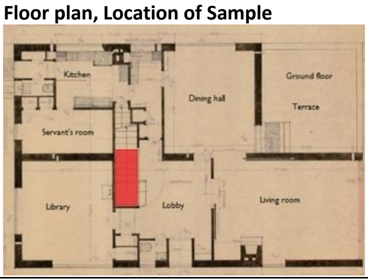
Photograph, drawing



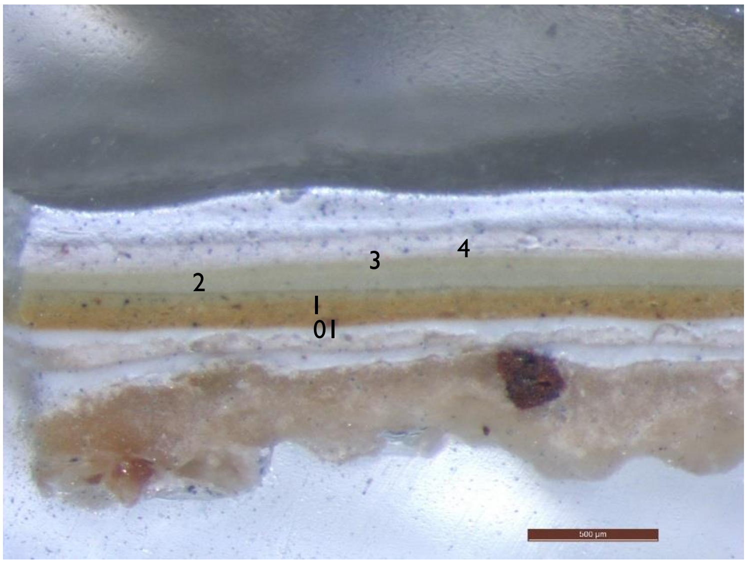
Layers of Sample

Layers of Sample
00 Plaster
01 Base coat, white
001 Filler
01 White base coat
1 Yellowish brown 3040-Y10R with 3060-Y10R
2 Green 3030-G90Y
3 Green 2020-G70Y
4 Light beige 1515-Y
5 Light pastel red 0507-Y80R
6 White
7 Grey 1502-Y50R

Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:
No excavation was made on the ceiling surface due to the research conditions.

Technique used to make and take Samples, Circumstance in site, Lighting:	Color chart in use:	Type of Sample, Place of Storage:	Floor plan, Location of Sample
crater technique, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written without the NCS prefix.	Sample number 128. Scale 1mm. Storage Alvar Aalto Foundation, Helsinki.	

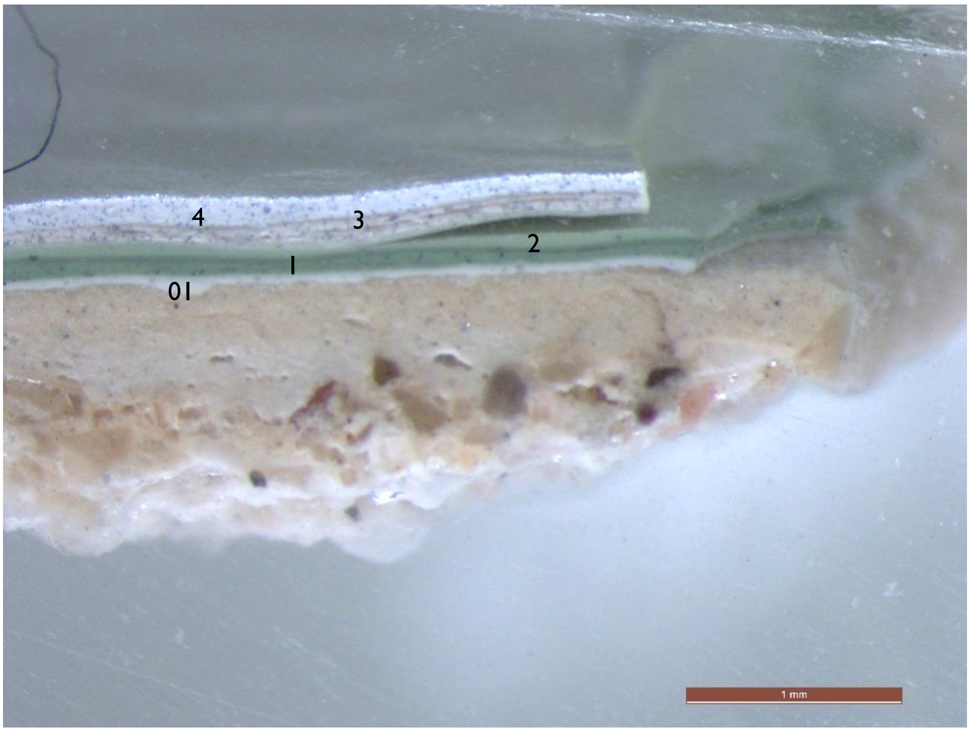
The wall of the stairway and surrounding walls in the lobby have been painted in rich brown – orange oil paint. The undermost layers are white and the perception is that the white layer 01 is only a base coat. It is also possible that the white was used under the orange to give it a slightly brighter look as oil paints were sometimes used in layers to affect the surface color look. With a white layer underneath, the deep surface color adapted a more bright and "luminous" look.[5]



Cross section sample 128. Scale 500 µm.

[5] Ulla Setälä, intendant of National Board of Antiquities, oral statement, 12.1.2016.

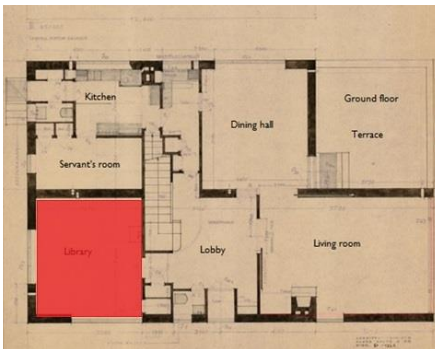
Lobby wall

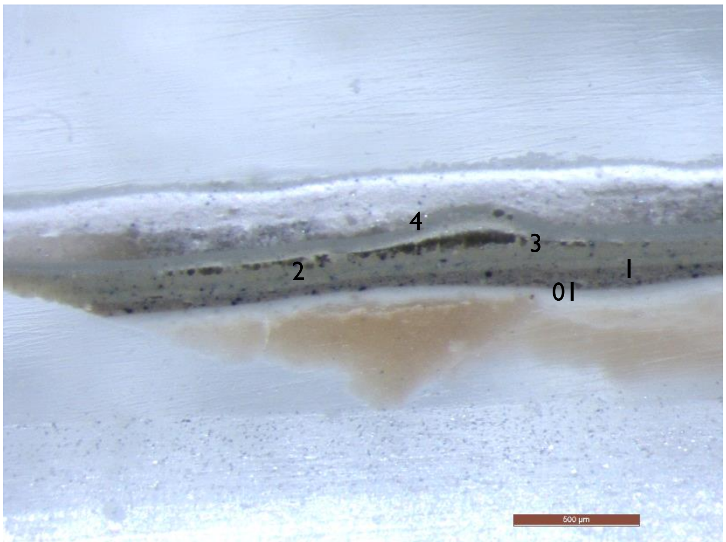


Sample 136. Scale 1mm.

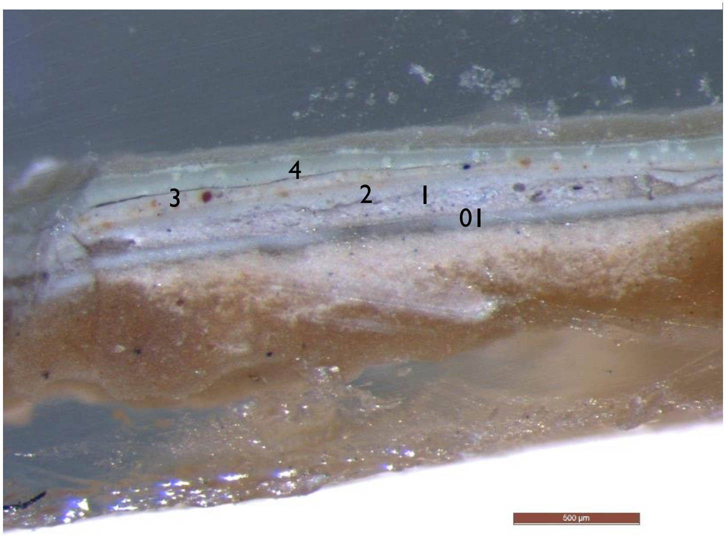
The sample no 136 taken from the lobby wall next to the doorways of dining hall and former kitchens had green undermost layers. that have the same hue as the ceilings in main building lounge. Similar green can also be found in the ceilings of some patient rooms in A-wing wards of the main building.

Library walls and ceiling





Sample 123. Scale 500µm.

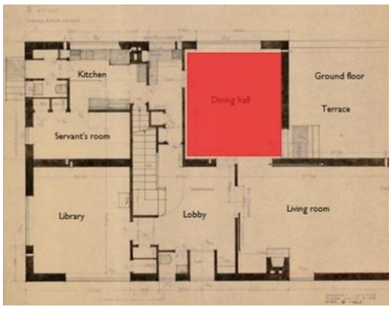


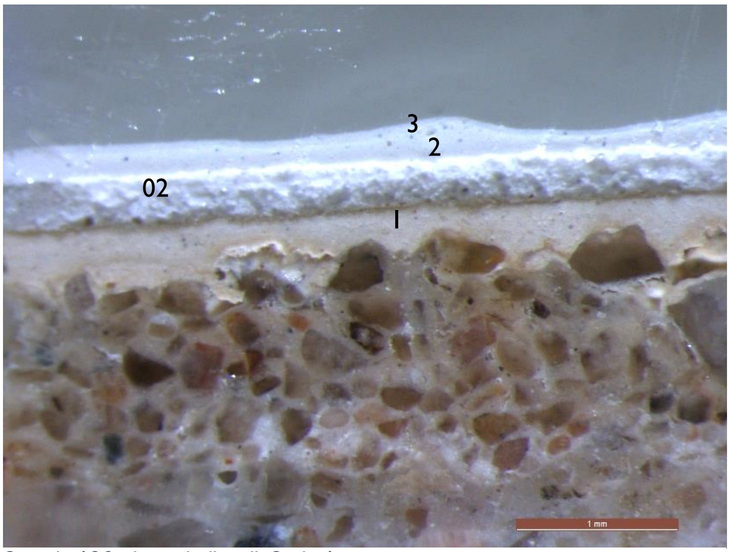
Sample 124. Scale 500µm.

Cross section samples 123 showed a grey undermost layer with black pigment particles. It was taken from the jamb of window, by the radiator. The sample 124 shows different layers. It has a white or cream white undermost layer. The sample 124 was taken from another side of the same library room, next to the other window and radiator underneath it.

Dining hall


SINIHELMI

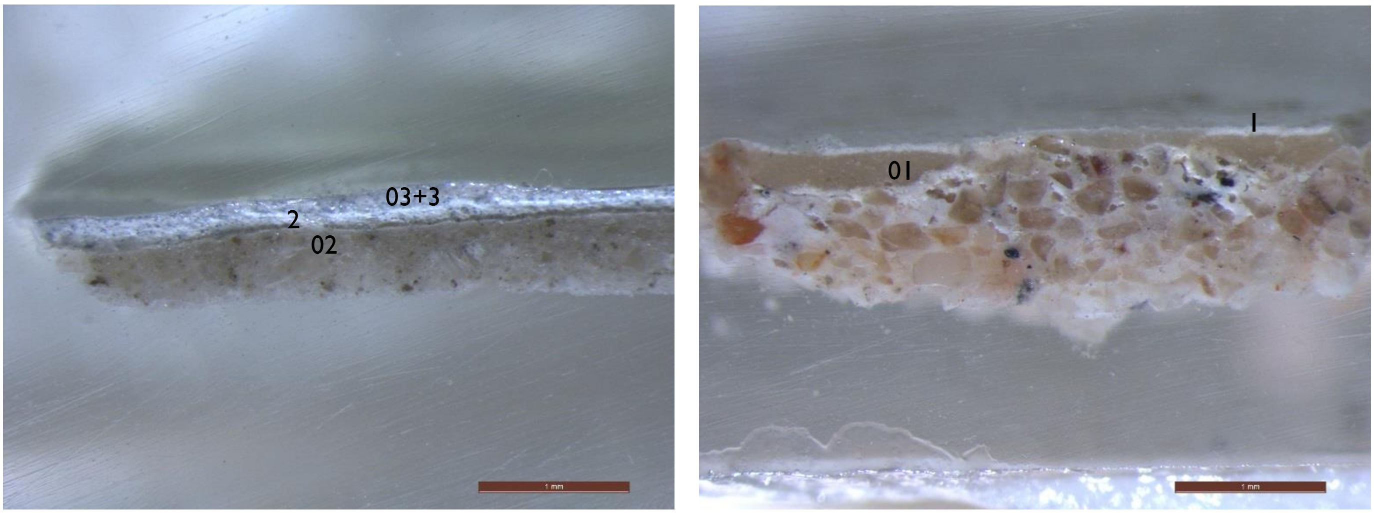

Kitchen
Ground floor
Dining hall
Terrace
Servant's room
Library
Lobby
Living room



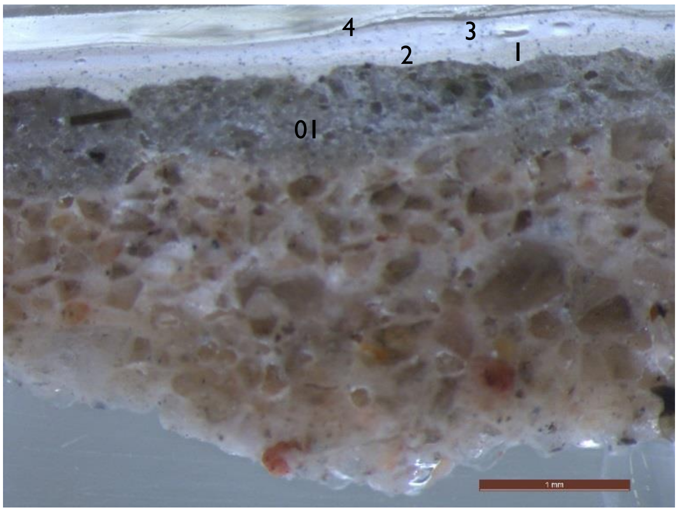
Sample 129, dining hall wall. Scale 1mm.

The dining hall wall samples no 129 and 131 had only white undermost layers. The sample 131 broke into two parts and is presented here in two different photographs.

The ceiling sample no. 130 showed also only white layers and a grey filler that had a porous and light weight texture that indicates that it is a modern filler (1970's or later). No excavations were made in this room.



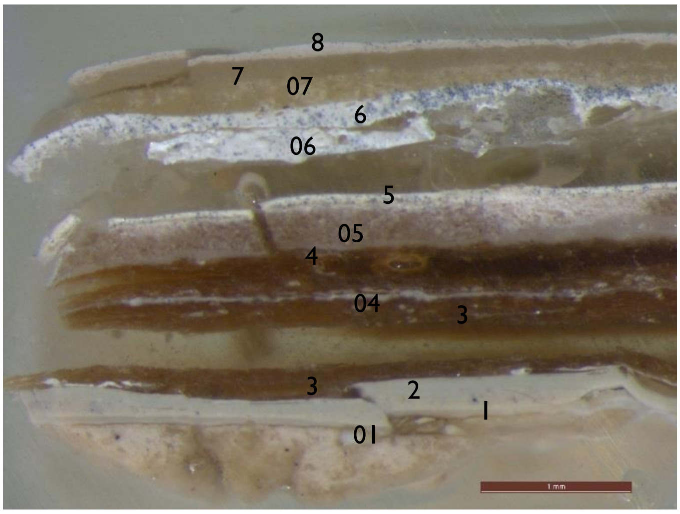
Sample 131. Dining hall wall. Scale 1mm. At the left are the uppermost layers.



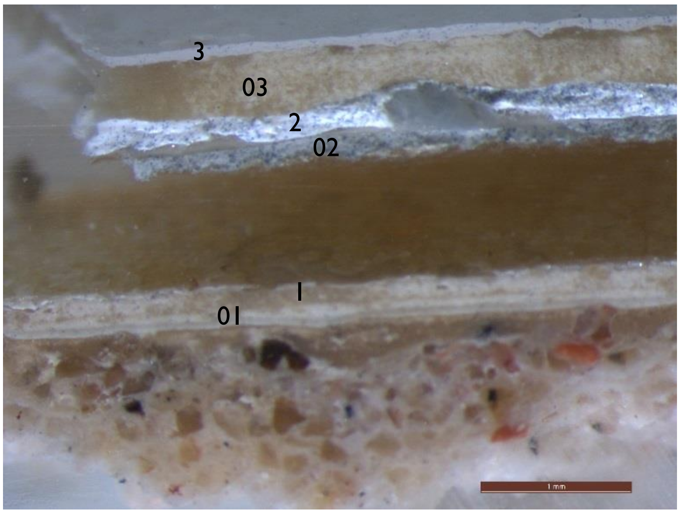
Sample 130. Dining hall ceiling. Scale 500µm.

Living room


Kitchen
Ground floor
Dining hall
Terrace
Servant's room
Library
Lobby
Living room

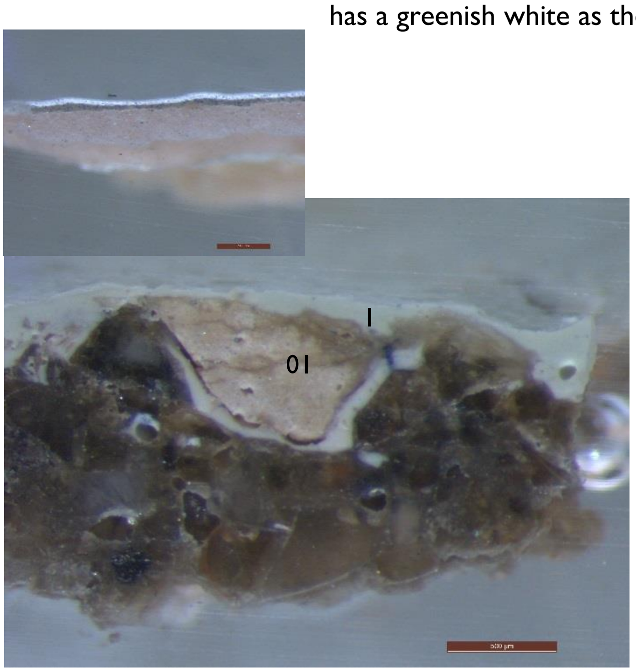


Sample 133. Living room wall, by the terrace windows. Scale 1mm.

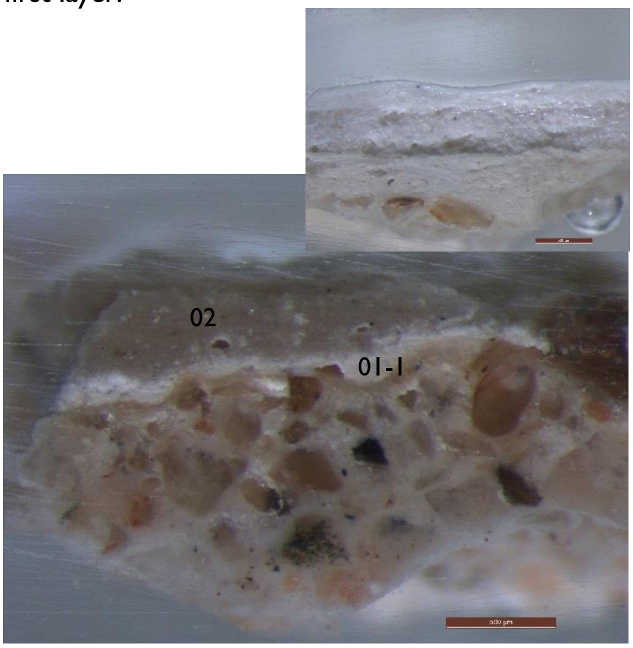


Sample 134. Living room wall by the fireplace. Scale 1mm.

The sample133 taken from the wall next to the large windows facing the garden showed dark brown layers, the undermost being however cream white. The opposite wall facing the main entrance gave also light cream white results. The undermost layer of ceiling is white. The sample 135 presenting the color layers of fireplace has a greenish white as the first layer.



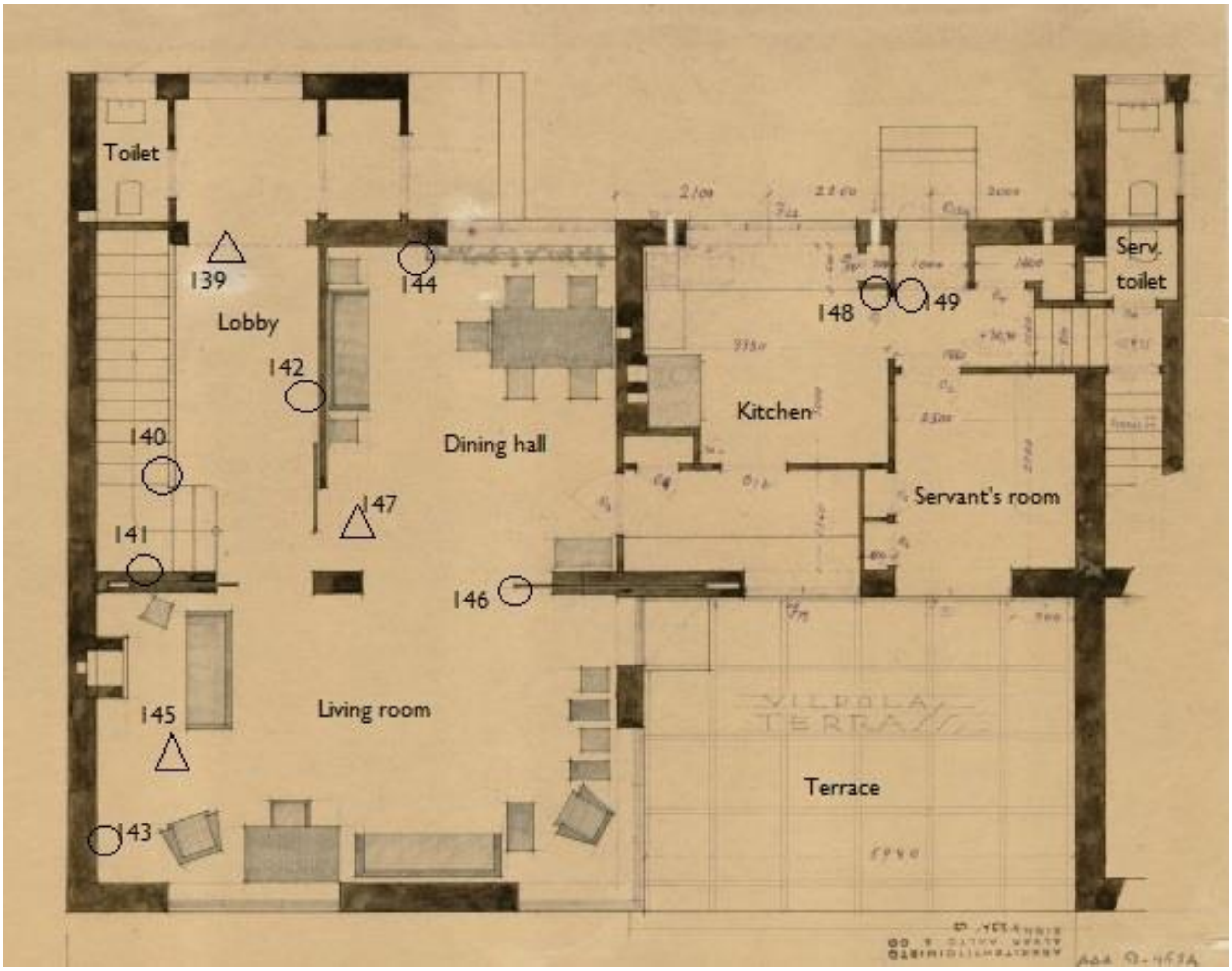
Sample 135. Cheeks of Fireplace. The small picture presents the upmost layers. of sample. Scale 500µm.



Sample 132. Living room ceiling. Small picture presents the upmost layers of sample. Scale 500µm.

4. The Sub Physicians' row house

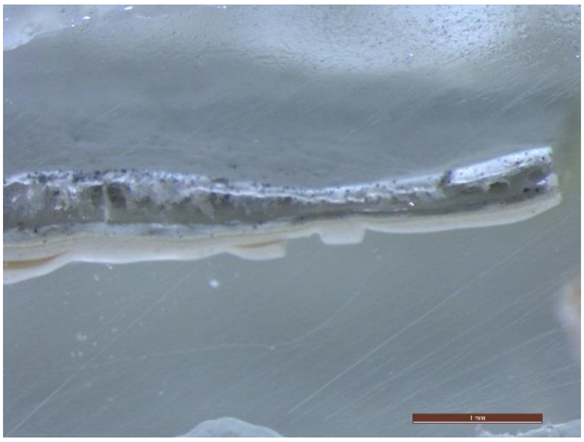
The sub physicians' row house has three attached apartments. This research was conducted in the middle apartment, due to its well preserved condition in comparison to other two apartments. All three apartments are still inhabited as they are rented to private families. The middle apartment still has original doors, kitchen cabinets, some toilet fixtures and assumably some surfaces as flooring preserved. The surfaces of walls of the apartment have gone through renovations, the last dating to 2010's when the walls were covered and fortified with fiberglass netting and painted over.

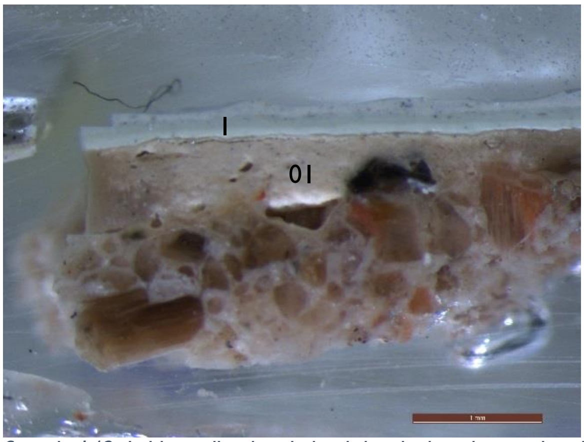


The Sub Physicians' row house soon after its completion. AAM Sign. 50-003-448.

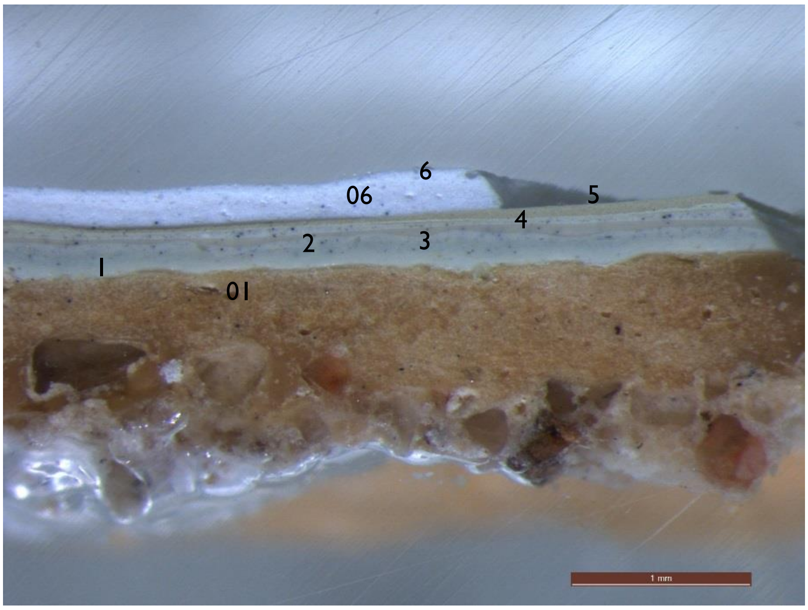
The living room corner of the sub physician's apartment with a fireplace at the right. AAM- Sign. 50-03-452.

Lobby ceiling and wall



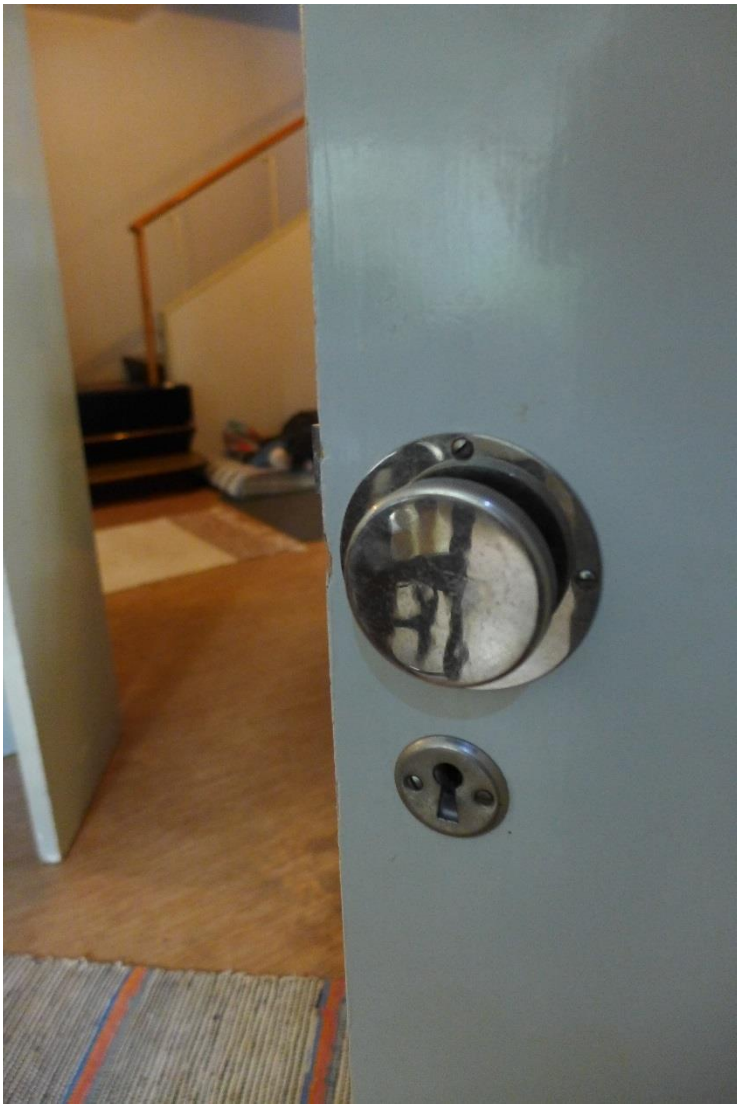


Sample 142. Lobby wall, taken behind the slinding door in the photograph at left. Scale 1mm.



Sample 139. Lobby ceiling. Scale 1mm.

The cross section sample 139 taken from the lobby ceiling has interesting layers. The first and second paint layers are light blue, and the third light grey. The Alvar Aalto Museum archives do not have interior pictures of the lobby for reference. The lobby wall sample 142 shows a light green undermost layer.


A detail of the original sliding door between the lobby and living room.

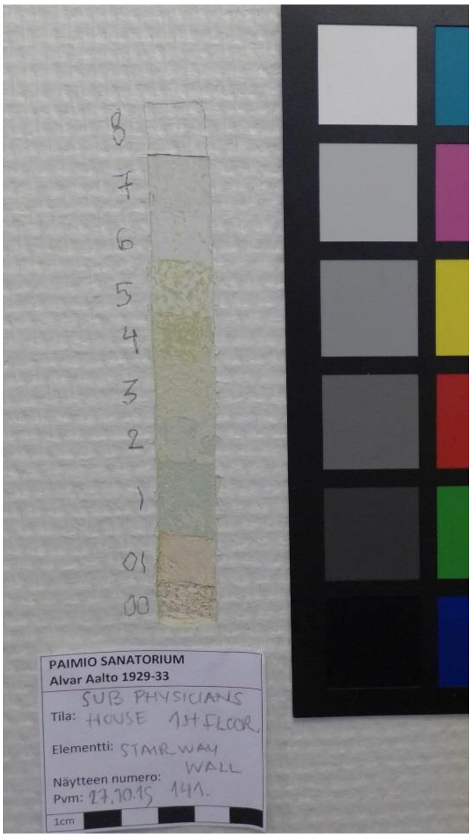
Stairway wall

Number of Sample 141	**Subject** Paimio Sanatorium	**Building / Space / Surface** **Sub** Physicians’ row house, middle apartment Ground floor Stairway wall
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

Fiberglass consolidating net has been glued on wall surfaces. Floors have linoleum flooring. Doors, windows and most of cabinets are original. Original light fixtures and original ceiling lights. Original window treatment

Photograph, drawing



Layers of Sample

00 Chalsium based Plaster

01 Filler

1 Paint light blue 1510-G

2 Paint White 0804-G20Y

3 Paint Light yellow paint 1015-G90Y

4 paint Beige 3020-Y

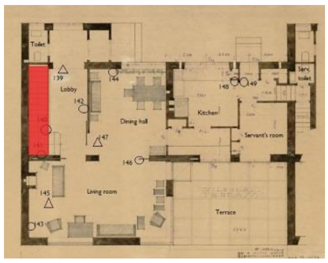
5 Paint Yellow 0502-Y

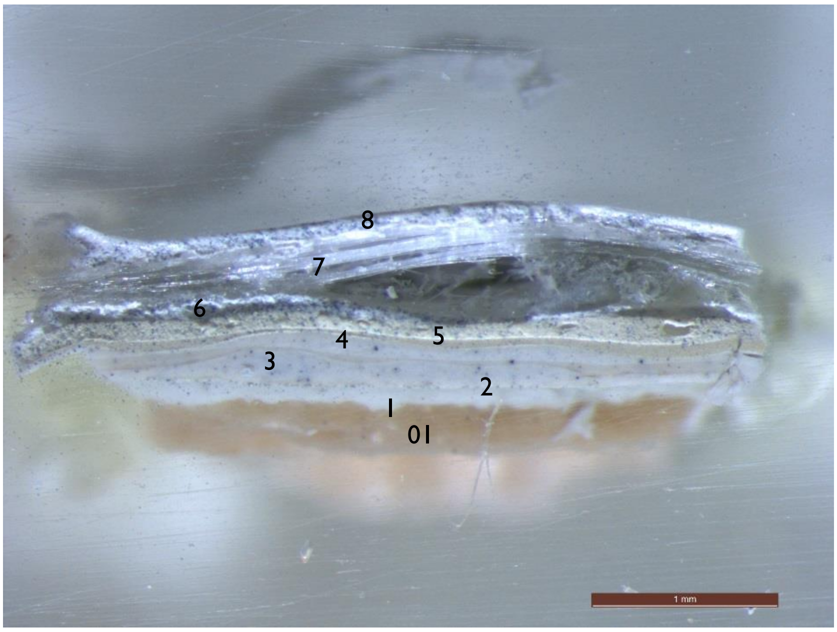
6 White

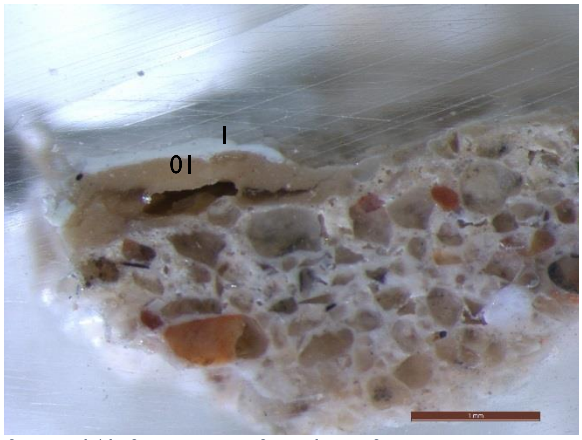
7 Glue of the glassfiber netting/Beige? 1510-G90Y Latex

8 White paint + glass fiber net, latex

Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:

Technique used to make and take Samples, Circumstance in site, Lighting:	**Color chart in use:**	**Type of Sample, Place of Storage:**	**Floor plan, Location of Sample**
Crater technique, excavation of paint layers, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written without the NCS prefix.	Cross section sample number 139. Scale 1mm. Storage Alvar Aalto Foundation, Helsinki.	





Sample 141. Stairway wall. Scale 1mm. Smaller picture presents the undermost layers.

The wall of the stair way seems to have the same undermost layers as the lobby wall (sample 142). The first layers are light blue.

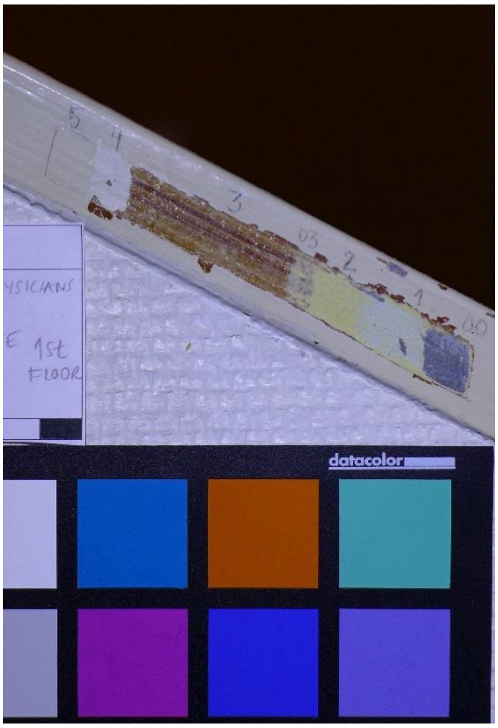
Stair handrail

Number of Sample	Subject	Building / Space / Surface
140	Paimio Sanatorium	**Sub** Physicians’ row house, middle apartment Ground floor Stairway Stair handrail, metal base
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

Fiberglass consolidating net has been glued on wall surfaces. Floors have linoleum flooring. Doors, windows and most of cabinets are original. Original light fixtures and original ceiling lights. Original window treatment

Photograph, drawing

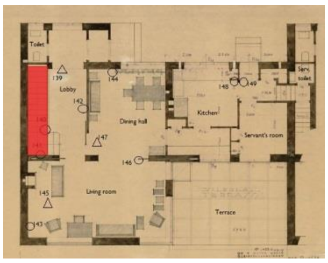


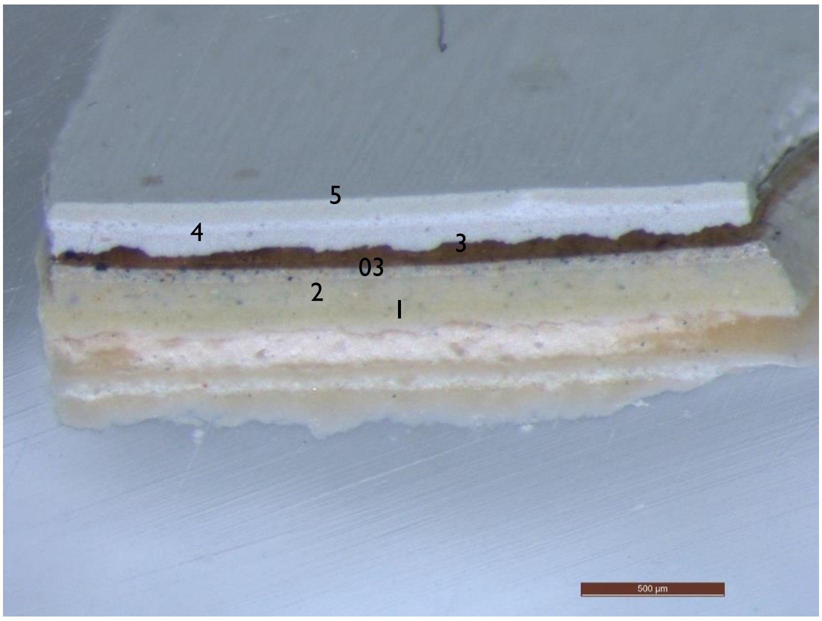
Layers of Sample

Layers of Sample
00 Metal
1 Light grey paint0907-G20Y
2 Light yellow 1030-G90Y
03 Filler, oil based
3 Wood imitation? 4040-Y10R, 6060-Y60R for “grains”
4 White (base coat?)
5 Grey / beigepaint 1510-G90Y

Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:

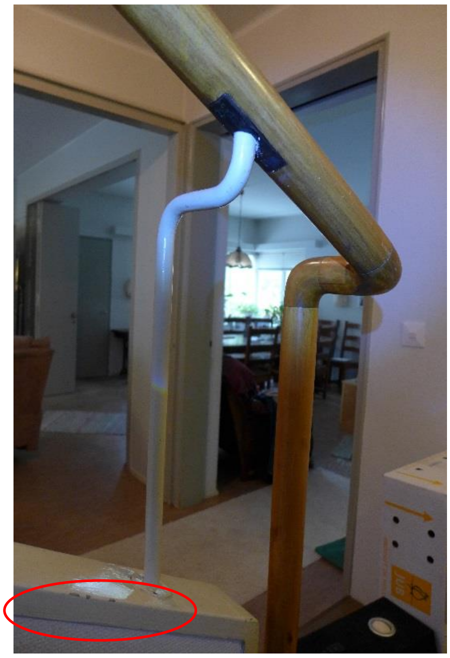
-

Technique used to make and take Samples, Circumstance in site, Lighting:	Color chart in use:	Type of Sample, Place of Storage:	Floor plan, Location of Sample
Crater technique, excavation of paint layers, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written without the NCS prefix.	Cross section sample number 140. Scale 1mm. Storage Alvar Aalto Foundation, Helsinki.	



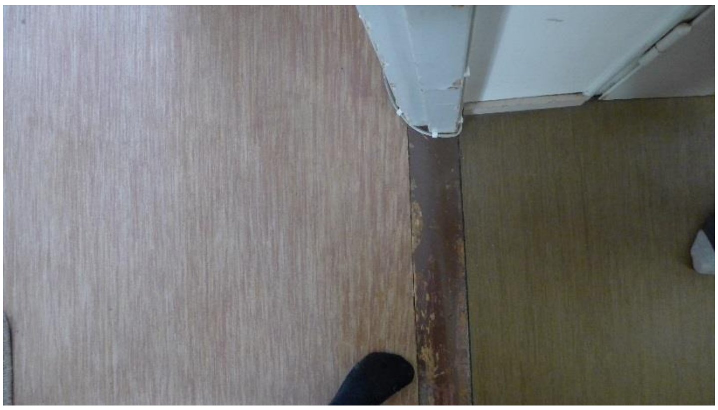
Sample 140. Stair handrail. Scale 500µm.

Sample 140 shows clearly the brown layers of probable wood imitation in the middle. The undermost layers are greenish grey.



Flooring

The flooring of Sub Physician's apartment today is linoleum. It is possible that some of the floorings are original. As no photographs nor maintenance documents of these apartments and their floors have been found, there are no proof of the originality of these floors.



Green flooring of the I and brown flooring of the living room.

Floors of living and dining room are heavily patterned linoleum. Notice the large original folding doors dividing the rooms.

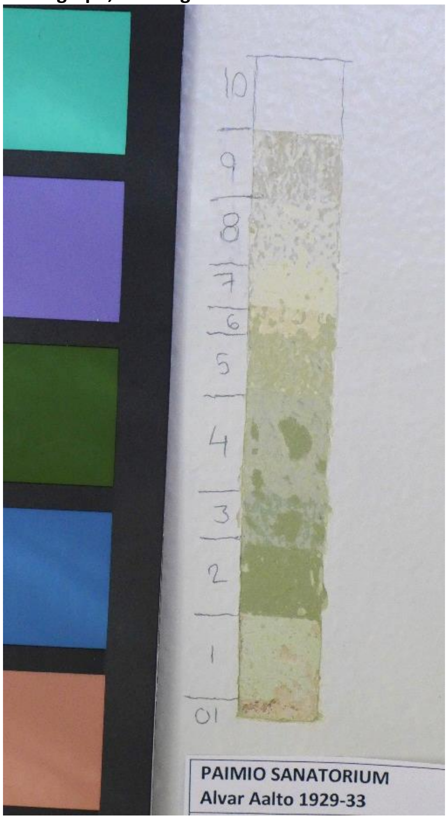
Living room wall

Number of Sample 143	**Subject** Paimio Sanatorium	**Building / Space / Surface** **Sub** Physicians' row house, middle apartment Ground floor Living room Wall facing North-East
Architect, building year Alvar Aalto, 1929-33	**Researcher, date** Elina Riksman, June-Dec. 2015, Alvar Aalto-foundation	

Most significant repairments and changes of the space, dates

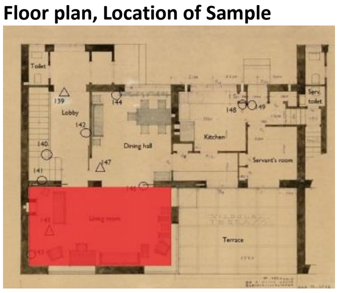
Floors have linoleum flooring. Doors, windows and most of cabinets are original. Original light fixtures and original ceiling lights. Original window treatment

Photograph, drawing

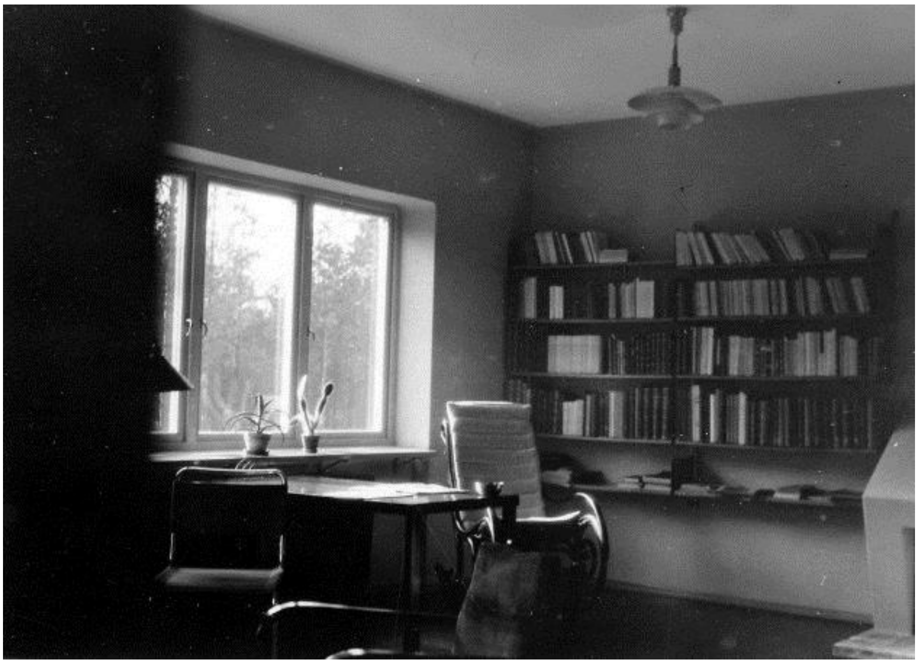


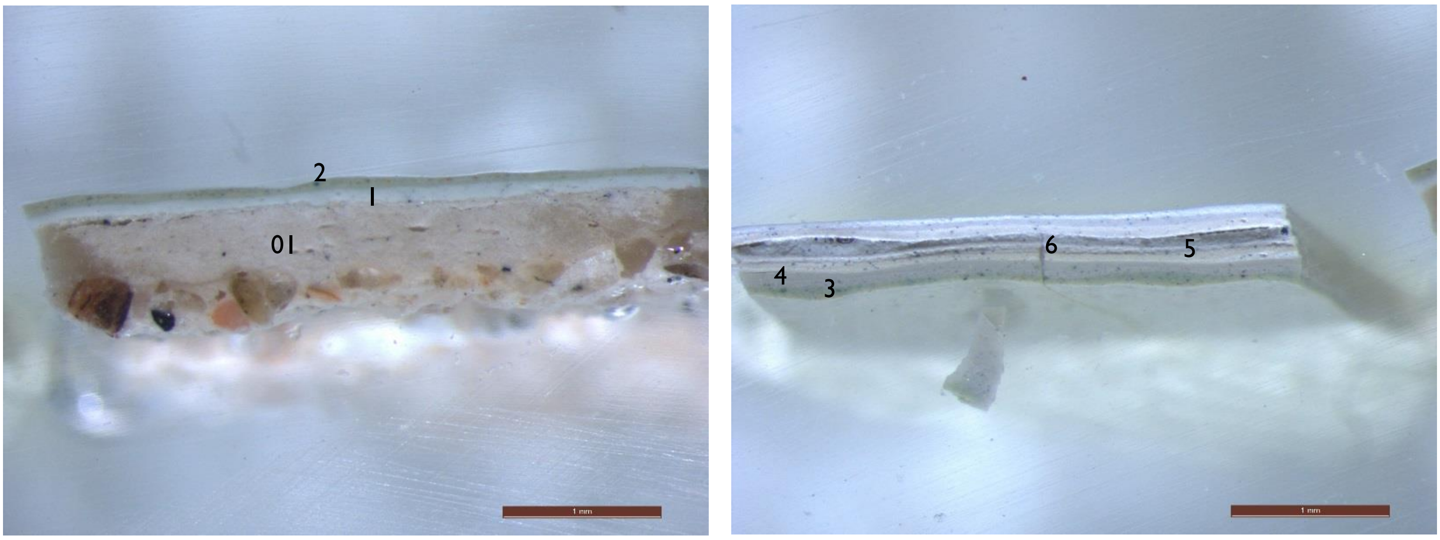
Layers of Sample
00 Plaster
01 Filler
1Light grey 1005-G50Y
2 Green 3020-G60Y
3 Green 3020-G30Y
4 Beige 1005-G80Y
5 Green 2020-G70Y
6 Beige 1015-10R
7 Light yellow 0510-G80Y
8 Grey 1002-B
9 Brown 4010-G80Y
10 White

Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:
-

Technique used to make and take Samples, Circumstance in site, Lighting:	**Color chart in use:**	**Type of Sample, Place of Storage:**	**Floor plan, Location of Sample**
Crater technique, excavation of paint layers, daylight + fluorescent lamps	NCS Teknos 2004 Color codes are written without the NCS prefix.	Cross section sample number 140. Scale 1mm. Storage Alvar Aalto Foundation, Helsinki.	

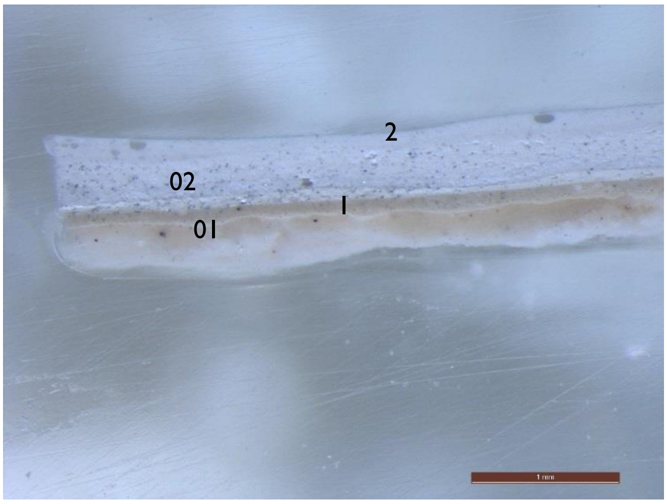
‘As the picture below shows, the original living room wall color in one of the apartments has had a rich coloring. The difference between ceiling’s white and the wall color is notable. It is possible that the second layer found in excavation (see picture in previous page chart), green, is the original color of the living room walls. The opposite side of the room showed same layers in carved crater excavations.





Sample 143 in two parts. Living room wall. Scale 1mm. Uppermost layers at the right.

Living room ceiling

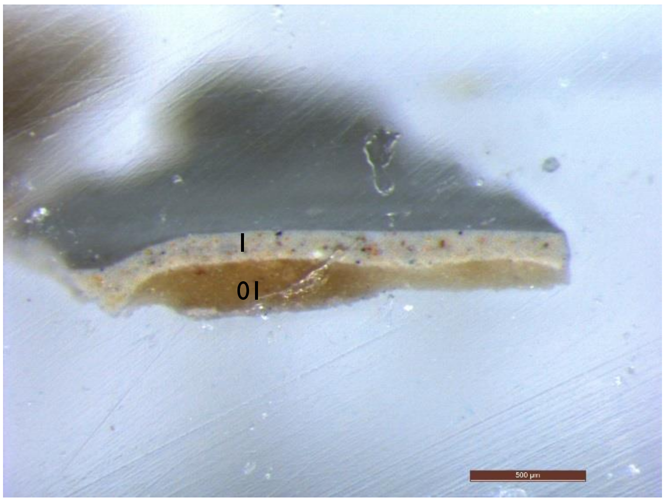


Sample 145. Living room ceiling. Scale 1mm.

Living room ceiling showed light paint layer, the undermost being greyish beige.

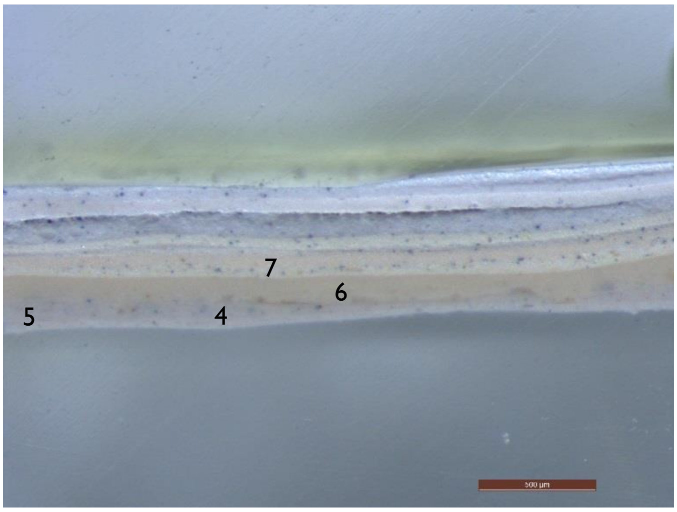
Dining room ceiling

The dining room ceiling shows warm white paint layer as the undermost layer. Paint layers have particles of pigment showing clearly in cross section sample. The sample broke into two parts. The upper part is presented above.



Dining room wall

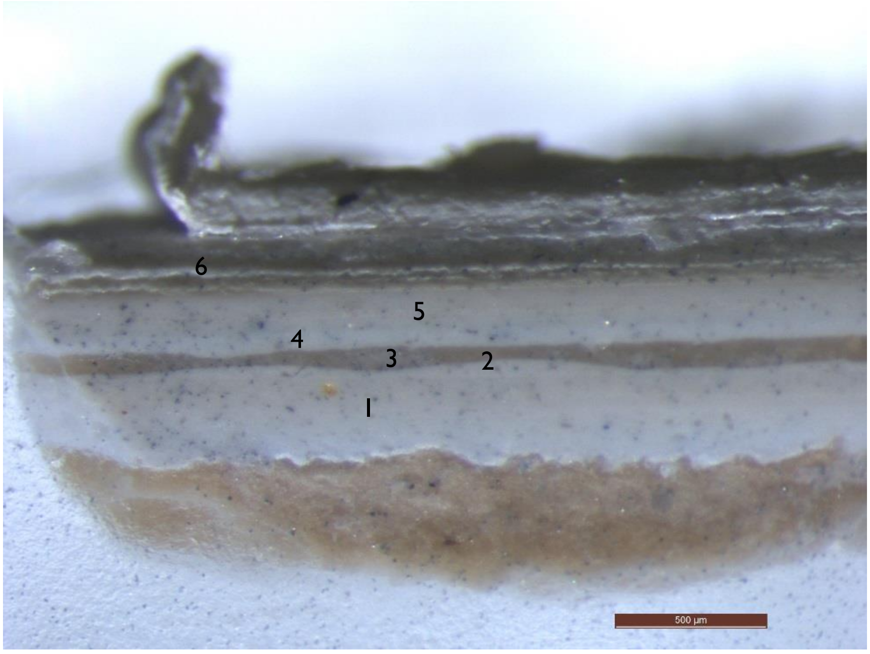
Undermost paint layer in the dining room is light green. The sample 144 does not have the same rich colors of green as the living room wall sample 143.



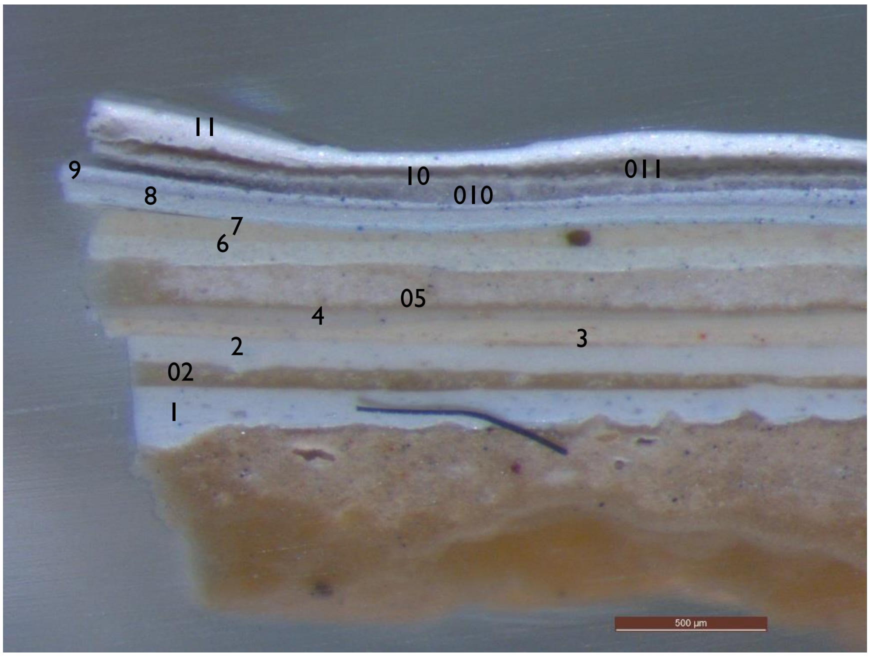
Sample 144. Dining room wall by the window. Scale 500µm. Sample broke in two parts, below are the undermost layers.

Kitchen wall and wall by the kitchen entrance

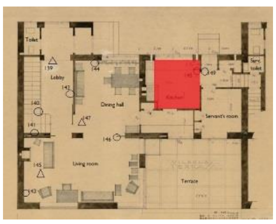
Kitchen wall sample 148 had only few light colored layers. Sample 149 taken from the wall by the kitchen entrance shows most layers that the whole sub pysician's apartment has so far. The undermost layer seems light blue.



Sample 148. Kitchen wall, by the door leading to servant's hall. Scale 500µm.



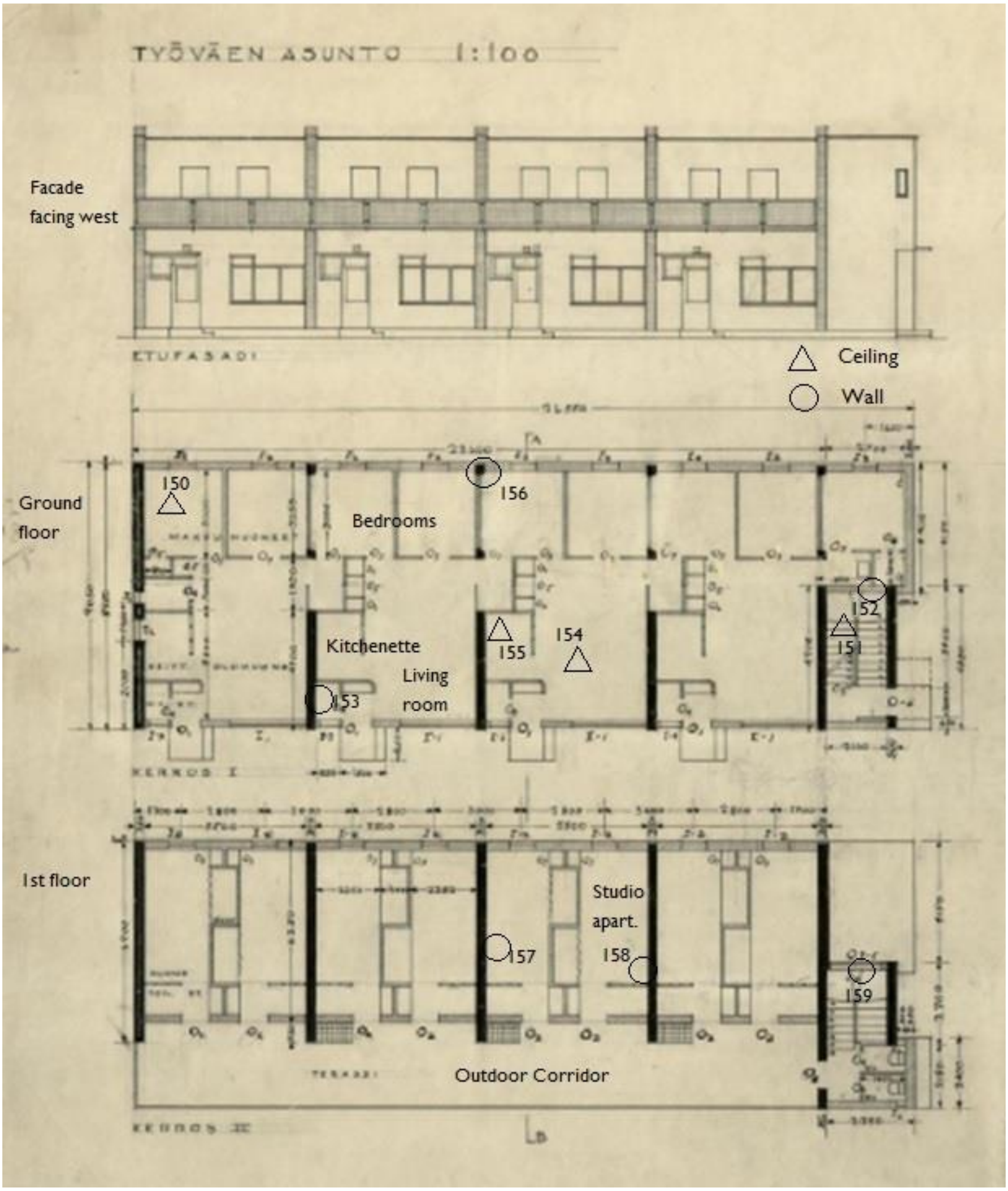
Sample 149. Wall by the kitchen entrance. Scale 500µm.



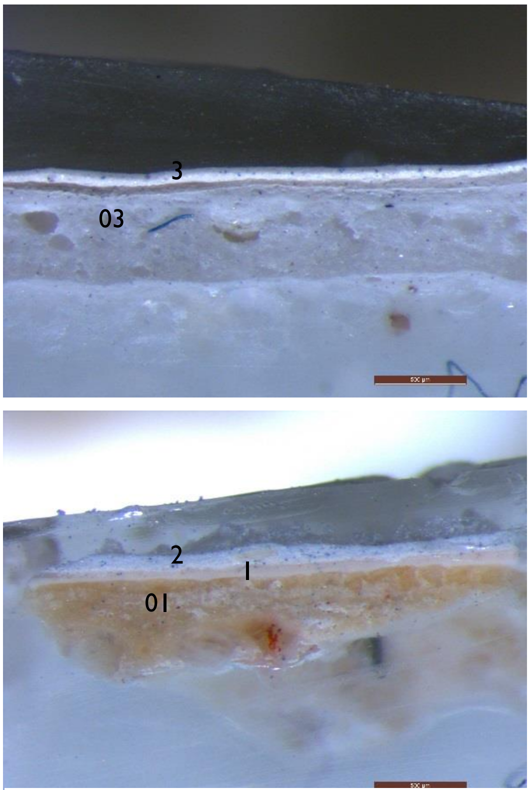
5. Staff apartment building

The former staff apartment building has been changed into a two storey office for the economy department of the hospital. No fragments or elements of the original apartment plan nor furniture has been preserved. This research addressed both floors. The ground floor has had four family apartments with a small kitchenette and bathroom. They were all convertible apartments between one to three bedrooms, depending on the size of the family resident in the apartment. First floor of the house consisted of eight studio apartments with one room, no kitchenette and a shared toilet at the end of the outdoor corridor. The corridor was converted into indoor space when the renovation of office space took place. The first floor Stoilets have been relatively well preserved.

Staff apartment building soon after its completion. AAM Sign. 50-003-432



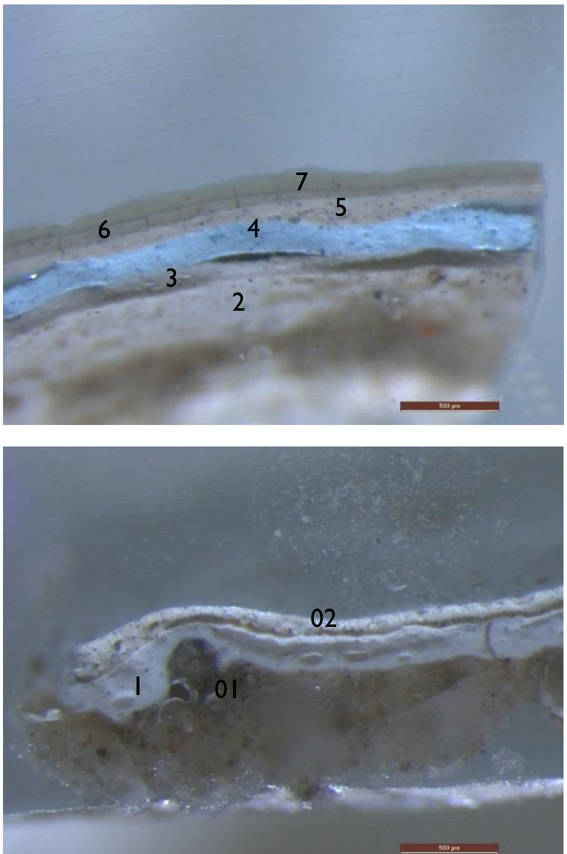
Cross section samples taken from Staff apartment building, ground floor and 1st floor. AAM



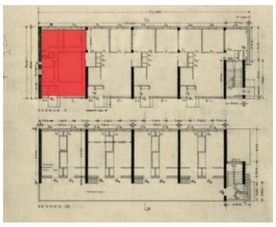
Sample 150 in two parts.. Former bedroom ceiling. Scale 500µm.

Sample 150 from former bedroom ceiling shows a cream white undermost layer.

Sample 156 from bedroom wall facing east has a white undermost layer. No excavations were made in this floor.

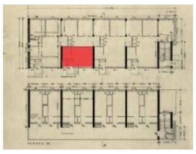


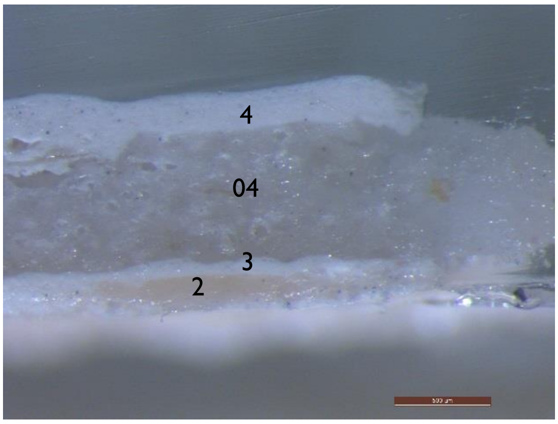
Sample 156 in two parts. Bedroom wall facing east. Scale 500µm.

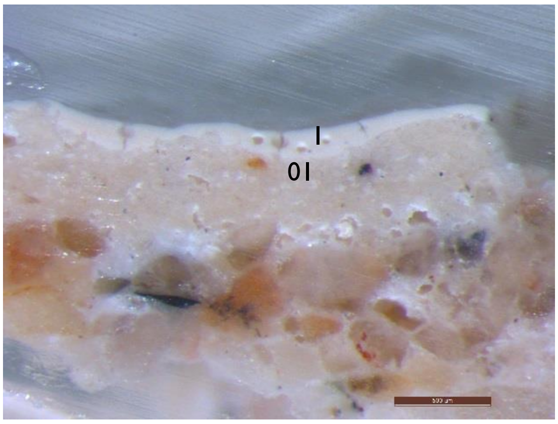


Ground floor, Family apartment: kitchenette and living room ceiling

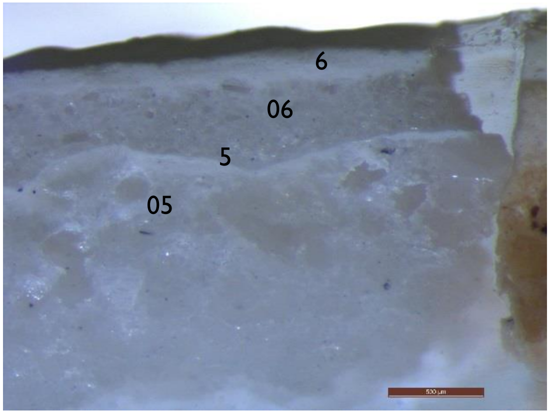
The former kitchenette cubicle seen in the picture at left, has gone through some changes in the 1980's renovation from staff housing to office space. It is the only one left of the kitchen cubicles in the staff house. The samples were taken from another point of the house, but from a similar spot. The results are white paint layers as undermost layers on both ceilings.

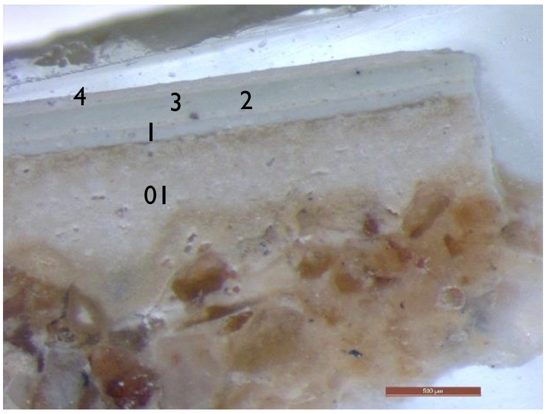






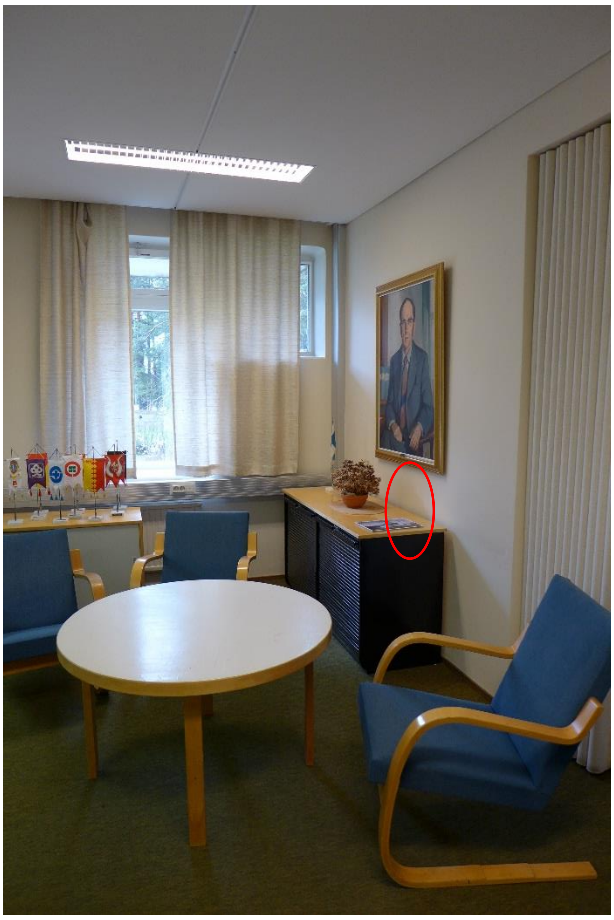
Sample 154 in two parts. Former Living room ceiling. Scale 500µm.





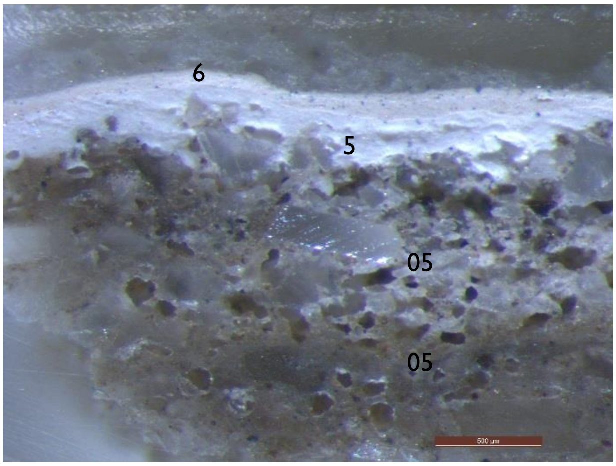
Kuva 1Sample 155 in two parts. Former kitchenette ceiling. Scale 500µm.

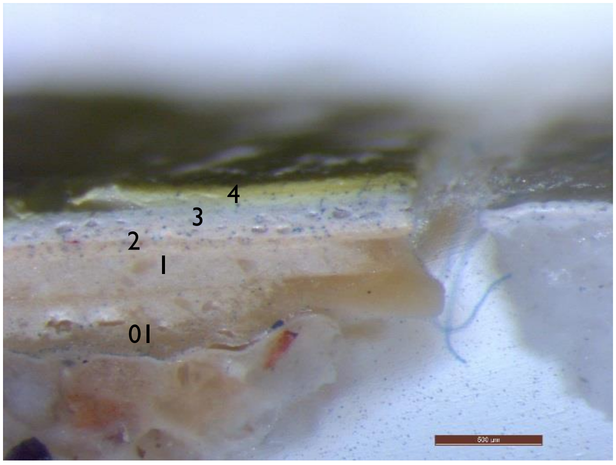
Ground floor, Family apartment: corridor wall



The renovation from apartments to office building changed the west façade. The front doors of every ground floor apartment was removed and the small corridors joined as one space with the next, former living room.

The sample 153 showed cream white undermost layer.



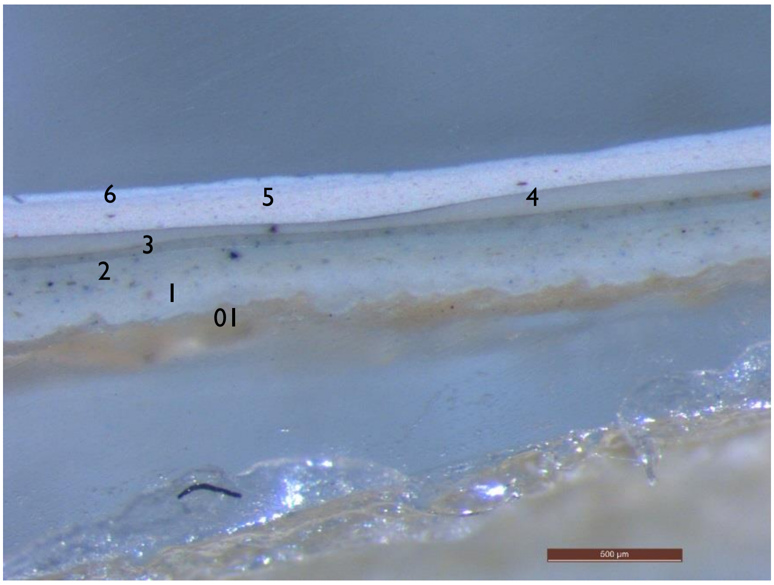


Sample 153 in two parts. Former corridor of the family apartment. Scale 500µm.

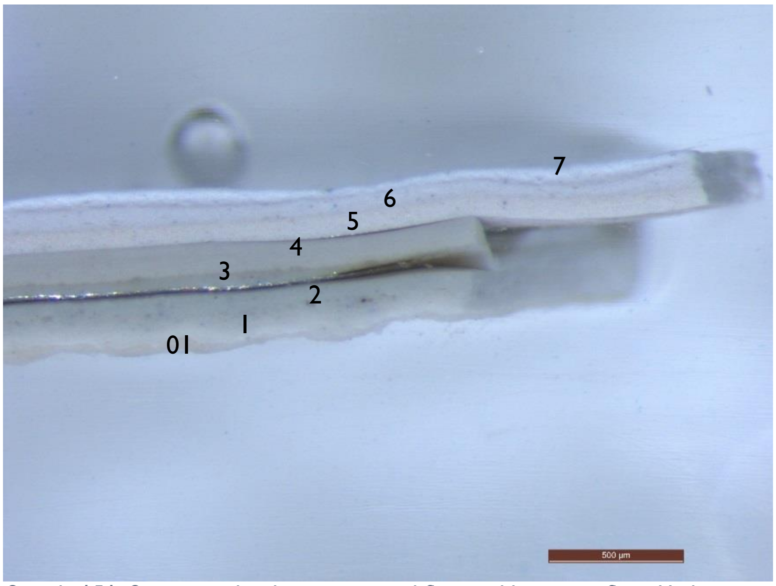
Stairway between basement and ground floor

The stairway wall sample 151 showed light blue first layer. This is the first color, differing from white paints in the ground floor.

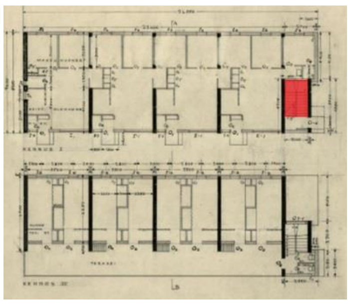
The ceiling sample 152 from stairway showed white paint as first layer.



Sample 152. Stairway wall, ground floor. scale 500µm.

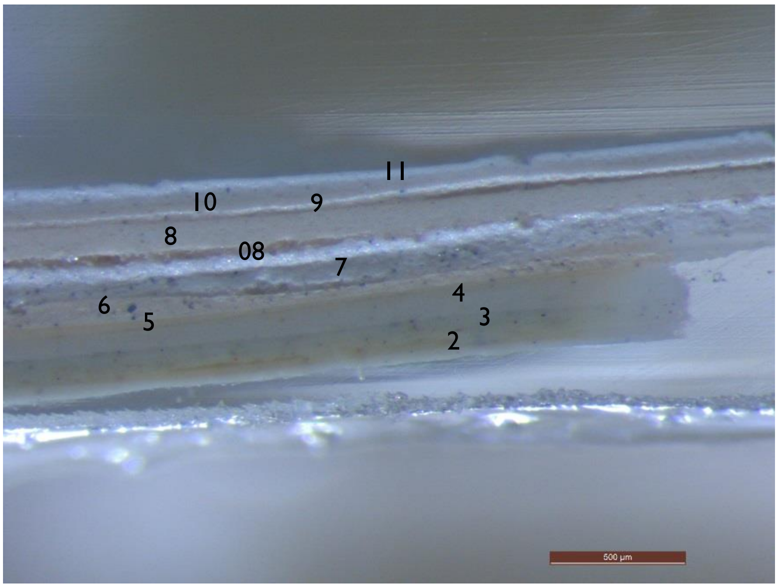


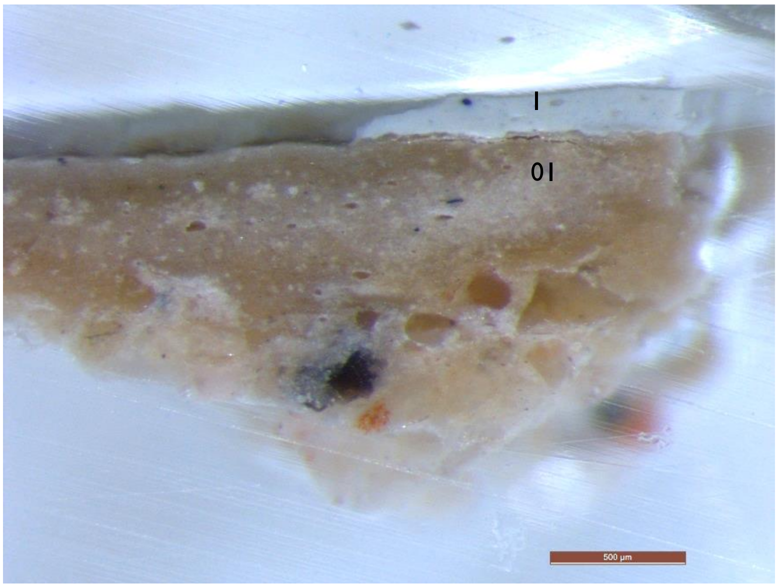
Sample 151. Stairway ceiling between ground floor and basement floor. Undermost material, plaster, is not shown in the sample. Scale 500µm.



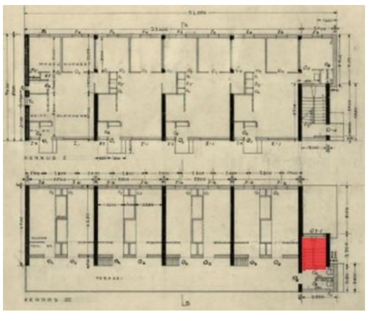
Stairway between ground and first floor

The wall of the stairway connecting ground and first floor showed light blue first paint layer. The layer has some blue pigment particles-



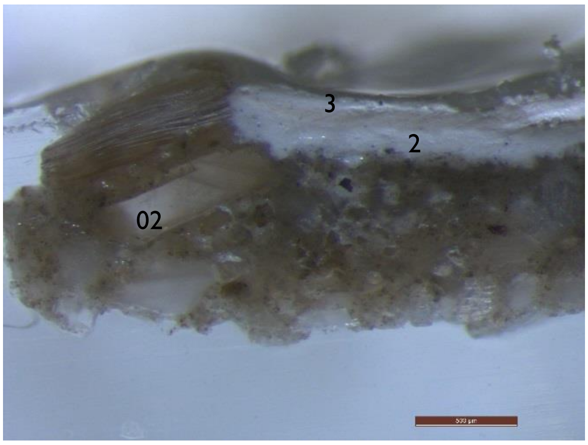


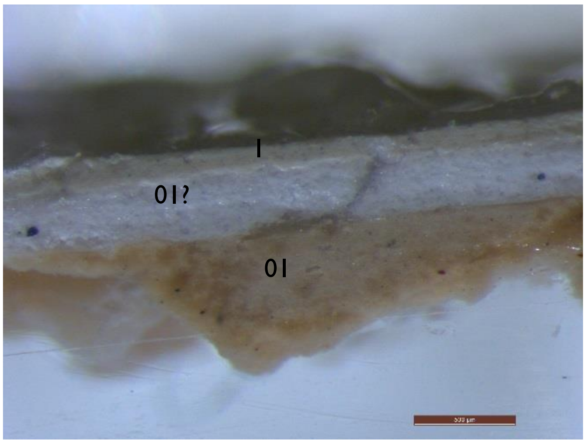
Sample 159 in two parts. Stairway wall. Scale 500µm.



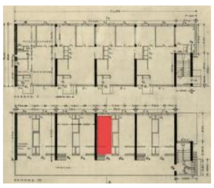
Frist floor, studio apartment walls

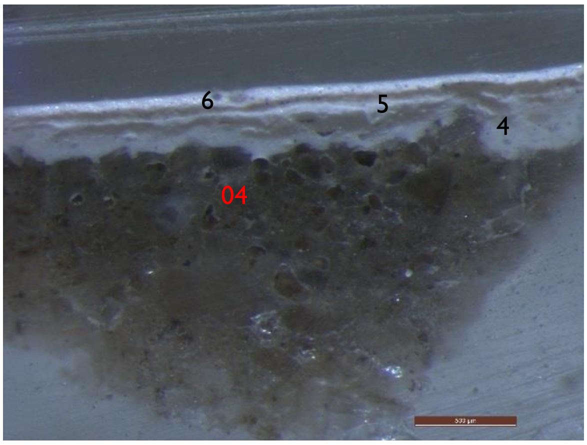
The first layers of the samples gathered from walls of upstairs studio apartments show undermost layer of filler that seems original. The second layer (marked “01?”) seems like a filler as well. This is the impression one gets from both samples. The undermost layers are all white or cream white. That has probably been the main original color of studio apartment walls.

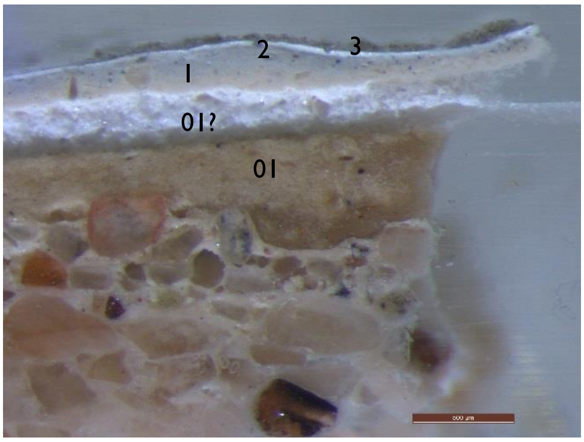




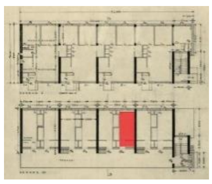
Sample 157 in two parts. Wall of studio apartment, first floor. Scale 500µm.







Sample 158 in two parts. Wall of studio apartment, first floor. Scale 500µm.



6. Rose cellar – The Morgue

The Rose cellar is a dome shaped concrete and tile structure with ceiling window for natural light and a natural stone, granite entrance. It served as the sanatorium morgue before the first chapel and morgue was built in the basement floor of the main building.

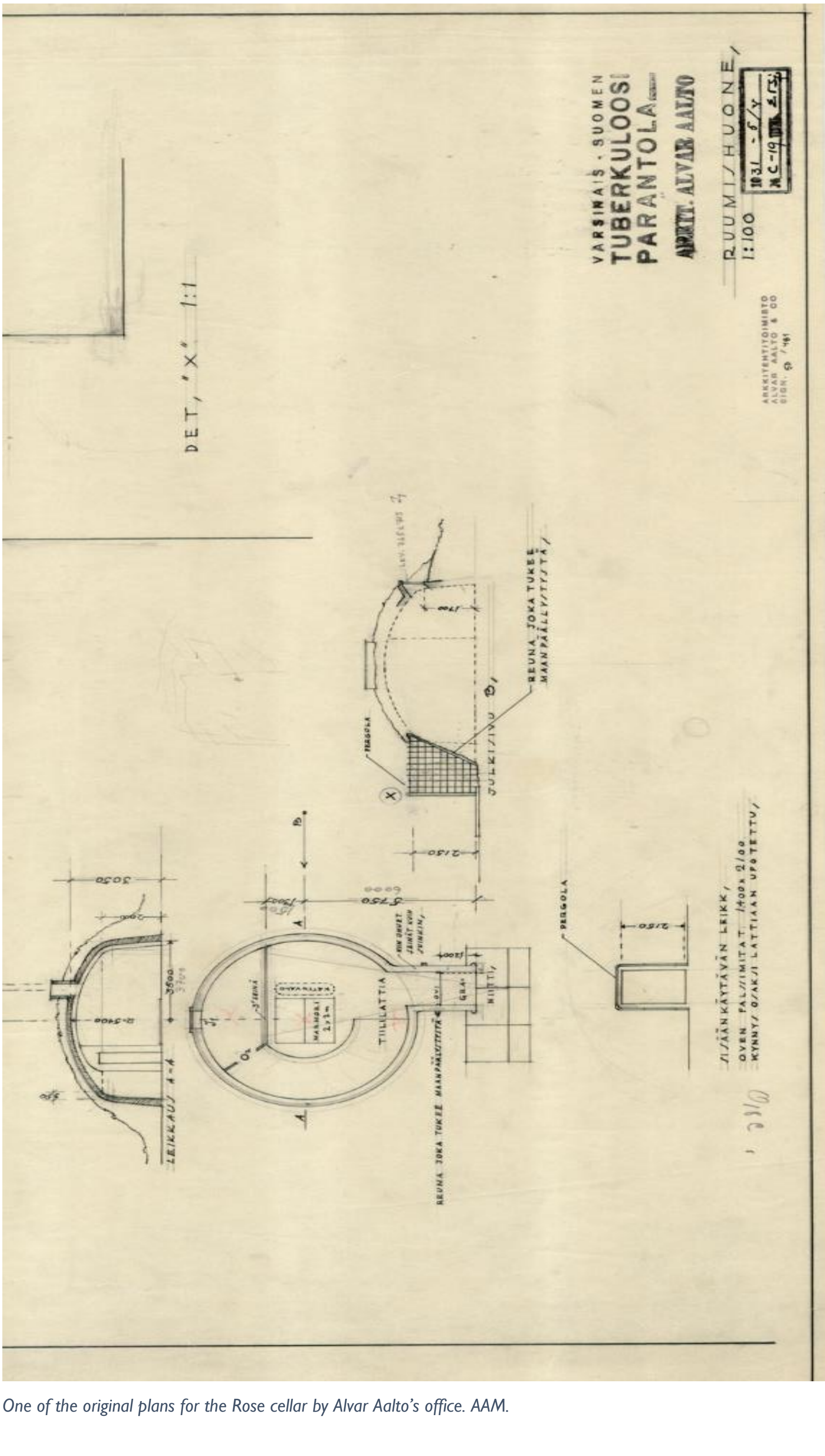
The mural on the wall dividing the round space is badly deteriorated due to humidity and subzero conditions of the cellar. The surface seems to be a traditional three-step calcium based plastering. Mural has an abstract matt, light colored painting that presents three different pastel colored, fan shaped areas overlapping each other. The right corner of the mural has been so badly deteriorated that the surface of the plastering has fallen off. Seems that this lost area did not carry any other color than the background color and not the actual theme of the mural.

The mural was originally painted by Eino Kauria. This has been stated in his interview from 1986 and in the paycheck receipts found in the archives.[6] An excerpt of the interview has been translated for this chapter. The interview on Kauria was in pivotal role when defining the status and origin of the peculiar lines shown in the undermost layers of the mural.

The Rose cellar in its original state, covered with soil and rose bushes. AAM 50-003-251

[6] Interview of painter Eino Kauria, Helsinki 30.9.1986, by Teppo Jokinen, Alvar Aalto Museum.

The state of Rose cellar today. The masses of soil covering the dome have been removed. The original moisture insulation, the black tar-like coating has been scraped down to ensure further drying of the structure. The cellar has been covered with a temporary shelter to protect it from rain and subzero temperatures during 2005. The original door has been removed, stored and replaced by a temporary door. An underground drain has been installed around the dome to gather most of the water from the ground.



One of the original plans for the Rose cellar by Alvar Aalto's office. AAM.

Interview of Eino Kauria

The following is a translation of a part of the Eino Kauria interview from 1986 addressing the paintwork of Rose Cellar mural. Translated from Finnish text by Elina Riksman.

(Interviewer Teppo Jokinen, TJ, is showing a photograph of a cellar wall to Eino Kauria, EK.)

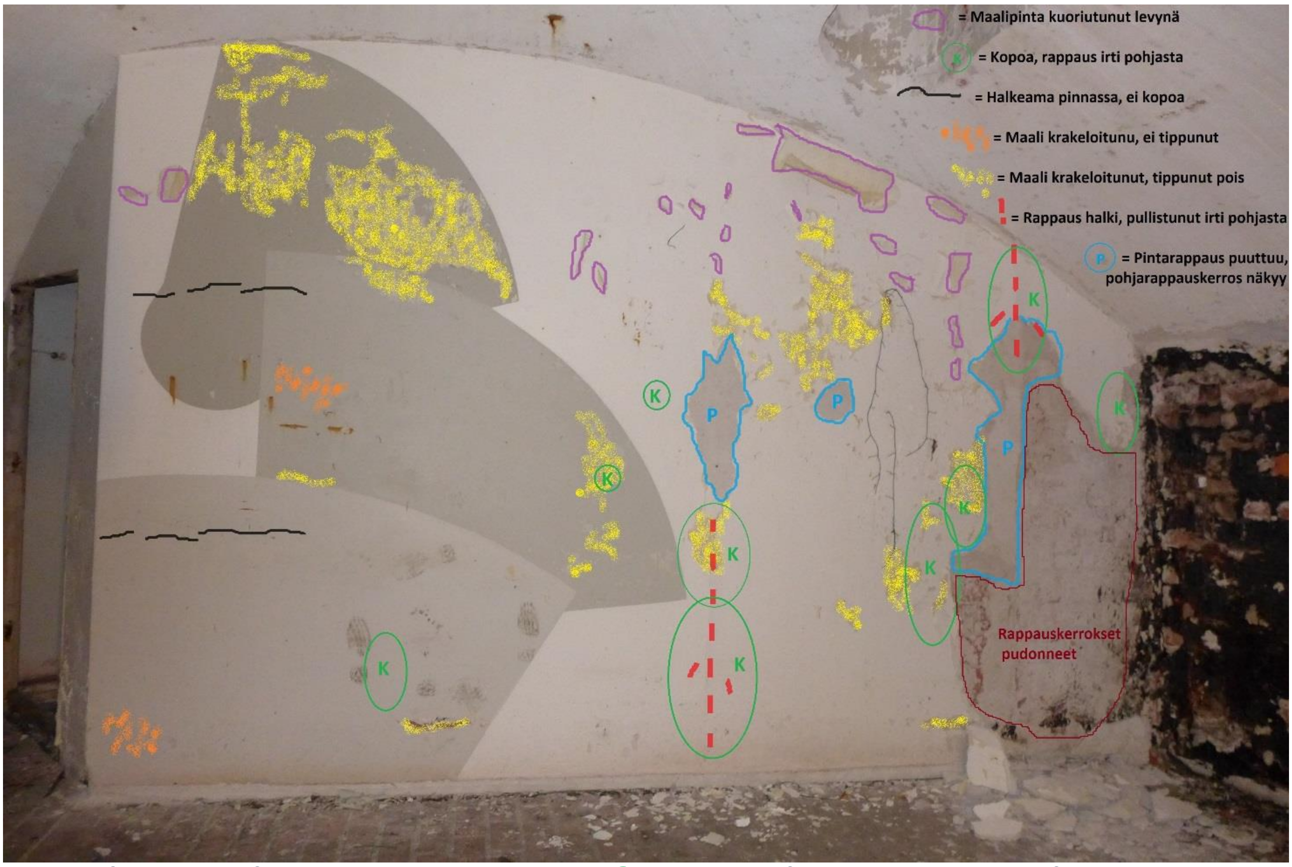
> *TJ: So these here don't belong to the fresco you painted?*
> *EK: Oh no, no they don't.*
> *TJ: Was it (the original) then the whole length of the wall?*
> *EK: Whole wall, yes.*
> *TJ: And how was it done then, you said that with some strings…*
> *EK: Yes, with strings, different thicknesses of strings we had, and so I watered this wall with a sprayer and the string was drawn through dry pigment and the other would hold the one end of the string, and the other from the one end and then we would snap the string so it became like that…*
> *TJ: A line?*
> *EK: Yeah, and it came out nice when it dried as the surface was wet and it kind of spread the color…*
> *TJ: So was it kind of an aquarelle look…got absorbed…?*
> *EK: Oh yes.*
> *TJ: And what colors did it have?*
> *EK: It might have had red and yellow and dark brown and might have had black also. I don't remember.*
> *TJ: Kind of strong hues anyway?*
> *EK: Yeah, yes.*
> *TJ: And was it made into…rays or like a round ball or just like that put there…?*
> *EK: Yes, well, they were…it had kind of these groups…*
> *TJ: Vertical and…?*
> *EK: Diagonal and it might have had verticals as well, I can't remember precisely.*
> *TJ: So anyhow it was completely abstract*
> *EK: It didn't especially portray anything, it was the color that was the main point there.*
> *TJ: And was it your mutual ideation with Aalto then or…?*
> *EK: Well yeah, it was kind of mutual that we did not have any sketches then, that we just made it…*
> *TJ: Just like that, without preparation?*
> *EK: Yeah, just like that!*

In the interview Kauria explains the technique of the pattern of the lines visible in the undermost layer today. The colors stated in the interview, red, yellow and dark brown and black, are not visible in the mural or in its lagoons today or in the cross section samples gathered from mural. Only light pastel colors of yellow, blue and grey are visible, additionally to the color of the lines which is dark grey. The lines are visible only partly, in lagoons were upper layers of paint has peeled off.

The cross section samples taken from the mural neither state any stronger colors. It is possible that Kauria mistakes the colors of Rose cellar to the colors of main building that did originally present these strong colors he mentions above. The floor of the Rose cellar has had a distinctive color. The red brick floor has had a concrete layer laid upon it at some point of the history. Concrete has now been demolished during the process of drying the water damaged structures. Original Aalto drawings show that tile was intended to be the original floor material.

The architectural office Laiho-Pulkkinen-Raunio, which has been involved in Paimio hospital renovation and development of the hospital area during 2000's, has planned and written instructions for the cellar's renovation and restorative work. This plan from year 2005 has been updated 2010. No operative work has yet taken place in the cellar, after the demolition of damaged structures (to start the drying process) in year 2005. At this time a digital hygrometer was installed to monitor the drying process of the cellar. Also a concrete research report has been made 2003.by a concrete, mural and plaster expert Thorborg von Konow as a part of a larger research project "The Analysis and Restoration of Historical Concrete".

The current state of the Rose Cellar mural. August 2015. The presumed original redbrick floor is now revealed after the peeling of concrete flooring. Black tar-like watertight coating has also been stripped partly to enhance the drying process of the water damaged wall structures.



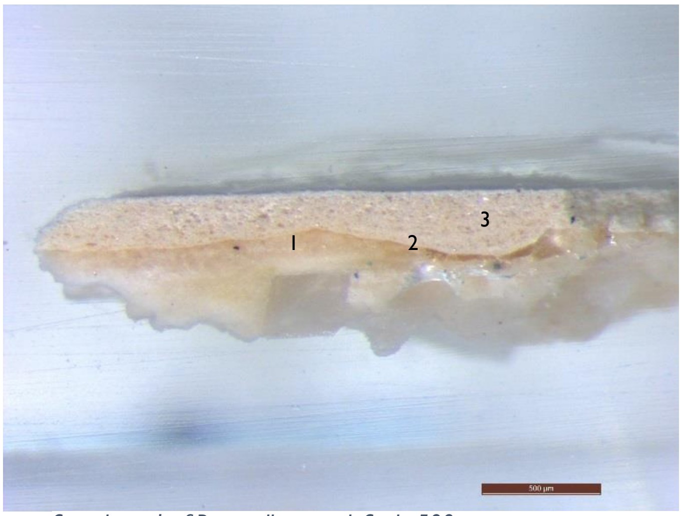
The map of deterioration of the Kauria mural. Violet: paint peeled. Green: vacuous surface. Black: a crack in the surface but no hollowness. Orange: paint crackled, but still attached. Yellow: paint crackled, falling off. Red: a fissure of the plastering, plastering loosened from its base. Blue: lagoon, missing surface plastering. Dark red lagoon at the right has lost all three layers of plastering, red tiles underneath showing.

Above is a small lagoon in the surface of the mural. It exposes the paint layers underneath. The dark grey stripes made by Kauria are clearly visible on the undermost layer. In the picture below it is shown how the stripes continue through the different color areas of light pastel blue and yellow.

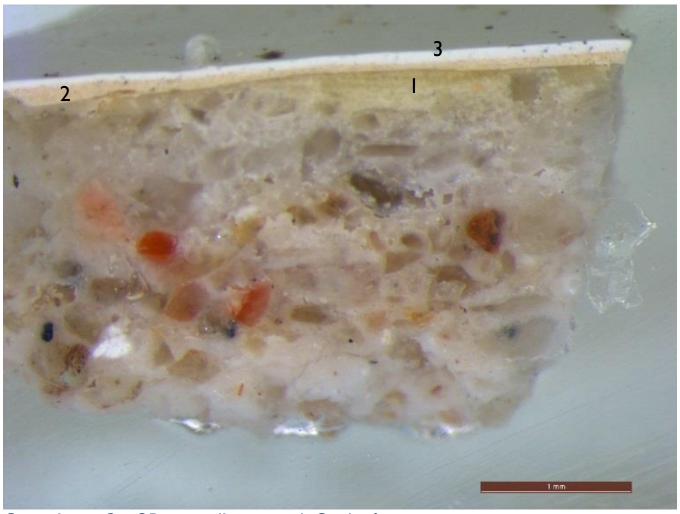
The cross section samples taken from the mural of Rose cellar.

The cross section samples gathered from the Rose cellar mural show three light colored layers. Sample number 1 shows light cream or yellow layers, as the bottom layer there seems almost nonexistent.

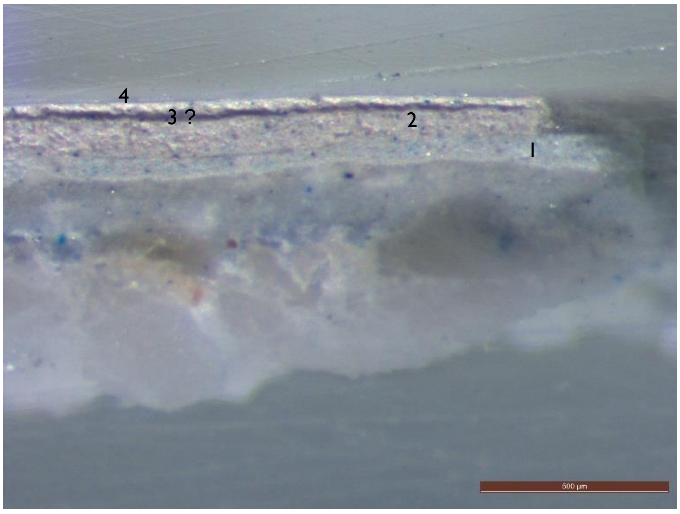
The sample number 2 has clear white upmost layer of latex-like paint. The second seems light yellow and the bottom layer again a barely there layer of yellow paint.



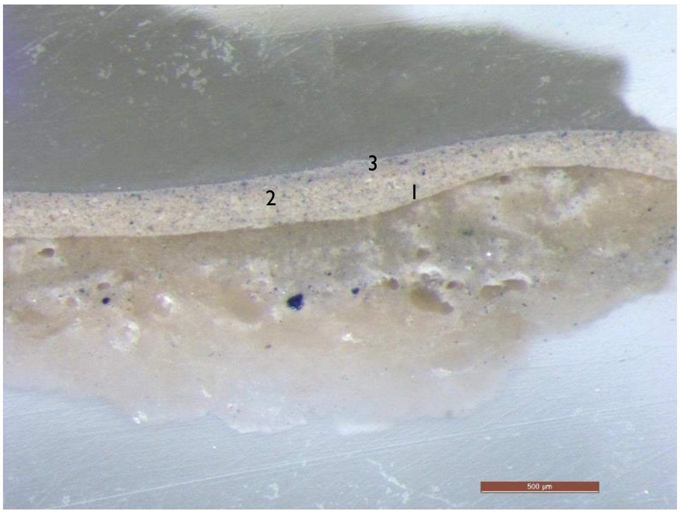
Sample no.1 of Rose cellar mural. Scale 500µm.



Sample no.2 of Rose cellar mural. Scale 1mm.



Sample no.3 of Rose cellar mural. Scale 500µm.



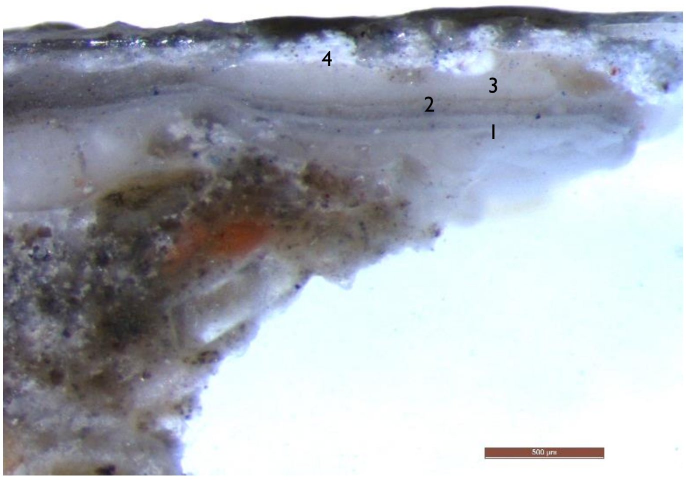
Sample no.4 of Rose cellar mural. Scale 500µm.

The sample number 3 from Rose cellar mural has a pastel blue undermost layer. Also the filler underneath the light blue layer shows clearly some bright blue pigment particles. The second layer is light grey and upmost is again white latex-type layer.

The sample number 4 has mainly cream or pastel yellow layers. The first layer's color is natural white, second yellowish white and third light grey.

A fifth sample, with number 00, has been taken from the wall behind the mural. It presents the general coloring of the Rose cellar. The first layer is light grey, as is the second layer as well. Third layer is actually a filler and the fourth layer white modern paint layer.

The inner surface of the wall structure of the dome has been removed due to heavy moisture problems inside the wall structure (water coming from outside gathered inside the wall structure). The wall with mural, the wall surfaces by the door way and the ceiling are still relatively good spots for research and gathering samples in the future.



Sample number 00, taken from the wall behind the mural, to present the "general coloring" of the Rose cellar.


The state of the walls inside the cellar. Tar-like coating has been partly stripped to help the drying process of the structure.

The Rose cellar in 1986. The now demolished concrete floor of Rose cellar is seen here. Kauria's original mural has been painted over at this stage. The vine on the mural wall is plastic. The catafalque standing in the center was made of wood and apparently painted.[7] *AAM. Sign L776.*

[7] LPR-Architects (2010). Paimion sairaala - Ruusukellarin korjaustyö. Rakennustapaselostus.