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

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The Getty Foundation

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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.

[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.

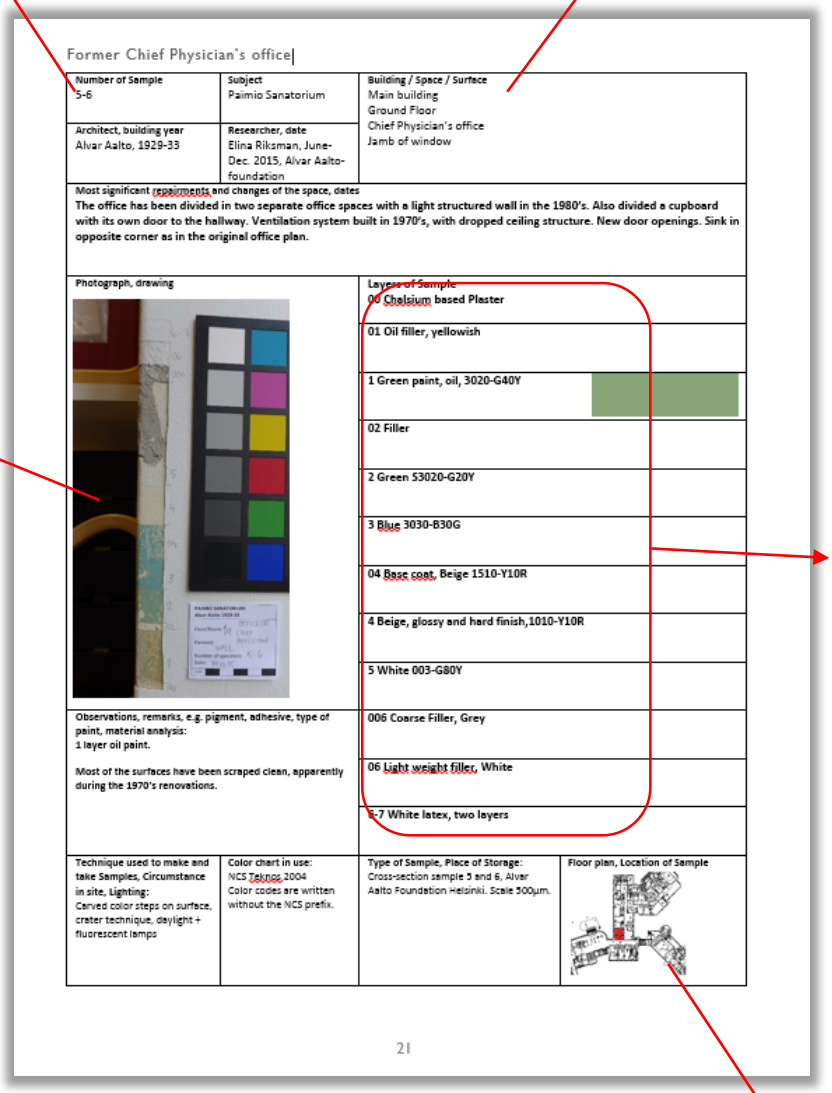
The number of the sample, this number can be found in the floor plan.

The place of sample and excavation point in the building.

Photograph of the excavation on surface.

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.



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	**Researcher, date**	
Alvar Aalto, 1929-33	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.	

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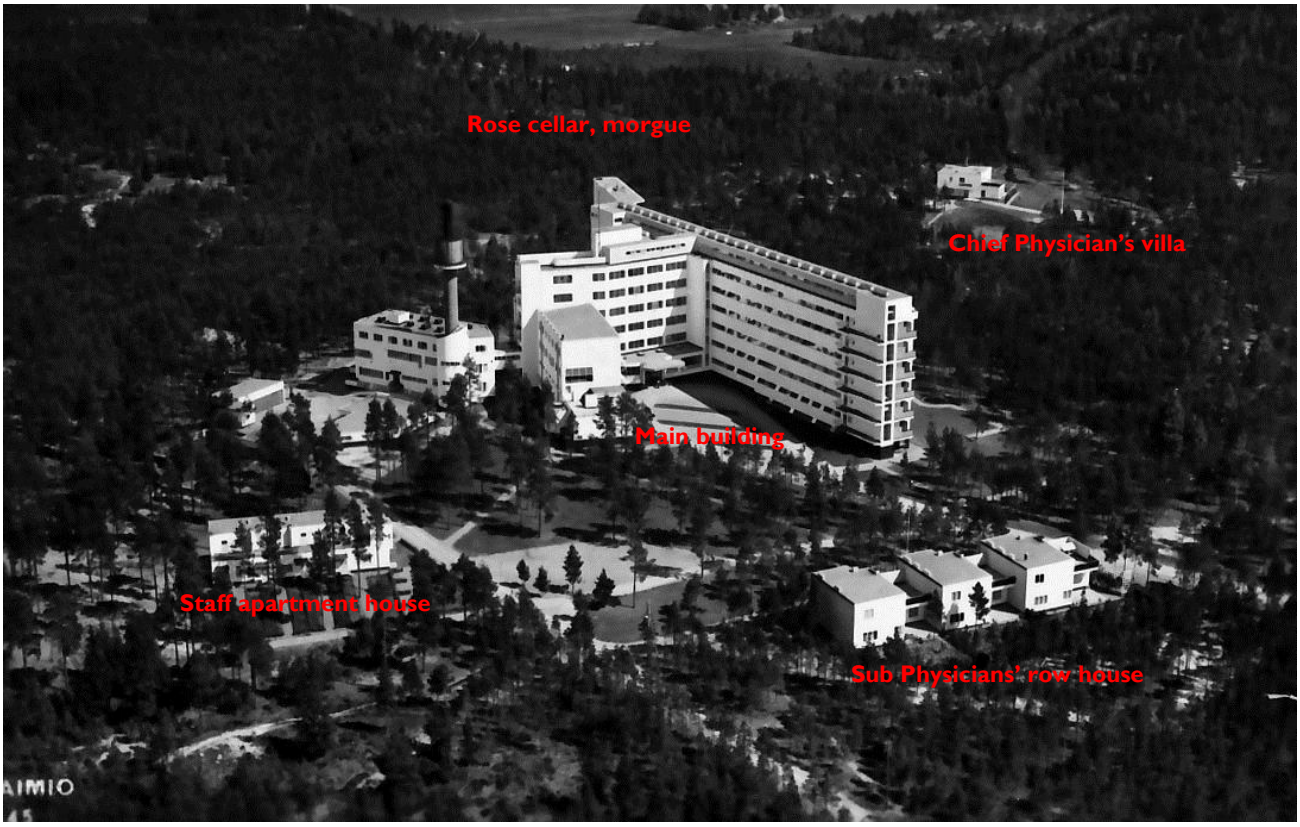
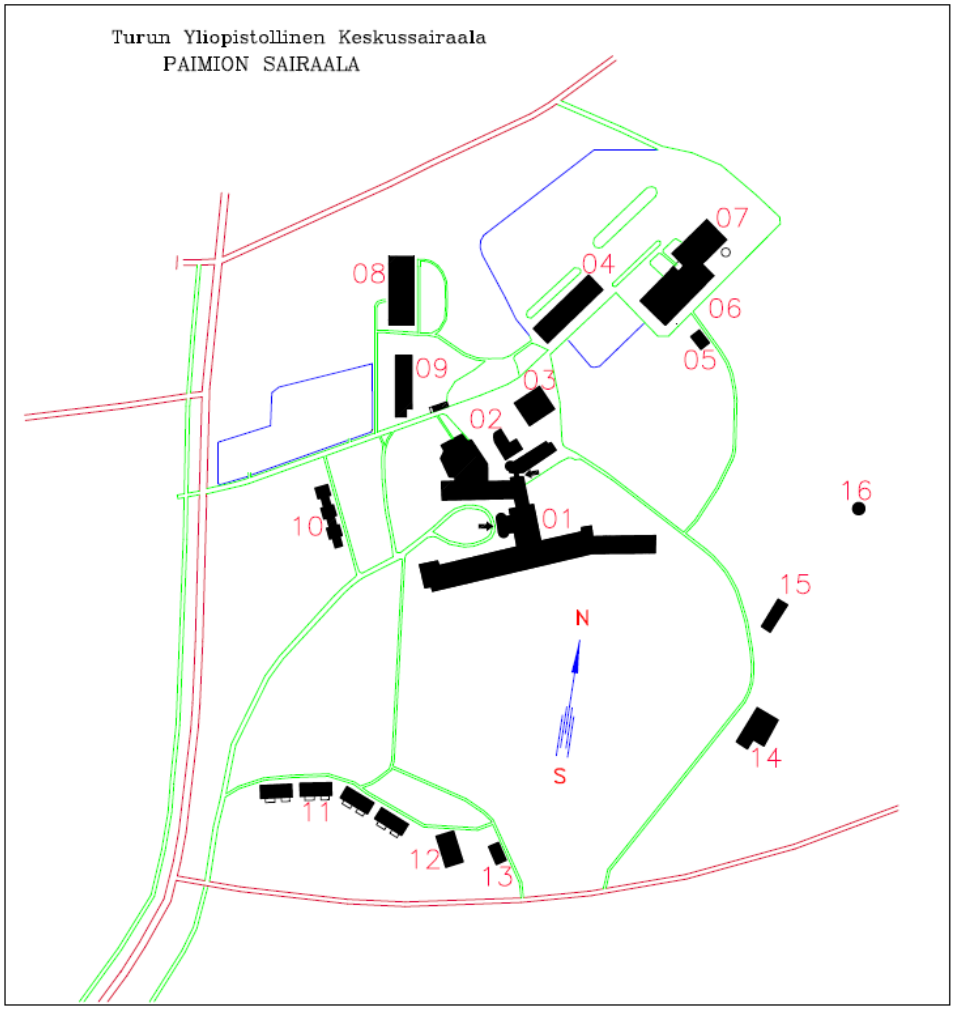
2. The Areal Plan of Paimio Sanatorium

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.



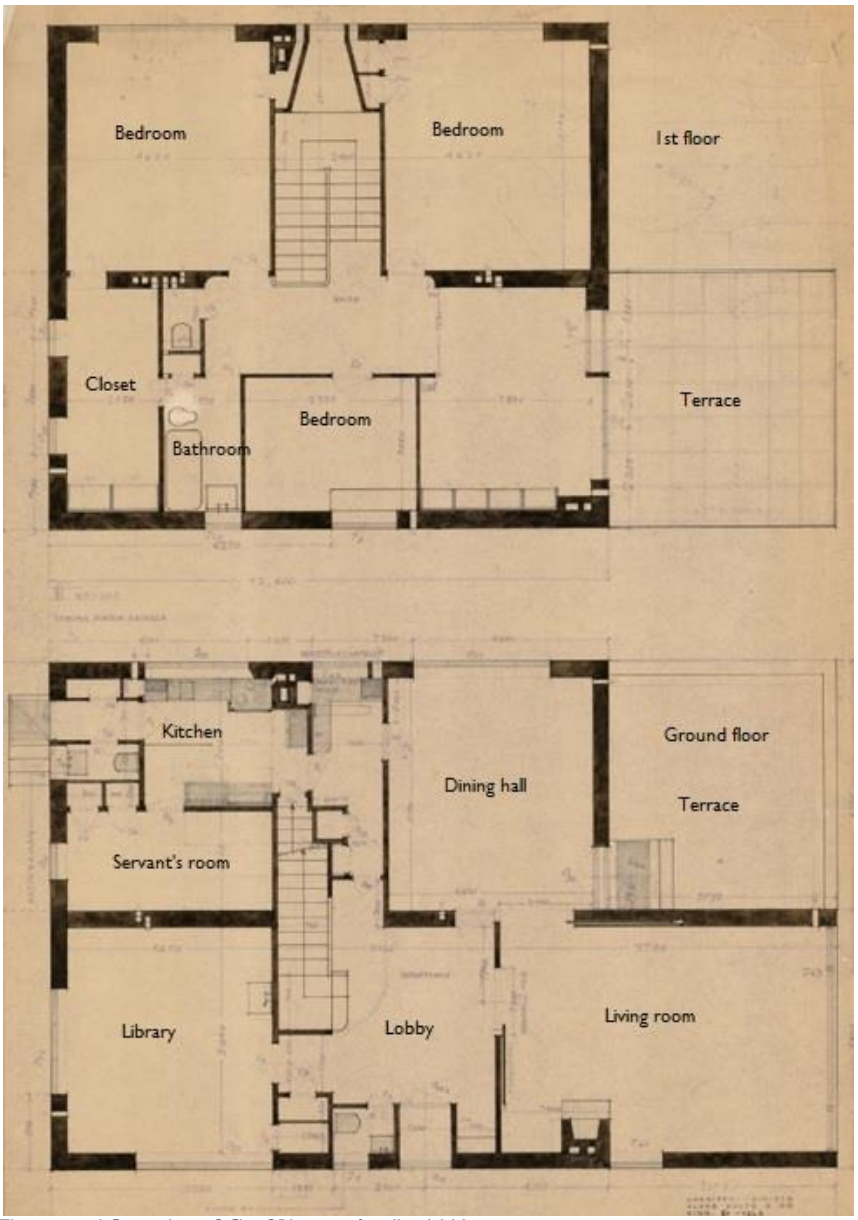
LPR-Arkkitehdit Oy, 2004.

The Area plan of Paimio Hospital 2004 by Architectural Office *LPR-Arkkitehdit Oy*

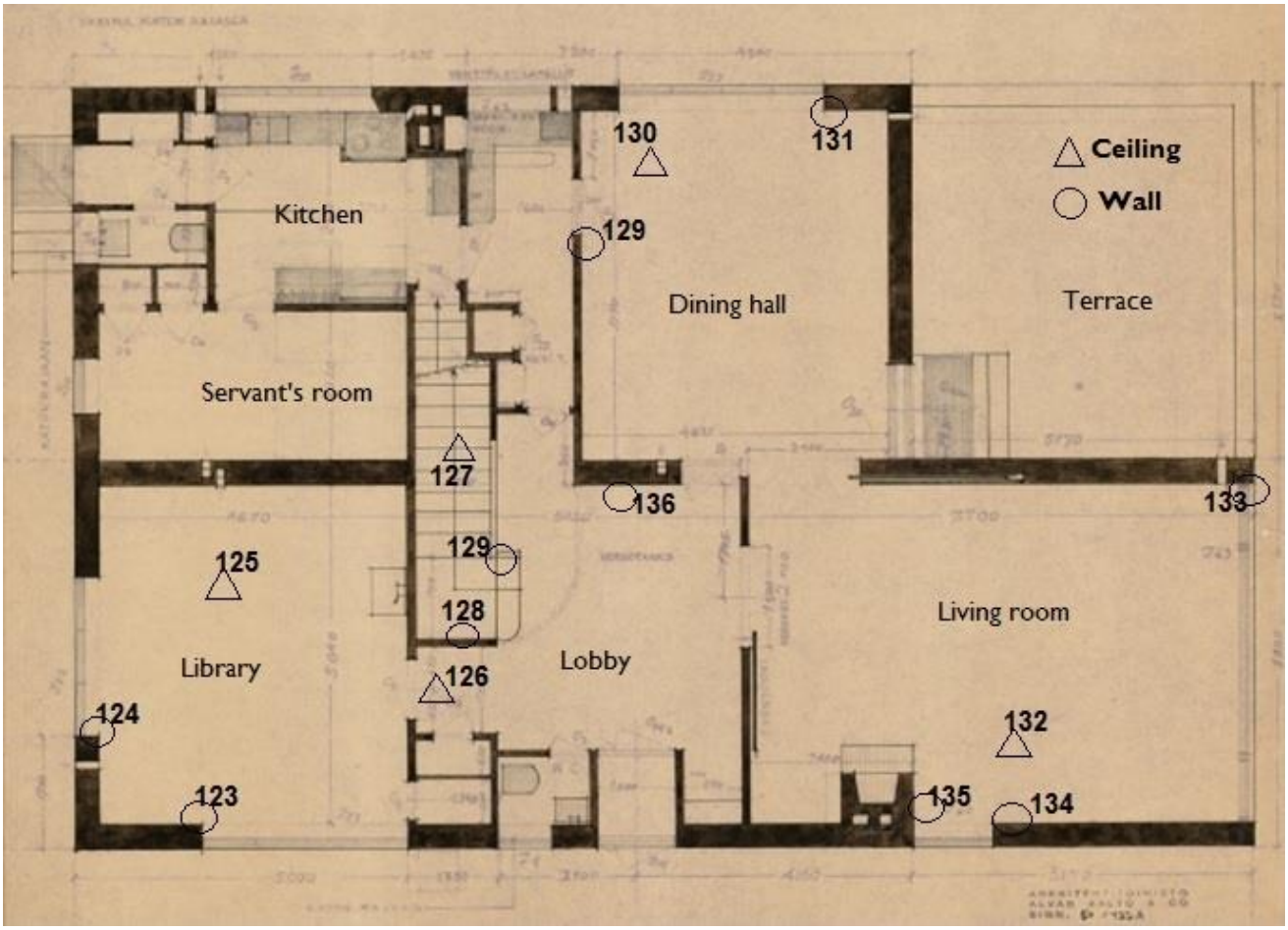
01 Main building
02 Heating station
03 Garrage
04 Storage house
05 A wooden private house
06 Storage house "K"
07 Heating station
08 Apartment Building "Mäntylä"
09 Former Staff aparment building
10 Former Sub physicians' row house
11 Aparment row house "Adder manor" B-E
12 Apartment row house "Adder 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



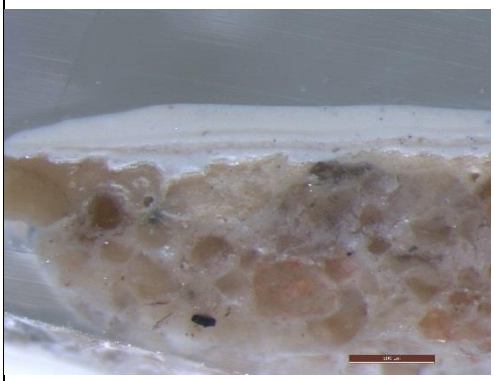
The cross section samples taken from the Chief Physician's villa's ground floor. AAM

The villa soon after its completing. AAM. Sign. 50-003-466

The Lobby ceiling

Number of Sample 126	**Subject** Paimio Sanatorium	**Building / Space / Surface** Chief Physician's villa Ground floor Lobby 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		

Photograph, drawing



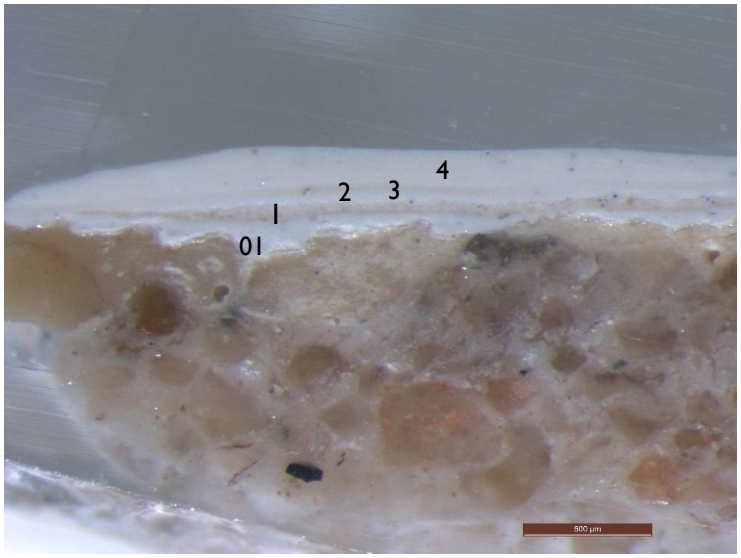
Layers of Sample
00 Plaster
01 Filler
1 White paint
2 White paint
3 White paint
4 White paint
5 Light green ?
6 Light yellow
7 White paint (with a hint of red)
8 White paint

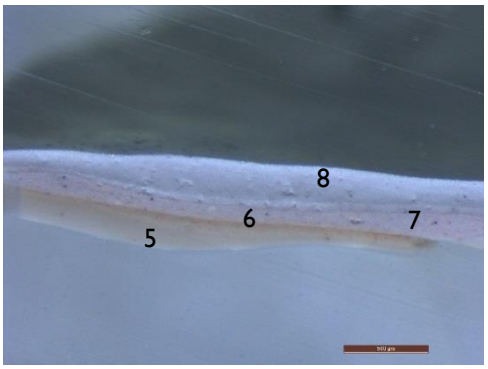
Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:
No excavation was made on the ceiling surface .

Technique used to make and take Samples, Circumstance in site, Lighting: 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:** Sample number 126. Scale 1mm. Storage Alvar Aalto Foundation, Helsinki.	**Floor plan, Location of Sample** 

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.





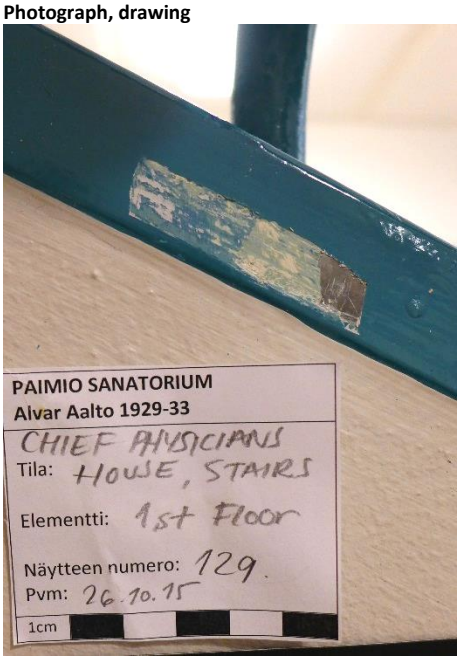
Cross section sample 126 shows white undermost paint layer. The samples broke into two pieces presented in the pictures above. Scale 500µm.

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

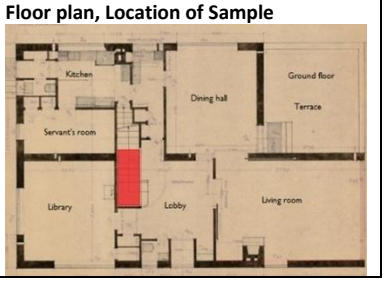
3 Blue 3050-B10G

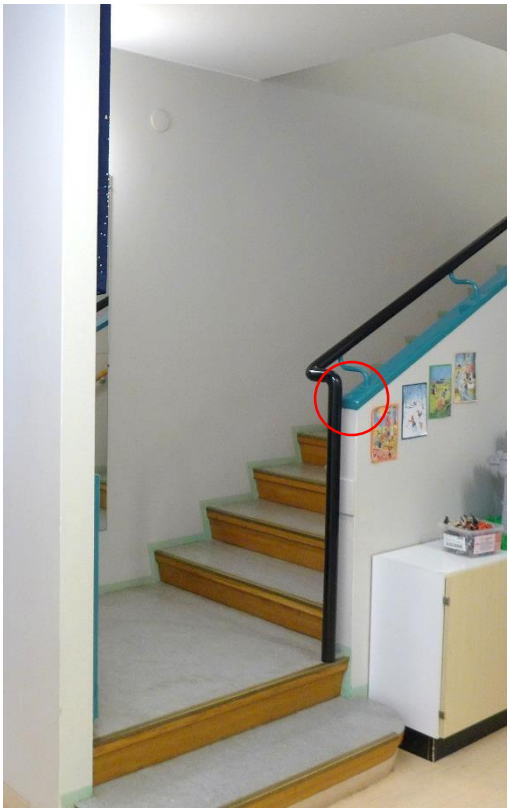
04 White base coat

4 White

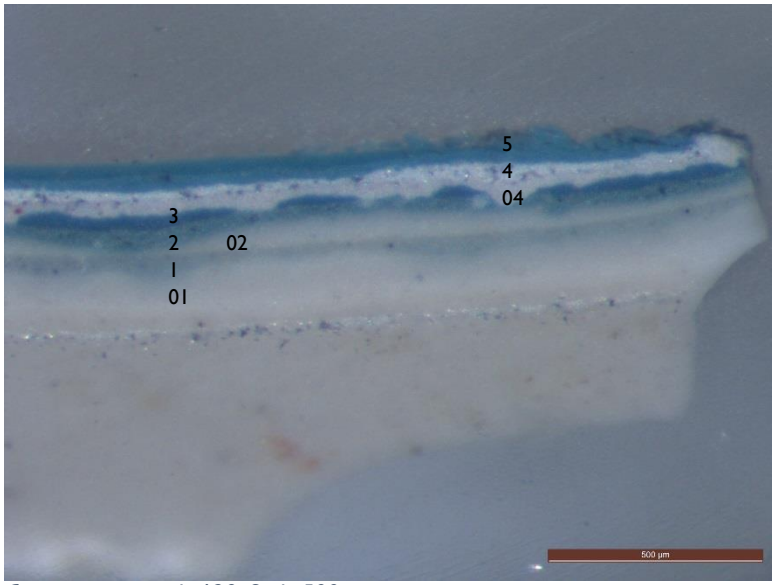
5 Turquoise 3050-B30G

Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:
-

Technique used to make and take Samples, Circumstance in site, Lighting: Cross section sample, 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:** Sample number 129. Scale 500µm. Alvar Aalto Foundation, Helsinki.	**Floor plan, Location of Sample** 



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 128	Subject Paimio Sanatorium	Building / Space / Surface Sub Physicians' row house, middle apartment Ground floor Lobby 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

Photograph, drawing

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

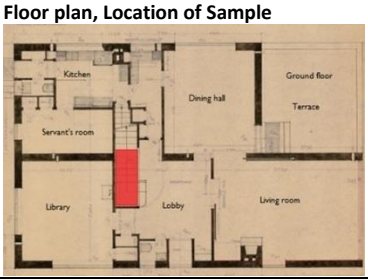
4 Light beige 1515-Y

5 Light pastel red 0507-Y80R

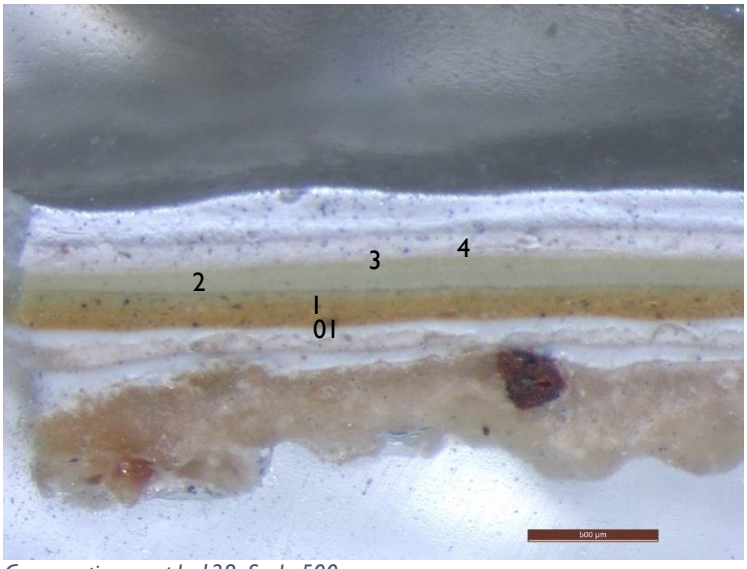
6 White

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: 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: Sample number 128. Scale 1mm. Storage Alvar Aalto Foundation, Helsinki.	Floor plan, Location of Sample 

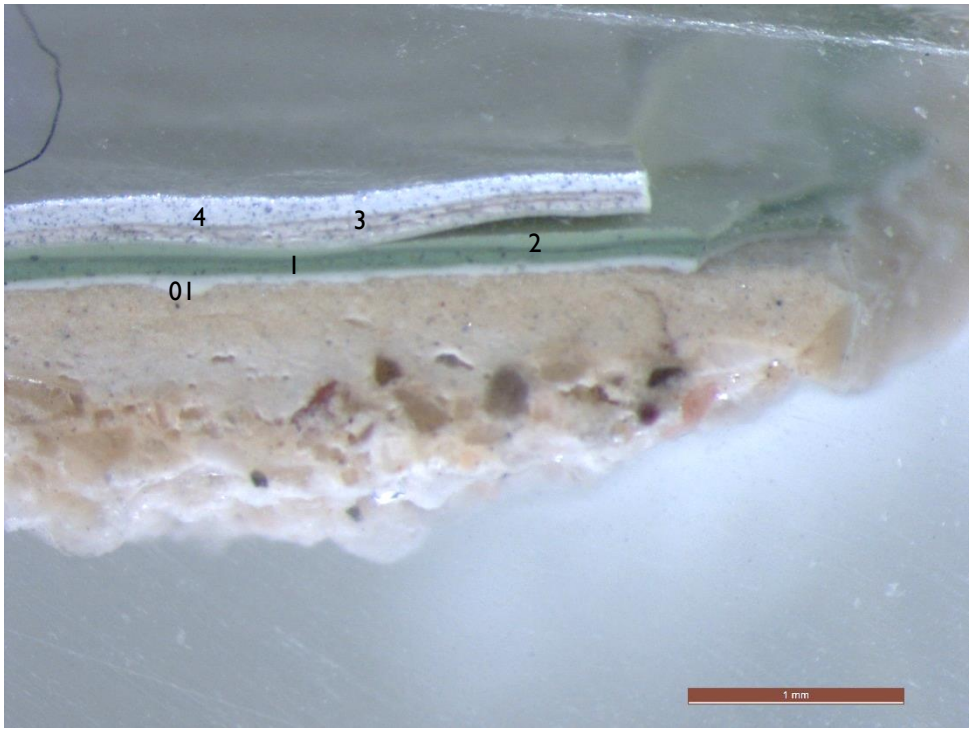
The wall of the stairway and surrounding walls in the lobby have been painted in rich brown – orange oil paint. The undermost layers are white and the perception is that the white layer 01 is only a base coat. It is also possible that the white was used under the orange to give it a slightly brighter 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.

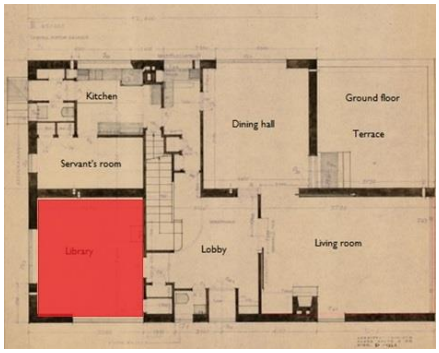
Lobby wall

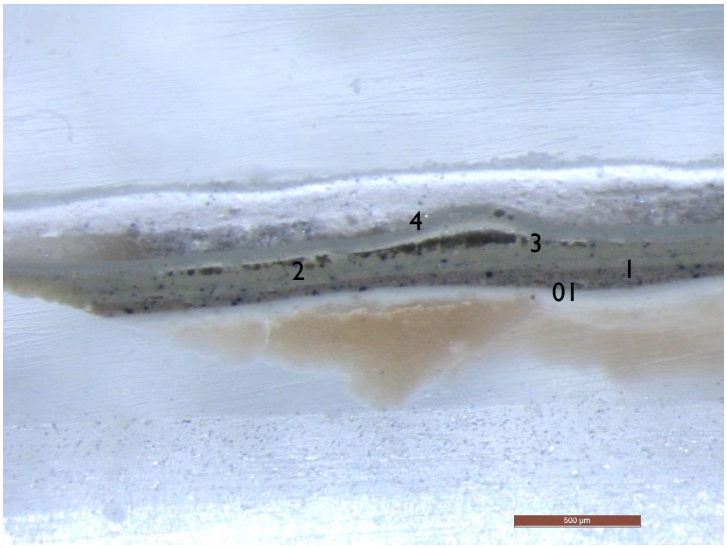


Sample 136. Scale 1mm.

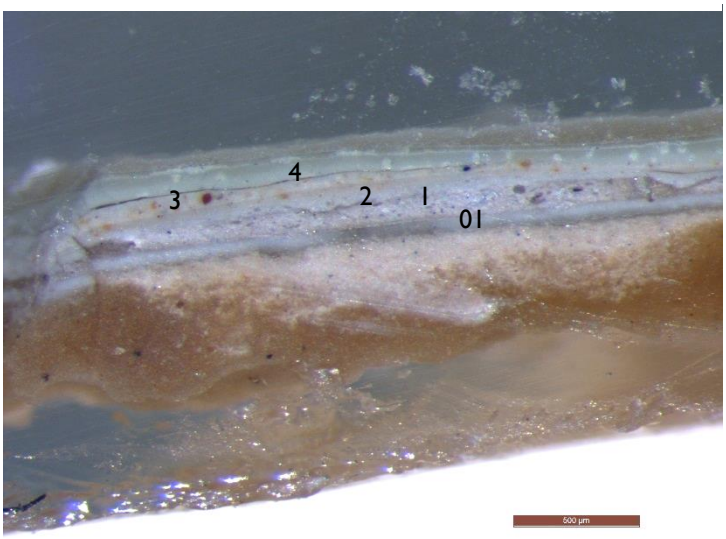
The sample no 136 taken from the lobby wall next to the doorways of dining hall and former kitchens had green undermost layers. that have the same hue as the ceilings in main building lounge. Similar green can also be found in the ceilings of some patient rooms in A-wing wards of the main building.

Library walls and ceiling





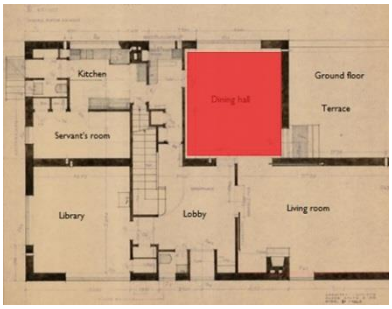
Sample 123. Scale 500µm.

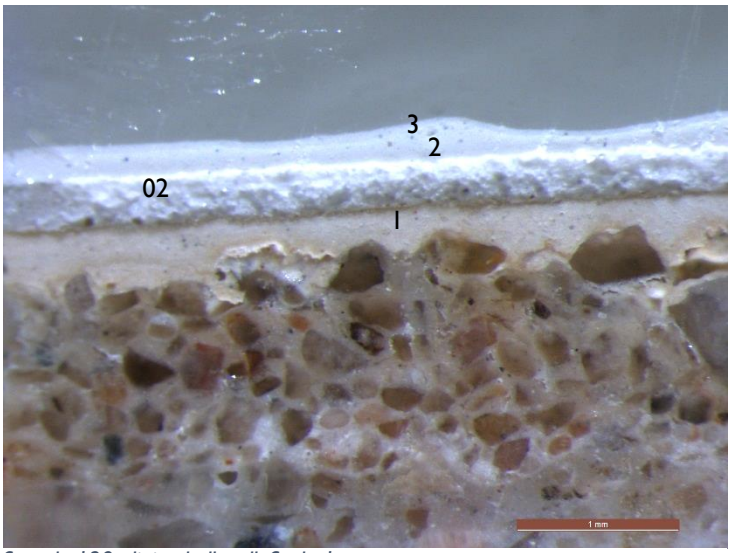


Sample 124. Scale 500µm.

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

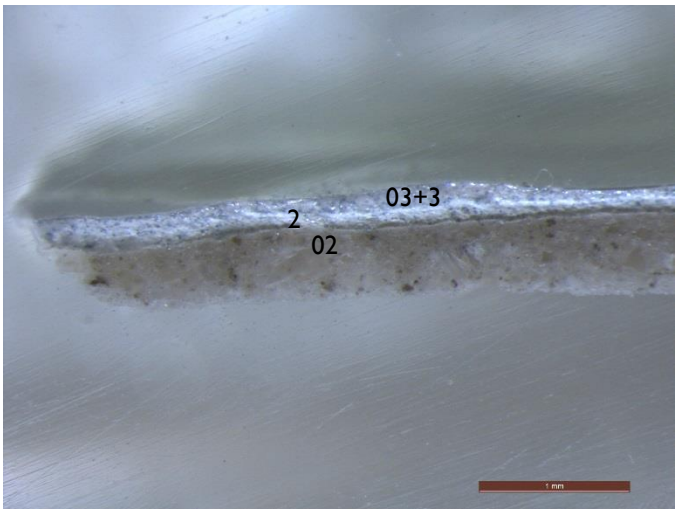

Kitchen
Dining hall
Ground floor
Terrace
Servant's room
Library
Lobby
Living room

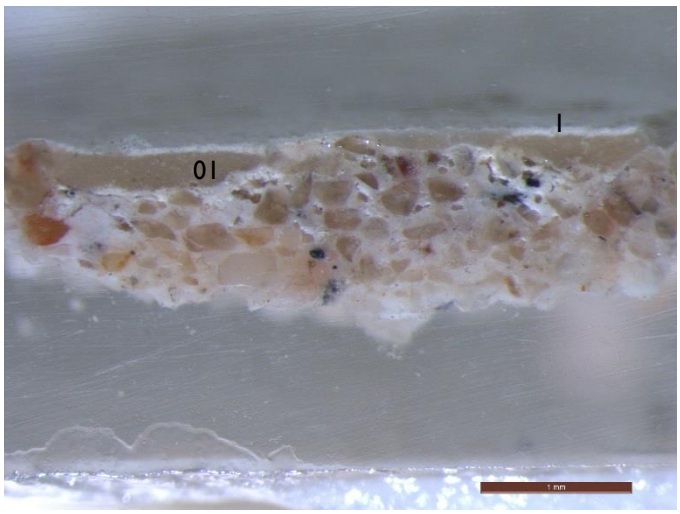


Sample 129, dining hall wall. Scale 1mm.

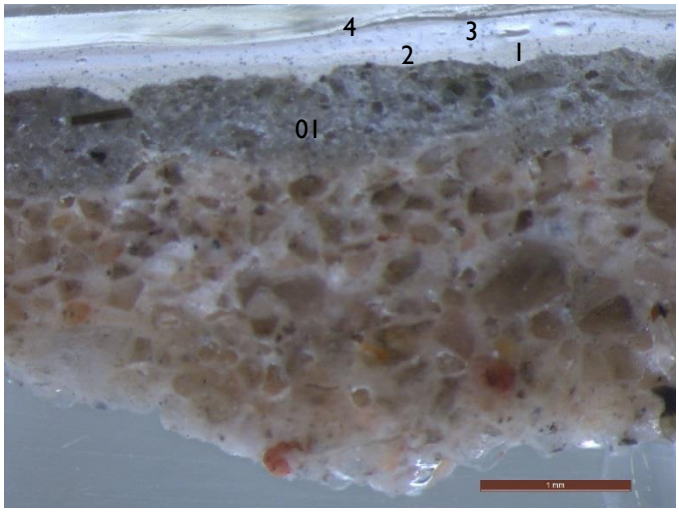
The dining hall wall samples no 129 and 131 had only white undermost layers. The sample 131 broke into two parts and is presented here in two different photographs.

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.





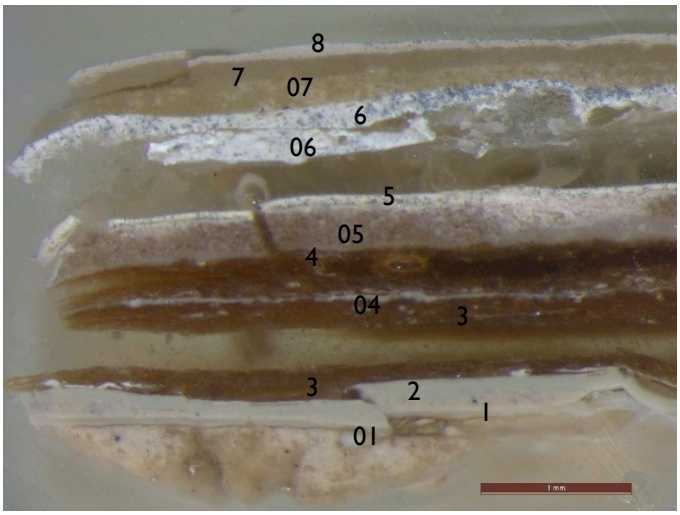
Sample 131. Dining hall wall. Scale 1mm. At the left are the uppermost layers.



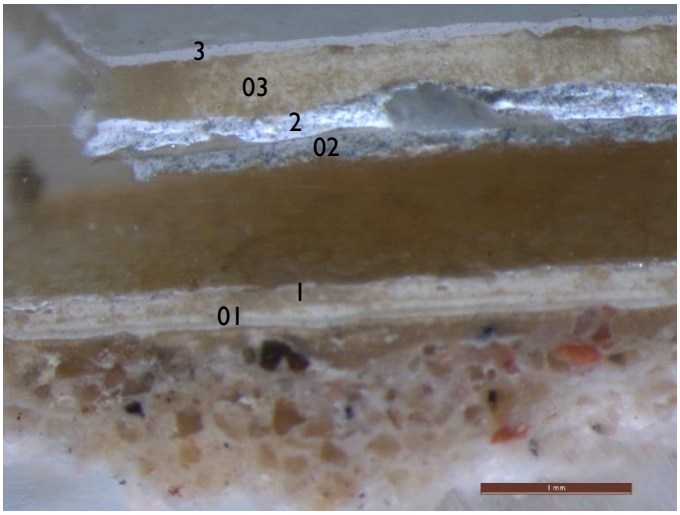
Sample 130. Dining hall ceiling. Scale 500µm.

Living room


Kitchen
Dining hall
Ground floor
Terrace
Servant's room
Library
Lobby

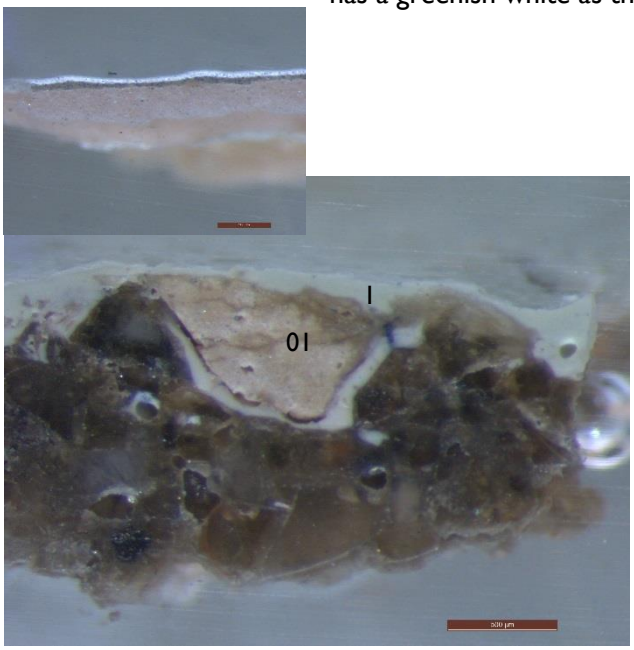


Sample 133. Living room wall, by the terrace windows. Scale 1mm.

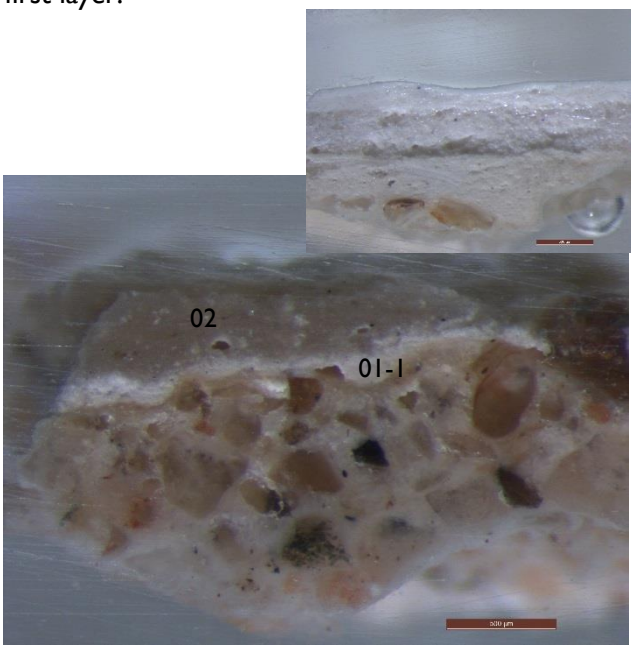


Sample 134. Living room wall by the fireplace. Scale 1mm.

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.



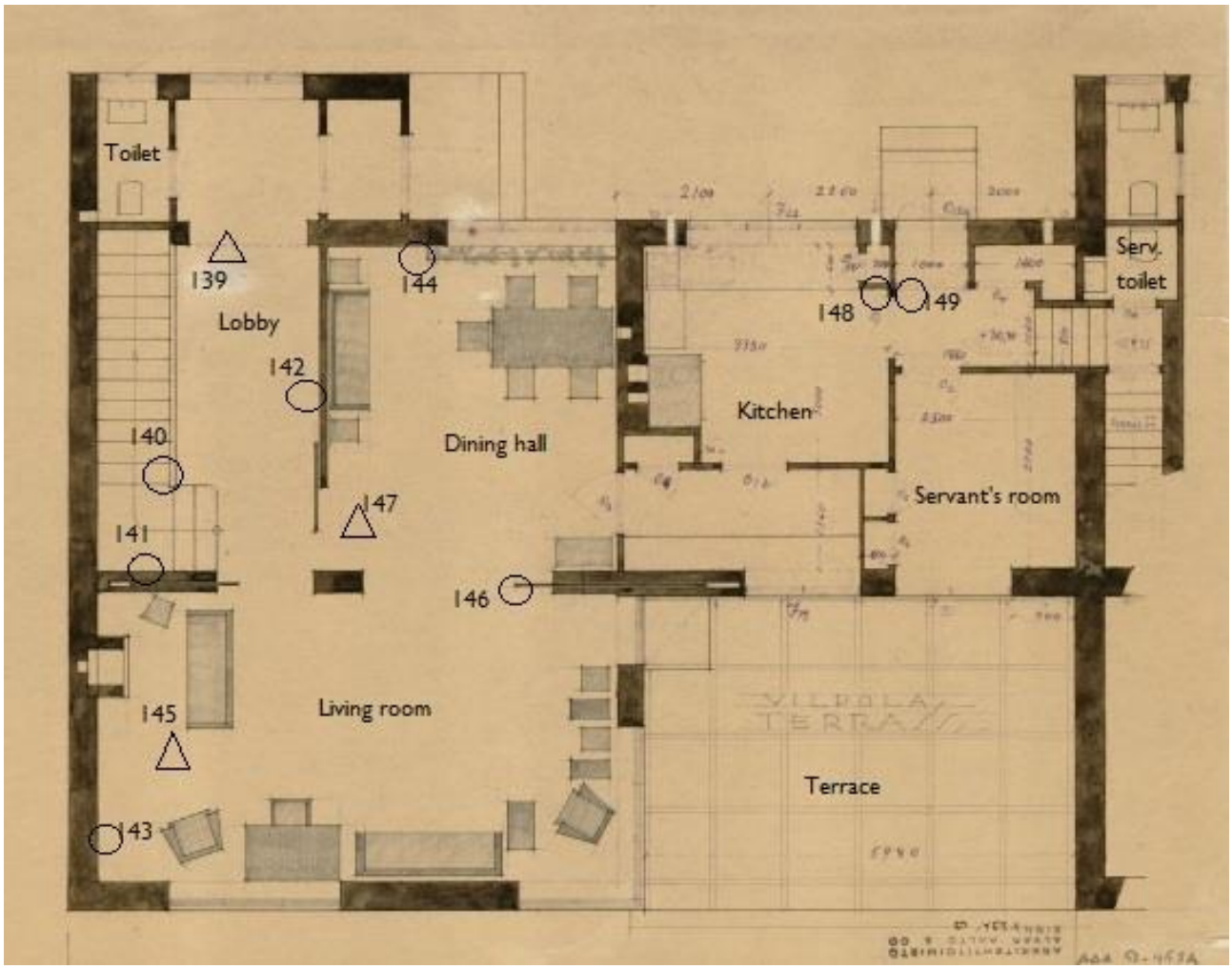
Sample 135. Cheeks of Fireplace. The small picture presents the upmost layers. of sample. Scale 500µm.



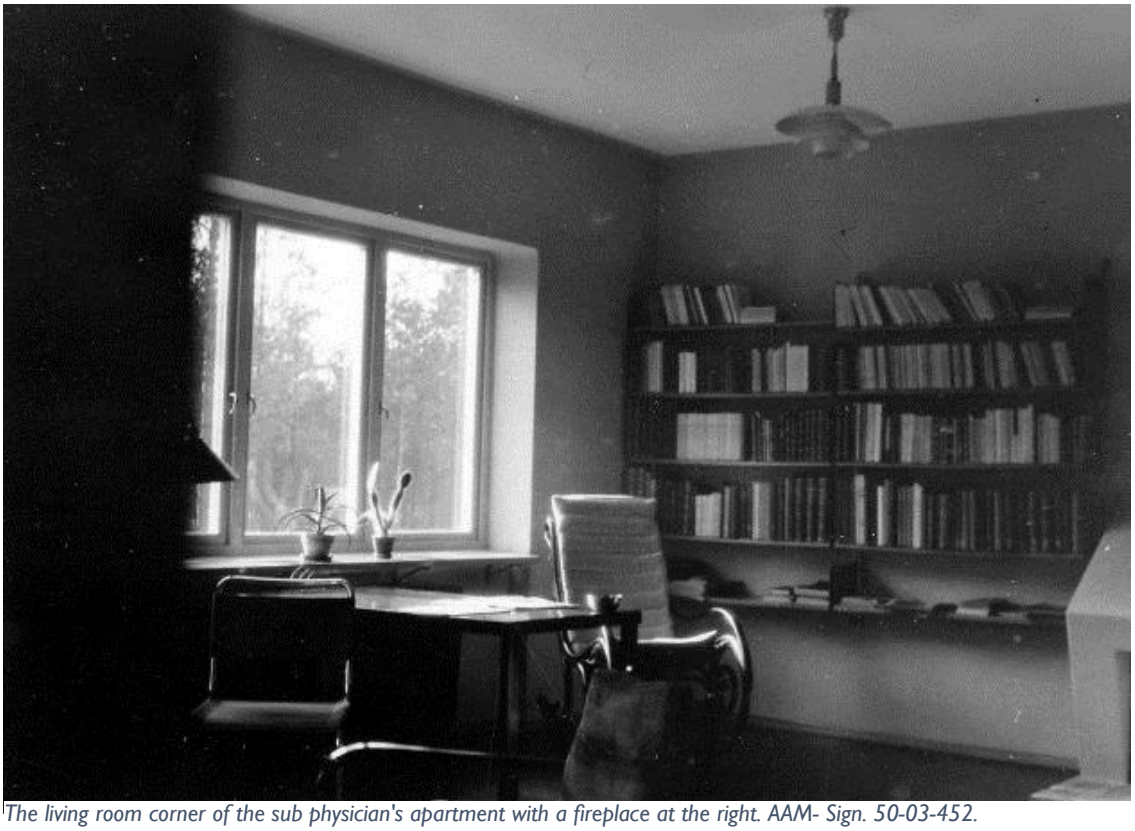
Sample 132. Living room ceiling. Small picture presents the upmost layers of sample. Scale 500µm.

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.

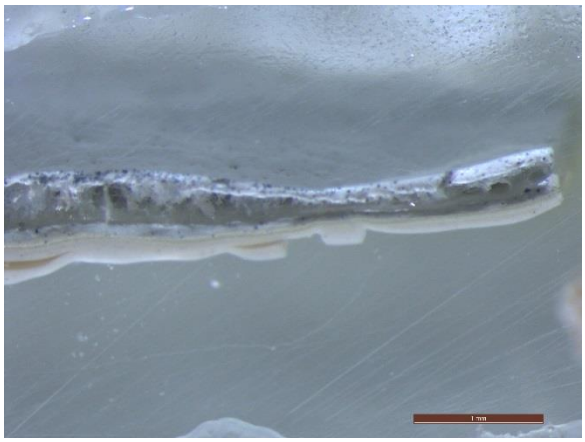


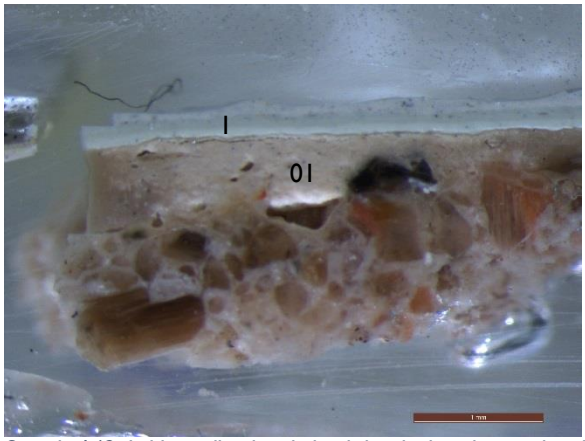
The Sub Physicians' row house soon after its completion. AAM Sign. 50-003-448.



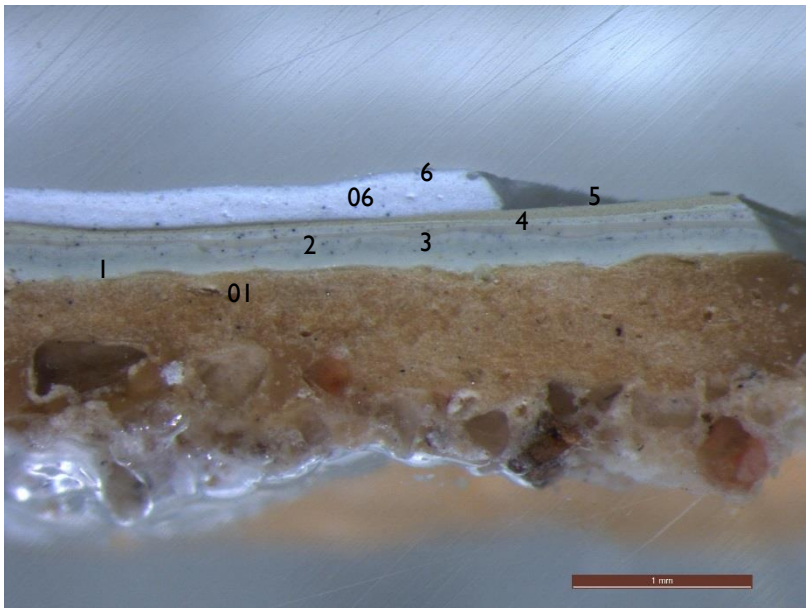
The living room corner of the sub physician's apartment with a fireplace at the right. AAM- Sign. 50-03-452.

Lobby ceiling and wall



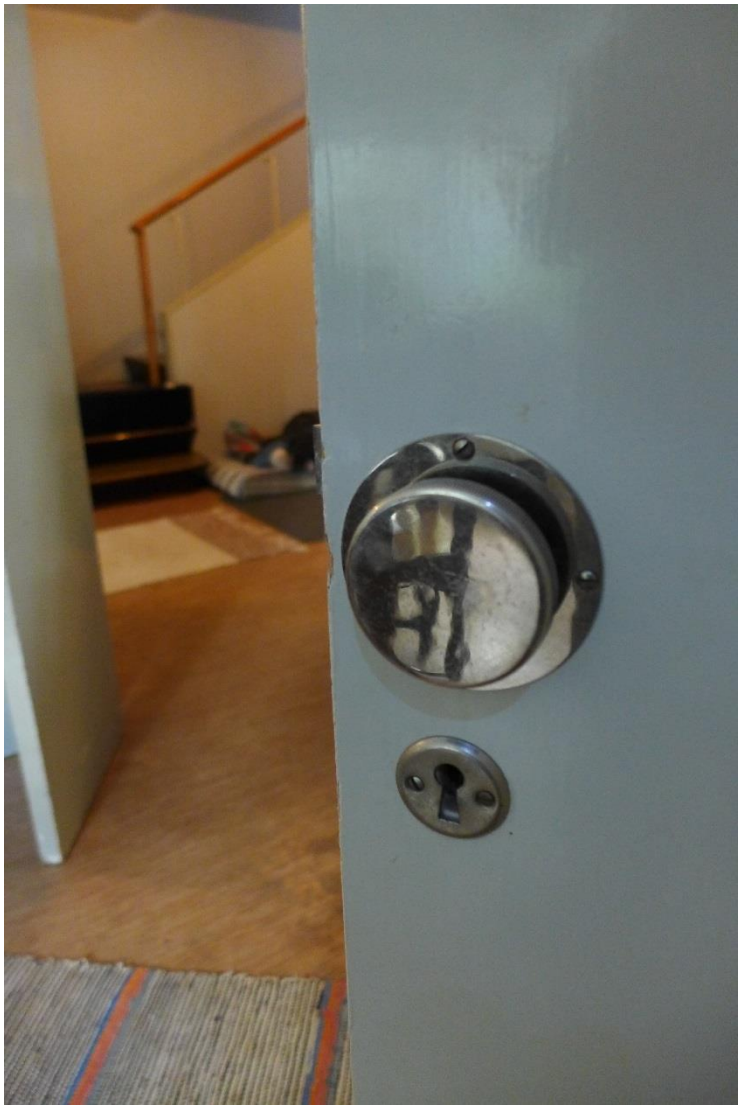


Sample 142. Lobby wall, taken behind the slinding door in the photograph at left. Scale 1mm.



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.

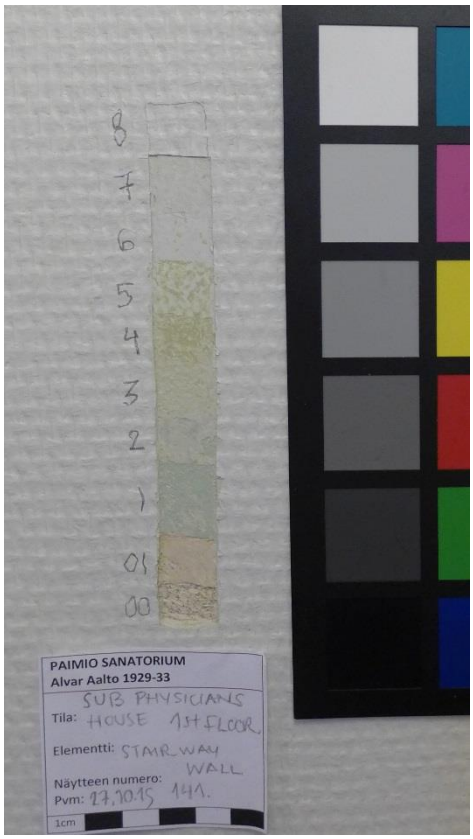
Stairway wall

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

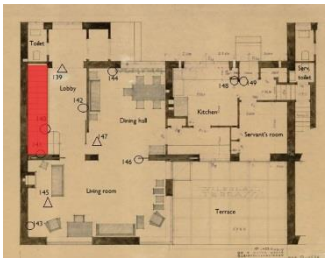
5 Paint Yellow 0502-Y

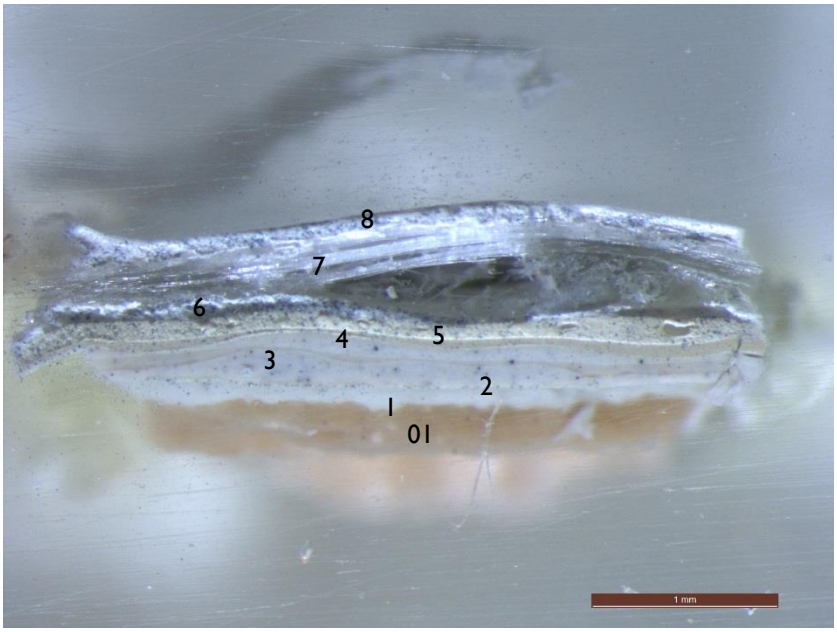
6 White

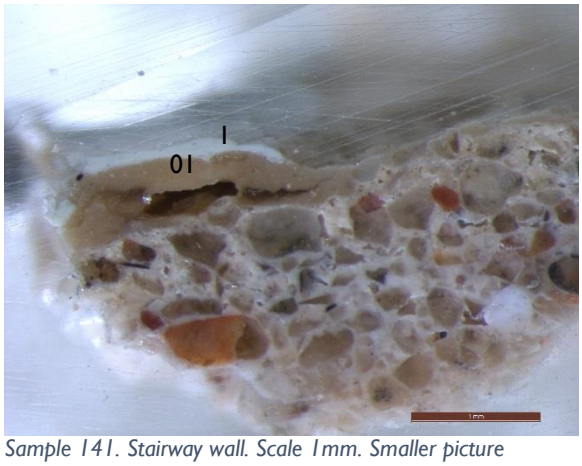
7 Glue of the glassfiber netting/Beige? 1510-G90Y Latex

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: Crater technique, excavation of paint layers, 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 number 139. Scale 1mm. Storage Alvar Aalto Foundation, Helsinki.	**Floor plan, Location of Sample** 





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.

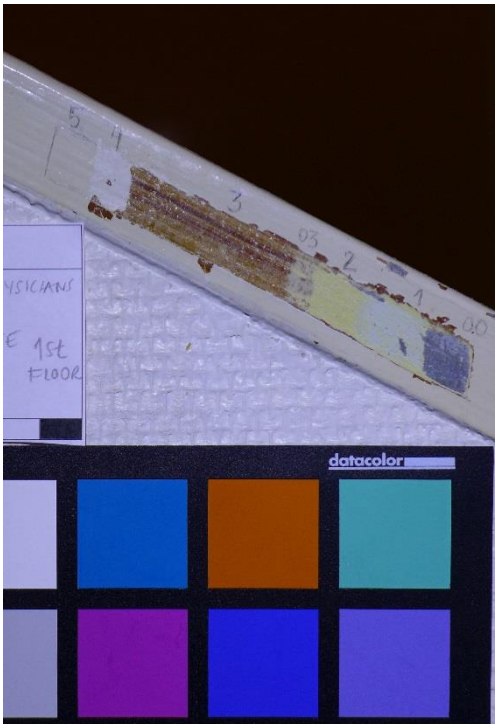
Stair handrail

Number of Sample 140	Subject Paimio Sanatorium	Building / Space / Surface **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

00 Metal

1 Light grey paint0907-G20Y

2 Light yellow 1030-G90Y

03 Filler, oil based

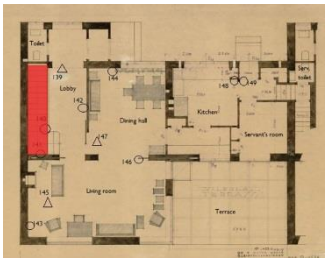
3 Wood imitation? 4040-Y10R, 6060-Y60R for "grains"

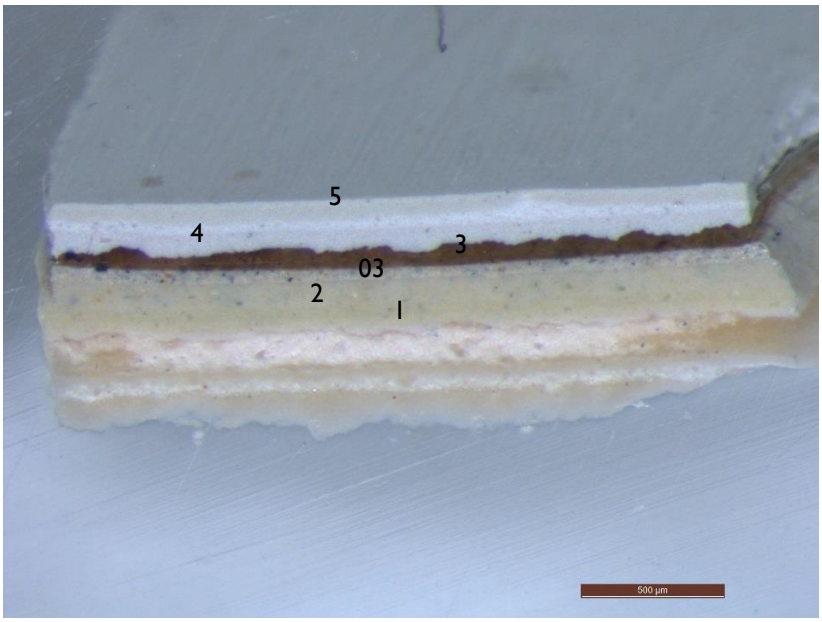
4 White (base coat?)

5 Grey / beigepaint 1510-G90Y

Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:

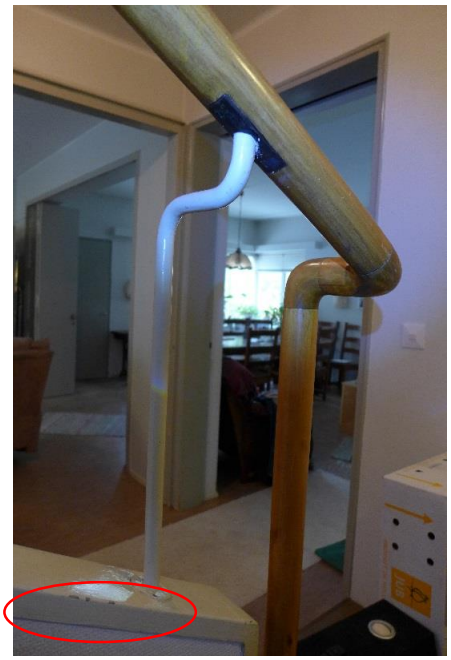
-

Technique used to make and take Samples, Circumstance in site, Lighting: Crater technique, excavation of paint layers, 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 number 140. Scale 1mm. Storage Alvar Aalto Foundation, Helsinki.	**Floor plan, Location of Sample** 



Sample 140. Stair handrail. Scale 500µm.

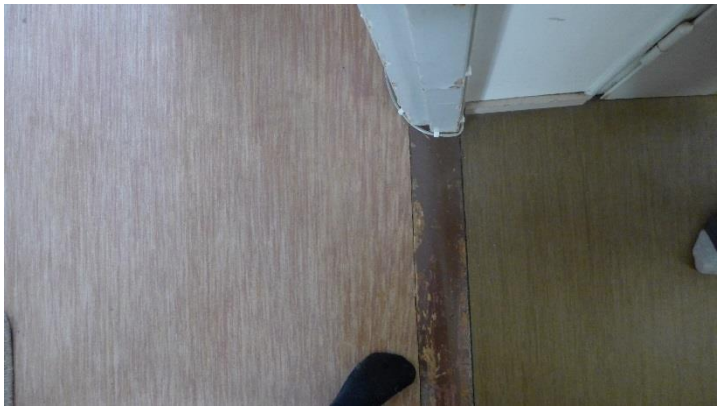
Sample 140 shows clearly the brown layers of probable wood imitation in the middle. The undermost layers are greenish grey.



Floors of living and dining room are heavily patterned linoleum. Notice the large original folding doors dividing the rooms.

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.

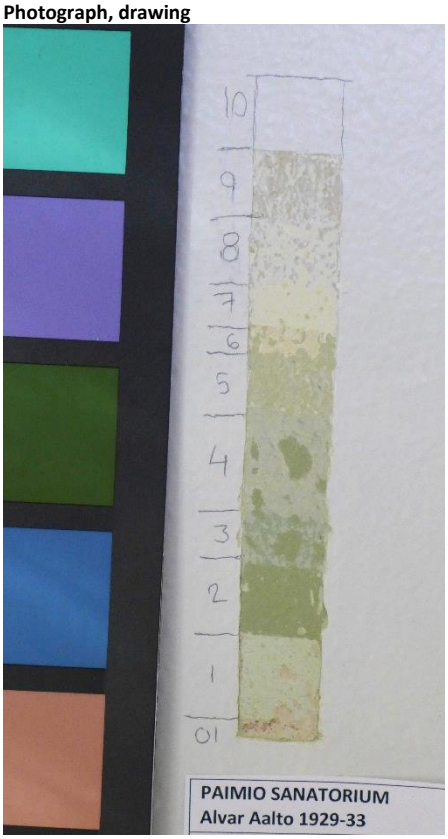
Living room wall

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

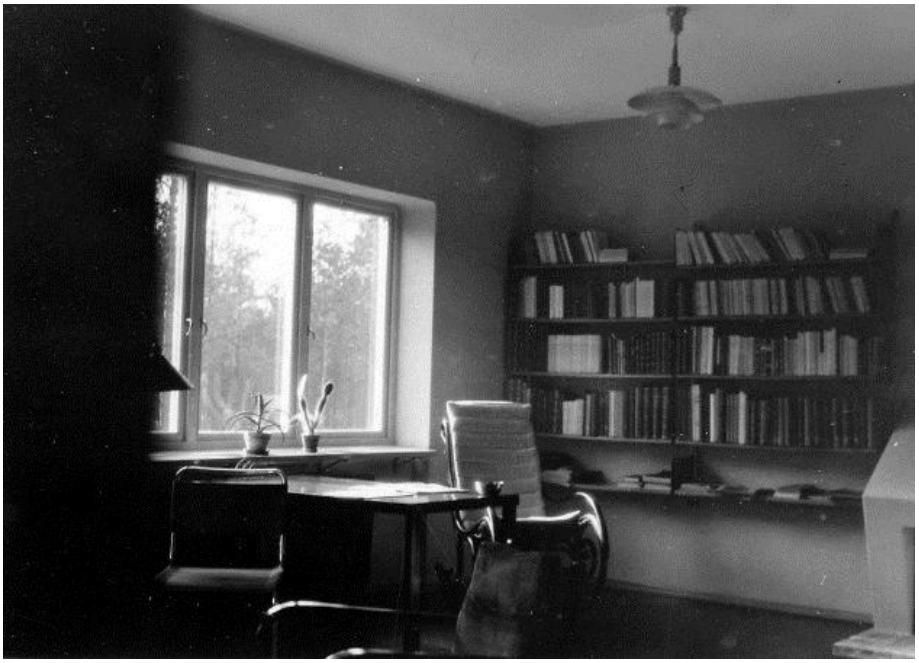
9 Brown 4010-G80Y

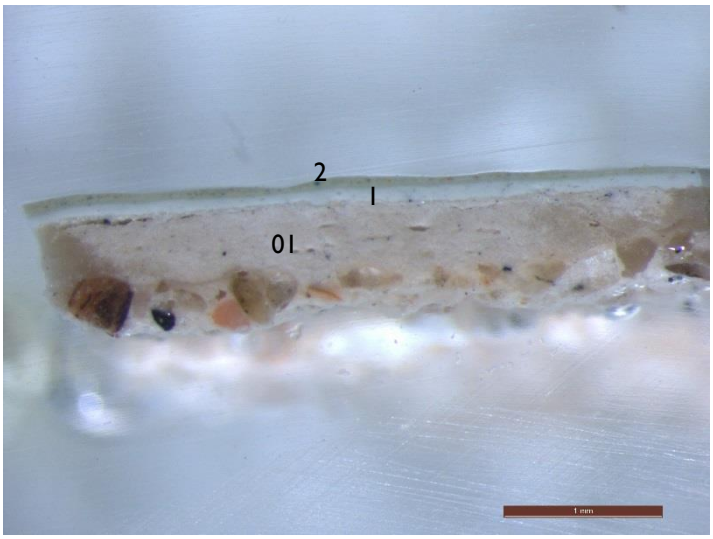
10 White

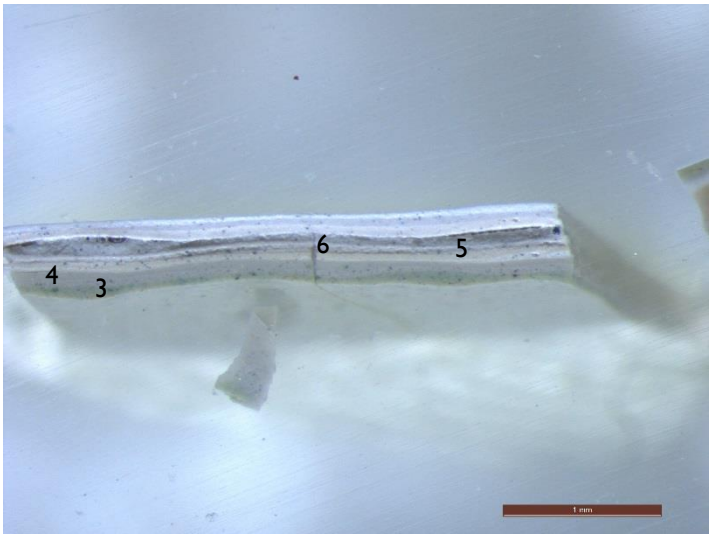
Observations, remarks, e.g. pigment, adhesive, type of paint, material analysis:
-

Technique used to make and take Samples, Circumstance in site, Lighting: Crater technique, excavation of paint layers, 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 number 140. Scale 1mm. Storage Alvar Aalto Foundation, Helsinki.	**Floor plan, Location of Sample** 

‘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.

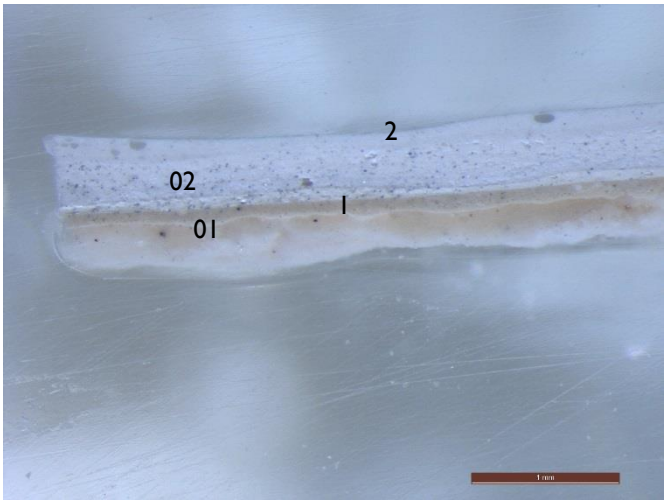






Sample 143 in two parts. Living room wall. Scale 1mm. Uppermost layers at the right.

Living room ceiling

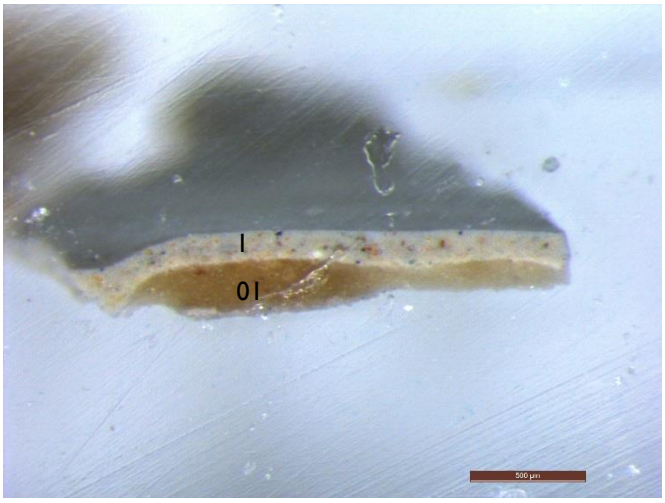


Living room ceiling showed light paint layer, the undermost being greyish beige.

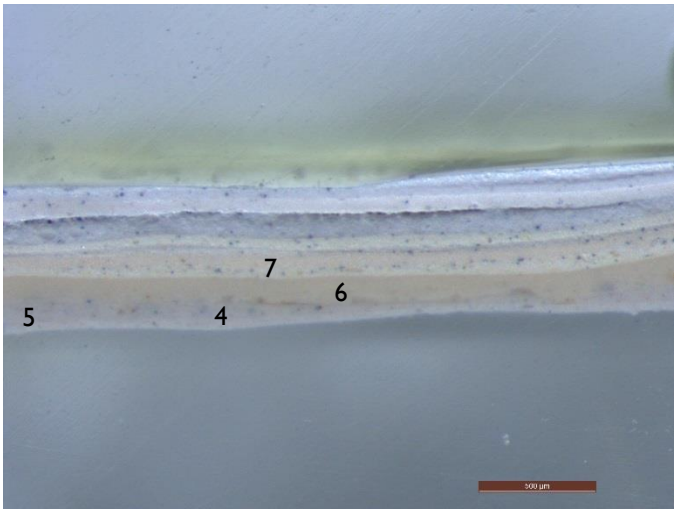
Sample 145. Living room ceiling. Scale 1mm.

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.

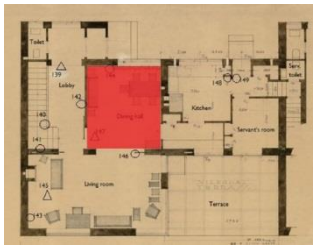


Dining room wall

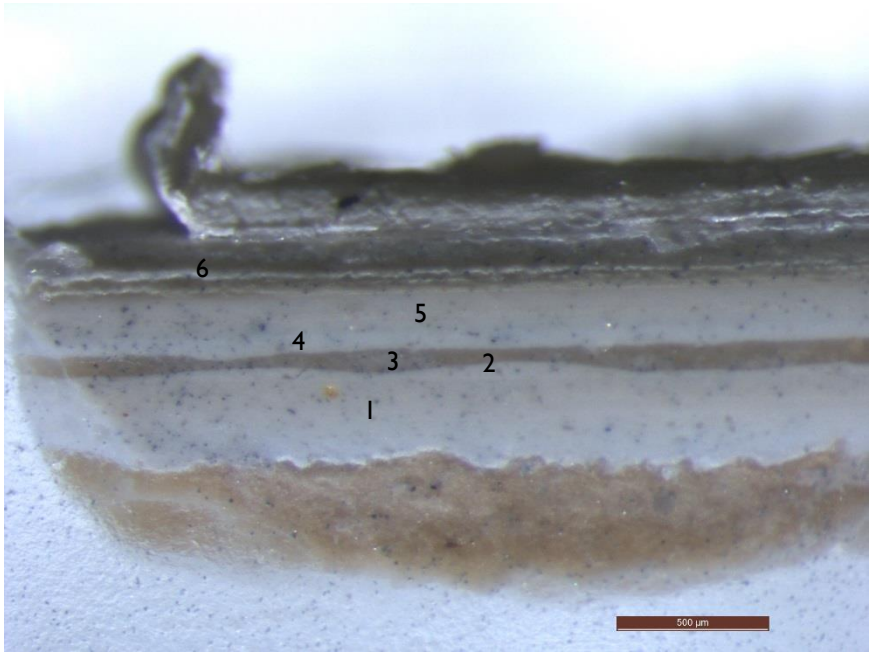


Sample 144. Dining room wall by the window. Scale 500µm. Sample broke in two parts, below are the undermost layers.

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.

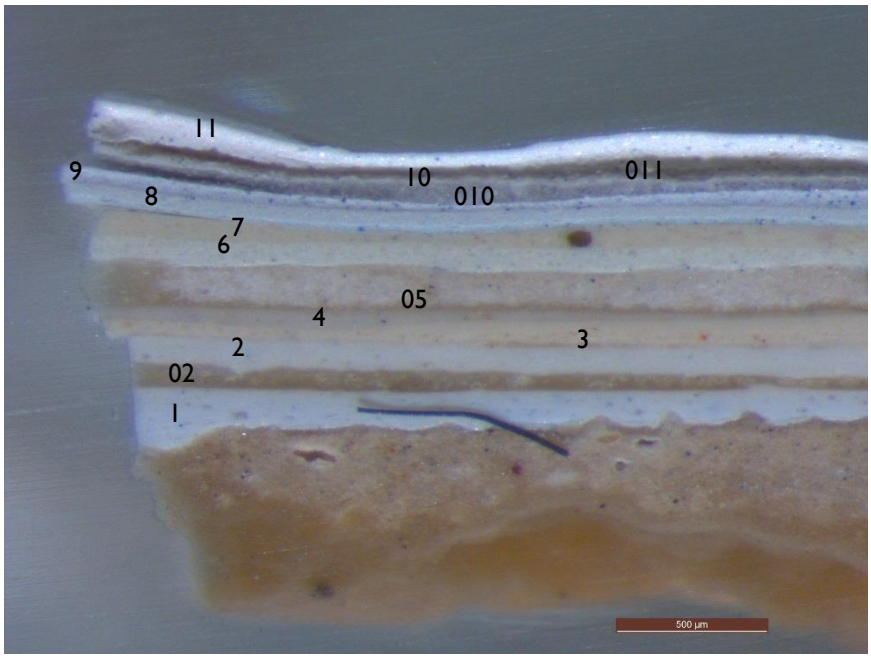


Kitchen wall and wall by the kitchen entrance

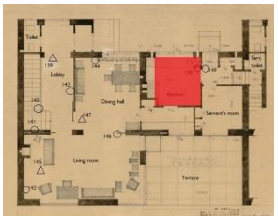


Sample 148. Kitchen wall, by the door leading to servant's hall. Scale 500µm.

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.



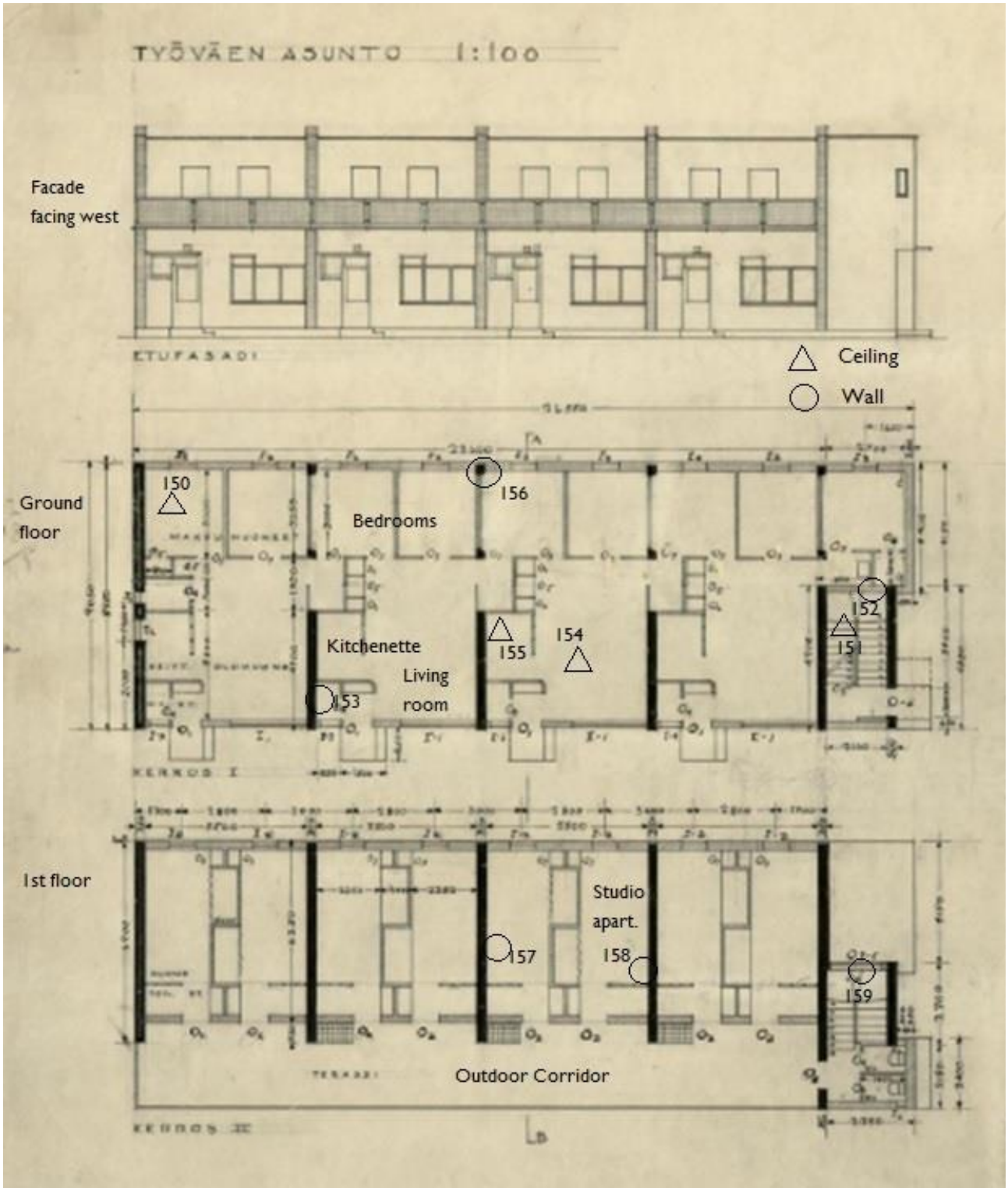
Sample 149. Wall by the kitchen entrance. Scale 500µm.



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.

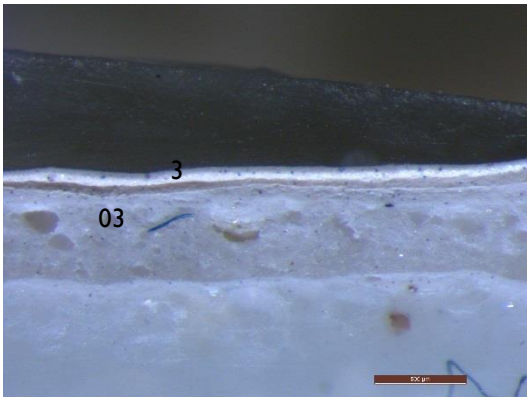
Staff apartment building soon after its completion. AAM Sign. 50-003-432

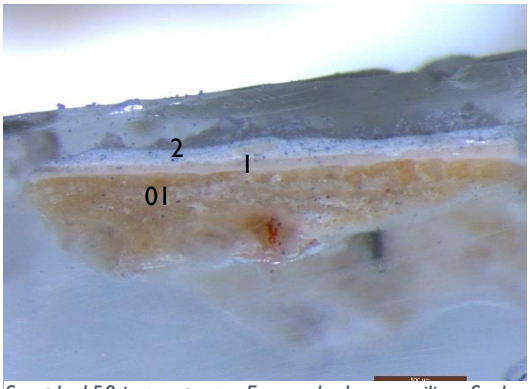


Cross section samples taken from Staff apartment building, ground floor and 1st floor. AAM

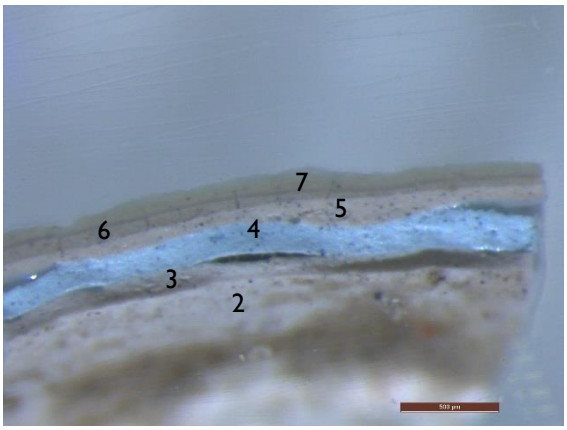
Sample 150 from former bedroom ceiling shows a cream white undermost layer.

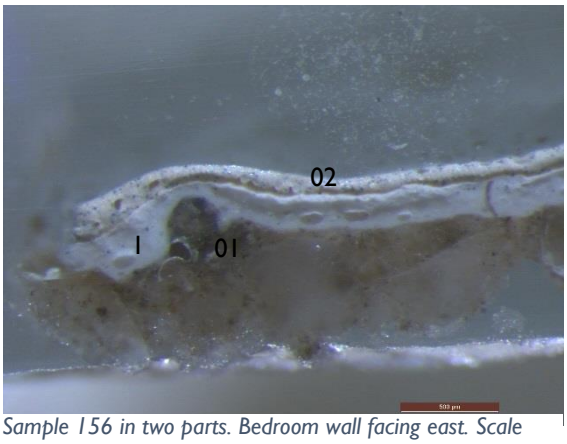
Sample 156 from bedroom wall facing east has a white undermost layer. No excavations were made in this floor.



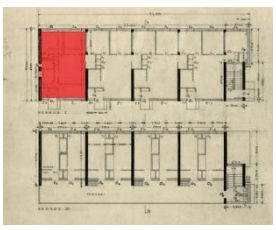


Sample 150 in two parts.. Former bedroom ceiling. Scale 500µm.



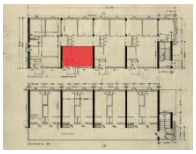


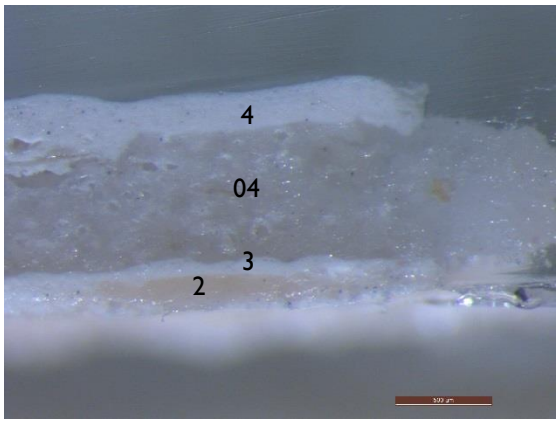
Sample 156 in two parts. Bedroom wall facing east. Scale 500µm.

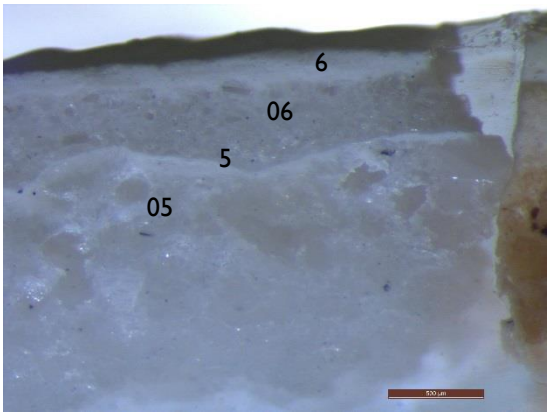


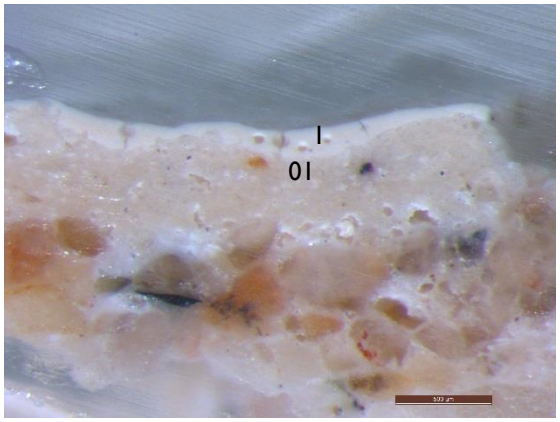
Ground floor, Family apartment: kitchenette and living room ceiling

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.

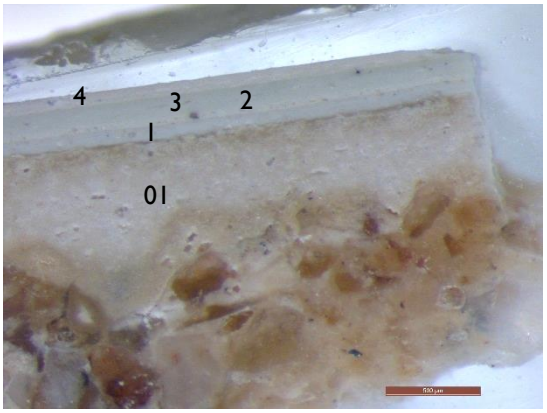








Sample 154 in two parts. Former Living room ceiling. Scale 500µm.

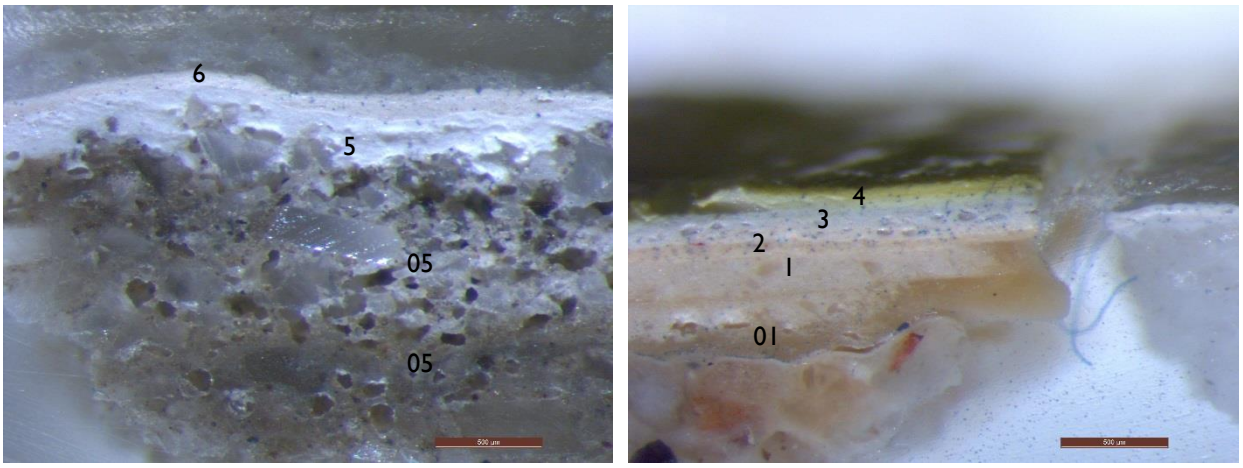


Kuva 1Sample 155 in two parts. Former kitchenette ceiling. Scale 500µm.

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.

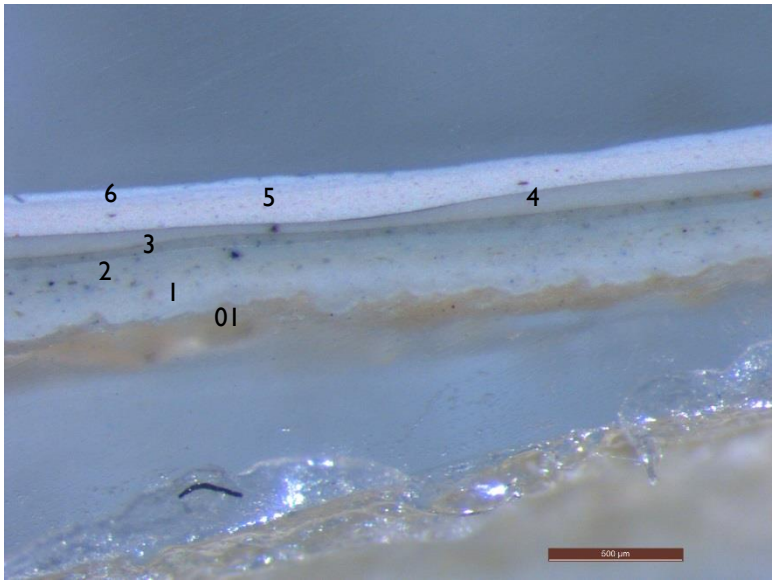


Sample 153 in two parts. Former corridor of the family apartment. Scale 500µm.

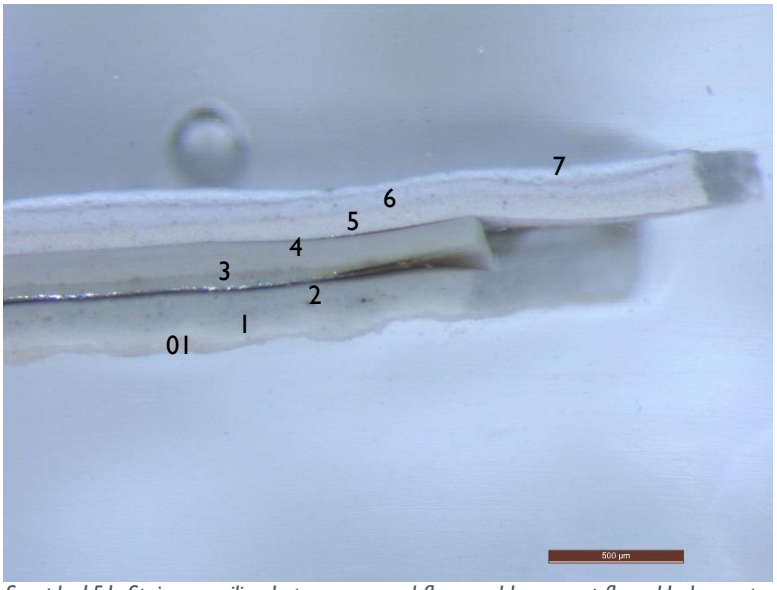
Stairway between basement and ground floor

The stairway wall sample 151 showed light blue first layer. This is the first color, differing from white paints in the ground floor.

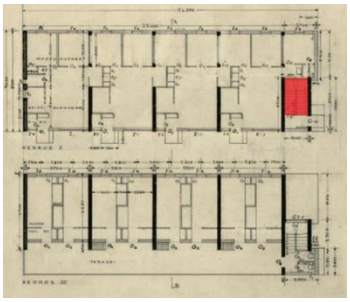
The ceiling sample 152 from stairway showed white paint as first layer.



Sample 152. Stairway wall, ground floor. scale 500µm.

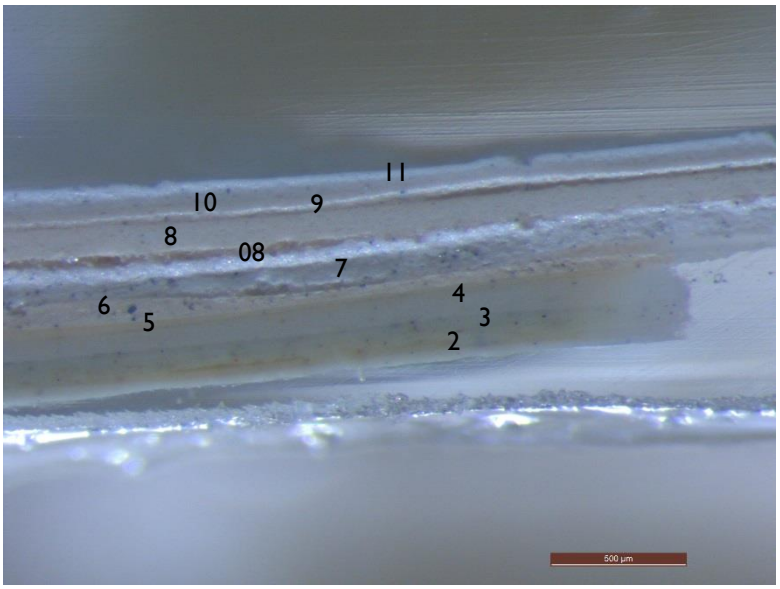


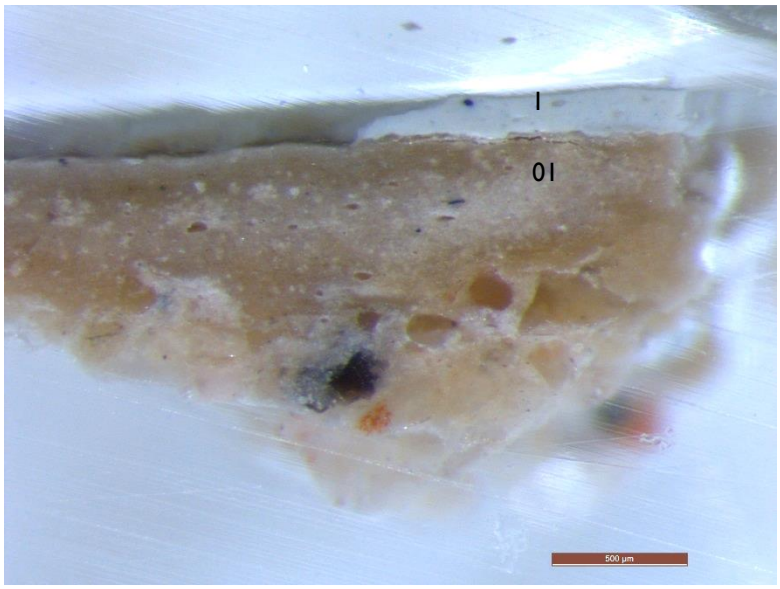
Sample 151. Stairway ceiling between ground floor and basement floor. Undermost material, plaster, is not shown in the sample. Scale 500µm.



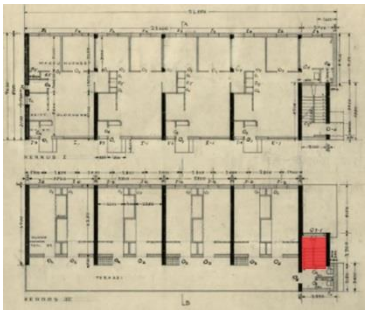
Stairway between ground and first floor

The wall of the stairway connecting ground and first floor showed light blue first paint layer. The layer has some blue pigment particles-

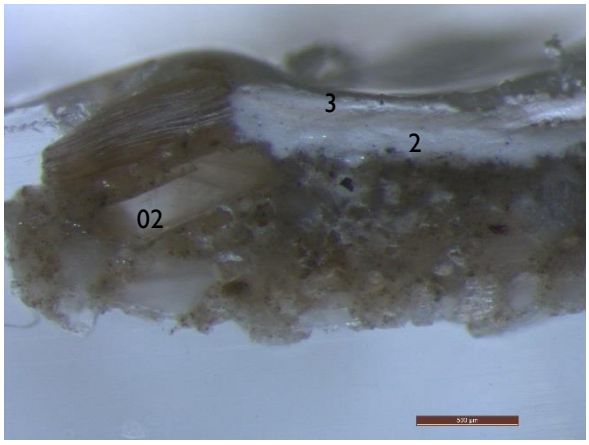


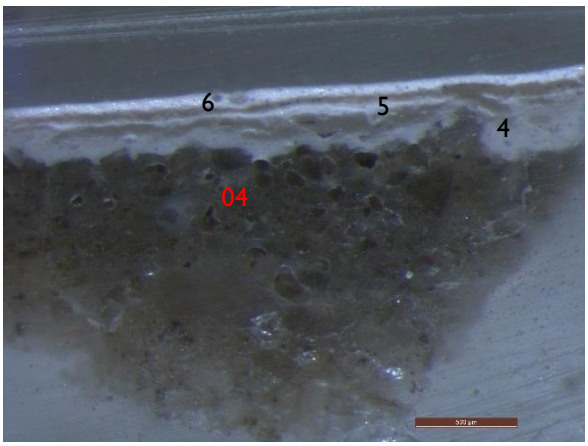


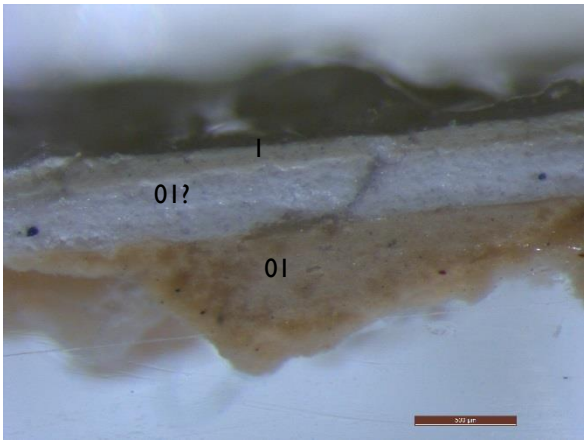
Sample 159 in two parts. Stairway wall. Scale 500µm.

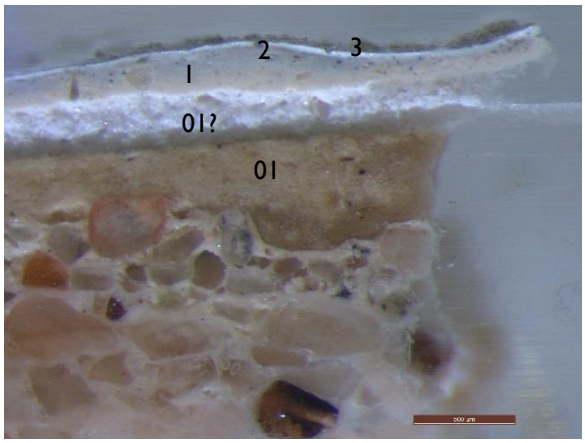


The first layers of the samples gathered from walls of upstairs studio apartments show undermost layer of filler that seems original. The second layer (marked "01?") seems like a filler as well. This is the impression one gets from both samples. The undermost layers are all white or cream white. That has probably been the main original color of studio apartment walls.



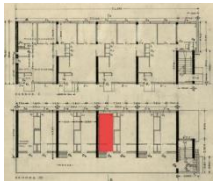


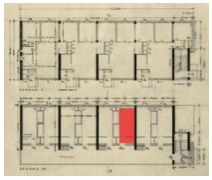




Sample 157 in two parts. Wall of studio apartment, first floor. Scale 500µm.

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.

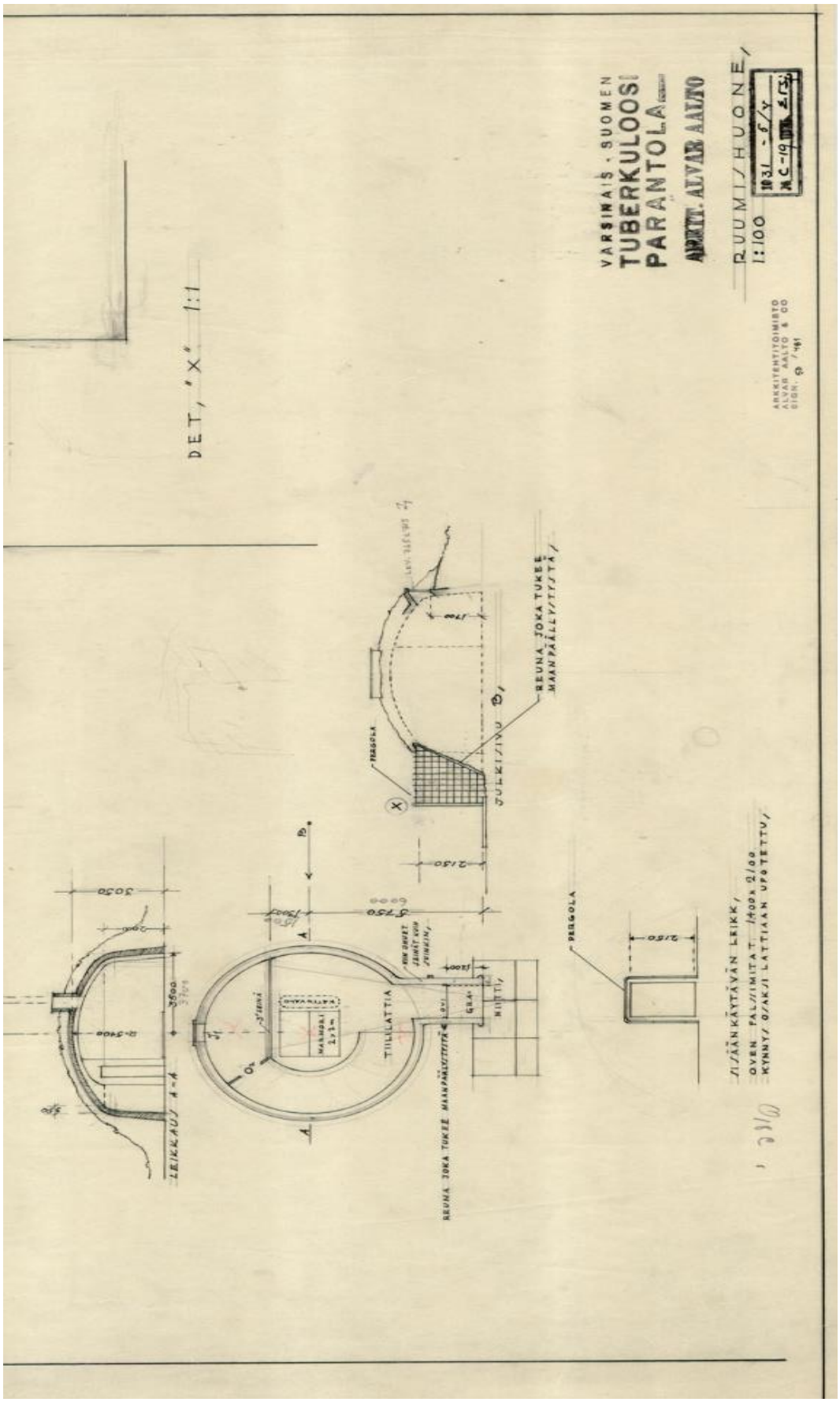
The mural on the wall dividing the round space is badly deteriorated due to humidity and subzero conditions of the cellar. The surface seems to be a traditional three-step calcium based plastering. Mural has an abstract matt, light colored painting that presents three different pastel colored, fan shaped 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.)

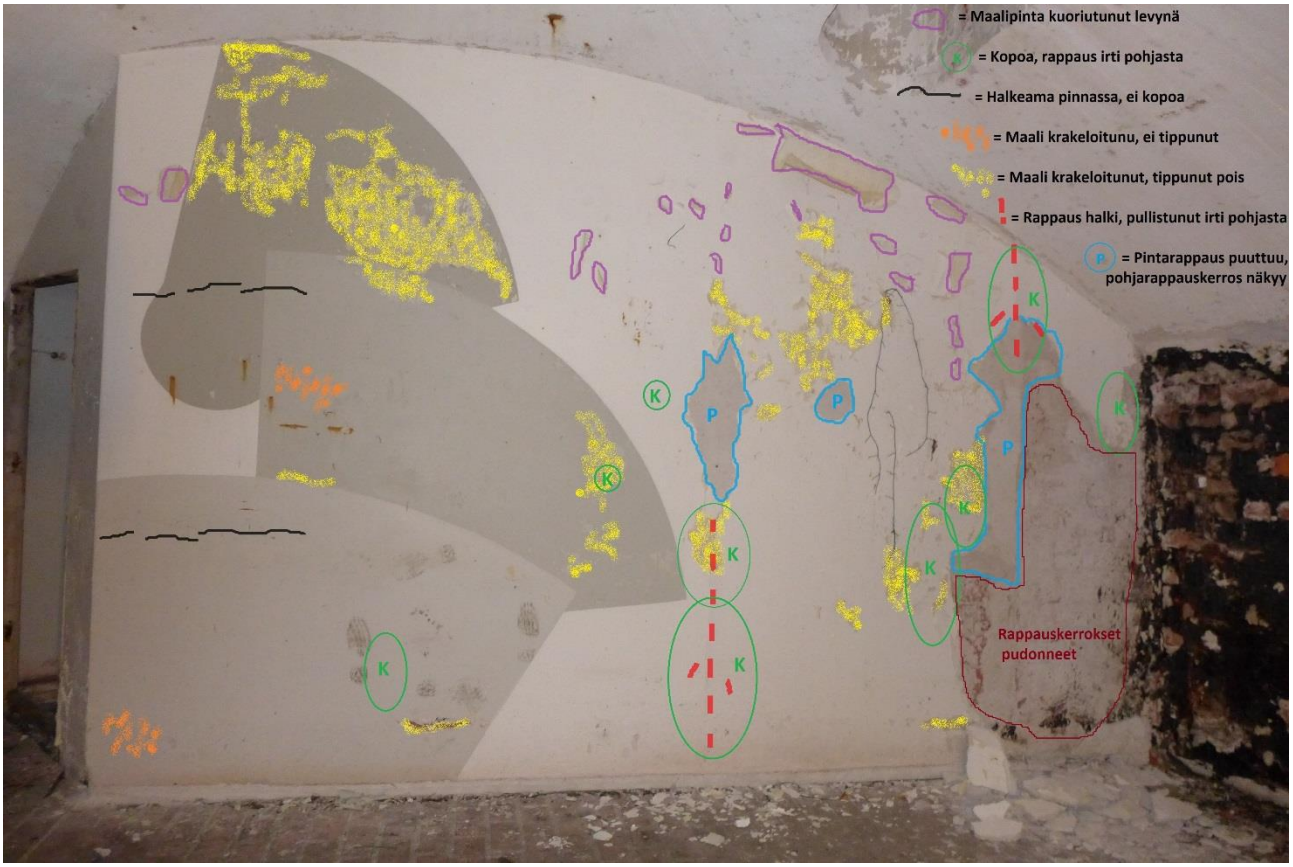
TJ: So these here don't belong to the fresco you painted?
EK: Oh no, no they don't.
TJ: Was it (the original) then the whole length of the wall?
EK: Whole wall, yes.
TJ: And how was it done then, you said that with some strings…
EK: Yes, with strings, different thicknesses of strings we had, and so I 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.

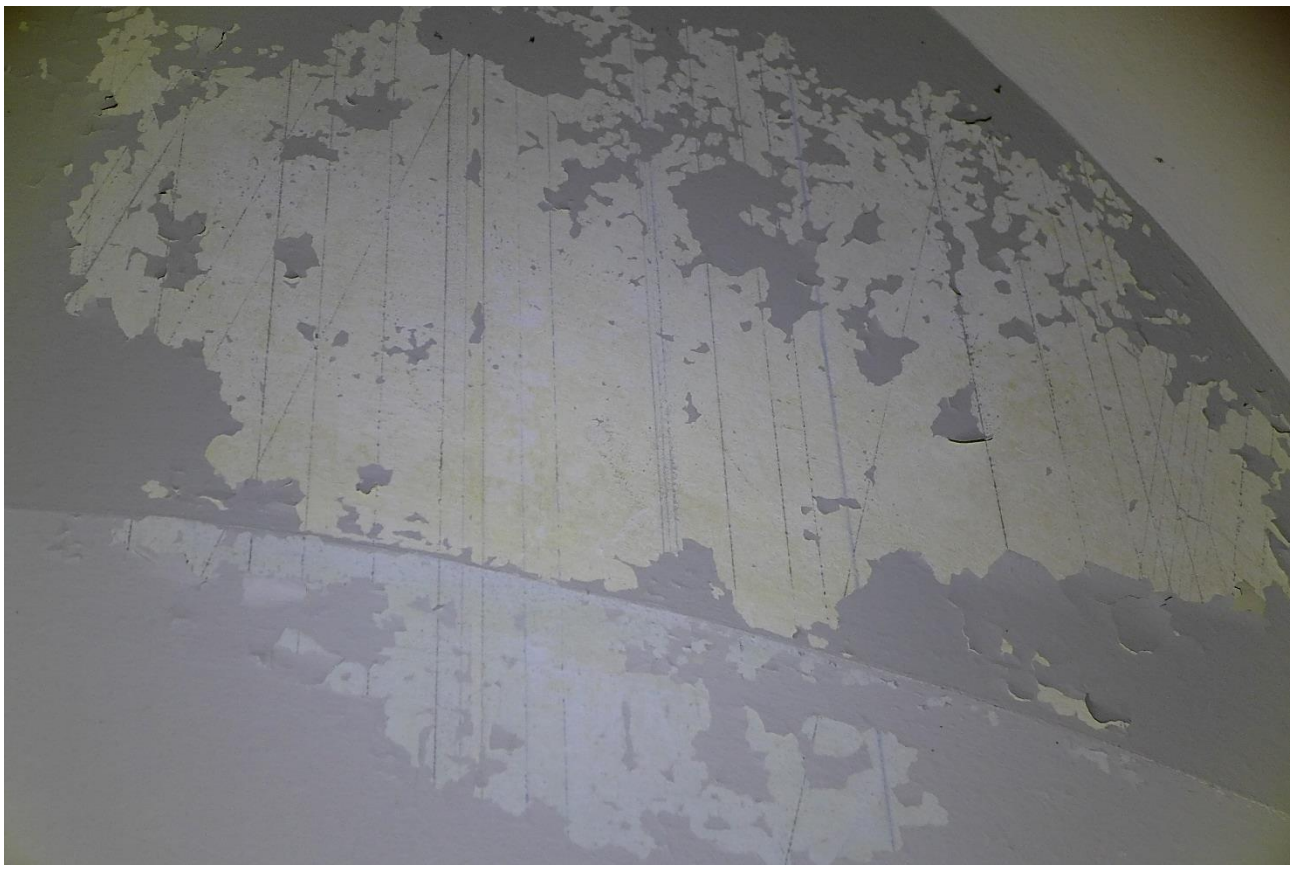
The architectural office Laiho-Pulkkinen-Raunio, which has been involved in Paimio hospital renovation and development of the hospital area during 2000's, has planned and written instructions for the cellar's renovation and restorative work. This plan from year 2005 has been updated 2010. No operative 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.

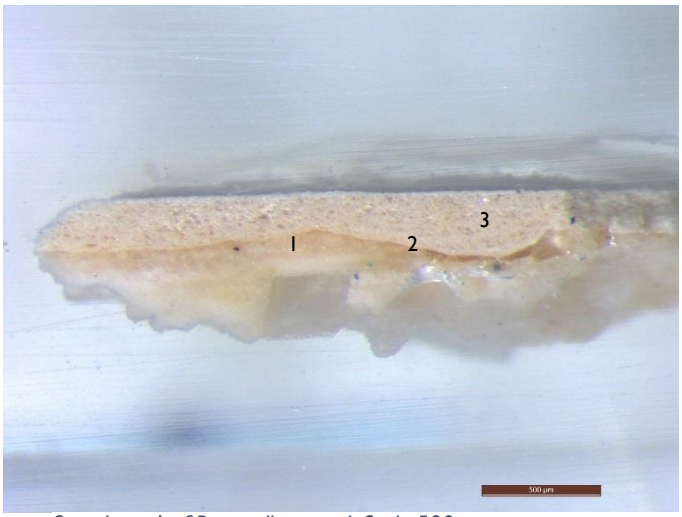
Above is a small lagoon in the surface of the mural. It exposes the paint layers underneath. The dark grey stripes made by Kauria are clearly visible on the undermost layer. In the picture below it is shown how the stripes continue through the different color areas of light pastel blue and yellow.



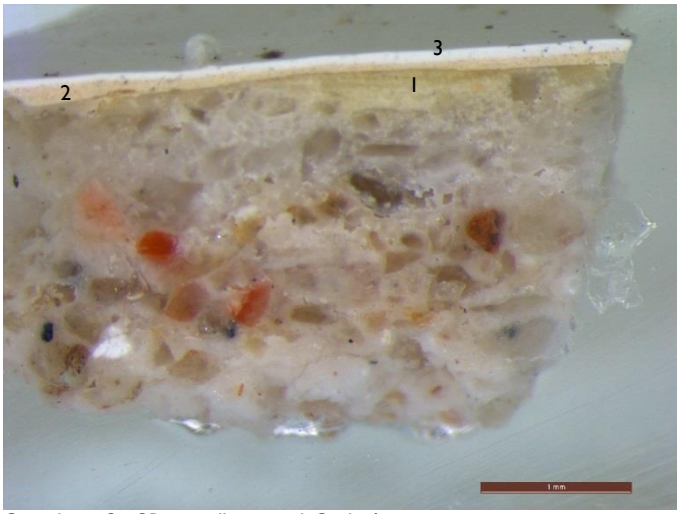
The cross section samples taken from the mural of Rose cellar.

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.

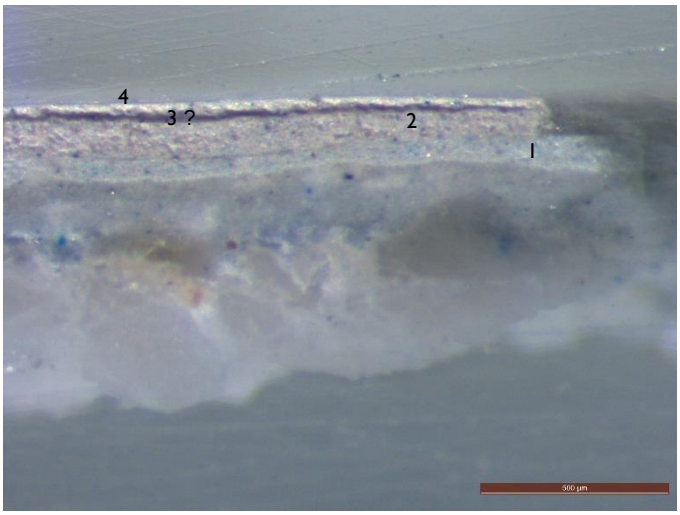
The sample number 2 has clear white upmost layer of latex-like paint. The second seems light yellow and the bottom layer again a barely there layer of yellow paint.



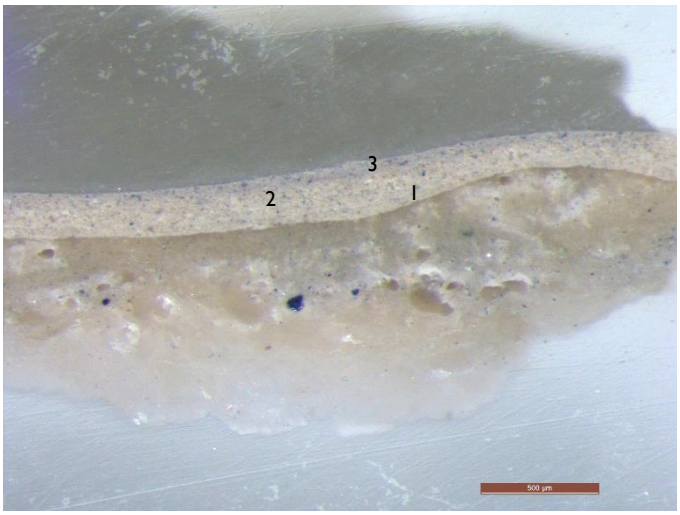
Sample no.1 of Rose cellar mural. Scale 500µm.



Sample no.2 of Rose cellar mural. Scale 1mm.



Sample no.3 of Rose cellar mural. Scale 500µm.



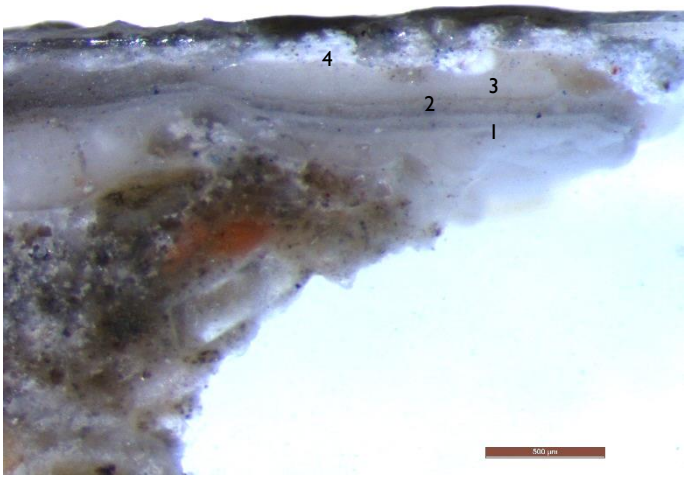
Sample no.4 of Rose cellar mural. Scale 500µm.

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.

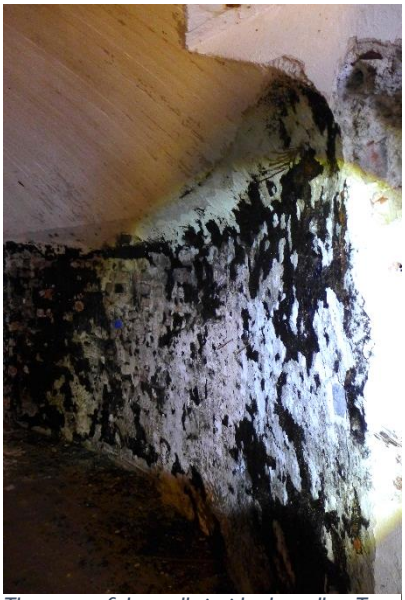
The sample number 4 has mainly cream or pastel yellow layers. The first layer's color is natural white, second yellowish white and third light grey.

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.