

# A GUIDE TO ALTERATION AND RENOVATION OF A HISTORICAL TIMBER BUILDING USING TRADITIONAL METHODS AND MATERIALS



THE ORIGINAL RELEASE

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UPGRADE, LAYOUT  
AND PHOTOS OF TAMMELA

2016 GHITA NYMAN

PUBLISHER

2016 THE TOWN OF RAUMA

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## WELCOME TO TAMMELA!

Tammela Renovation Centre is a part of the building inspection of the town of Rauma. The Renovation centre was founded in October 1995 and it has operated in the house of Tammela, owned by the town of Rauma, since then. The house displays renovation work in Old Rauma as well as the UNESCO world heritage. Visitors are also given practical instructions and advice on traditional building and renovation methods suitable for timber buildings. A bank of spare parts, where spare parts for old timber buildings are recycled, is also a part of the house of Tammela. There is also a workshop on the property where residents can do woodwork.



In addition, lectures and courses connected with Old Rauma and renovation are held in Tammela.

## THE HISTORY OF TAMMELA

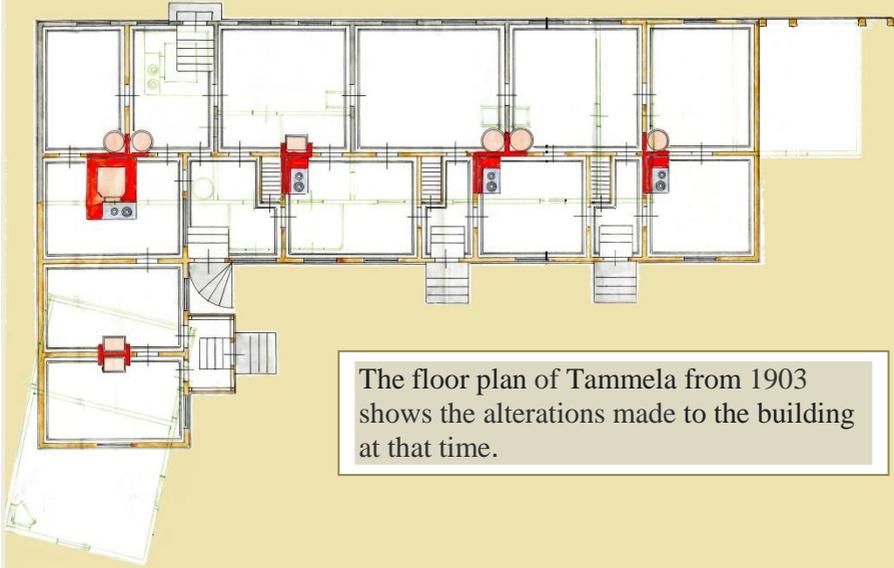
Tammela is one of the largest estates in Old Rauma. The size of the plot is 1774 m<sup>2</sup>. In the past the estate included a main house and a large outbuilding with a cow shed and a barn.

Today the property has as an additional building, a granary that serves as a bank of spare parts. The granary was moved to its place as a work presentation. Also the timber frame of the workshop was built of recycled timber.



The yard and the garden are kept simple by retain traditional Finnish material and garden plants.

The main house of Tammela was originally built as a home for several households. The exact year of construction is not known. It is stated in the oldest fire insurance document available, dated 1857, that the house was built in earlier times. In other words, the house of Tammela supposedly dates back to the early 19th century.



The floor plan of Tammela from 1903 shows the alterations made to the building at that time.

The oldest building permit plan is dated 1903. It was an alteration plan according to which the main building was extended on the courtyard side. At the same time a south wing was built by attaching a separate timber frame to the main building. In the alteration the length of the main building was shortened by removing one timber frame in the east end. A natural gate to the courtyard was formed.

When these alterations had taken place, the living area of Tammela measured 237m<sup>2</sup>, which is also the present size of the building.

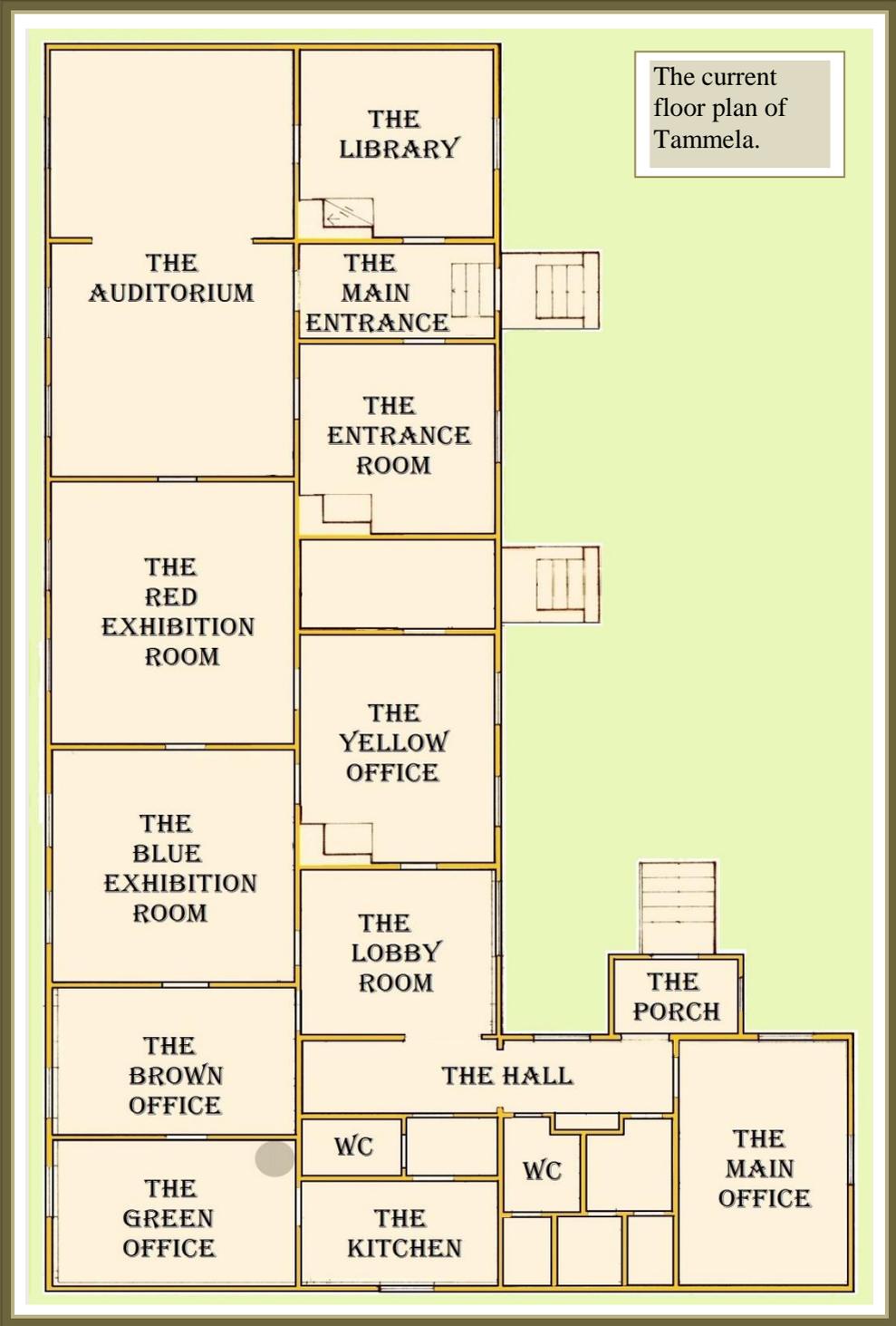
The estate was privately owned until the year 1952, when it was purchased by Länsi-Suomi Ltd. Only minor alterations were made to the house and various tenants lived in it in the following years. In 1975

the estate of Tammela was sold to its present owner, the town of Rauma. The building was transformed into a school of music during 1976 and 1977. The changes were extensive: for example, the walls were clad with chipboard and mechanical ventilation was installed. This was typical of the decade. Furthermore, all the walls were straightened and supporting rails were attached, even to the non-bearing internal walls. Also, the ceilings were suspended. These changes made the rooms considerably smaller.

The house of Tammela was transformed into an information center and an exhibition space by retrieving the characteristics of the timber building that were lost in the alterations of the 1970s. The layout of the building is now that of the alteration plan of 1903.

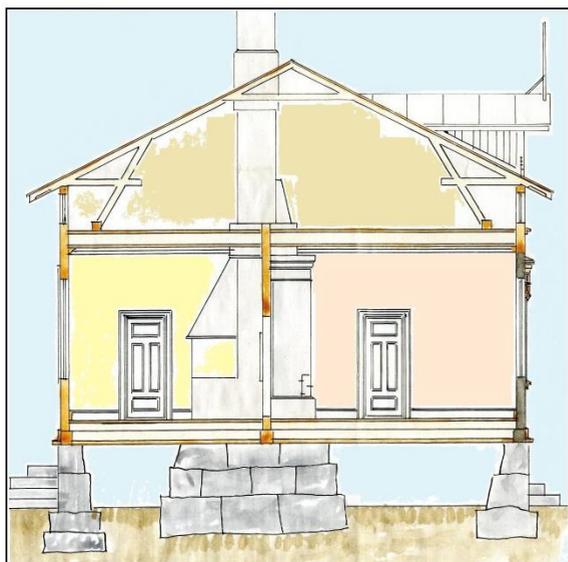


The current floor plan of Tammela.



## TAMMELA BECOMES A RENOVATION CENTRE

Most of the actual renovation work was carried out by a carpenter who is an expert on challenging renovations of timber buildings. Some of the work was carried out by students of renovation and employment courses. Also the Regional Renovation Workshop/Old Rauma Renovation Workshop and Innova have participated in the renovation. During the renovation process some openings and pockets were left in the structures to guide the visitors to the use of traditional materials and suitable renovation methods. Some of these openings displays historical phases of the house of Tammela.



A cross section of the house of Tammela from 1903 shows the typical structures of a timber building. The foundation is made of natural stone and the timber frame rests upon it. The attic has a board structure.

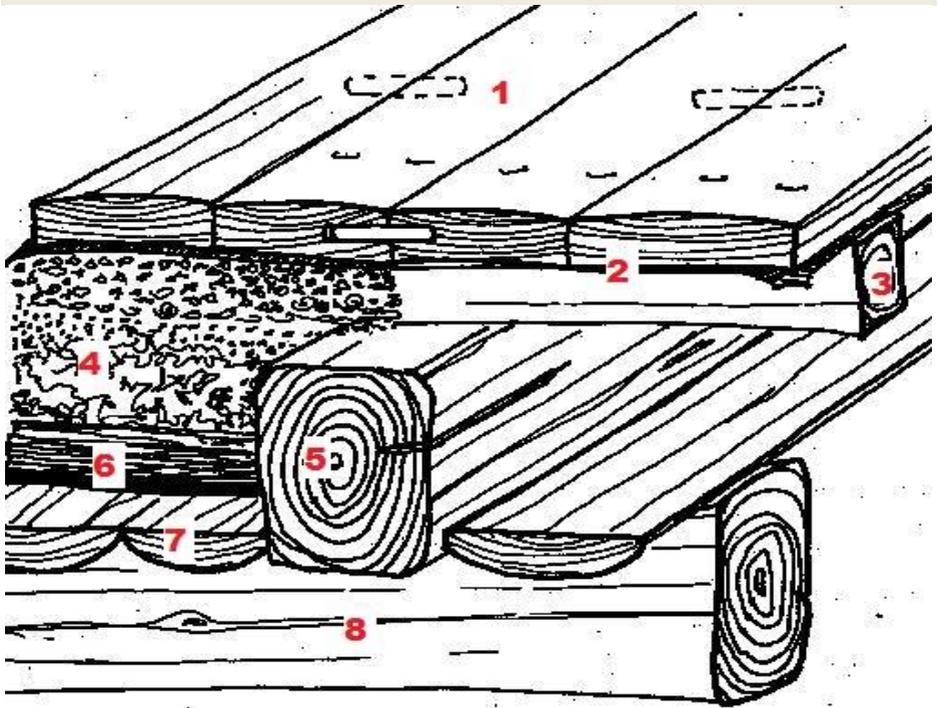
## ADDITIONAL INSULATION

To add insulation on the external timber walls, two 12 mm sheets of softboard have been used. The draught from the corners and from the joints of the ceiling and the base of the building is prevented using building paper. The old doorways on the street side of the house and in the lobby have been insulated by filling them with blown pulp wool. In the base of the office wood shavings have been used as additional insulation. The insulation of the base of all the other rooms has been improved by rebuilding the bases that had partly been destroyed. New windprotective panels, pulp wool insulation and building paper have been installed in the base of the building. In the ceiling blown pulp wool and a mixture of saw dust and wood shavings have been used as insulation.

## DOORS AND WINDOWS



All doors have been repainted, modern rimlocks have been removed and thresholds have been reinstalled. Also the handedness of some of the doors has been changed. The joints of the window frames and the wall structure have been checked and some caulking has been added in order to prevent draught. The bottom parts of some of the external window frames have been changed and all window frames have been painted.



## A BREATHING BASE OF A BUILDING

- 1.floor planks fastened with wooden dowels
- 2.building paper:tar paper
- 3.supporting rails
- 4.insulating layer:saw dust and wood shavings or pulp wool
- 5.floor supporters
- 6.old layer of insulation: moss, peat , sand and a layer of birch-bark
- 7.boards or planks
- 8.primary floor beams

## THE PORCH

The vinyl floor covering of the 1970s remains. The walls and the ceiling of the porch have been clad with tongued and grooved board and painted with lacquer paint.



## THE MAIN OFFICE

In the alteration of 1903, a separate timber frame was attached to the main building. The old timber shown above the door is the old external wall of this timber frame.

The phases of the painting process can be seen on the old panel door: the cleaning of the surface, the filling of uneven areas, a primer coat, a second coat of paint and a final coat of paint.



The office is the only room in the house of Tammela with the old wooden floor that has survived the alterations of the 1970s. The planks have been numbered, taken out and reinstalled after the reinforcement of the floor supporters. Saw dust has been used as additional insulation in the base of the office. In the reinstallation of the floor the planks have been fastened to each other with wooden dowels. Before painting the planks have cautiously been cleaned. The planks have been left convex on purpose. If old floor planks are smoothed their grain structure is

broken. The planks become splintery and are unpleasant to use. The paint used is lacquer paint.

The walls have been primed with inexpensive, white wallpaper and painted with tinted distemper. For decoration, an old splashing method was used.



In order to disguise some of the obliquity of the ceiling, the top part of the walls has been painted with white distemper. To add decoration, a simple marine motif has been stencilled. The ceiling of the office has been covered with building board and painted with distemper.



In the wall opposite the window a timber post, connecting the timber wall and the fire proof wall, has been left partly visible. The purpose of the post is to join two different structures in such a way that the timber structure can freely settle when it dries. In this case the post connects a timber wall and a brick wall, but there are also other kinds of posts. They are named after the structure to which the timber wall is connected: a door, a window or a fire proof wall.

Also displayed in this room is the additional insulation on a timber wall. Softboard is used as additional insulation, because softboard "breathes", as does the timber structure. The natural breathability of the timber structure is thereby retained.

## THE HALL

Because high wearing qualities are required of the floor of the hall, a linoleum floor covering was chosen instead of planks. The walls of the hall have been clad with tongued and grooved board with a pearl profile. The panelling is over two meters high, which has been typical of public premises such as schools.



The ceiling of the hall has been clad with tongued and grooved board with a pearl profile and painted with lacquer paint. A noteworthy detail

in the hall is the coat rack which is an excellent example of skillful carpentry.

On the left hand side of the window of the hall the joint of the window frame to the timber wall has been left visible.



A flat iron is used to attach the window frame to allow the wall structure to settle while it dries.

## THE LOBBY ROOM



There is an opening in the ceiling of the lobby room. Through the opening the structure of an old roof truss can be seen. Also visible in the attic are the old boards beneath the roofing. They have been recycled from other old buildings and traces of red ochre can still be seen. Some of these boards are old, grooved roofing boards. On the wall between the two doors the top part of the panelling shows the different phases of the wood imitation treatment.

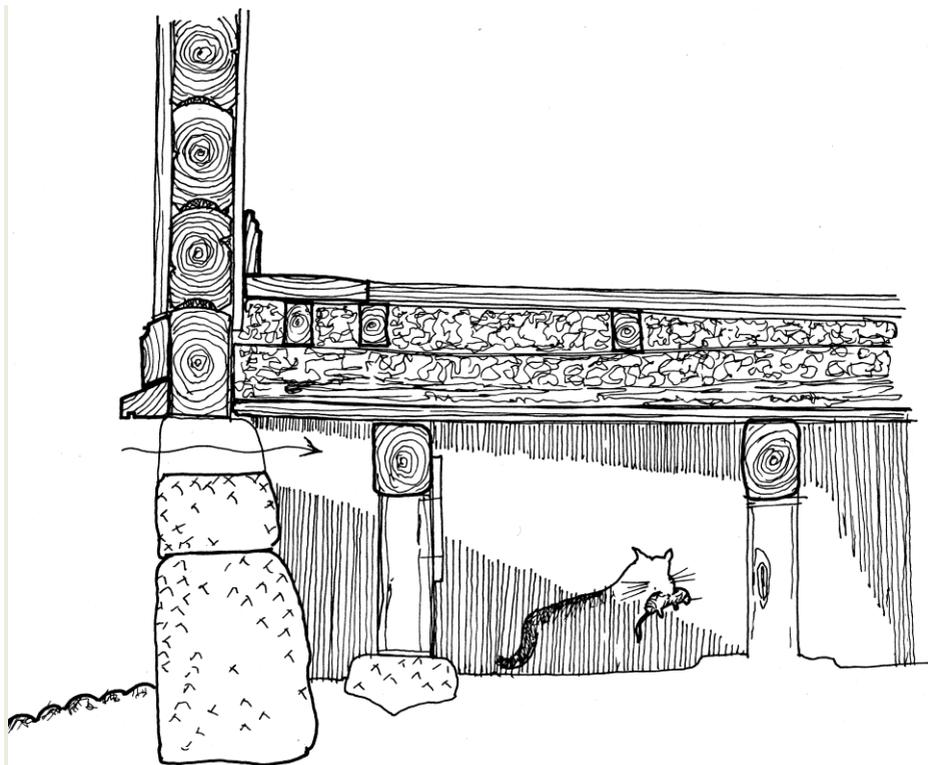


The phases for the wood imitation are: an untreated surface, a primer coat, a treatment with a fixing agent, wood imitation and finally lacquer. Root beer has been used as a fixing agent.

The wall which displays the phases of wood imitation also has a small window at the floor line. The window displays the worst enemy of a timber building, namely, dry rot. The light coloured, gauzelike layer is dry rot that has dried up. Dry rot has destroyed some of the timber structure already before the alterations of the 1970s. Dry rot destroys wood when the structure is damp and it is, therefore, extremely important to ensure sufficient ventilation in the base of the building.

The traditional, breathing base of the building enables the timber structure to stay dry. In the latest renovation the timber structure was

allowed to dry and the base of the building was replaced with a new one. Therefore, dry rot can no longer destroy the structures.



A breathing base of a building is a traditional floor structure, the advantage of which is a good ventilation. When the foundation is high, as in the house of Tammela, the floor structure can be checked from below.

## THE YELLOW OFFICE



The floor of the yellow office has been replaced with a new one. The material used is tongued and grooved pine board that is 120 mm wide. The boards have been fastened with nails in the groove. The floor has been treated using grey oil glazing paint. In order to show the grains of the wood, a layer of paint with colour pigment has been applied first. This has allowed the wood to absorb the colour pigment. Protective layers without colour pigment have been applied next. In the exhibition rooms a colourless layer has been applied first, which has prevented the absorption of the colour pigment into the wood.

The walls have been primed with inexpensive, white wallpaper and papered using a Swedish wallpaper and a Finnish-made border.

The ceiling of the yellow office has been clad with tongued and grooved board with a pearl profile. The semi-gloss finish of the ceiling has been achieved by mixing some linseed oil paint with lacquer paint.

## THE BROWN OFFICE

In old days this room was a baking room with a large baking oven in the corner.



The charred timber wall tells of the fire hazard that lurked behind the furnace. In this case, fortunately, the timber wall has only been charred. Later on the wall has been partly tidied by carving.

But the brown office has also served in the past as a negotiation room.



The floor planks of the room were saved from a villa that was later on incinerated. The planks have been fitted in place and fastened with wood screws. In order to disguise the screws, wooden dowels have been used. The paint used is lacquer paint.



In six decades the walls have been papered 15 times, which is surely more often than in the homes of today. The frequent papering of the walls is partly explained by the fact that wood heating caused blackening of the walls. On the other hand, new tenants may have wanted to hang new wallpapers as they moved in. The pocket has been created by cautiously removing the layers of wallpaper one by one with the help of a spray bottle. The original building board is still in its place and the wallpapers have not been transferred here from elsewhere.

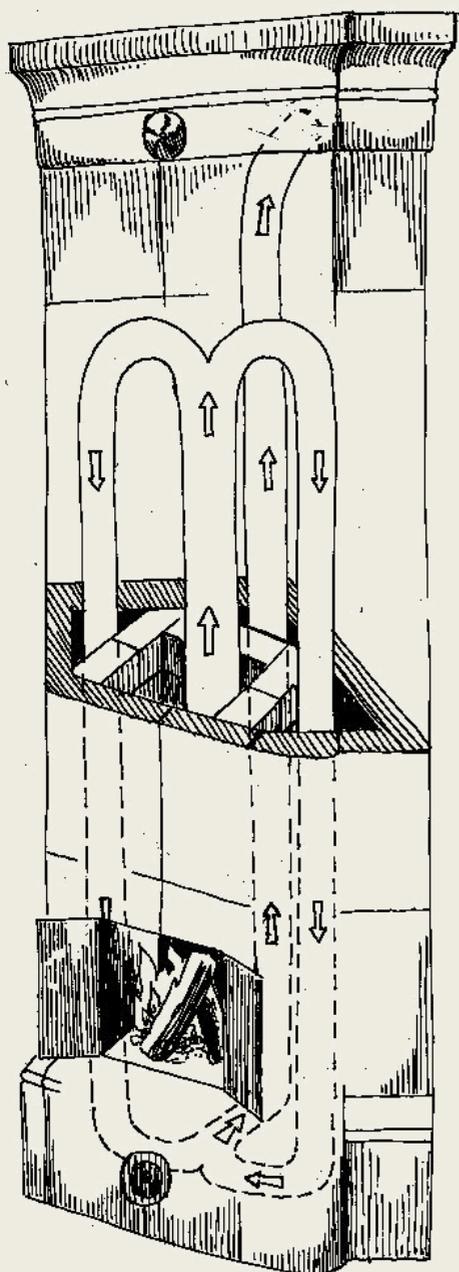
The walls have been primed with an inexpensive, white wallpaper and papered using a wallpaper and a border chosen from the selection of a Swedish wallpaper factory, Lim&Handtryck. The ceiling of the negotiation room has been covered with building board and painted with distemper.

All these wallpapers have been hung after the alteration of 1903. The latest layers date back to the late 1960s, to the time of the last tenants of the house.



Lead-covered electronic wiring can be seen in the wall opposite the window. The wiring has been inserted in the timber wall and it represents the alteration of the 1940s.

In the street side corner of the room, additional insulation of the timber wall is displayed. Blown pulp wool and softboard are visible in the pocket. In the corner of this room there is a half of a tiled stove built for exhibition purposes.



The cross section of the white stove displays the circulation system of the furnace. The combustion gas rises from the furnace and bends down along the flues on both sides of the furnace. The combustion gas then goes underneath the furnace and further to the rear where it leads up to the chimney. A tiled stove is taken apart by pouring water over it, as clay mortar dilutes in water. To be able to rebuild the stove, the tiles must be numbered. Horizontally, the tiles are marked with consecutive numbers and vertically, the courses of tiles are marked with consecutive letters, starting from the bottom course. The cross section of the stove also displays the wire tie that must be noted when taking the stove apart.

## THE GREEN OFFICE

Also this room has been used for different purposes, like as a library. The floor planks of the green office, as of the brown office, were saved from a villa in Petäjäs in Rauma. The villa was later on incirated.



The planks have been fitted in place and fastened with wood screws. In order to disguise the screws wooden dowels have been used. The paint used is lacquer paint.

The walls have been primed with inexpensive, white wallpaper and papered using a Finnish-made wallpaper from Pihlgren ja Ritola. The ceiling of the library has been covered with building board and painted with distemper.



The dilapidated stove has been renewed by skilful marbling, the phases of which can be seen in a small area: a primer coat, a mixture of beer and colour pigment, treatment with a natural sponge, and finally lacquer. The marble-like image is created with a fine brush.

## THE KITCHEN

Some of the alteration of the 1970s, the era of chipboard, can still be seen in the kitchen of Tammela. Here the visitor can see the starting point of the latest renovation. The rear of the kitchen displays the typical material used in the 1970s, namely, chipboard with open joints. The colours, dark brown and white, were also typical of those times.





The use of chipboard often caused needless protective casing as the rooms were completely clad. In small rooms, such as this kitchen, a lot of useful space was lost. The suspended ceiling disguised the wiring necessary for lighting.

On the kitchen floor the dark brown vinyl floor covering of the 1970s remains. Without removing the chip board, the lower part of the wall has been clad using tongued and grooved board with a pearl profile and painted with lacquer paint. The top part of the wall has been covered with knot pulp cardboard and painted with tinted tempera.

## THE TOILET

In the toilets the vinyl floor covering of the 1970s remains. The lower parts of the walls have been clad with tongued and grooved board with a pearl profile and painted with lacquer paint.



The top parts of the walls have been covered with knot pulp cardboard and painted with lacquer paint. The ceilings have been clad with tongued and grooved board and painted with lacquer paint.

## THE BLUE EXHIBITION ROOM

The floor of the room has been replaced with a new one in the latest renovation. The material used is tongued and grooved pine board that is 120 mm wide. The boards have been fastened with nails in the groove. The floor has been treated using grey oil glazing paint.



The walls have been primed with an inexpensive, white wallpaper and papered with an English wallpaper. The border has been especially handmade for this room. The goal was to find a wallpaper and a border that are suitable for a home of the early 20th century and, on the other hand, for an exhibition room. In this room the selection of the wallpaper was strongly influenced by the remaining old wallpaper between the windows. This wallpaper dates back to the early 20th century, as do the layers of old wallpaper on the opposite wall. Another historical detail on this wall is the old telephone wiring which has been installed as open branching over the wallpaper. The ceiling of the blue exhibition room has been covered with building board and painted with tempera. The exhibition in this room displays the UNESCO World Heritage.

## THE RED EXHIBITION ROOM



The oldest remaining timber in the house of Tammela can be found in this part of the house.

The old doorway filled with vertical logs shows that alterations have been made in several phases. The low height of the old doorway is explained by the fact that the floor has earlier been considerably lower.

Also in this room, the floor has been replaced with a new one. The material used is tongued and grooved pine board that is 120 mm wide. The boards have been fastened with nails in the groove. The floor has been treated using grey oil glazing paint.



The walls of this exhibition room have been primed with an inexpensive, white wallpaper and papered using an English wallpaper and a Finnish-made border.

As in the blue exhibition room, the goal was to find a wallpaper and a border that are suitable for a home of the early 20th century and also for an exhibition room open to the public.

The ceiling has been covered with building board and painted with distemper.

## THE AUDITORIUM

In the south end of the building were two rooms combined by removing most of the dividing wall. There are about thirty seats.



The wooden floor is decorative painted with a few different-toned oil glazing paint. The walls are covered with a blue-gray wallpaper

A historical feature on the wall is a log joint without visible log faces. As the building methods improved around the 1840s, logs were no longer joined with visible log faces. Especially in a case where an internal wall was notched in a solid wall of another room, this was a considerable improvement. The walls became much easier to paper.



A peek hole of the log joints without visible log faces can be found in the wall of the auditorium. The visitor can touch traditional materials used for insulation and smell the scent of traditional and ecological materials used for repairs.

## THE MAIN ENTRANCE AND THE ENTRANCE ROOM

The lower parts of the walls have been clad with tongued and grooved board with a pearl profile. The upper part of the wall is covered by green wallpaper. The floor is painted with lacquer paint.



In the entrance room the walls are covered by swedish Duro wallpaper. Previous wallpaper layers are visible above the coat rack. The floor is painted with green lacquer paint.



## THE LIBRARY



In the library is "life in Tammela" presented, which tells about the last family which owned the house.

Historical culture can be read by the table. Literature of the world heritage, traditional constructing as well as books about the old towns in Finland can be found in the bookcase.

The doors of the bookcase are recycled old windows that are refurbished and put into reuse. Different phases of painting has been left visible on the door. The walls are covered with traditional wallpaper and the wooden floor is painted with green lacquer paint.

## WORDSTOCK

### **Breathing base of a building**

This kind of a base has been used in traditional Finnish floors. There is a "crawling space" between the floor and the ground, which allows the ventilation of the base of the building. Moisture as well as harmful gases rising from the ground are also aired out.

### **Dry rot (Serpula lacrymans)**

If the base of the building dampens, even a thick structure may quickly be destroyed by dry rot. Therefore, it is extremely important to ensure the ventilation of the structure. Dry rot destroys the pulp of the wood and, consequently, the strength of the wood deteriorates quickly. The wood that is damaged by dry rot is brown in colour and has deep cracks in it. White mycelia can be seen on the surface of the wood. The rhizomorphs may be even as thick as a finger. Dry rot is easily recognised by the strong scent of mushroom.

### **Flat iron**

The joint of the window/door frame and the timber wall must be flexible, because the timber wall settles as it dries. The correct way to fasten the frame to the wall is to use a flat iron which can turn as the wall settles.

### **Log joint without visible log faces**

Traditionally a short bit of the log face has been left outside the corner joint. When the logs are joined without visible log faces the notching locks up" the corner and the logs don't exceed the corner joint. This technique became common around the 1840s.

### **Log joint with visible log faces**

A short bit of the log face is left outside the joint of the corner. This has been the oldest way to join logs. In townhouses visible log faces have been encased and disguised in corner pilasters when boarding the walls.

### **Pulp wool**

Ecological material used for insulation, today mainly available in loose form and blown into the desired place. 80% of the pulp wool is recycled paper. To prevent dry rot boric acid and borax have been added.

### **Vertical timber post that connects a timber wall to a brick wall**

The joint of the timber wall and the brick wall must be supported with a vertical post that stands in the groove cut to the ends of the logs. This structure allows the timber wall to settle while it dries, but it keeps the logs from twisting to the sides.

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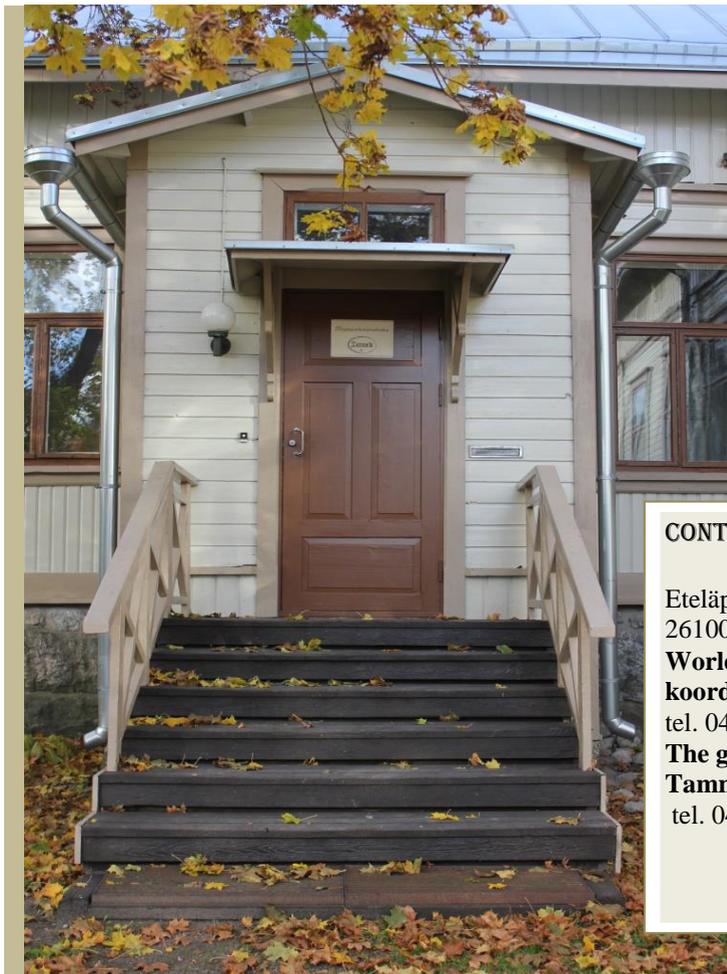
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## COME AND EXPLORE!

- the historical logbuilding
- the two eras of world heritage
- the red ocher paint fabrication
- the bank of spare parts