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GUIDELINES FOR PURCHASING AN APARTMENT AND THE EXECUTION OF MAINTENANCE WORKS

Bachelor's Thesis 2011

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ABSTRACT

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Guidelines for Purchasing an Apartment and the Execution of Maintenance Works.

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Saimaa University of Applied Sciences, Lappeenranta

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Instructors: Mr. Raine Valtonen, Mr. Sami Rantanen, Ms. Kirsi Taivalantti

The purpose of the study was to develop guidelines for a foreigner who decides to buy an apartment in Finland and for an apartment owner who decides to carry out maintenance works in apartment facilities. The main tasks of the study were to describe the process of purchasing and the execution of maintenance works within a housing company. In addition, our task was to examine building materials used for the renovation. The study was commissioned by supervisor from university – Mr. Raine Valtonen and Ms. Kirsi Taivalantti. Also the supervisor from the company was Sami Rantanen.

In the study the main issue was to define responsibilities between a housing company and the shareholders, concerning maintenance work in apartment facilities. The main points of purchasing an apartment and the organisation of maintenance with the description of common building materials were described. Data for this study were collected by Finnish acts and decrees, Finnish national building codes, RYL-codes and RT-files. The information was gathered from literature and Internet.

As a result the guidelines provides with adequate information concerning an apartment purchasing and carrying out apartment facilities renovation. The new regulation of maintenance responsibilities is provided in the thesis. There are also the descriptions of the renovation phases with the list of various possible structures.

Keywords: Purchasing an Apartment, Maintenance Works, Maintenance Responsibility, Housing Company, Shareholders, Renovation.

1 INTRODUCTION

In Finland the most apartment buildings are in a housing companies' administration. The main aim of the thesis is to give complete information concerning the new regulations on responsibilities between a housing company and the shareholders – new Housing Company Act № 1599/2009.

Another issue of these guidelines is the purchasing of an apartment in Finland. There are the main points and rules of the purchasing, Finnish regulations to conclude a sale deal and information about taxation. The purchase of an apartment is usually the single most expensive purchase made in a person's lifetime. That is why it is so important to conclude the sale deal with an apartment according with Finnish law and regulations.

During the owning of an apartment the problem of carrying out repair works is happen periodically. When someone decides to repair a bathroom the main question is what way is better for doing this construction works. The thesis answers on this question and describes the organization of renovation works in apartment facilities. A process of this important and challenging, it has a number of features.

Nowadays there are a wide variety of solutions for repairs implementation and quite a lot different kind of products for construction works. The last chapter of the thesis describes common building materials used in Finland for apartment facilities renovation.

A building company, which has been found by me for writing the thesis, is Rakennuspinnoitus Rantanen Ky. It is situated in Lappeenranta, in southeastern part of Finland. The company was found in 1990. The company's customers are real estate companies, housing companies, building companies and private persons. Customers have contract on the whole repair project with the company and it takes all the responsibility on the fulfilled works.

The main scope of the company's works is renovation and repair works of apartment buildings. The maintenance works include:

- demolition and dismantling of old structures;
- decoration works (painting and papering, leveling, lining and tiling);
- carpenter's work;
- water insulation works;
- sanitary ware works;
- electrical works;
- welding.

Quality of works is ensured according international standard - ISO 9002. Also the company has VTT certificate for the implementation of waterproofing works. Employees of the company are certified to deliver the promised services of a wet-room waterproofing installer (www.vtt.fi).

There are quite a lot Russian customers in Lappeenranta because this town is situated in 30 kilometers from boarder. That is why the company quite often deals with Russian customers. These guidelines are made to explain to the company's customers their rights and obligations concerning the implementation of apartments' renovation within a housing company. It is very important for foreigners to be competent in the field of Finnish law concerning apartments.

2 PURCHASING AN APARTMENT IN FINLAND

According to the order established by Finnish law, apartment houses are the property of housing companies. The possession of an apartment signifies to have the ownership of shares (real estate securities) in a housing company. To buy a flat in Finland means to become the shareholder of a housing stock company.

Some measures are needed to implement prior to the purchasing an apartment:

1. Decide on the area where an apartment will be situated;

2. Pay attention to the planning of rooms and facilities and availability of a balcony, fireplace, parking and sauna.
3. Research the market of sale apartments. It has the aim to get value for money.
4. Get financing to buy an apartment.

If the new apartment is chosen the buyer shall get all necessary information from the seller concerning the apartment before concluding the deal. In this case the information is available in the safekeeping documents and sale brochures. The framework for the realization of the building project is constituted in these documents.

If the used apartment is chosen the buyer shall implement some additional measures prior to the purchasing an apartment:

1. Consider the age of the building. Obtain an architect or engineers report on the building condition. Learn when major repairs were conducted and if the owner repaid his debt. Consider the apartment condition learning condition certificate and energy certificate.
3. Consider security measures in apartment building.
4. Learn the amount of maintenance charge and what are included in the charge.
5. Check up the condition of a housing company: results of financial activity for previous years; states of bank debts, taxes and other payments; accepted decisions concerning the major future repairs or other expensive operations. Learn the Article of Association of the company.

The main purchasing question is a financing. The financing of a purchasing an apartment by buyer carries out with using own capital or with taking a loan. A loan may be given by a bank, other financial institution, or a municipality. The government participates in the financing by granting guarantees and interest subsidies. Also it is possible to get the loan from a private person.

The total cost of transaction is transfer tax in addition to the purchasing price. Also the cost can include the overall buyer's expenses. These expenses are the

commission (usually 1,85 – 6% of the purchasing price) payable to the real estate broker with VAT tax, the cost of drawing up the contract (1,5 – 2,5% of the purchase price) and the consequences of any delays in the payment of the purchase price (for example, the penal interest). The value added tax (VAT) payable on the brokerage's services is 23% of services' price (The Finnish property market 2011, p.20. & Vänskä).

The penal interest is payable by the buyer if he does not pay the purchase price according to the schedule agreed on the deed of sale. This penal interest is defined in the contract of sale or the Interest Act, for the time after the due day. The penal interest according to the Interest Act is defined every six months, and it is 9,5%. The parties can also agree on a higher penal interest (The Finnish property market 2011, p.20. & Vänskä).

2.1 Legal system

Finnish legal system concerning an apartment purchasing includes in the Housing Transaction Act (Asuntokauppalaki) 843/1994 and the Contracts Act (Laki varallisuusosoikeudellisista oikeustoimista) 228/1929.

The Housing Transactions Act, passed in 1995, is applied to transactions with shares in housing corporations. The act also takes into account consumer protection. Amendments that improve consumer protection have been made to the act, and the latest became effective at the beginning of 2006. The Housing Transactions Act makes a significant difference between regulations on old and new properties. There are also extensive regulations on transactions made during the construction phase. This act has special clauses for the responsibilities, duties and rights for both the seller and the buyer.

The Contracts Act contains general provisions on the conclusion of agreements. These provisions are very important with regard to making and accepting a purchase offer.

If brokerage services are used for purchasing the Brokerage Act and the Consumer Protection act are used to protect consumer's right. The Brokerage Act contains provisions on the obligations and responsibilities of a brokerage firm.

2.2 General rules for closure of the sale deal

Now everyone including the foreigner has the legitimate right to own an apartment through shares in a real estate company without any general limitations. The purchase of shares or a housing company is legally a purchase of movable property.

The ownership of the shares in a housing company is transferred at the conclusion of the written contract. The shares are connected with a flat or a floor in the building. The seller in fact transfers to the buyer the right to possess the premises. The seller shall surrender possession of the apartment and the share certificate to the buyer on the agreed date or at the same time as possession of the apartment (Act № 843, Chapter 4 Section 29, Chapter 6 Section 22). The transfer of ownership is connected with the payment of the remaining purchase price. No public purchase witness is required for the transaction. The purchasing can be implement with real estate brokerage's services that have aim to define the value (the sale price) of an apartment and to conclude an agreement on the sale of shares.

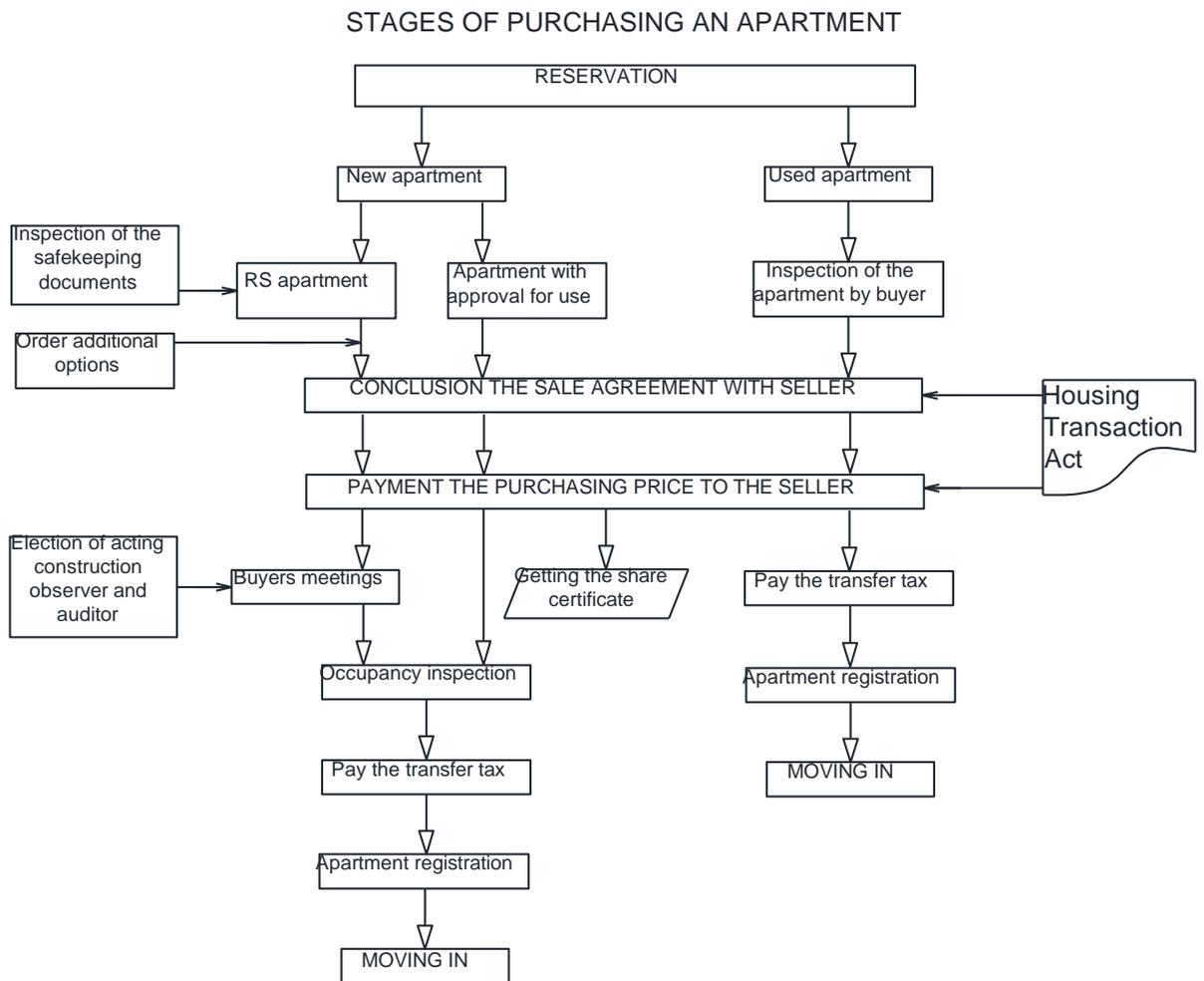


Figure 2.1 Stages of purchasing an apartment

Figure 2.1 shows the actions of buyer for carrying out the purchase an apartment are described. In Figure 2.1, you can see some differences between the purchasing of an apartment in new building and the purchasing a used apartment. Further in this chapter these differences are described more detailed.

2.2.1 New apartment purchasing

Chapter 2 of the Housing Transactions Act provisions the protections of the buyer in the transaction of an apartment in a building during construction stage (before the inspection of the municipal authority to approve for putting the building into operation). The apartment sold during the construction stage with all necessary securities is known as RS apartment (Palviainen, p. 5). In this

case it is important that the safekeeping documents shall be deposited in a deposit bank by the seller (the founding shareholder). The safekeeping documents are the certificates of securities, company's articles of association, project's financing plan, construction project (information on the property concerned, building permit, permit-related drawn plans, description of the manner of building, descriptions of special work to be carried out) and the contract concerning the building work.

The seller of RS apartments shall put up the security provisions for the benefit of the housing company and the share buyers. These securities ensure that the contract on construction and the housing transaction contracts are fulfilled. Table 2.1 gets information on the security provisions according to the Housing transactions Act (Chapter 2 Sections 17, 19).

Table 2.1 Posted securities (Palviainen, pp. 17-20)

Security	Security for construction stage	Security after the construction stage	Security against a founding shareholder's insolvency – security certification
Term of force	From the first offer the apartments for sale till at least 3 months after the inspection	After close of the security for construction stage, be in force at least 15 months	Is taken out before the sale of apartments begins. Shall be in force for 10 years after the building has been approved for use
Amount	At least 5% of the overall price specified in the construction project	Shall correspond to at least 2% of the total transaction prices of shares sold	Max. sum of compensation is 25% of the cost of construction
Form	A bank deposit, a bank guarantee or applicable	A bank security	A insurance obtained from an insurance company

	insurance		
Release	Upon fulfillment of the obligations of the sales and the contracting agreements	The obligations of the apartment sale and the contracting agreements have been fulfilled	Shall not be released separately

A housing company board of a building under construction shall convene a share buyers' meeting at the beginning of sales (when at least one fourth of the company's apartments are sold). On this meeting the share buyers have the right to elect a construction observer with the requisite professional qualifications, whose duties consist of overseeing that the company's building is completed in accordance with the construction contract. The observer's term of office shall extend to the end of the construction period. Also the share buyers have the right to select an auditor for the housing company for a term extending from the end of the construction stage to the end of the following accounting period. The observer and auditor are selected as the shareholders' representatives. The housing company shall pay the auditor's fee and the observer's fee, which can be entered in the company's expenditure irrespective of the financing plan. The construction observer shall have for the assignment, and he shall not be dependent on the builder or founding shareholders (Act No 843, Chapter 2 Sections 20, 21, 22).

2.2.2 Used apartment purchasing

Chapter 6 of the Housing Transactions Act provisions the protections of the buyer who purchases a used apartment. The main steps of the purchasing are the same like with RS apartment. There are the same steps to conclude the sale deal, the procedure of taxes payment, but with exceptions of measures needed only for RS apartment (the inspection of the safekeeping documents, buyers' meeting, occupancy inspections). The main added step is inspection of the apartment by the buyer before the conclusion of the sale deal.

During the deal with used apartment transaction the seller shall give to the buyer the certain list of documents. There are the certificate of securities, copy of the company's articles of association, house manager's certificate with details of current repair needs, apartment condition certificate and energy certificate. Also the seller shall grant the copy of minutes of the recent general shareholders meeting and any financial documents reviewed in the meeting such as financial statements, the balance sheet and financial plan of the housing company.

When used apartment is transferred some features shall be taken into account. The first one concerns any equipment or other objects belonging to the usual appurtenances of the apartment. All equipment and other objects, located in the apartment at the time when it was shown to the buyer, shall be included in the transactions, unless otherwise agreed (Act № 843, Chapter 6 Section 3).

According to Chapter 6 of the Housing Transaction Act the seller shall be liable for regular maintenance charges and other comparable fees payable to the housing corporation, any other expenses related to management, upkeep or improvement and any fees under public law applying to the time before the assignment of possession of the apartment, unless otherwise agreed (Act № 843, Chapter 6 Section 5). Also, unless otherwise agreed, in the relationship between the parties to the transaction the buyer shall be liable for payment of any stamp duty arising from the transaction (Act № 843, Chapter 6 Section 6).

2.2.3 Obligations of the parties

The Housing Transactions Act defines the obligations of a sale deal parties. The seller has an extensive obligation to disclose information on the apartment to be sold and its surroundings and nearby services. The seller must inform the buyer about all such circumstances that may have an impact on the purchase decision. The seller must disclose whether the property deviates from the standards of the buyer expectation. This level determines with taking into consideration such circumstance like the price and age of the apartment, the level of equipment, general requirements on a reasonable standard of living,

any defects and deficiencies, and etc. The seller must also inform the buyer of financial considerations related to the property. Such considerations are the size of the maintenance charge and any corporate loan, liens and other rights (lease and etc.) with which the apartment will be burden with after the conclusion of the deal. All information given by the seller to the buyer must be true and sufficient.

In the case of the purchasing an used apartment the seller have the obligation to give the buyer:

- house manager's certificate;
- articles of association;
- documents on financial statements;
- the company's budget;
- floor plan.

The house manager's certificate is one of the most important documents to be acquired. It is explained the information about the company's property. According to the housing company regulations the certificate must mention the length of the period the information comes from. The consumer should check if the house manager's certificate includes all information about renovations made to the apartment, or a record only from a certain period. The house manager's certificate may not be older than three months, when the assignment is being carried out. If an older than three months certificate is used the information in it must be checked.

The house manager's certificate should declare the apartment's share of the loan of the housing corporation in such a way that it covers all installments which must be paid in order to get the apartment free of debt. The information should show the total actual amount of the debt, including the interest and expenses. The house manager's certificate should also declare the known faults in the apartment, the resident's maintenance and conversion work, as well as whether the articles of association include a stipulation for maintenance liability. It should also include the amount of parking spaces, the company's maintenance plan, and information about estimates and inspection for its

condition, as well as repair requirements emerging after the shareholders' meeting (<http://www.kuluttajavirasto.fi/en-GB/archive2010/current-issues-in-consumer-law-3-2010/new-house-manager-s-certificate-to-support-housing-trade>).

Also the seller must provide the buyer with Energy Performance Certificate (EPC) and condition apartment certificates. EPC assessed and certifies both the Energy Efficiency and the Carbon (CO₂) Emissions of the property and gives a score out of 100 for each (these scores are converted into a grade from "A" (excellent) to "G" (very poor)). EPS also shows a potential rating, and gives detailed advice on how to achieve this potential value – to improve the CO₂ emission and energy efficiency of the property. It includes an analysis of the property, detailed recommendations of how to improve the current rating, how much money owner can save in the long-run because of these improvements.

The buyer's obligation is to inspect carefully the object. The buyer must visit the apartment at least one before concluding an agreement. The extent of the obligation depends on the age condition of the property. But the buyer cannot use any special technical measures and make any other unusual arrangements in order to fulfill the inspections if it is not the special requirement of the seller.

If the sold property is not in the condition that the buyer has expected and the seller has told, the buyer may be compensated for the fault. Also it is possible to cancel the sale in the case of serious problems. The liabilities of the seller may be limited in the purchase agreement but the limitations must be specified. Normally the term guarantee is five years from the purchase but can be longer if the faults are serious.

2.3 Content of the purchase contract

The deed of Sale form of Rakennusteollisuuden Kustannus RTK publishing company is generally used (Palviainen, K., p.9). This deed of Sale form is right for both the purchasing of RS apartment and used apartment. The form has a comprehensive content, in accordance with the Housing Transaction Act and

approved by Finland's Consumer Ombudsman. The purchase agreement should be made in at least two copies, one for both of the parties. The purchase takes place when the transfer contract is made, that is, usually when the deed of transfer is signed.

The purchase agreement for the apartment must include certain terms. The obligatory terms are:

1. The parties - seller and the buyer.
2. The object of sale – shares of a housing company – with information related to the object. This term includes information about the housing company (the name of the housing company, its business identify code number, its address) and on the apartment (the numbers of the shares bought, the type of apartment, its floor area and the code number of the floor). This information is taken from the certificate of securities.
3. The purchase price. The purchase price is the sum of money paid the buyer to the seller for shares. A reservation fee or down payment paid by buyer shall be entered into this term. The information on the bank account for payment of the purchase and the name of the bank are entered too.
4. The scheme of payment.
5. The time to transfer the possession of the apartment (Nykänen, p.71).

Usually the agreement also includes at least the following terms about the arrangement of mortgages, if any; the limitations of liability for the apartment; the permission of the mate (if the seller is married) to sell the home of the family, even if the mate does not own a shares.

2.4 Tax on conveyances

After the purchase the buyer is due to register the company shares and to pay the transfer tax without prompting. The tax rate of securities is equal to 1,6% of the purchasing price. Transfer tax is paid to the bank account of Eastern Collection Unit, using the bank slip approved by the Finnish Tax Administration (Veroh 6022). There are two scheme of tax payment in depending on the way of conclusion the deal – with or without real estate's services. The buyer should

pay the tax within two months from the transaction in the case of the deal without a real estate agent. In the deal with a real estate agent the transfer tax must be paid at the purchase. If transfer tax has not been duly paid within the set time limit, a tax increase will be payable in addition to the unpaid tax amount. The amount of the penalty interest is fixed in the sale agreement by the parties and can be 9,5 – 12% of the purchasing price per six months. The transferee should notify their domicile's tax office about the tax payment using the form (Veroh 6012) approved by the Finnish Tax Administration (VERO SKATT 71e.10. p. 1). When submitting the notice, the transferee must present documentation to prove the payment of tax, and the contract or the deed of sale.

When a transfer is intermediated by an estate agent, the transferee must pay the tax when the transfer contract is made. The estate agent will fill out the transfer tax return form and send it to the tax office in the domicile of the object of the transfer by the 15th day of the month following the making of the transfer contract. The estate agent will give page one of the form to the transferee as proof of transfer tax payment. In the case of the purchasing a new apartment through the intermediation of a real estate agent the transferee should pay the transfer tax and present proof of payment, a notice of transfer tax and the transfer contract to the tax office in his domicile within two months of the transfer of ownership (Viitanen, p.47).

The buyer of shares for entering in the shareholder register of the housing company must provide the board of the housing company with evidence of the tax having been paid. The information is provided using the part of the notification submitted to the tax office remaining with the transferee or a certificate provided by the real estate agent. The buyer who has transfer tax-exemption also shall declare transfer tax.

No transfer tax is payable on acquisitions of securities on the basis of a gift, inheritance, bequest, partition and dissolution of joint ownership if the acquisitions are completely gratuitous.

First-time homebuyers (also foreign first-time homebuyers) need not pay the transfer tax when the following requirements are met:

1. First-time homebuyer has received at least half of the relevant shares or participations that entitle to the possession of an apartment;
2. First-time homebuyer uses or will use the apartment as the own regular residence;
3. First-time homebuyer has not, after 1989, held half or more of shares of a housing company/apartment, flat/house;
4. First-time homebuyer is between 18 – 39 years of age when the deed of transfer is signed (Publication of the National Board of Taxes 70e.07).

3. THE HOUSING COMPANY

Owner-occupied apartment building means that the property are owned and managed by the housing company. These companies issue the right to live in their properties to shareholders. The company essentially sells its shares in exchange for the right to possess an apartment within the company.

All Finnish housing companies are incorporated as non-profit limited-liability companies (LLC or Osakeyhtiö Oy). Limited-liability Company is a type of business ownership combining several features of corporation and partnership structures. Like LLC Housing Company is registered at the Trade Register of the National Board of Patents and Registration (the Trade Register).

Like LLC the purpose of a Housing company is to generate profits for the shareholders, unless otherwise provided in the Articles of Association (Act № 624/2006, Chapter 1 Section 5, p.1). Housing Company is designated for management of the houses.

Housing companies are focusing primarily on the needs of their members. The one of the responsibilities of a housing company before the shareholders is constant maintenance work on the buildings within this housing company. The company is charged with the structures, insulation and basic systems like

heating, electricity, data transfer, gas, water, sewage, ventilation. Residents pay a monthly fee to the company to cover utility bills and can also influence the housing company's policies at open meetings.

3.1 Legislation

The most important legislation on the administration of housing companies is contained in new Housing Company Act (1599/2009). The Finnish name of this act is Asunto-osakeyhtiölaki. The new Housing Cooperative Renovations Law that came into effect in Finland in July, 2010. The old version of the act is Ne 809, Housing Companies Act, 1991. The aim of the new act was to clarify the Finnish housing law.

In comparison with the old act the new one provides for a new scheme of renovation work notification. A key reform for shareholders is that a written notice to the housing company, instead of a verbal one, is now required for many alteration and refurbishment works. The company will grant permission, ask for further clarification, or prohibit the work. The basis for the division of responsibility remains the same as before.

The law stipulates that all shareholders must inform their building's superintendent or housing board about the range of alterations that they may wish to make in a notification. The written notification reveals to the company who is doing, what and when. The aim of the reform is also to guide shareholders towards better planning of their maintenance and repair work and to using professional workers. It encourages owners/shareholders to take care of their living spaces.

Figure 3.1 describes schematically the relationship between the board of a housing company and the shareholders who decide to carry out renovation works. The board of a housing company decides to accept or not the shareholder application on renovation implementation. The written notification like the application shall contain all necessary information about planning works. On the basis of this information the board make a decision on the accepting.

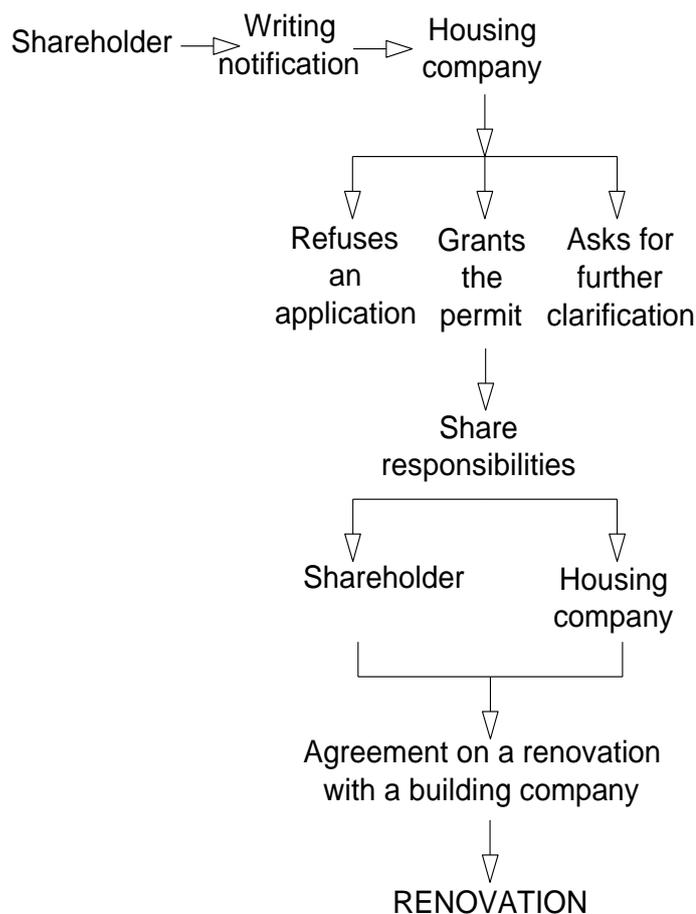


Figure 3.1 Procedure for taking decision

After granting permit by a housing company all planning works are distributed between the housing company's responsibilities and the shareholder's responsibility. The list of maintenance responsibilities is described in this chapter below.

3.2 Housing Company organization and management

The management of a limited liability company vests by law in the company's board of directors (the board). The board is comprised by at least three members (or at least one deputy member if the company has less than five residential apartments in the possession of shareholders) and elected by the shareholders' meeting.

The board like a manger is entitled to represent and sign on behalf of the company. The board is responsible for the management and proper arrangement of a company's operations. Also the board shall see to the company's bookkeeping and financial management. A housing company can have a superintendent appointed by the board. The superintendent shall see management of the company according to instructions and orders issued by the board. The superintendent, members of the board and supervisory board must act in the best interest of the company, and in accordance with both the articles of association and the Housing Companies Act.

Another obligatory member of the company is a chairperson. The chairperson is elected by the board or someone according the articles of association. The chairperson is responsible to convene the border and superintendent when it is needed. A housing company also shall have at least one auditor. The auditor is elected by the shareholders' meeting.

As a legal entity, Housing Company can contract with other companies or hire individuals to provide it with services, such as a maintenance contractor or a building manager. The border with the superintendent hire employees, such as a manager or a caretaker, to deal with specific things that volunteers may prefer not to do or may not be good at doing, such as maintenance works.

Like LLC a housing company should have the article of association. All shares carry equal rights in the company, unless otherwise provided in the company's articles of association.

A housing company shall have own capital. The capital amount resides in the shares negotiability. Individuals, corporations, or other LLC's can buy the shares and become the member of the housing company. Shares are offered by the company for trade, or transferred. Its shareholders bear no liability with their assets, to the company's debts and obligations. Company's shares are issued for non-cash consideration. All the shares in the company confer equal rights within the company unless provide by the Housing Company Act or the articles of association.

3.2.1 Fund for the company's expenditure

The maintenance charges are used by a housing company for covering its expenditure. The main expenditure is to upkeep and management of real estate and buildings. Also maintenance charge is used for renovations and modernizations aimed at making the real estate and building meet normal current requirements.

A maintenance charge is paid by the shareholders to a housing company. The amount of payment is laid out in the articles of association and depends on different kind of expenditure (floor area of the apartment, the number of shares held, actual consumption of water or electricity, the floor number and etc.).

3.2.2 Distribution of maintenance responsibilities

A distribution of maintenance responsibilities between a housing company and shareholders is described in the new Housing Companies Act № 1599/2009 in Section 2 and 3. The articles of association and agreements are other documents that contain amendments to the act and additional regulations about the maintenance distribution.

According to the provisions of the Housing Company Act the maintenance responsibilities for the building and other premises of the company are distributed between a housing company and its shareholders. Other additional conditions about distribution of the maintenance rights can be prescribed in the articles of association during the general meeting.

In special cases the performance of maintenance measures appurtenant to a shareholder's responsibility can be performed by company's expense. For example if these measures are connected to other maintenance or renovation work in the company or if the measures are otherwise financially appropriate from the company's viewpoint and do not violate equality between shareholders. This decision is made on the general meeting.

It is possible to transfer the company's maintenance responsibilities to the shareholders during an open vote. Any changing the article of association requires at least two thirds of the votes given by the shares presented in the meeting. A separate agreement between a shareholder and the company should be done in case of a transfer in responsibilities (Chapter 4 Section 2 and 3. Act № 1599/2009).

3.3 Maintenance responsibilities

Building management besides security and cleanliness of buildings, should also include implementation of maintenance plans to provide a safe and pleasant living environment. Subjects of maintenance can be premises, outdoor areas, building services and construction.

Premises maintenance is considered further. Premises maintenance is the practical (technical and economical) upkeeping of it. Premises maintenance includes all items related to routine repair of buildings, structures of the buildings, and appurtenances, including normally recurring repairs and preventive maintenance. The main targets of apartment maintenance consist in upkeep of:

- the value of apartments;
- good technical condition in apartment facilities;
- usability of apartment facilities;
- tidiness and hygiene in apartments;
- comfort and pleasant living environment.

Reparation and maintenance work on a building are mainly in the owner's responsibility, i.e. a housing company and the shareholders. A housing company and its shareholders have the maintenance responsibilities which are prescribed by the Housing Company Act. These responsibilities are differed from each other between company's responsibilities and shareholder's responsibilities. The performance of all maintenance works must be with following of good construction practice. The executor must guarantee that the works are planned, implemented and supervised in a way that does not caused

any damages. And they are responsible for any damages caused by their negligence. This obligation is equally for the company and for the shareholders.

The company's and the shareholders' maintenance responsibilities concerning apartment facilities in (like bathroom, toilet, sauna) include all points described in Table 3.1.

Table 3.1 Maintenance responsibilities concerning facilities (Petäjä, pp. 10-31)

Structure	Company	Shareholder
Framework	Basis structure of intermediate floor, exterior/interior walls, and heat, water and sound insulation of these structures	Interior paintings, paneling, tiling and other equivalent floor and wall coatings; interior plastering, filler surfaces and suspended ceilings; interior doors
Window	exterior parts of windows - outer frame, casing, outer windowpane	inner part of windows – inner frame, middle, inner windowpanes frame, window stay fastener, windowsills
Water, sewage and water-heating equipment	water taps and mixers, valves, basin, bowl, apartment-specific water meter and circulation pump, boiler, radiators, underfloor heating, dryer radiators; unclogging piping and ducts	water, sewage and water-heating equipment – basins, sinks, furnished saunas, stream baths, hoses and connecting pipe, bidets, mounting a washing machine
Ventilation systems	Fresh air valve, filters, exhaust valve	
Electrotechnical	Distribution center, switch,	Fuse, fluorescent tube, lamp,

systems	socket, apartment-specific electric heating devices and cables with related regulators (underfloor heating, electric heaters and etc.), boiler	led, fiber light, domestic appliances, sauna stove and control center
Fixtures and equipment		Cabinets, cupboards, sauna benches, curtain rods and etc.

3.3.1 Housing company responsibilities

The company is responsible for maintenance insofar as it is not the shareholder's responsibility. The responsibility of the company is limited to the so-called basic level within the company.

The basic level within the company defines as either the original state of the apartments which have been executed by the builder. Also it is a level which was later adopted by the company. The basic level is, therefore, always determined by the measures taken by the company.

According Finnish housing law the company must upkeep the structures and insulation of the apartment within the housing company. Also maintenance of the exterior of the building and balconies is in the company liability. The company is also liable to maintain heating, electricity, water, sewage, ventilation and other such equivalent basic systems. All these basic systems are wholly belong to the company's responsibility with all devices which are part of the basic system within apartments.

All damages of any interior parts of the apartments must repair by company if they are happen caused by a flaw or flaw-related renovation work in structures or in some other parts of building which are belong to the company's maintenance responsibility. In the case of moisture damage it includes the restoring of the bathroom surface to the basic level.

Structures, insulation and basic systems are in a housing company responsibility if the company has either executed the previous alterations itself or accepted the responsibility for. Also it is concerning a repairing the apartment interiors to the current basic level within the company. Any normal wear and tear caused by the use of the premises is in the company's responsibility.

In the case of installations which are comparable to measures that the company has either executed itself, has been able to supervise the implementation or accepted the responsibility for are the company's liability even if through these installations are conducted or commissioned by a shareholder.

Concerning apartment facilities the company responsibilities consist in maintenance and repair of general structures and apartment-external parts and the basic systems' equipment. During all maintenance and renovation the company is responsible for following good construction practice in mutual understanding with the shareholder.

3.3.2 Shareholder's responsibilities

The shareholders are responsible for the interior of the apartment that they occupy. This liability does not include the structures, insulation and basic systems that are in the company's responsibility. In other words all reparation works that result from so-called decorative additions or special structures is the shareholder's responsibility.

The main aim of shareholder concerning this liability is carefully upkeep the apartment and carries out any maintenance work. But the works should be in a manner that does not compromise the intactness of the real estate, building or apartments that are in the company's responsibility.

The shareholder is responsible for any substantial additional costs for the apartment's improvements. The shareholders are responsible for all apartment-internal devices that do not belong to the basic systems.

3.4 Maintenance rights

All maintenance rights are written in the new Housing Company Act No 1599/2009. Shareholders' maintenance rights concern alteration and repair works in their apartments. The rights of the company apply in whole to building or buildings which are owned by the company. The company and the shareholders have the general maintenance right to commission each other maintenance works which they perform.

3.4.1 Housing company rights

A housing company has the right to be a commissioner for controlling the process of apartment-specific repairs which are carried out by the shareholder. But in this case this repair work should be the company's responsibility. As the commissioner of the work, the company has the right to determine the scope and performer of the reparation work.

The company has the right to demand the notification from shareholders about any estimated repairs or renovation in the apartment which include works related to the company's responsibilities. In this notification the shareholder reports about his/her intention to carry out the repairs or renovation in the apartment and the main information about planning works (the list of tasks, duration, information about all executors and etc.). The notification should be in writing. The repairs or renovation works need the notification if it may affect a real estate, building or part of an apartment of the company's or another shareholder's liability. The company or the property manager is not allowed to charge for handling a notification of small jobs (such as interior painting) that are in the shareholders' responsibility.

3.4.2 Shareholder's rights

Shareholders have the right to conduct maintenance and alteration work in their own apartments according to the Housing Company Act. But before starting of

almost all renovation works in the apartment shareholder should ask the permission for implementation of these works in writing the board or house manager. This obligation of notification should be done in advance of any such work that may affect a real estate, building or part of an apartment.

The shareholder has right to improve the level of the apartment. These improvements are executed by the shareholder. The shareholder is liable for installations and devices which are not the company's basic systems. The improvements can be carried out during the construction phase or later.

The shareholder has right to implement such apartment-specific repairs by the company's expense which are belong to the company's responsibility. But in this case the shareholder should get an approval for fulfillment these repair works. Without this approval the shareholder does not have this right.

4 RENOVATION PROCESS OF APARTMENT FACILITIES

The main task of a renovation (also called remodeling) is improving building structures and equipment for creation healthy, convenient, attractive living places for people. There are many reasons to renovate and modernize facilities of an apartment. These reasons are depend on the customer needed and the technical condition of the structures. These reasons are economical, technical reasons and operational changes.

With a view to economical reason renovation of facilities may be a good investment in the value of an apartment. Since remodeling a bathroom can increase the value of an apartment. Bathroom renovation makes the apartment more appealing to potential buyers. It is because of quality repaired bathroom is often major consideration in the decision to purchase an apartment.

The technical reason for renovation comes over time. The bathroom needs a repair because it shows signs of damage, wear and tear, and aging of materials and fixtures. Technical reasons for the renovation must be exposed by technical

inspections. During these inspections deformations, mold, rot, partial destruction of building structures and functional wear can be found by the special building control authority or other responsible inspector. And these indicators of technical deterioration show about renovation needed.

Aside from these reasons, renovation helps maintain a quality lifestyle. Decorating trends change and customer starts to dislike the design of the being bathroom or needs more space and new solutions for the facilities. That is why customer decides to start repair. And also the bathroom needs to be safer. Safety upgrade can be the reason for renovation too for avoiding accidents and injuries.

Parties participating in the renovation are customer and contractor. Customer (or developer) is the party who needs the renovation. Generally customer is the owner of an apartment. Customer starts the project and responsible of getting the funding, planning and making the contracts between builders. Contractor is responsible for the implementation of a renovation.

Renovation is not an easy task. Certain things should be done for a successful renovation. The successful renovation project needs careful planning, the necessary permits, financing and a precise agreement with a contractor.

The process of a renovation usually can be broken down into several processes. They are a planning phase, preconstruction phase and building phase (renovation engineering). Figure 1 in Appendix 1 clearly diagrammed the organization of a renovation process. The main questions of each phase are described more detailed below in this chapter.

4.1 Planning phase

Preparation stage is very important for the realization of any construction project. Every home remodeling needs a careful, intense planning. It is essential to have a good preparation from start to finish of a project. Planning will help to keep communication clear and costs realistic.

Firstly the renovation ideas are assessed and discussed during a start meeting between a customer and licensed builders/renovators of a building company. The company representative suggests all possible options for the carrying out of renovation works. He/she helps the customer to choose between the different designs. Discussion should touch upon the issues of the volume of works, duration of works, cost estimate with taking into account customer's needs and possibilities (budget, time). After this study of the customer needs, engineers can create the most effective plan for any particular structures.

The one part of the planning is determining the budget and how much customer is willing to spend to see the project to completion. All too often, people kick off the process without any clear plan of what they really intend to accomplish.

4.1.1 Cost estimation

For any renovation it's important to get some estimates. Approximate cost estimation supports decision making required for the allocation of funds to reconstruction projects. A building company leads the cost estimating effort for the project in accordance with the customer budget. Also the renovation cost estimation shall be complying with association guidelines. Figure 4.1 shows the schematic of the cost estimation process. A preliminary estimation is foregone to a quantity survey. It helps to customer to evaluate the approximate project cost. A quantity survey is a result of the cost estimation and defines exact project cost. The quantity survey is made up during preconstruction phase.

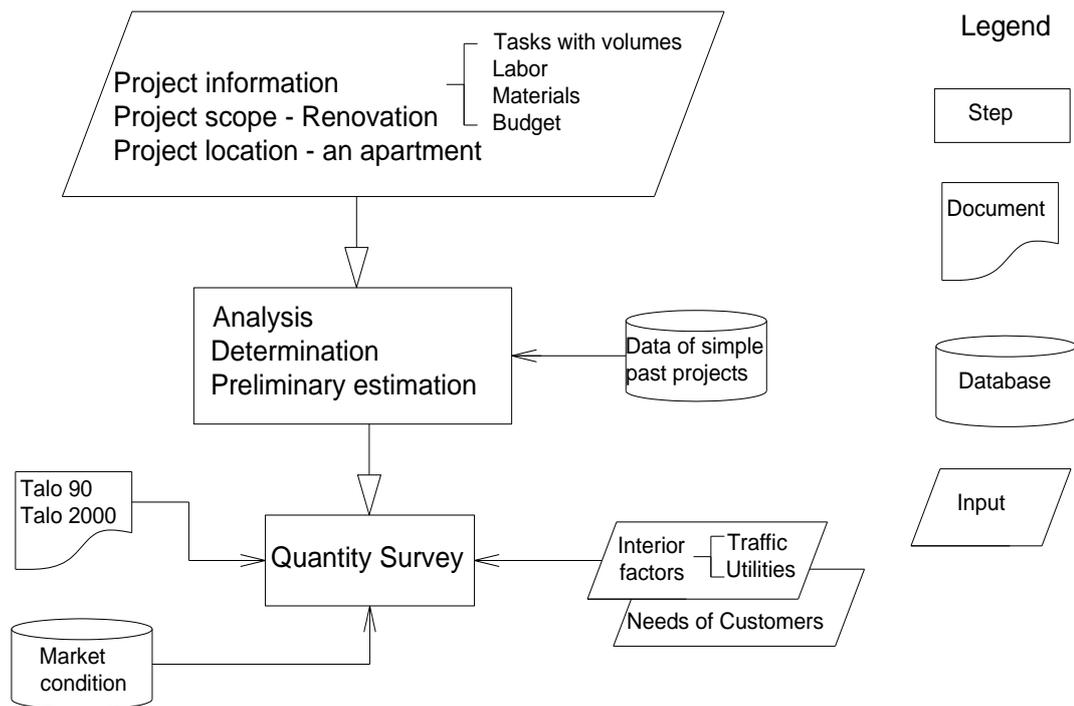


Figure 4.1 Cost estimation process

The costs of the renovations can vary widely. This cost includes different points which are listed below:

- demolition costs are incurred for labour, bin rental and transport and disposal fees;
- labour cost should include total hours required, payroll taxes and workers' compensation insurance;
- cost of safety equipment like hard hats, dust masks, gloves and goggles;
- cost of needed equipment and tools and cost of leasing of expensive equipment with cost of energy use;
- cost of materials including flooring, paint, insulation, tile and etc.;
- cost of new facility's equipment including cabinets, sink, toilet seat, plumbing fixtures, heating and ventilation units and etc.;
- handling cost;
- tax on getting a building permit;
- consulting fees;
- including estimated costs of upgrades and changes;
- 10 - 20% contingency amount for changes in the work;

- appliances and furniture but typically this cost is not included in the construction costs and are supplied and installed by the owner.

4.2 Preconstruction phase

The preconstruction phase includes all works needed for starting a renovation project. All documents needed to starting the renovation are collected by the building company and the customer.

The renovation project is developed by the building company according with the decisions predesigned in the earlier phase. The renovation project includes working drawings represented detailed technical solutions to structures and structural members. Characteristics of the main structures and description of the renovation process should be in the project. The order of the different renovation tasks is given in the description.

Also a quantity survey is performed by the building company during this phase. The quantity survey produces information for a budget, time schedule, resource plan and procurement plan. The quantity survey is done by a quantity surveyor. It is based on nomenclature (talo-2000) and all information is got from drawings and the specification of customer's needs. The budget is divided to labour, materials and other expenses. The budget is the first estimation of a final cost. The general time schedule is also generated by the building company for describing the whole progress of the renovation project.

The quantity survey consists of work and product calculation sheets. The production bill and estimate includes the specification of building materials and elements used for each internal surface (floor, wall, ceiling) with quantities and costs. The work activity plan consists of the list of labour tasks with the volume and cost of works. Building elements (Internal space elements) and products are covered by the Building 2000 Project Classification.

During the cost estimation the internal wall and ceiling space elements are described with using special alphanumeric codes for the identification of the

works combination. It is very important because of the wide range of building materials and their combinations. This code consists of six indices:

- element index (1 - wall, 2 - ceiling);
- surface index (12 – brick, 2 – concrete substrate, 32 – cement substrate, 4 – screed, 9 – painted surface);
- stress group (Group 4, see Table 5.2, p. 44);
- smoothness class (L0, L1, L2 or L3. See Table 5.4, p. 46);
- appearance category (Ts1, Ts2 or Ts3. See Table 5.5, p. 46);
- index of further action (0 – no coating, 1 – painting or papering, 2 – paneling, 3 – tiling, 4 - leveling) (RT 33-10858, pp. 2-3).

A task specification for the bathroom renovation project consists of demolition works, plumbing and electro technical works, leveling of the surfaces, insulation works and finishing of the surfaces. This list of tasks and time plan with quality plan are used for the task planning. There are three work groups during the bathroom renovation - plumbing specialist, electrical technician and general workers. The task planning synchronizes all tasks and defines how the workgroups are handing over the tasks. The main rule is that the tasks should follow each other, avoiding groups working in same working point.

During preconstruction phase the building agreement is prepared for protection the customer and the building company rights. Most standard building agreements provide a process for dealing with variations. The building agreement is concluded between the customer (the developer) and the building company (the contractor) before work commences.

4.2.1 Building agreement

There are RT Information files RT 80265 EN which is template of agreement on small building works in English language. RT-file is Building Information File which contains all information needed by the parties for any construction project with regard to real estate development, construction planning and design, production, building maintenance and the construction products industry. The RT file includes standards, regulations and product files, an index, the RYL

Handbooks (General Specifications for Construction Work) as well as the Building Products Index.

The template of the agreement on small building works is based on the General Terms and Conditions of Building Contracts YSE 1998. This agreement applies to small building works in apartment with short duration (structural work, electrical installations, plumbing, air conditioning, painting and etc.).

The building agreement contract is a document that contains information about parties and clearly states the expectations, responsibilities and rights of the parties involved in a project. The contract should be made in writing. The contract includes obligatory points listed below:

1. Description of the works - explanation about the repair project with a clear definition of the works that will be performed.
2. Object of the works - information about place where repairs is planning.
3. Description of the materials, products and equipment to be used. A request for all written warranties from any appliances, equipment, or materials used in the project.
4. Information about the parties:
 - personal information of the applicant (the developer), phone number, mail address;
 - contractor's name, address, phone, and license number, if required;
 - listing of any subcontractors which may be used on the project.
5. Obligations of the participants:
 - contractor's obligations (to perform works and measurements, to purchase materials and products, to deliver the results of the work, to manage of the site, responsibility for the safety and on-site services and etc.);
 - developer's responsibility to co-operate (to provide the contractor with reasonable time to complete the works, to co-operate ensuring that the works are completed and etc.).
6. Information about the currency (currency unit (euro)).
7. Responsibilities for permissions:

- developer shall obtain official permission for building, dismantling and any other operations that are performed on the project;
 - contractor shall be responsible for seeing to it that the inspections of the works performance are carried out. The liability for the cost of the inspections which are not covered by the building permission fee is belonged to the contractor.
8. Information about the time for performance (a start and estimated completion date, in consideration of situations beyond the control of the contractor (weather, change orders, back-ordered materials, availability of specific subcontractors or other unforeseen problems) which can delay a project, working days (weekdays from Monday to Friday or other time regime).
 9. Information about the liquidated damages which paid by the contractor in case of works be delayed. The developer fixes the rate of pay for the liquidated damages.
 10. Information about the guarantee (the period of guarantee for the building works shall be 24 months calculated from the acceptance of the entire building works).
 11. Information about security (the security rate for the fulfillment of the obligations during the building period and during the period of guarantee). The contractor shall give the developer a surety ship granted by a bank or an insurance institution, or other security. The security also covers additional work and changes. The building period covered by the security (10% of the price exempt from value-added tax) is three months after the approved building works completion date and the security for the period of guarantee (2% of the price exempt from value-added tax) for three months after the period of guarantee.
 12. Information about the insurance. There are two alternatives for the insurance. First one is a so-called constructor's all risks insurance which the contractor takes out in the developer's name. The second one is when the site is covered by a constructor's all risk insurance. If contractors don't carry the appropriate insurance customer could be held liable for any injuries and damages that occur during the project.

13. Information about the price of the project (the price exempt from value-added tax, the amount of the value-added tax and the total amount).
14. Information about the payment (the payment schedule, a down payment rate required by the contractor and installments rate throughout the course of the project).
15. Price fixing.
16. Supplementary specific stipulations.
17. A method for settling any disputes.

This list of the points is based on RT 80265 EN.

All needed permits should be included in the contract. The roles of the contractor and the homeowner as to permits must be carefully laid out in the agreement. Homeowners usually bear the cost of obtaining a permit. A renovation can demand a building or action permit I special cases. But it is needed the renovation approval from a housing company in any case even if a building or action permit are not required.

4.2.2 Building permit – rakennuslupa

According to the provisions in Land Use and Building Act № 132 for starting realization of all construction project the approval from authorities is needed (Chapter 18, Section 125, Act № 132).

The building permit is needed for reconstruction work in any apartment which influences on safety and health of people, also if the reconstruction considerably changes of operational functional of a part of a building.

Every construction project is individual and represents the system of certain measures. The final decisions about necessity to get permit is takes by the local building supervision authority.

As a rule heavy repair is needed to getting building permit. On the other hand, if a building project includes only face-lift which does not affect on structures, the construction works can be execute without building permit.

The municipal authority takes decision about necessity of getting permits. Before the implementation of the building project the applicant should ask about is the permit needed or not in the municipal authority and a housing company border. In absence of a permit, a renovation will be considered a violation.

The action permit is needed for carrying out small building projects. As a rule, the procedure of getting permit is easily. The action permit does not provide for wide supervision from authority. For implementation of works which change plan of building the action permit is needed. Also the action permit is needed for carrying out repairs of sewerage systems.

The first precondition for the application of a building permit is that the applicant proves his/her rights to do reconstruction works on the intended place. The applicant should be an owner or tenant on this place. Another precondition is that the reconstruction meets any technical and other essential requirements. Also all reconstruction works must be organized so that does not cause environmental problems and excessive harm to the neighbors.

The application for a building permit must be submitted to the local building supervision authority in writing form. The proposal form is got in the local building supervision authority. All information about order for getting the permits and list of necessary documents are gave in this proposal form.

The application shall include attached the master drawings of the apartment and the floor plan where it is to observe that the reconstruction will be in keeping with fulfill the requirements set to reconstruction. The drawings must have the signatures of the designer or architect.

The building permit is approved by the local building supervision authority. In every municipality of the country there is a building inspector who prepares the issue or, in case of small buildings, decides the permits himself. The municipal authority asks for opinion from the neighbors and usually also the opinions of the fire and health authority in the municipality. Providers of electricity, telecommunication services, water supply and sewerage must also approve the

application. Neighbors, who have the right to express their opinion, shall be notified when an application for a building permit is submitted. If preconditions for permit are fulfilled in concordance with laws and regulations, the permit shall be granted.

The applicant is required to pay a fee to the local authority for the treatment of the permit. Its purpose is to cover only a part of the administrative cost. The times needed for the treatment of the building permit vary, but are in larger cities in the average between 2 and 8 weeks. An applicant or a neighbor that is unsatisfied has the right to appeal, first to the local administrative court and then to the Supreme Administrative Court.

Generally, contractor, owner, owner's agent or tenant (with permission from the owner) can obtain building permits. In general the contractor often will obtain the permits covering the electrical, mechanical, and plumbing work in addition to the building permit, eliminating the need for any subcontractor to obtain a separate permit. Depending on the community codes, permits in addition to those listed may be required. Be cautious of a contractor who requires that the homeowner must obtain the necessary building permits. It may mean he is not licensed to work in this area.

4.2.3 Condition inspection

Condition inspections are commonplace in real estate. A condition inspection should be carried out with the appropriate expertise for understanding of the building's condition and excluding unnecessary repairs. The inspection provides information on repair and maintenance requirements, also gives indication of defects which can be detected through an external inspection.

Owners and a housing company should provide the inspector with detailed and accurate information regarding the building for correct results. It is good if the owners and company's representatives participate in such inspection.

A standard condition inspection is done on a sensory basis, without breaking down the structures of the apartment or house. For example, humidity measurements are based on a surface reading, which does not reveal possible humidity damage within structures. Focus of the inspection is based on evaluating the overall quality, structural elements, technical systems and charting the need for renovations. Generally a pipe test pressure, waterproofing insulation and tiling inspection, floor slope and electrical inspection are executed by building control inspection during wet room check. After inspection the act of mistakes is drawn up.

Also during the inspection Interior room card (Sisätilan huonekortti) is filled in. The interior room card contains complete information about finishing materials of the floor, ceiling and walls and about technical conditions of the surfaces. The interior room card contains information about original and current floor, ceiling and walls structures and their technical conditions. The technical conditions are estimate in four-points (excellent, good, satisfactory and bad). Also special damages are entered in the card. The interior room card is represented itself a table with all necessary characteristics of structures. The example of the interior room card can be found in the Appendix 1 of the thesis.

4.3 Building phase

The main task for the contractor during building phase is to organize right the process of renovation. To have a successful bathroom remodeling project, proper organization is essential. The correct order of renovation works implementation is very important for quality of the work and also reduces the duration of works. It is the main principle of the work organization that all follow-up works do not trouble already done works.

Renovation of a bathroom starts from surface preparation. The surface preparation includes several standard steps. These steps are a demolition of the old surface (tiles, linoleum and etc.) and a diamond grinding of the floor. These types of works require allotted time depended on the location of an apartment (story) and the method of moving materials out of.

The demolition works include demounting of old non-serviceable bathroom equipment, demolition of faulty surface structures and unneeded partitions. Before starting the next step of renovation all demolition works should be completely done. But it is not necessary condition to a dismantling of a bathroom old surface. However, it is needed operation in a few cases. Firstly this work helps to keep a designed height of the bathroom. Also it is needed when the old surface is in a bad condition and needed a replacement by new one.

The following works are sanitary ware works and electric installation works. And the sanitary ware works like ducting of cold and hot water with sewerage pipe system should be done firstly. Then the surfaces of the floor, walls and ceiling are prepared for further finishing works are carried out. The finishing work direction is top-down.

Before using any building mixtures the substrate must be clean, firm and strong. All impurities (laitance, paint stains, adhesive residues) must be removed, after which the surface is brushed or vacuumed properly. After that the surface must be covered by bonding agent – primer. Concrete subfloors are pretreated with diluted start primer prior to floor screed. With compound surface (paint, ceramic tiles and etc. – nonabsorbent surfaces) undiluted start primer must be used. For walls and ceiling special start primer are used for the surfaces dedusting. In the case of soft substrate it shall be strengthening by special primer.

Rational order for the implementation waterproofing and facing of surfaces in a bathroom shows in Figure 4.2 and consist of 5 steps:

- 1 - strengthening of walls' surfaces and carrying out of a waterproofing;
- 2 - walls tiling, starting from the second layer and then rise;
- 3 - strengthening of a floor surface and carrying out of a waterproofing;
- 4 – a floor tiling and the first layer of walls;
- 5 - filling-in of joints and corners (Waterproofing rules. Kiilto Oy).

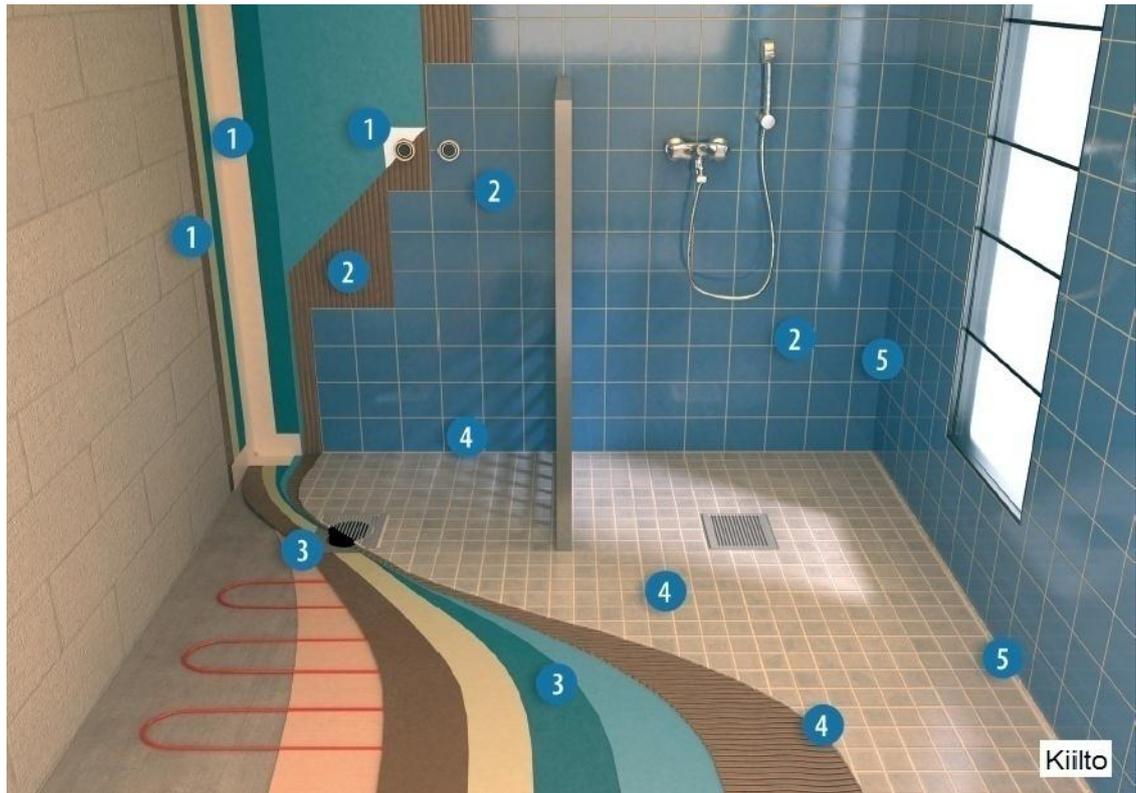


Figure 4.2 Order of a bathroom renovation (Waterproofing rules. Kiilto Oy)

4.3.1 Codes for renovation works

RYL (rakentamisen yleiset laatuvaatimukset - general quality of construction) is the Finnish state codes series of building practice which contains information about quality for different kind of construction works. This guidance line consists of four books – RunkoRYL (quality of frame erection), MaaRYL (quality of earthworks), SisäRYL (quality of general construction works) and MaalausRYL (quality of the finishing). These books are very necessary instrument for contractors and their employees to implement quality construction works.

A few words about RYL codes which used for reconstruction works in apartment are going next. These are two of them - SisäRYL 2000 and MaalausRYL 2001. SisäRYL is the code of the building practice for internal finishes. MaalausRYL 2001 is the general specifications for finishing systems of building surfaces such as painting, transparent finishes and wallpapering for painting work. The codes describe a generally accepted standard of good construction practice. A menu

of building elements, finishing-system and work sections are contained in these codes and specified according to Talo 2000 (Construction 2000) classification system (product and work nomenclature).

Chapters of the codes devoted to work sections define requirements for building products and the performance of labour. Chapters describing building elements in SisäRYL serve as a guide and reminder for design. The finishing systems described in MaalausRYL serve as a guide in planning and carrying out finishing work of building surfaces. These chapters of MaalausRYL contain standards for painting material and work performance.

4.3.2 Facilities in an apartment

Facility in a house is a special room or a part of room which is needed for a particular purpose. Sauna, bathroom and toilet are a common set of facilities in every finish houses.

Nowadays people give the big attention for repairs of their apartment's facilities because it is very important for comfortable life to have the facilities with purity, freshness and which meets the all technical requirements.

Among all the rooms a bathroom has a special place in any house. A bathroom is the most used room perhaps in competition with a kitchen. Also a bathroom is the most private space in a house for people. The functionality of a bathroom greatly effects on people life. Every day people have personal hygiene procedures there. That is why it plays an important role in the lives of everyone.

The sauna is the characteristic part of everyday culture in Finland. At the present, a small apartment sauna has almost become a standard feature of apartments. The apartment saunas are established as an appendage to the bathroom. The apartment saunas are quite small and its space is average 2,3 square meters in floor area. The smallest one can be 1,4 square meters in floor area.

4.3.3 Work safety

All construction works closely associated with operation of the equipment and different tools, and also with harmful factors like dust, toxic gas from paint and etc. The conditions of the works are needed the performance by workers special safety procedures. Safety procedures reduce and eliminate the potential for injury in the workplace. An employer and workers have safety obligations.

The employer shall provide with all necessary safety equipment for each employee. The employer and each employees should be trained how and where to use such equipment. All equipment should be checked on correct work before beginning of the works. And each foreman should control that his/her employees comply with these rules and use this equipment.

Workers should be informed and training about all safety risks during the implementation of any renovation works and know what they need to do to avoid those risks. Table 4.2 shows the information about common risks during the different type of renovation works in an apartment.

Table 4.1 Risks during apartment renovation

Type of work	Subject of influence on people	Protection for employee	Risk
Manual handling	Heavy materials	Sensible footwear with a good grip; use trolleys, hoists equipment for keeping to a min the manual lifting	Problems with health
Demolition and demounting	Work with heavy equipment and tools. Work with dust. Noise. Hand-arm vibration	Following all equipment instruction and properly operate it. Inspect equipment before using. Use glasses, respirators	Accident. Problems with lungs and eyes. Hand-arm vibration syndrome

		and earplug. Follow the working regime	
Works at a height	Work with ladders and scaffolds	Right ladder and scaffold construction. Inspection before using	Accident
Painting, plastering, leveling	Work with dust from mixes and harmful substances. Alkalized fresh mixtures	Glasses and respirator masks. Avoid direct skin contact with substances and use gloves. See MSDS	Problems with eyes and lungs. Irritated skin and mucous membrane
Electro-technical works	Electric current, high electrical voltage	Low voltage is used for tools/equipment. Cables and leads must be protected from damage. Connections must be properly made using suitable plugs	Accident, problems with health
Welding	Condensation aerosols of metal	Glasses and respirator	Problems with eyes and lungs

4.3.4 Building waste management

Timely building waste removal measures should be taken by the building company or the customer. The responsible for the organization of the removal is assigned by terms of the building agreement on renovation works.

The responsible should find a special company specializing in waste removal. Also the building company can organized a transportation of building waste removal by own cars and labors to the special place for storage and reprocessing of waste.

4.3.5 Working regime

In the first place a working regime of the renovation is fixed depending on demands of the neighbors. All renovation and repair works should be carried out without action of any discomfort to the neighbors. People are not involved in the renovation work should be kept away from the source of detriments. Any noisy works must not carry out during holidays.

The working regime should be prescribed in the agreement on renovation. The customer and the building company fix the time for implementation of renovation work. Neighbors should give their consent with the working regime fixed in the agreement. Also neighbors should be informed about the duration of works.

5 APARTMENT FACILITY STRUCTURES

The main goal of facility's renovation project is to do the project which shall satisfy the needs of a customer. And the project at the same time shall meet all requirements of the building regulations, norms and specifications. These are National Building Codes (RakMK), RYL Codes, RT-information files. Table 5.1 lists the main Building Codes and RT-files.

Table 5.1 Finnish Building Codes and RT-files

Short name/sign	Name
C2	Moisture. Regulation and guidelines
D2	Indoor climate and ventilation of buildings. Regulations and guidelines
SisäRYL 2000	Code of Building Practice. Internal finishes
MaalausRYL	General specifications and finishing systems for painting work
RT 80-10712	Moisture damages in buildings. Renovation.
RT 33-10858	Interior walls and ceiling.
R T 84-10806	Renovation of wet rooms in residential apartment.

RT 84-10759	Wet room structures.
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There are the main indices of a wet room and its surfaces below. The first one is the characteristic of an indoor environment. It defines the optimal renovation way and shows the level of mechanical and physical environment influences on internal surfaces. Internal surface requirements of resistance against stress are represented in four stress groups (rasitusluokka). Bathrooms belong to the stress group 4 – RL4 (RT 33–10858, table 3, p.4. SisäRYL clause 732.21, p.285). Table 5.2 shows main characteristics of these groups.

Table 5.2 Environment stress groups

Stress group	Group 1 RL1	Group 2 RL2	Group 3 RL3	Group 4a RL4a	Group 4b RL4b
Type of Indoor climate	dry	dry	dry	wet	wet
Decree of mechanical loads	low	common	high	high	high
Other loads	-	-	-	-	chemical
Requirement of surface	not needed in high abrasive resistance	should have enough abrasive resistance	should have the high abrasive resistance	should have the high abrasive resistance.	should have the high abrasive resistance.

Bathroom stress group RL4a means that the one of the defining characteristics of a bathroom is moisture. RakMK C2 is building regulations and guidelines concerning moisture. There are all necessary measurements to avoid damages from moisture. The measurements are aimed to make the microclimate of a repaired facility which shall not carry health risks to people and shall not store moisture in the components (RakMK C2; clause 1.2.1, p.3).

Bathroom is the wettest room in the home and any structures will be subjected to frequent exposure to water. It is happen either directly through drips, splashes and spillages or indirectly though the cooling of steam that has risen from hot water being used in a bath or shower. If the structures are made wrong it will be cause of moisture damage of the structures. That is why the main requirement for the renovation of wet room structures, especially floor, are to use water resistant building materials. According RakMK C2 wet room's floor and walls should have water insulation and ceiling should be made from water resistant materials (C2, clause 7.2.1, p.10. RT 84-10759, p.2). Table 5.1 shows requirements for facility's structures against water influence (RT 84-10759, p.2).

Table 5.3 Requirements for structures against water influence

Space	Floor	Wall	Ceiling
Bathroom	Waterproofing	Waterproofing	Moisture resistant surface
Sauna	Waterproofing	Vapor proofing	Moisture resistant wooden surface
Toilet	Waterproofing	Waterproofing of sink space	-

Type of water insulation material is chosen for each specific case. Waterproof layer shall have enough strength, water resistance, flexibility, layer thickness and bonding strength with substrate. Waterproof floor membrane shall be prolonged on walls in minimum 100 mm (C2, clause 7.2.3.1, p.10). In a wet room structures unnecessary joints shall be avoided.

In order that water is going away straight to a drain according RakMK C2 the floor of a bathroom should have slope in direction to the drain. The slope shall be enough for free directing water at the drainage and shall be minimum 1:100 (C2, clause 7.3, p.11). A heated floor is recommended for bathroom for speed up moving away of water. Wet rooms shall have a good ventilation system for making the requisite microclimate (D2, clause 2, pp.3-4). The temperature in a bathroom shall be 22 °C (D2, table 1, p. 3).

There are also requirements for surface finishing. According SisäRYL any finished surfaces should be strong, stable against stresses, have desired and required external appearance and smoothness, have possibility for following coating if it is needed (SisäRYL, clause 732.2, p.285).

Appendix 3, pp. 78-80 contains the detail drawings of main wall and floor joints. The first one is plastic floor and tiling wall joint. The second one is tiling floor and wall joint. And the third one is the wall-floor joint between a sauna and washroom.

There are four smoothness classes (tasaisuusluokka) of wall and ceiling surfaces – L0, L1, L2, L3. The walls, ceiling and floor surfaces of class L1 have the most smoothness surface. Added symbols means: P – following coating, tiling; K – varnish; V – finishing, painting. (SisäRYL clause 732.22, p. 285).

Table 5.4 Smoothness classes and their further coating (RT 33-10858, p.4. SisäRYL , clause 72.5, p.282, clause 37.5, p.155)

L0	L1	L2	L3
High plastering performance. Further painting	Further painting, plastic lining, papering	Further papering, covering with thick textile or tiling	Further tiling

Requirements for walls and ceiling finishing are define in three categories. There are three finishing appearance categories (ulkonäköluokka) for walls and ceiling – Ts1, Ts2 and Ts3. These categories are defined quality of finish layer performance for wall and ceiling. (RT 33-10858, p.6)

Table 5.5 Appearance categories for walls and ceiling finishing

Ts1	Ts2	Ts3
High requirements for a complete surface appearance, smoothness,	General requirements for a complete surface appearance, smoothness, homogeneousness. The	Less than general requirements for Ts2 category concerning a complete surface

homogeneoususness. Particles shall not be. Defects, scratches, corrugations and crack shall not be visible.	most commonly used. Particles shall not be. Some defects, scratches, corrugations and crack are admitted.	appearance, smoothness, homogeneoususness. Some defects, scratches, corrugations and crack and pores are admitted.
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The main demand for workers is that they must have VTT certificate for the implementation of structures in wet rooms. It means that workers know the specifics of such structures and painfully aware with working instructions, and also have sufficient skills.

Bathrooms, WC and sauna have space requirements. Table 5.6 contains information about the main permissible dimension between drains and wall, and also the main facilities fixtures.

Table 5.6 Space requirements (RT 84-10806 & Finnish Sauna, pp.38-46)

Object	Distance/size	Value
Door of a bathroom/WC room	width x height	800x2100 mm
Door of a sauna	width x height	700x1900 mm
Sauna	height	2000-2200 mm
Sitting platform	length	≥ 600 mm
Sitting platform	width	400-900 mm
Platforms' step	height	300-400 mm
Drain center of a toilet seat and wall	distance	100 – 200 mm
Wash basin drain center and wall	distance	90 – 110 mm
Floor drain center and wall	distance	≥ 600 mm
Shower cabinet	width x length	700x900 mm
Shower cabinet and wall	distance	≥ 700 mm
Toilet seat center and sink center	distance	≥ 500 mm
Sink center and wall	distance	≥ 350 mm
Toilet seat center and wall	distance	≥ 350 mm

Quite high requirements are laid claim to all building materials used in a wet room renovation. The building materials should cope with the demands placed on it without being damaged. It is also important for building materials used in a wet room that they will not develop mold or mildew when exposed to moisture. Leveling compounds, tile adhesives, joint mortars should be cement based. All water insulation materials shall have VTT certificate. All building materials shall have certification mark CE for providing the proof of the quality corresponded with European standards (SisäRYL clause 632.11, p.255).

Also for indoor climate the emission class of building materials is important value. The emission class of building materials shows the level of emission and the quality of the materials concerning indoor air. The emission classification has three classes. There are M1, M2 and M3. The emission class M1 corresponds to the best quality and lowest emission. Any plasters, tiling products, leveling agents, putty, mastics, fillers, screeds and renders shall not contain casein if they belong to the emission class M1. The emission class M1 is an absolute advantaged when the contractor choose the products in Finland.

The choice of the required materials for renovation depends on:

- current structure (tiles, concrete slab, painting surface and etc.);
- the condition of substrate (peeling surface, mold and rot, corrosion and etc.);
- current condition of insulation systems (water insulation with defects, low level of sound insulation);
- planning thickness of layer;
- hurry of works (using rapid mixtures).

There are four main trade names in Finland which produce building mixtures for the construction. These are Kiilto, Vetonit, Casco, FESCON. It is very important to use the same trade mark of materials for structures. RT-files of each trade mark contain information about the production processes applied during the renovation and design solutions. All works shall be carried out in accordance with the working instruction of producers.

5.1 Conception for bathroom and sauna floors

Traditionally, most popular materials for the coating of a bathroom floor are ceramic tile or vinyl. These materials are affordable, waterproof and easy to maintain. There is needed water insulation under such coating. Another floor material is a plastic mat. This material does not demand water insulation under it. This material itself has good waterproofing characteristics. The main requirement for the surface of any floor coating that it shall not be slippery when the floor is dry or wet. And also shall be easily to clean and wash.

5.1.1 Possible floor structures

Floor structures are needed good designing concerning moisture resistant because of great water influence on it. Standard solutions for a bathroom and sauna floor is tiling floor (Figure 5.1). Tiling floor in a bathroom, WC and sauna can be equipped with water-circulation or electric heating elements (Figure 5.2). Another floor type for a bathroom is a finish coating with a plastic mat (Figure 5.3). In this case the plastic mat is also a waterproofing layer.

1. Tiling floor.

The most popular material for floor coating is tiles. Tiling floor are used for bathrooms, WC and saunas. Tiles are fixed to the floor by tiles adhesive plaster. Choice of the adhesive plaster depends on the size of tiles and the materials (ceramic or stone) of tiles. There are four conceptions for tiles floor of different trademarks – weber.vetonit, Kiilto, Casco and FESCON.

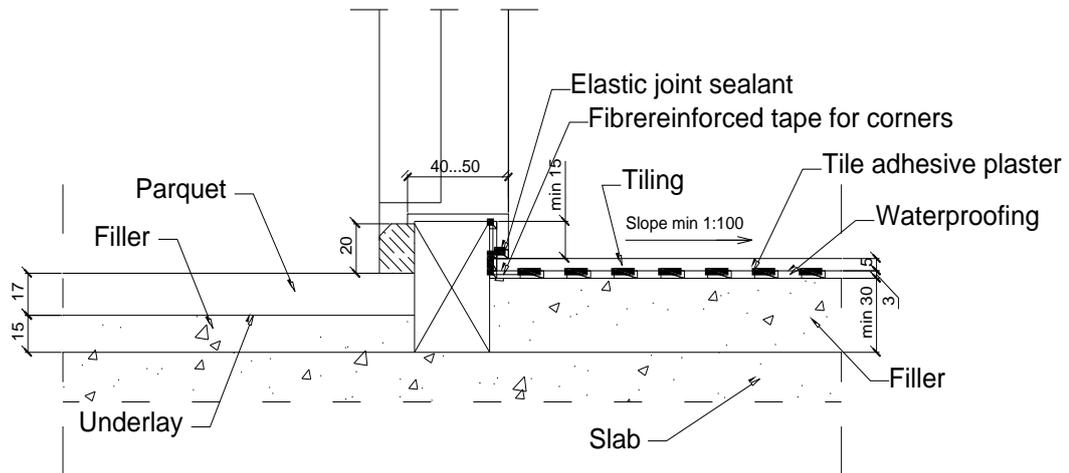


Figure 5.1 Tiling floor

Ceramic tiles, weber.vetonit TG, weber.vetonit SSL
 Tile adhesive plaster - weber.vetonit RF/RFF/RFB
 Waterproofing membrane - weber.vetonit WP, 2 layers
 Moisture barrier - weber.vetonit MS
 Primer - weber.vetonit MD 16
 Present substrates/floor screed for casting -
 - weber.vetonit 4400/5000
 Primer - weber.vetonit MD 16
 Slab

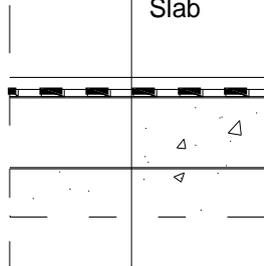


Figure 5.2 Weber.vetonit floor conception

Ceramic tiles, Kiilto Saumalaasti,
 Kiilto Saniteettisilikoni
 Tile adhesive plaster -Kiilto Saneerauslaasti/
 Superfix/ Kerapid/Superfix DF/Remonttilaasti
 Waterproofing membrane - Kiilto Kerafiber/Kerami
 Moisture barrier - Kiilto Keraprimer
 Present substrates/floor screed for casting -
 - Kiilto 70/77/Maxirapid pikatasoite/Fiberflex
 Primer - Kiilto Start Primer
 Slab

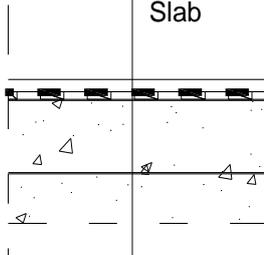


Figure 5.3 Kiilto floor conception

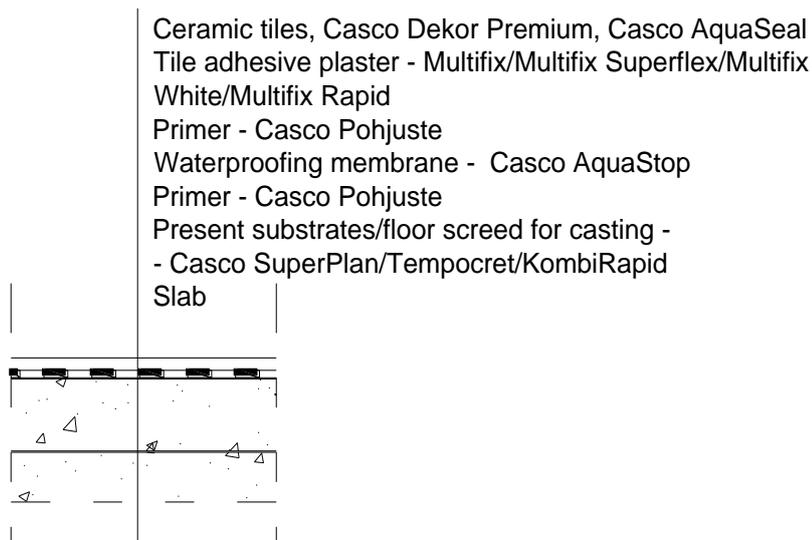


Figure 5.4 Casco floor conception

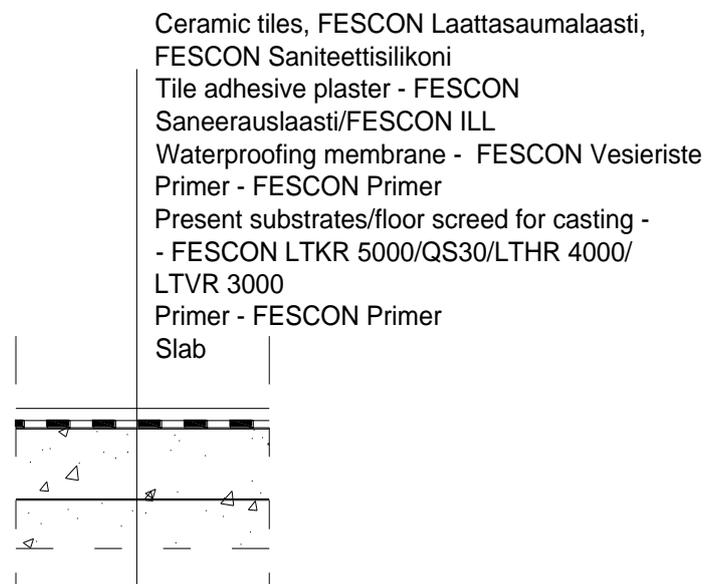


Figure 5.5 FESCON floor conception

2. Tiling heated floor.

Underfloor heating increase the level of comfort for users, and also raises the safety of a room by drying a floor surface and thus reduces of the risk of slipping. Underfloor heating has own sources so that it can be used during also the period when the central heating of the building has been disconnected.

Heating of a floor can be realized by heating pipes, heating cables or fiber glass heating mat. The choice of floor type depends on the possible thickness of the floor structure and future finish surface (ceramic tiles, stone tiles, linoleum and

etc.). Besides general heating cables other heated floor types have self-regulating heating systems and special energy-efficient systems. The energy-efficient system combines the self-regulating heating system with heat-insulated polystyrene panels. The heating mat is very effective type of heated floor in the renovation because a thick layer of screed is not needed. For example the heating mat's thickness can be 3 mm and a thickness of the heating cable can be 6 – 8 mm.

The heating elements are installed during casting in the topping layer. The distance between water membrane and electric heating elements shall be more than 5 mm and between water-circulation heating pipes – more than 15 mm (Vetonic waterproofing. Work instruction. p.6).

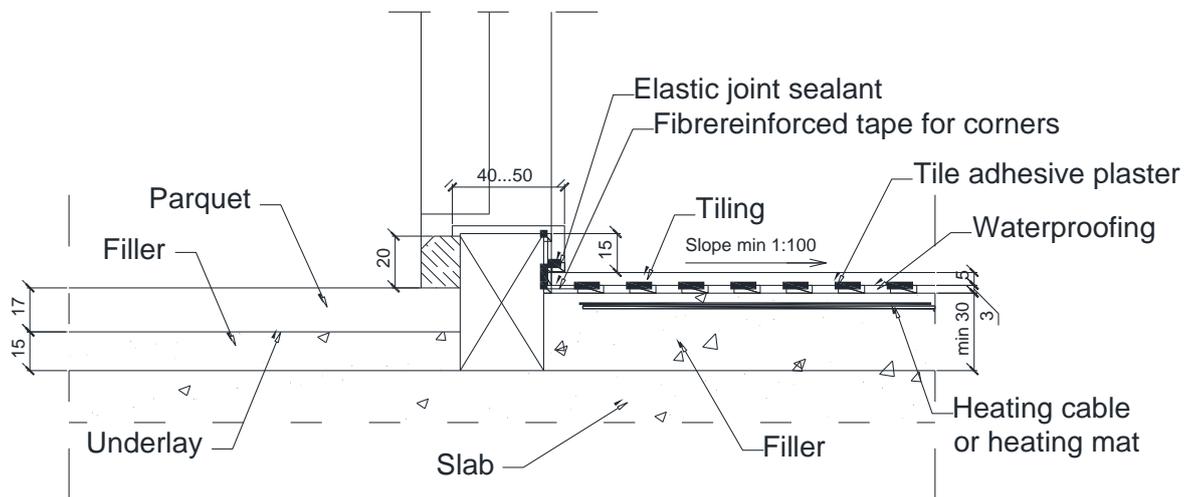


Figure 5.6 Heated tiling floor

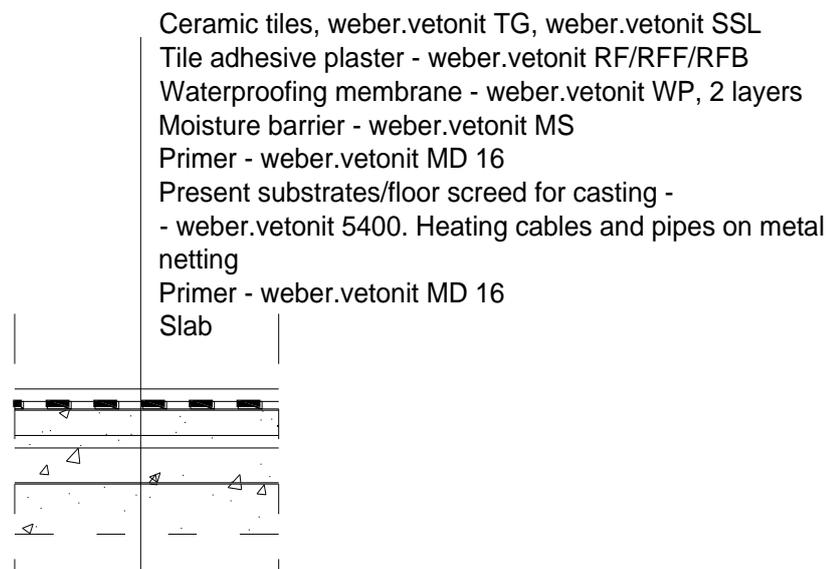


Figure 5.7 Weber-vetonic conception for heated floor

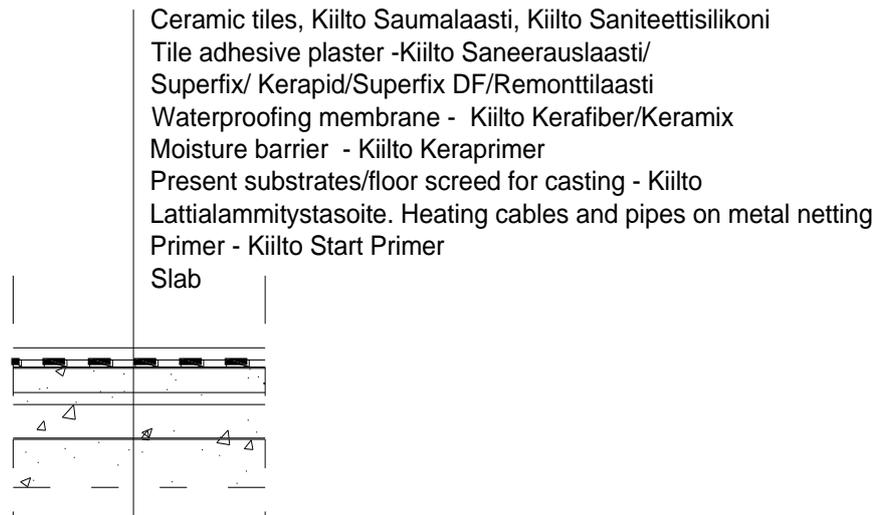


Figure 5.8 Kiilto conception for heated floor

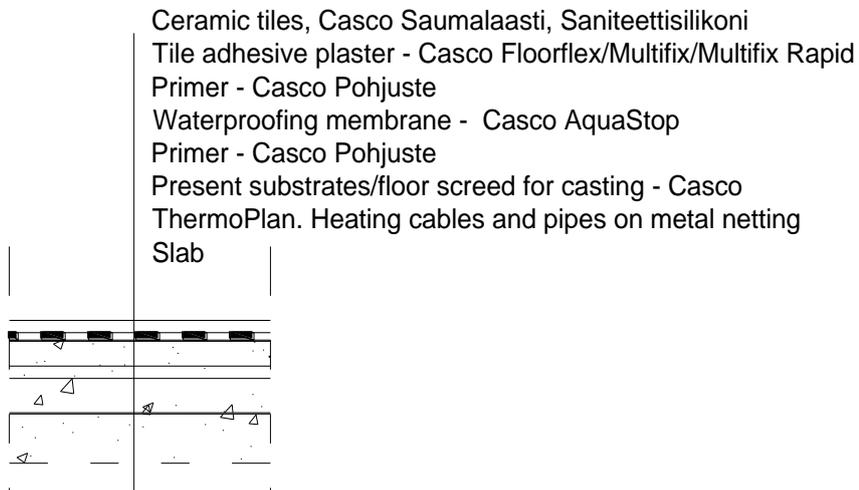


Figure 5.9 Casco conception for heated floor

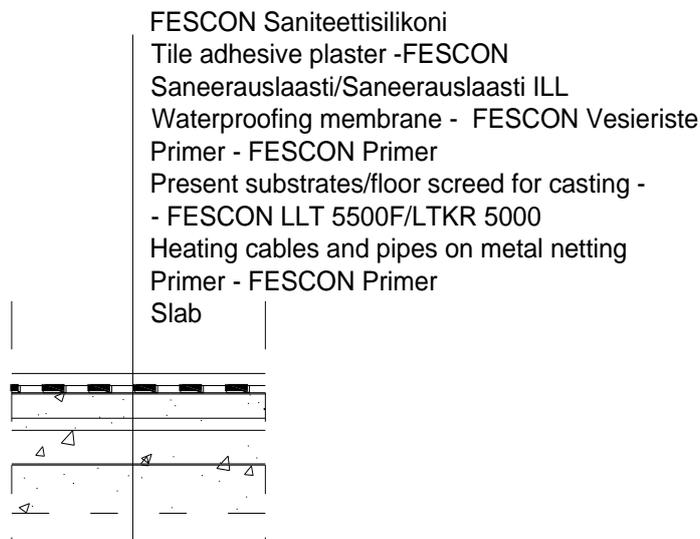


Figure 5.10 FESCON conception for heated floor

3. Floor with plastic mat. Plastic mat can be used in the capacity of the waterproofing layer for a bathroom floor. In this case the plastic mat are also be the final layer (Figure 5.11). The mat shall be fixed to substrate by special adhesive mixture.

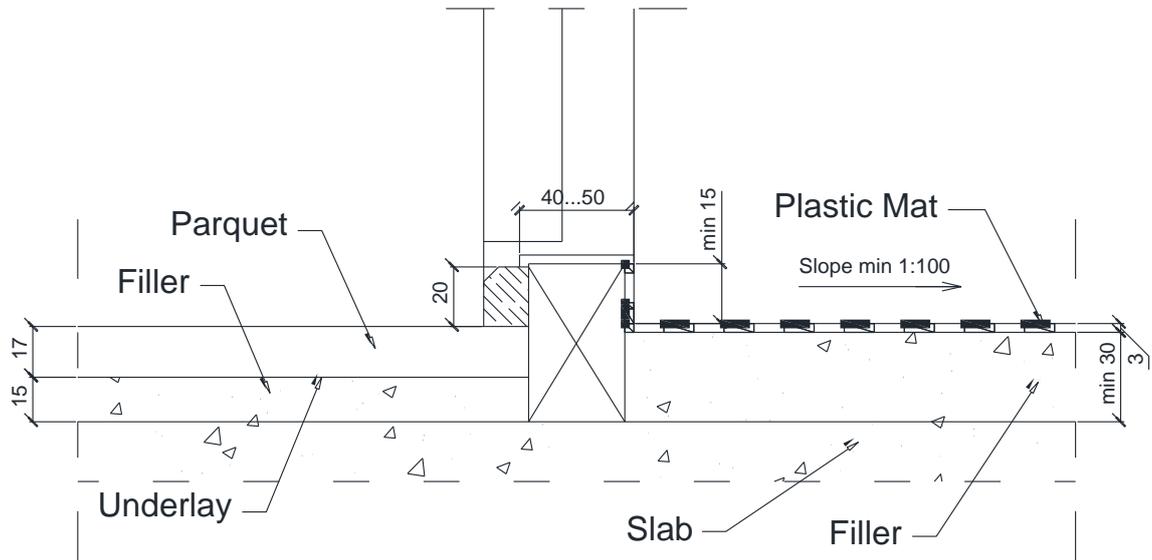


Figure 5.11 Plastic floor

5.1.2 Building materials

Table 5.7 presents building dry mixtures needed during wet room renovation of floor structures. There are weber.vetonit, Kiilto, Casco and FESCON products. The table contains the main characteristics of the dry mixtures like time needed for drying, consumption and maximum possible thickness for one layer. The mixtures divided into several groups in dependence on tasks.

Table 5.7 Building materials for floor

Task	Special application		Name of materials	Alloted time		Consump- tion
				Foot traffic	Final covering	
level	Subst- rates	Thick-ness, mm		standard		

Common substrates Rough leveling	5-100	weber.vetonit 5400	2-3 hours	1-3 days	1,8 kg/m ² /mm	
	5-100	Kiilto 70	2 hours	1-5 days		
	3-50	Kiilto 77	4 hours		1-5 days	1,6 kg/m ² /mm
	1-50	Kiilto Lattialämmitystasoite	4 hours			
	3-40	Casco ThermoPlan 3652	4 hours	1-5 days	1,8 kg/m ² /mm	
	15-80 (100)	FESCON Lattialämmitystasoite LLT 5500 F	2-3 hours	1-5 days	1,5 kg/m ² /mm	
	3-80	FESCON Karkealattiatasoite LTKR 5000	3 hours	1-8 days	1,8 kg/m ² /mm	
			rapid			
	0-30 (50)	weber.vetonit 4400	1 hour	2 hours	1,6 kg/m ² /mm	
	5-50	weber.vetonit 5000	2-3 hours	1 day	1,8 kg/m ² /mm	
	1-40	Kiilto Maxirapid	1 hours	2-4 hours	1,5 kg/m ² /mm	
	0-10	weber.vetonit 3300	2-4 hours	1 day		
	Compound substrates Rough leveling	3-20	Kiilto Fiberflex	1 day	1-3 days	1,6 kg/m ² /mm
		10-80	Casco TempoCret 3650	3 hours	1 day	1,8 kg/m ² /mm
5-75		FESCON Erikoisnopea lattiamassa QS30	1 hours	1 day	1,5 kg/m ² /mm	

	Common substrates Thin-layer leveling			standard		
		0-5	weber.vetonit 3000	2-4 hours	1-3 days	1,5 kg/m ² /mm
		1-7	kiilto 97	4 hours	1-2 days	1,6 kg/m ² /mm
		3-20	Kiilto Tasoflex	5 hours	1-3 days	
		0,5-25	Casco SuperPlan 3668	3 hours	1-2 days	1,6 kg/m ² /mm
		2-30	FESCON Hienolattiatasoite LTHR 4000	3 hours	1 day	1,5 kg/m ² /mm
		1-5	FESCON Viimeistely Tasoite LTVR 3000	2 hours	1 day	1,6 kg/m ² /mm
				rapid		
		1-20 (30)	Casco KombiRapid 3729	30-40 minutes	2 hours	1,6 kg/m ² /mm
Primering	For screeds	weber.vetonit MD16 Kiilto Start Primer Casco Pohjuste 3698 FESCON Primer	2 – 4 hours			
	Moisture barrier	weber.vetonit MS	1-2 hours	3 hours	0,1-0,2 l/m ²	
Water insulation	Watertight membrane	min 0,5 mm	Kiilto Kerafiber	2 hours	1-3 days	1 l/m ²
		min 0,6 mm	weber.vetonit WP	6 hours	12 hours	1,1 l/m ²
		min 0,5 mm	Casco AquaStop	5 hours	12 hours	0,45 l/m ²

		min 0,6 mm	FESCON Vesieriste	1-8 hours	12 hours	1 l/m ²	
	Water- proofing membrane	min 0,8 mm	Kiilto Keramix	1-2 hours	4 hours		
	Primering		Casco Pohjuste 3698	2-4 hours			
Flooring	Tiles adhesive			standard			
		Common substrates	weber.vetonit RF	12 hours	2 weeks	3 kg/m ²	
		Compound substrates, for fixing ceramic and stone tiles	Kiilto Superfix DF	1 days	1 weeks	2-3 kg/m ²	
			Kiilto Saneeraulaasti				
			Casco Multifix 4141	4 hours	1 day		
			Casco Multifix Superflex 4142	1 hour	1 day		
			FESCON Saneerauslaasti	4 hours	2-3 days		
		Compound substrates, for fixing big- sized ceramic tiles	Kiilto Lattialaattalaassti	5-24 hours	1 week	3-6 kg/m ²	
			Casco Floorflex 3714	3 hours	16 hours	2,6-3,3 kg/m ²	
			FESCON Saneerauslaasti ILL	1 day		3-6 kg/m ²	
		Mosaic and glass tiles (white cement)	weber.vetonit RFB	12 hours	2 weeks	2-3 kg/m ²	
			Casco Multifix White 3711	3 hours	1 day	2,5-3,3 kg/m ²	
					rapid		
		Compound substrates	weber.vetonit RFF	4 hours	2 days	3 kg/m ²	
			Kiilto Kerapid	2 hours	2-4	2-3 kg/m ²	

					hours	
			Casco Multifix Rapid 4113	45 minutes	3 hours	
Joint compound	Join thickness 2-6 mm	weber.vetonit TG	Kiilto Saumalaasti	1-2 days	1 week	0,7-1,5 kg/m ²
		FESCON Laattasaumalaasti				0,5-1,5 kg/m ²
		Casco Decor Premium				1 hour
		Silicone	weber.vetonit SSL	Kiilto Saniteettisilikoni	FESCON Saniteettisilikoni	Casco AquaSeal

5.2 Conception for bathroom and sauna walls and ceiling

Bathroom's walls shall have water insulation membrane. Bathroom's and WC-room's walls can be covered with plastic panel, ceramic tiles or painting. Before covering wall surface shall have special preparation. The quality of the substrate preparation depends on type of further coating materials. If the current wall structure is rugged it shall be leveling with special wall leveling compound. For covering with plastic panel or pain the plastered wall surface shall be L1 or L2 smoothness class. For covering with tiles the wall surfaces can belong to L3 smoothness class. Plastered walls with finished plaster and which belong to L0 or L1 smoothness class can be ready without further coatings.

Saunas wall need more detailed design. Differences of exterior and interior temperature and intermittent use of a sauna are required specific properties of

building materials. Sauna's wall shall have proper thermal insulation and floor waterproof layer. The thermal insulation can be mineral wool. Thermal insulation material shall satisfy thermal and fire requirements on such materials. Minimum thickness of the thermal insulation is 50 mm on the walls and 100 mm on the ceiling. Watertight membrane is used in the capacity of saunas' water insulation. Owing to the high temperatures and humidity of the sauna, special attention must be paid to the transmission of vapour within components and elements. The vapour should not freely admitted into the components. The vapour barrier is plastic-paper-aluminum foil laminate, with the aluminum inside. The vapour barrier must be properly sealed with generous overlapping and absolutely air tight without any pinholes. An air gap of minimum 20 mm shall be between the vapour barrier and the interior panel. Sauna's walls coating shall be wooden (<http://www.saunasite.com/text/insulati.htm>). Wood absorbs excess steam and resists condensation. Also wood does not transmit temperature very quickly. Only wood are felt comfortable for skin and the most ecological materials. There are different types of timber used in sauna like most popular aspen, spruce, lime, pine, alder, abachi and cedar. This list of the types is in the timber value increasing order. The main timber characteristics are resin content, resistance to moisture, scent and colour. The most suitable timber for a sauna is which has few knots and good resistance to heat and moisture, are porous and which executes little resin. Lack of knots is an advantage in order to avoid drops of resin. Spruce is more popular sauna timber for all surfaces because of its good characteristics. Table 5.8 presents the properties of certain species of timber.

Table 5.8 Properties of timber used in saunas (Finnish Sauna, p.55)

Timber	spruce	pine	aspen	alder	birch
Resin content	Relatively resinous	Resinous	-	-	-
Resistance to moisture	Relatively poor	Resistant heartwood	Poor	Poor	Poor
Scent	Faint resin scent	Strong resin scent	Sour smell when wet	-	-

Colour	Light	Light surface, red-brown heartwood	From grey-white to light brown (greys with age)	From reddish light hue to red-brown	Light yellowish colour
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Bathroom and sauna's ceiling shall have sufficient light-reflecting and sound reflecting characteristics, appropriate level of fire resistance and water resistance. Also the materials of ceilings shall be ecological and easily to maintenance.

5.2.1 Possible bathroom's wall and ceiling structures

There are drawings of most common bathroom/WC walls options below. There are tiling, painting wall structure conceptions. The tiling structures are represented by different trademarks of building materials like weber.vetonit, Kiilto, Casco and FESCON. The painting wall is Tikkurila trademark conception.

1. Tiling bathroom.

Tiling bathroom are the most popular way for bathroom wall surface. Figures 5.12 -5.15 are represented tiling wall conception for bathroom remodeling.

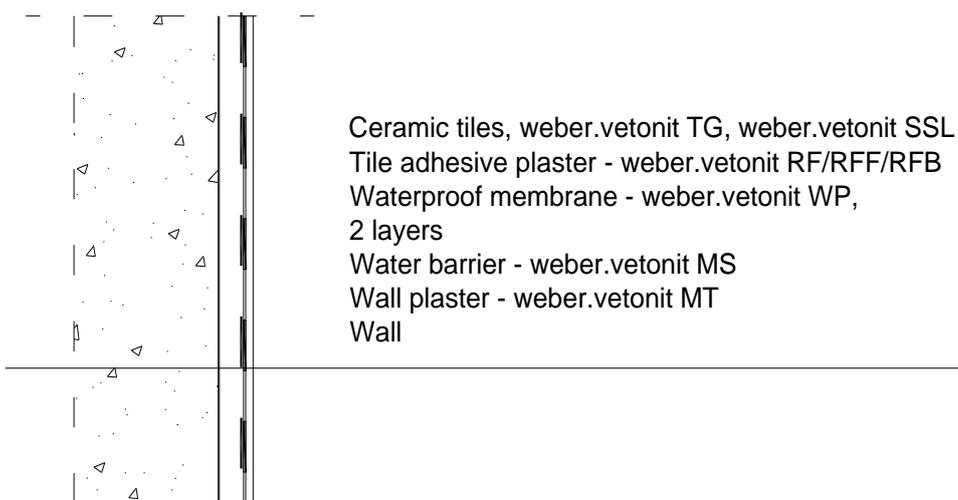


Figure 5.12 Conception of weber.vetonit for tiling walls

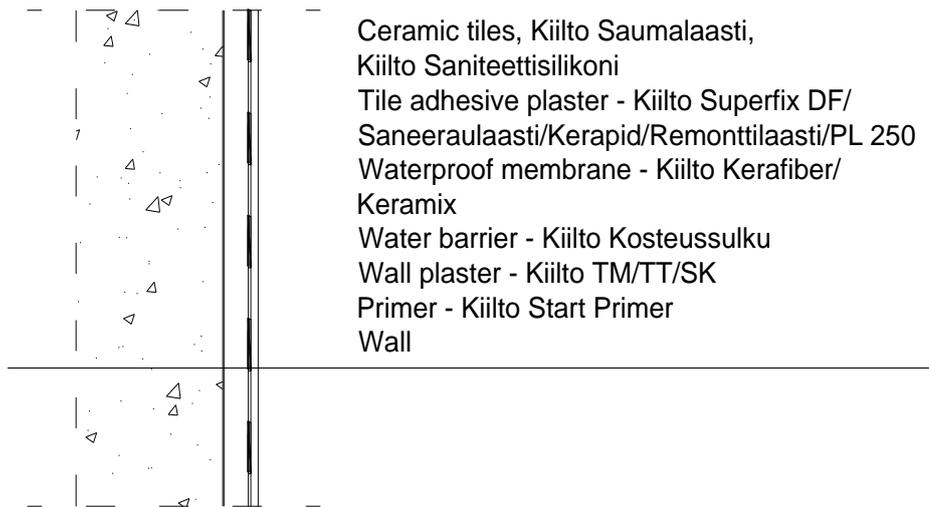


Figure 5.13 Kiilto conception for tiling walls

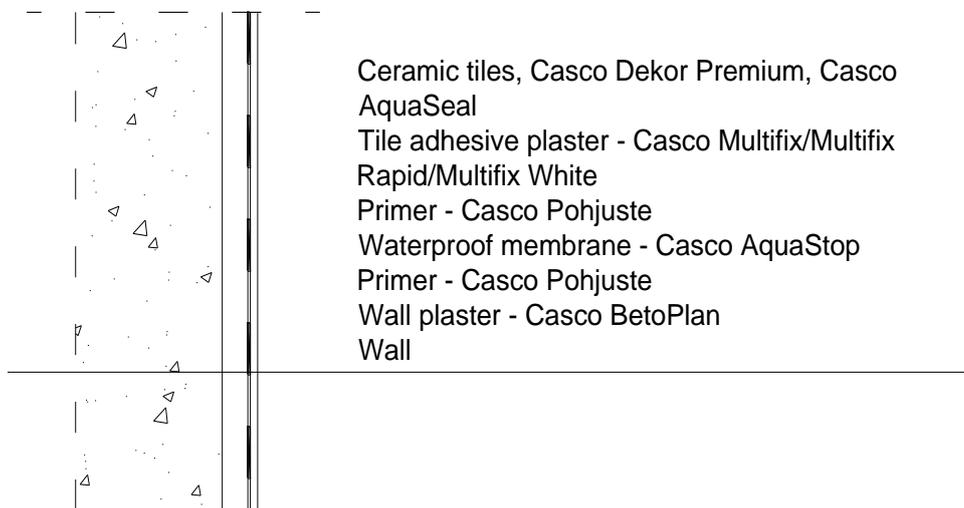


Figure 5.14 Casco conception for tiling walls

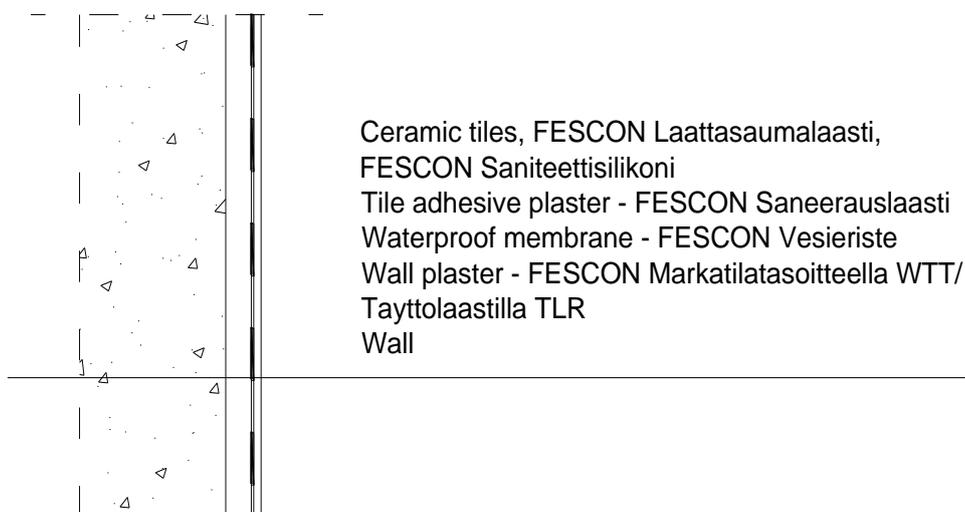


Figure 5.15 FESCON conception for tiling walls

2. Painting bathroom walls and ceiling.

Luja scheme for waterproofing is the conception for painting wall that is made by Tikkurila. This scheme has VTT certificate and all materials are M1 emission class. Luja includes building materials for finishing works like:

1. Water-resistant primer, drying time is half an hour;
2. Acrylic paint (semigloss, half-matt) contained the component against mould, consumption is 7,5 m²/l at the average, drying time is 4 hours;
3. Water-resistant filler;
4. Fiberglass paper for further painting with special water-resistant adhesive and joint filler.

Figures 5.16 and 5.17 are presented Tikkurilla conceptions for the walls and ceiling in a bathroom and WC-room. The first way is used for screed surface. The second one for painted being surface.

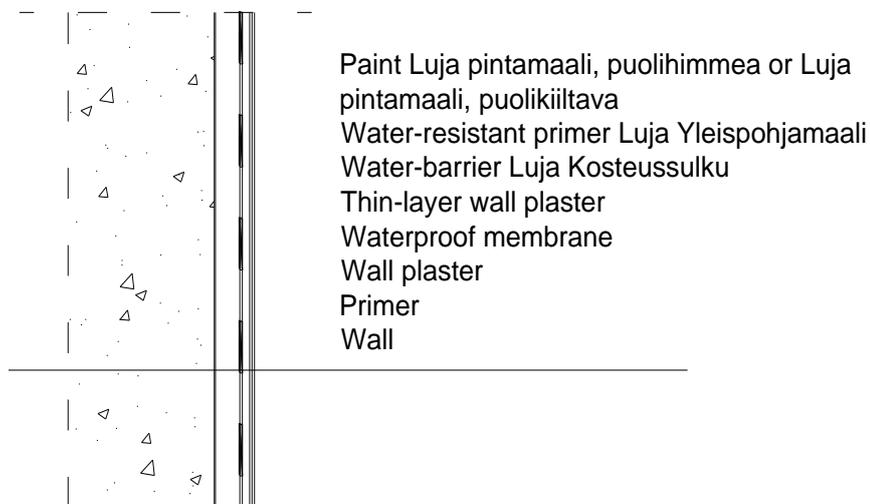


Figure 5.16 Tikkurilla conception for the wall and ceiling of bathroom/WC

It is also possible to renew old painting wall surface. But the condition of old pain shall be enough for wearing a new layer.

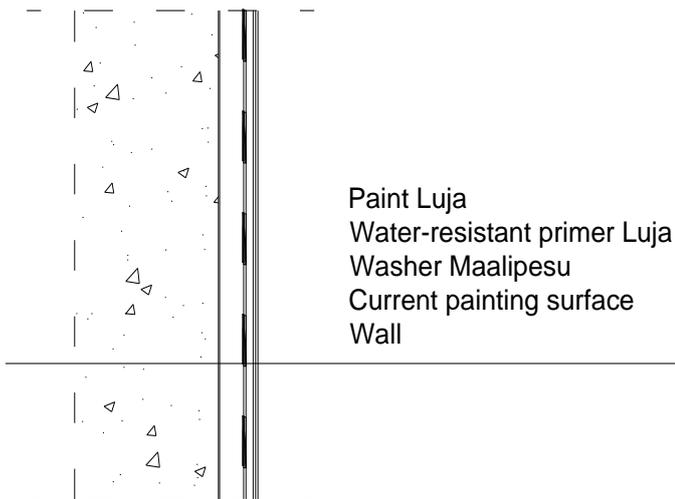


Figure 5.17 Tikkurila conception of bathroom/WC painted wall and ceiling

3. Bathroom/WC-room's ceiling.

The ceiling of a bathroom/WC-room can be suspended ceiling, painting ceiling and just skim ceiling. The suspended ceiling is made from plastic panels which can be strip-form or square-form. There are different types of ceiling structures below. These structures are made by different trademarks like weber.vetonit, Kiilto and FESCON. Figures 5.18 – 5.20 are represented different conceptions for ceilings in bathroom and WC-rooms.

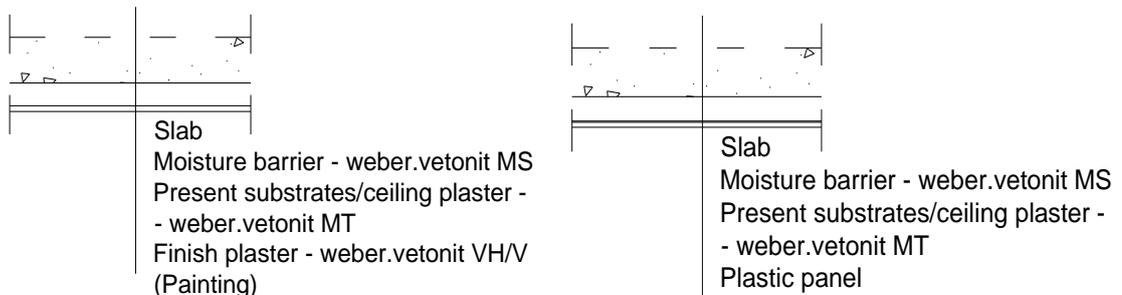


Figure 5.18 Weber.vetonit conception for skim/painting ceiling and suspended ceiling

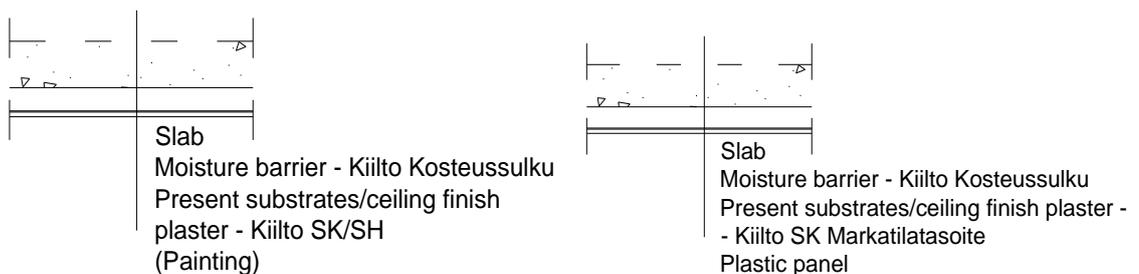


Figure 5.19 Kiilto conception for skim/painting ceiling and suspended ceiling

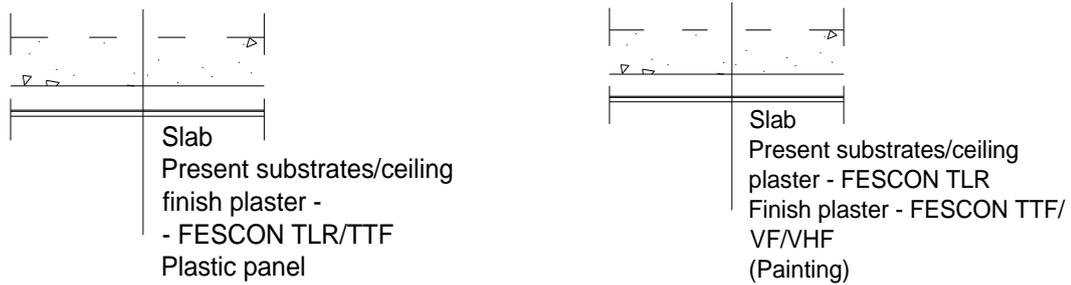


Figure 5.20 FESCON conception for skim/painting ceiling and suspended ceiling

5.2.2 Building materials used in bathrooms renovation

Table 5.9 describes main characteristics of materials used in a bathroom/WC-room's wall renovation.

Table 5.9 Building materials for a bathroom/WC walls

Task	Thick-ness, mm	Name of materials	Allowed time	Consump-tion
Rough leveling	1-10 (15)	weber.vetonit MT	1-2 days	1,3 kg/m ² /mm
	5-50 (5-20)	Kiilto TM Täyttömassa	1 day	1,5 kg/m ² /mm
	1-10(20)	Casco BetoPlan	1 day	1,2 kg/m ² /mm
	2-10 (30)	FESCON Märkätilatasoitteella WTT	1 day	
	5-30 (50)	FESCON Täyttölaastilla TLR	1 day	1,5 kg/m ² /mm
Thin-layer leveling	0-5(30)	Kiilto TT Seinätasoite	3-4 days	1,4 kg/m ² /mm
	0-3(10)	Kiilto SK Märkätilatasoitte	1 day	1,3 kg/m ² /mm
Primering		Casco Pohjuste 3698	2-4 hours	

Water insulation	Moisture barrier		weber.vetonit MS	0,5 hour	2 hours	0,1-0,2l/m ²
	Watertight membrane	min 0,5 mm	weber.vetonit WP	6 hours	12 hours	0,8 l/m ²
		min 0,4 mm	Kiilto Kerafiber	2 hours	1-3 days	
		min 0,3 mm	Casco AquaStop 3635	5 hours	12 hours	0,3 l/m ²
		min 0,4 mm	FESCON Vesieriste	4-8 hours	12 hours	0,7 l/m ²
	proofing membra	min 0,8 mm	Kiilto Keramix	1-2 hours	4 hours	
	Primering		Casco Pohjuste 3698	2-4 hours		
Tiling	Adhesive			standard		
		Common substrates	weber.vetonit RF	12 hours	2 weeks	3 kg/m ²
		Compound substrates, for fixing ceramic	Kiilto Superfix DF	1 days	1 weeks	2-3 kg/m ²
			Kiilto Saneeraulaasti			
			Casco Multifix 4141	4 hours	1 day	
			FESCON Saneerauslaasti	4 hours	2-3 days	
		Mosaic and glass tiles (white cement)	weber.vetonit RFB	12 hours	2 weeks	2-3 kg/m ²
			Kiilto PL 250 Laattaliimakovete	2 hours	8-9 hours	0,5-1,5 kg/m ²
			Casco Multifix White 3711	3 hours	1 day	2,5-3,3 kg/m ²

	Compound substrates	rapid	weber.vetonit RFF	4 hours	2 days	3 kg/m ²
			Kiilto Kerapid	2 hours	2-4 hours	2-3 kg/m ²
			Casco Multifix Rapid 4113	45 minutes	3 hours	
		Joints, thickness 2-6 mm	weber.vetonit TG	1-2 days	1 week	0,7-1,5 kg/m ²
			Kiilto Saumalaasti			0,5-1,5 kg/m ²
			Casco Decor Premium	1 hour	6 hours	0,3-1,5 kg/m ²
			FESCON Laattasaumalaasti			0,8-1,1 kg/m ²
		Silicone	weber.vetonit SSL	5-20 minutes	1-7 days	
			Kiilto Saniteettisilikoni			
			Casco AquaSeal			
	FESCON Saniteettisilikoni					

Table 5.10 describes main characteristics of materials used in a bathroom/WC-room's ceiling renovation.

Table 5.10 Ceiling materials for bathrooms/WS

Task	Thickness, mm	Name of materials	Alloted time	Consumption
Ceiling levelling	1-10(15)	Vetonit MT	1-2 days	1,3 kg/m ² /mm
	5-30(50)	FESCON Täyttölaastilla TLR	1 day	1,3 kg/m ² /mm
	2-10	FESCON Tiilitasoite TTF	1 day	1,2 kg/m ² /mm

Thin-layer leveling	1-3(5)	Vetonit V	1-2 days		1,2 kg/m ² /mm
	1-2(3)	Vetonit VH	1-2 days		
	0-3(10)	Kiilto SK Märkätilatasoite	1 day		1,3 kg/m ² /mm
	0-2	Kiilto SH	1 day		
	1-5	FESCON Pohjatasoite VF	1 day		1,2 kg/m ² /mm
	0-3	FESCON Pintatasoite VHF	1 day		
Moisture barrier		Kiilto Kosteussulku	1-2	3	0,1-0,2l/m ²
		Vetonit MS	hours	hours	

5.2.3 Possible sauna's walls and ceiling structures

Figure 5.21 and Figure 5.22 present the common wall and ceiling of a sauna. In the saunas' wall and ceiling structures for coating only a wooden lining can be used. The main conception is the same for the walls and ceiling. But only smooth planed boarding is suitable lining material for the walls of a sauna. The ceiling can be lined with smooth planed or sawn boarding. To minimize cracks caused by drying, the boards must be sufficiently thick in relation to their width. Countersunk nails are recommended for the lining. A vertical cladding is a preferred form for the finishing of the sauna's walls.

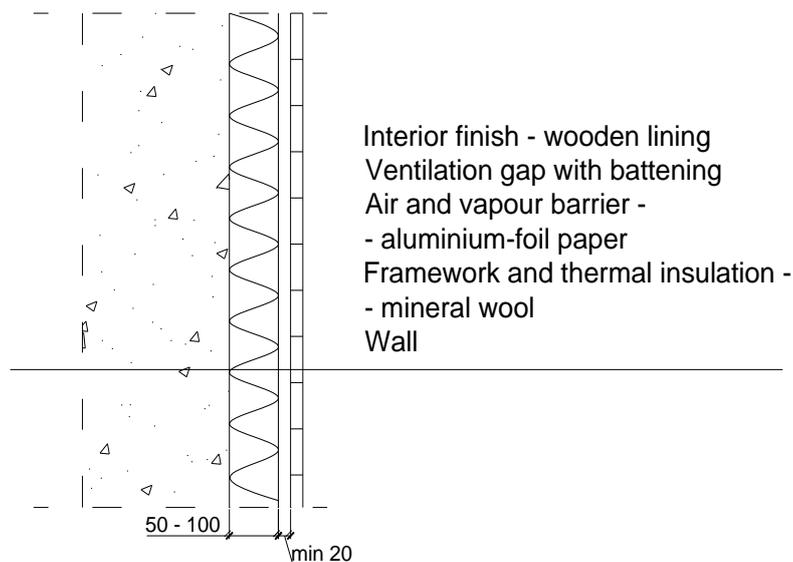


Figure 5.21 Sauna walls structure

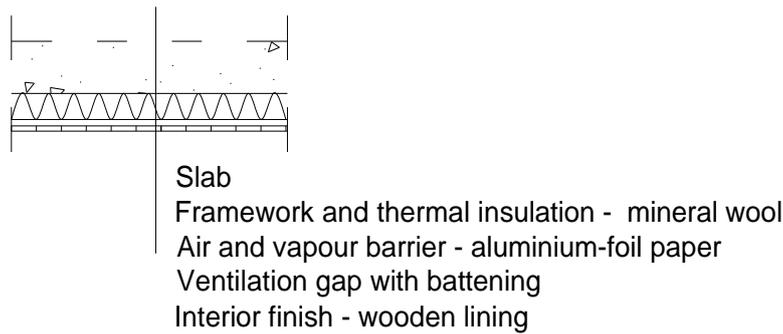


Figure 5.22 Sauna ceiling structure

The moist air from the sauna shall be ventilated from beneath for the preservation of the boarding. And the wooden wall lining is not extended down to the floor. There must be a gap between the wall paneling and the ceiling paneling so that the vapour can get out from behind the panel. Figure from Appendix 4, p. 78 shows the way of air moving. In the case of the horizontal paneling the gap admitting air between the upright bottom battens and the parts behind the lining boards are ventilated. Also the supporting battens for the vertical lines must have gaps for ventilation in a vertical direction.

6 RESULTS

These guidelines consider two big questions concerning an apartment in Finland. The first one deals with a purchasing an apartment in Finland. This part of the manual is made mostly for foreigners who decide to buy an apartment and do not know much about the order of assuming possession of an apartment. The second series of questions is about the implementation of maintenance works in an apartment's facilities. It includes the useful information for people who already own an apartment and decides to carry out renovation works but who do not know anything about renovation.

Concerning the first question, the manual helps foreigners to buy an apartment in accordance with Finnish law. Finnish law has own specific terms for foreigners. The manual has been created to help them to understand the main points of purchasing an apartment in Finland, on the basis of Finnish law.

The second part of the guidelines answers on the second series of questions. This part helps a reader to comprehend a relationship between a housing company and its share owners. This part looks into Finnish housing company organization and gives the main point of a maintenance relationship between the housing company and the shareholders. This information based on Finnish housing law and explains to readers his/her rights and obligations concerning a renovation. The particularization of a housing company's and the shareholders' relationship is defined here.

The guidelines also can be reference book for beginner in the renovation and who just starting to learn a process of an apartment renovation. The basis of renovation organization is described in these guidelines. This information has been collected from Finnish building codes, regulations and norms for the successful implementation of the renovation works in apartment facilities. Also a list of useful materials is in the last part. There are materials of weber.vetonit, Kiilto, Casco, FESCON and Tikkurila trademarks. The main materials characteristics can be found from tables here.

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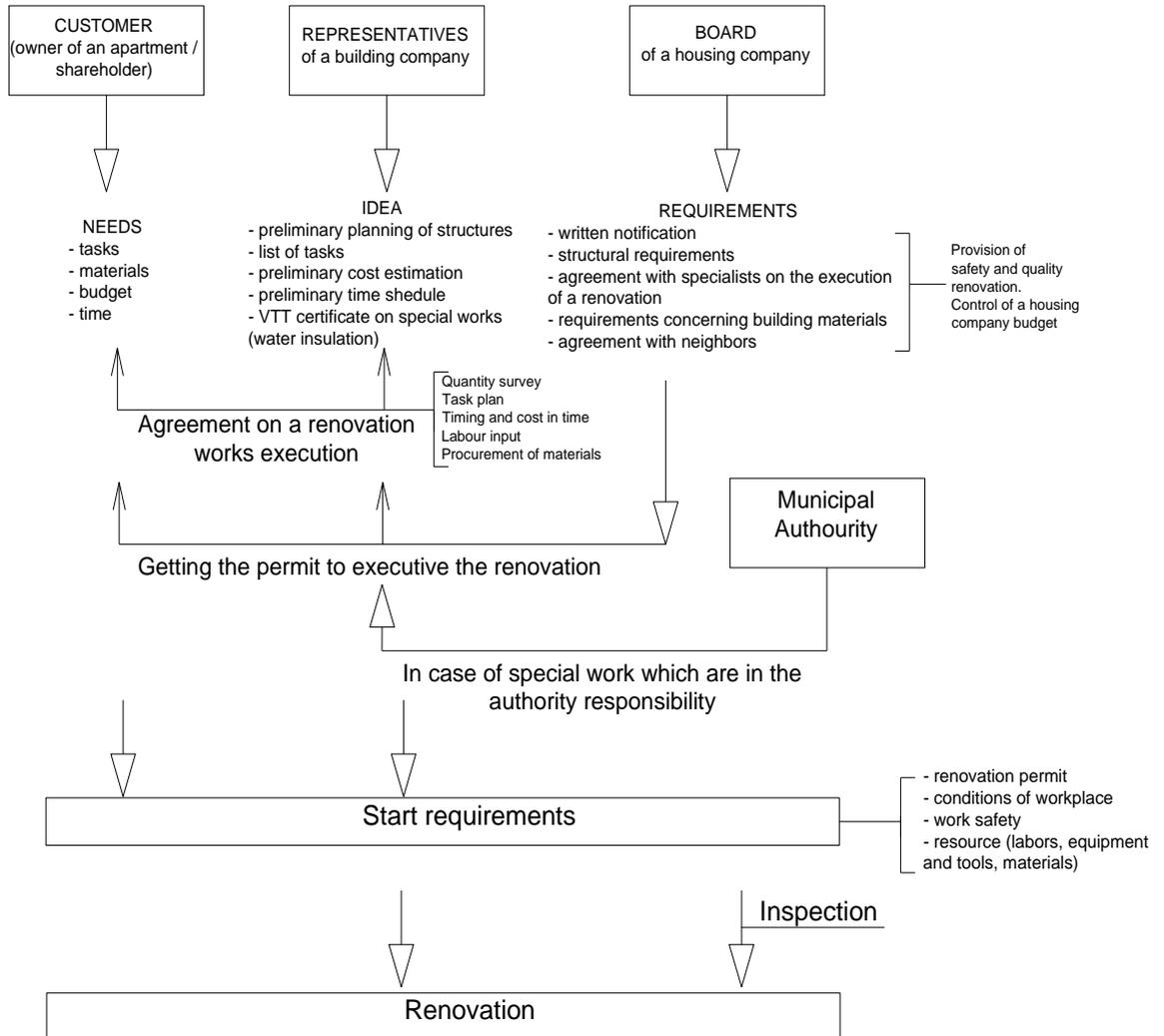
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APPEDICES

APPENDIX 1

Renovation organization 1(1)

ORGANIZATION SCHEME FOR RENOVATION



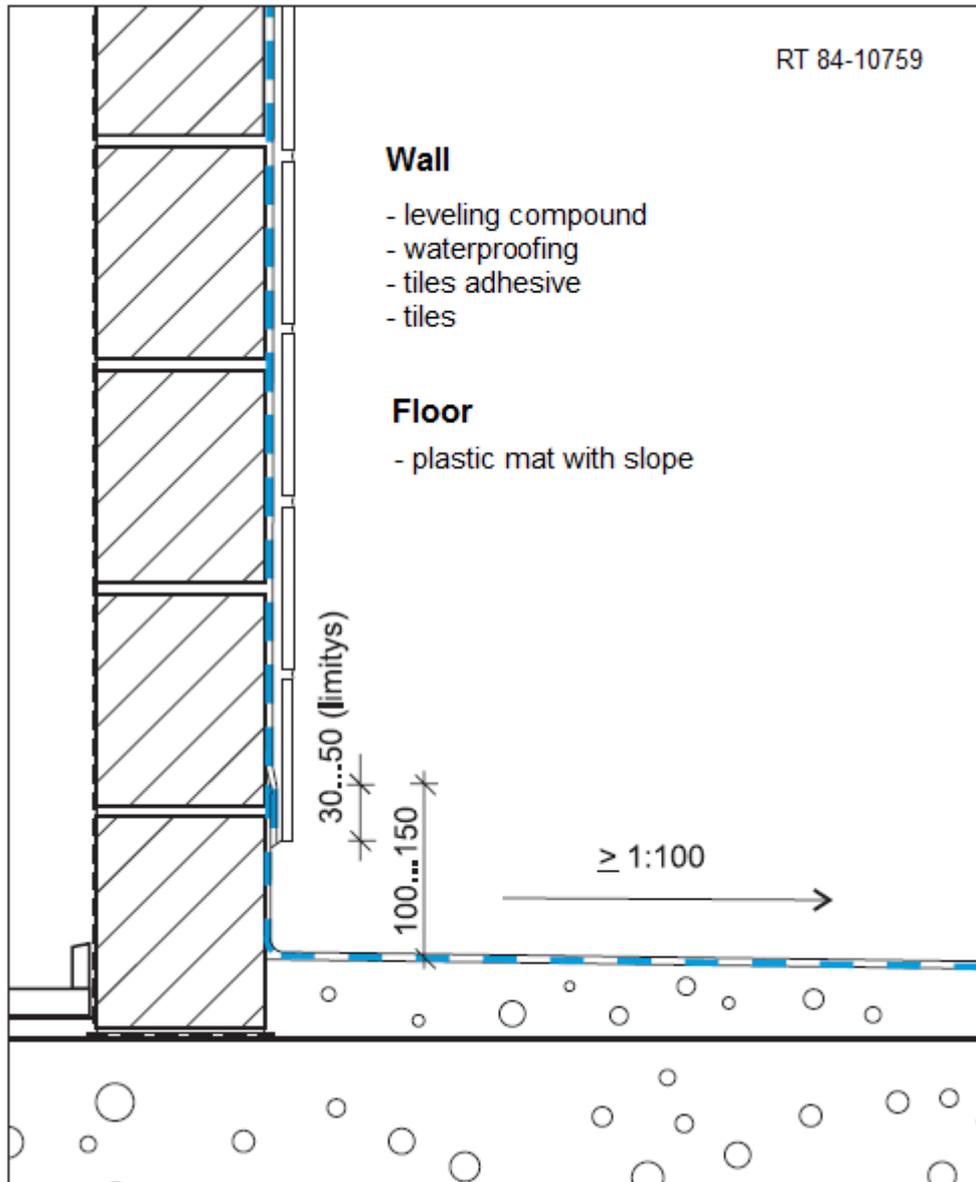
APPENDIX 2

Interior room card 1(1)

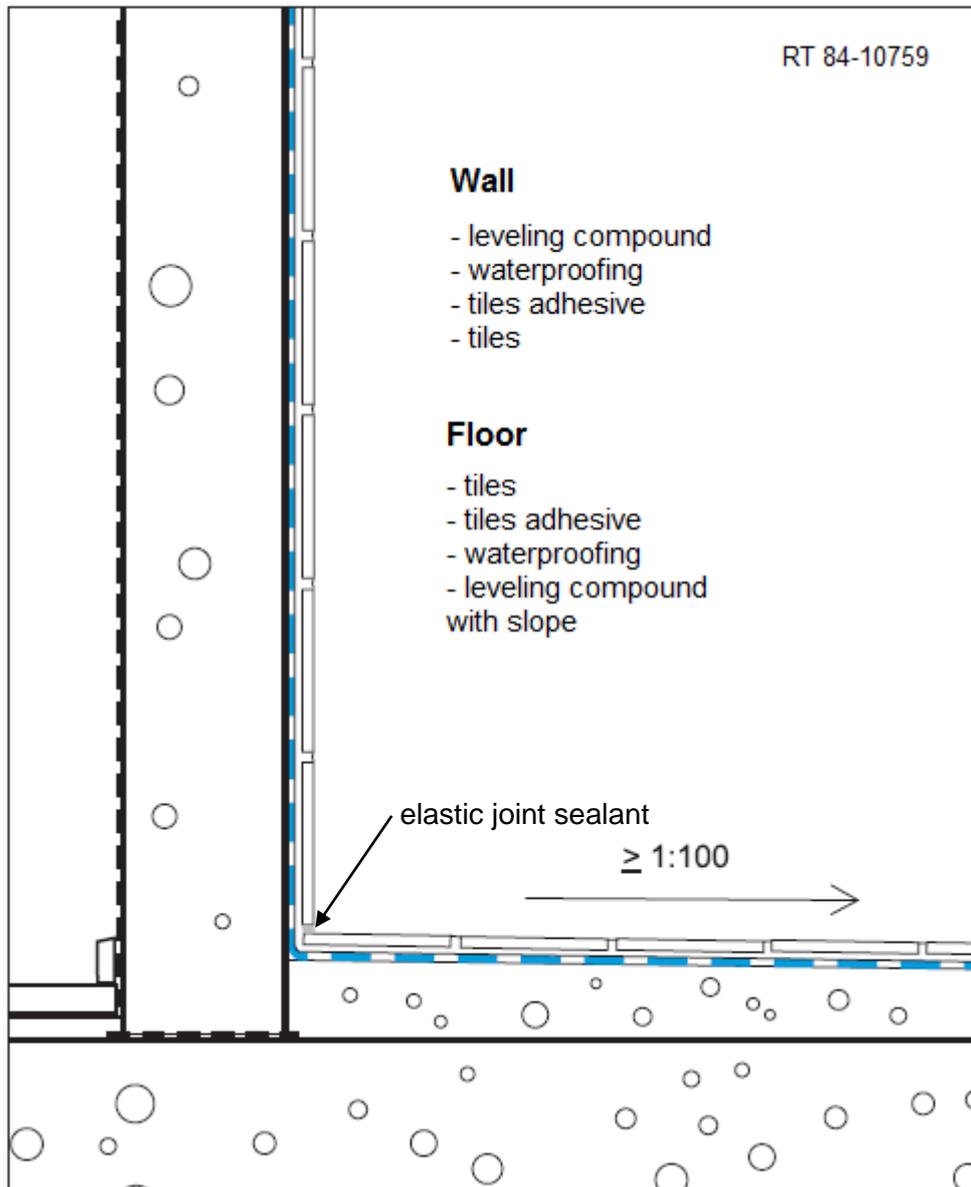
Interior room card						
	Original	Current	Condition	Special damages	Area, m ²	Measures
Floor						
material						
surface						
Ceiling						
material						
surface						
Wall 1						
material						
surface						
Wall 2						
material						
surface						
Wall 3						
material						
surface						
Wall 4						
material						
surface						

APPENDIX 3

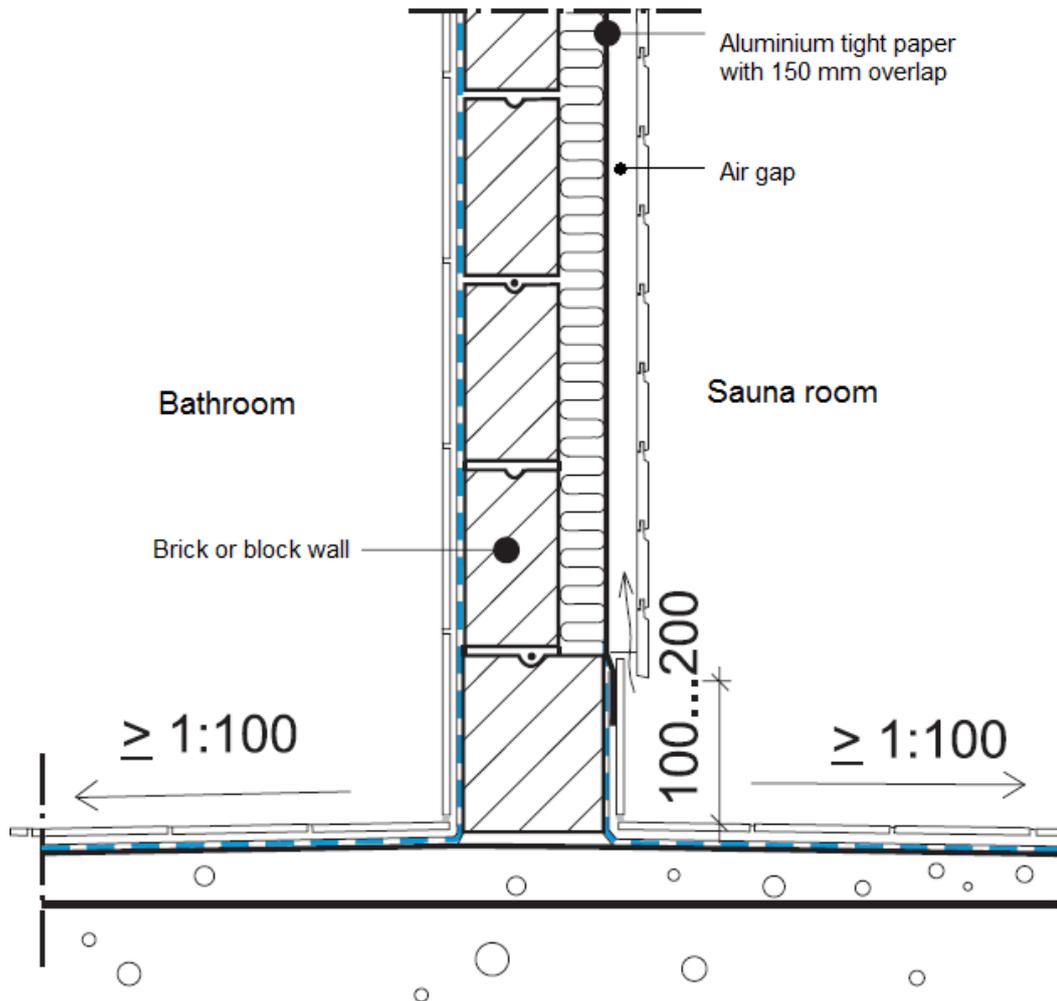
Tiling wall and plastic floor structure 1(3)



Tiling wall and floor structure 2(3)



Wall structure between sauna and bathroom 3(3)



APPENDIX 4

Ventilated gaps in a sauna 1(1)

