

Accessible Finnish Sauna

Maija Könkkölä

Illustrations Keli Koivu



*The National Association of The Disabled in Finland /
Disabled Persons Planning Service (VYJ)*

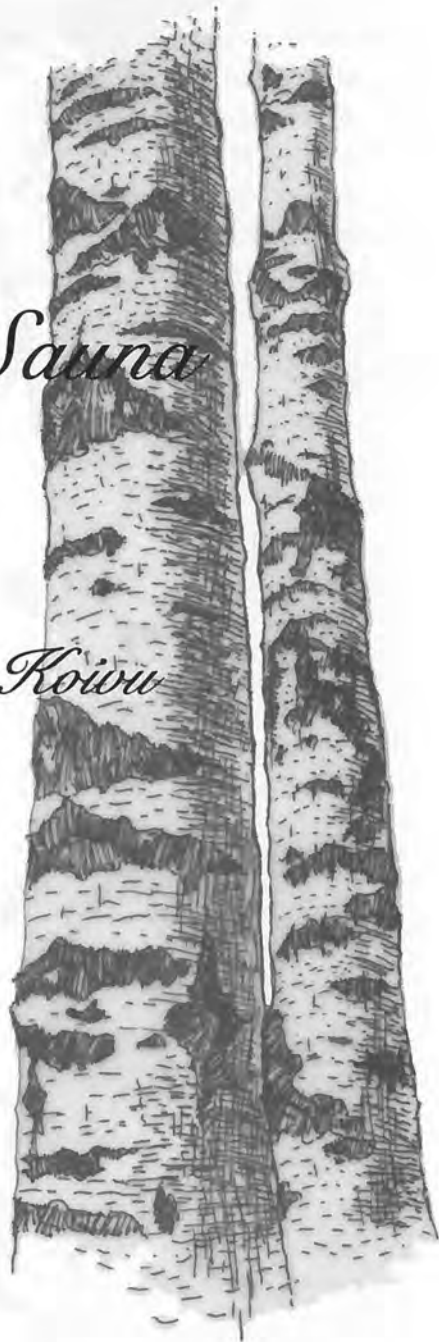
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FOREWORD

The idea of writing this book began when several colleagues requested advice on designing an accessible Finnish sauna. The design itself of a Finnish sauna is demanding, and the task becomes much more complicated when it must be accessible to all users. The invaluable support of Professor Erkki Helamaa made possible the writing of this book, and my sincere thanks go to him. Thanks also go to Heli Koivu, architect, for the drawings and layout design; she fulfilled her task with enthusiasm and talent, and helped to bring the manuscript to a successful completion. The text was translated by architect Eric Pollock and kindly checked by professor Andrew Chesterman. My gratitude also goes to Eero Heinonen, M.A., and Ari Kurppa, M.Eng., at the Disabled Persons Planning Service.

I hope this book serves designers as they delve into the demanding task of planning a functional and original, accessible Finnish sauna.

Helsinki, Finland, Dec. 27th, 1999

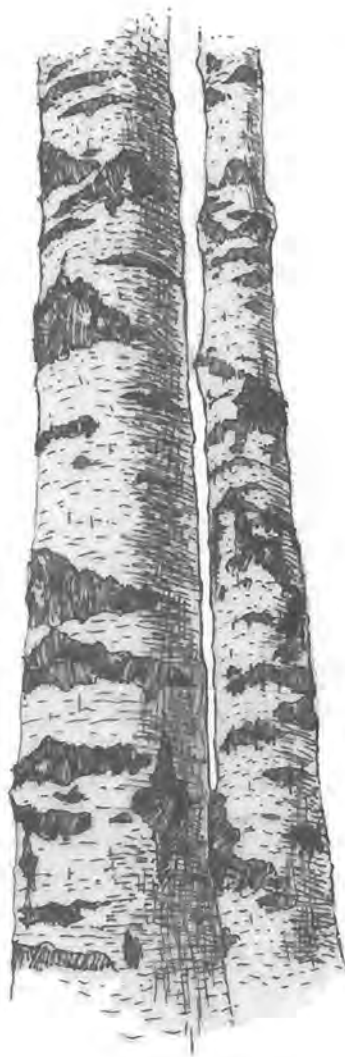
Maija Könkkölä, architect SAFA

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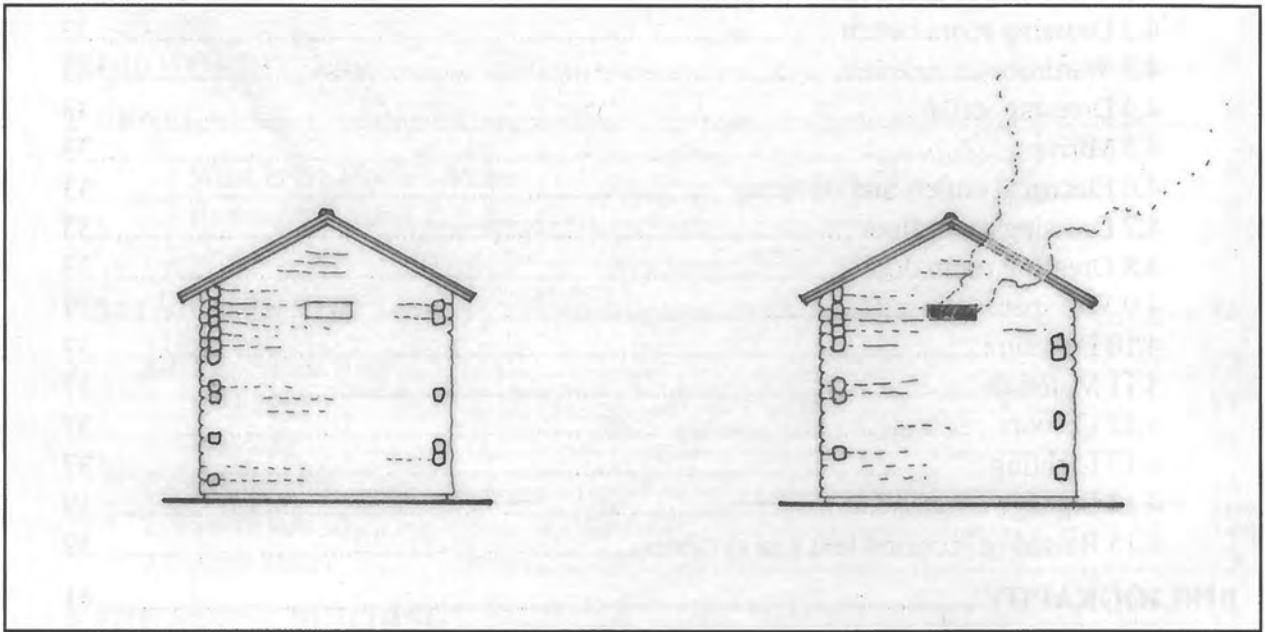


Illustration 1: The (flueless) smoke sauna during the heating phase, and afterwards

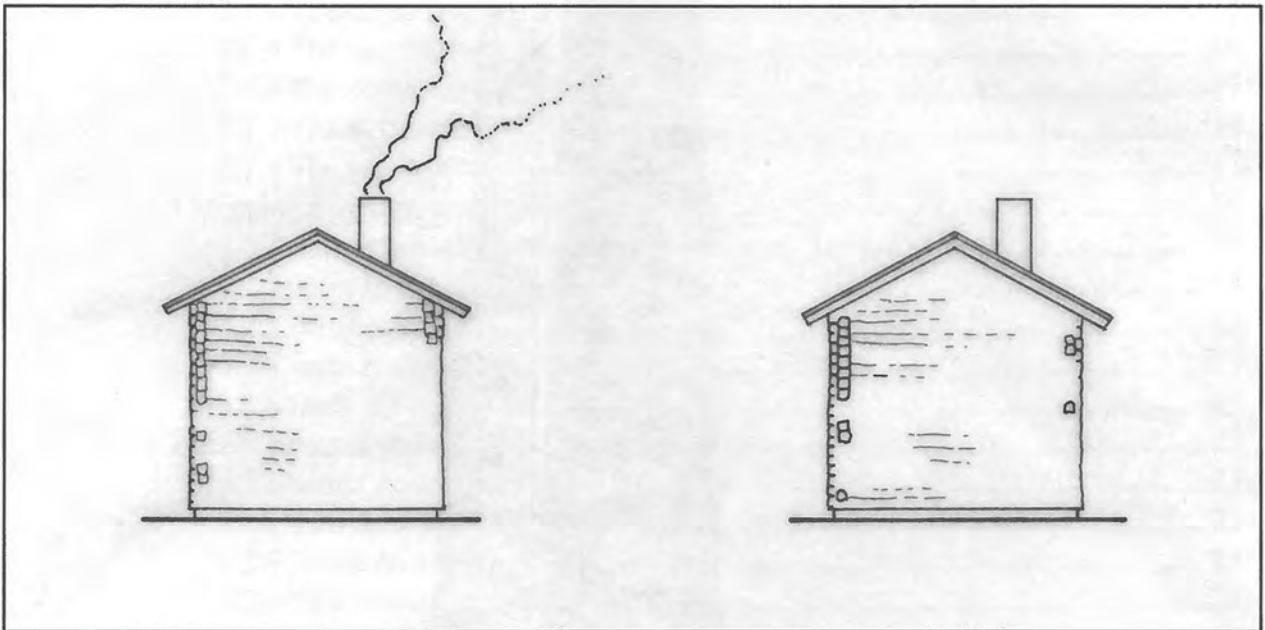


Illustration 2: The (chimney) sauna during the heating phase, and afterwards

1 GENERAL



1.1 What is the Finnish Sauna

The Finnish Sauna Society defines sauna as follows: “The sauna is a wood-surfaced room or wooden building with wooden decks at different heights suitable for a sweat-bath, with heatable stones in the sauna stove. The sauna must have space for washing and relaxing.

The temperature of the upper sauna area is 70-100 C. The increase in the relative humidity must be at least 20 %, when water is thrown on the hot stones. The air ventilation must be five to ten times per hour.

The sauna bath includes washing, sweating for five to ten minutes and relaxing, which the bather can repeat as desired.

The sauna bath promotes health, relaxes both physically and psychologically and provides a clean and pleasant feeling.”

1.2 Heating the sauna

The sauna has changed, developed and adapted over its’ two-thousand-year history according to the life-style and cultural habits of people in different eras.

Even today, the traditional flueless smoke sauna (small sauna buildings without flues, where the smoke escapes through holes in the wall or roof, called ‘hatches’) are in use as well as modern stoves with flues, which are either pre-heated or continuously heated by wood or electricity, or in special cases by oil or gas. The pre-heated sauna stove is heated before the sauna bath begins, and the continuously heated sauna stove is heated during the sauna bath (illustrations 1 and 2).

The stones on the sauna stove give both heat and steam to the sauna room, and their position (normally 800-1000 mm height from the sauna floor) regulate the heat given to the sauna in the upper half of the sauna room. The hot air above the stove stones may be as high as 100 C (212 F) near the ceiling of the sauna room. The floor level air is considerably cooler.

An accessible sauna should be built in such a way that a mobility-impaired person may enjoy the heat and steam of the sauna without having to step up to the sauna deck in a conventional way.

1.3 Ventilation

The sauna ventilation system may be one of two types: natural (gravity) or mechanical ventilation. The natural ventilation system may be used when the stove is wood-burning. Fresh air vents from the exterior should be placed where the firebox needs oxygen to burn, i.e. next to or under the stove.

An accessible sauna is more often heated with an electric stove and mechanical ventilation, where the fresh air vent is either 500 mm above the stove or from the gap between the door and the threshold, which should be over 50 mm. The return air vent should be underneath the sauna deck, height 200 mm. Another return vent connected to the same duct should be placed near the ceiling for after-sauna ventilation and drying.

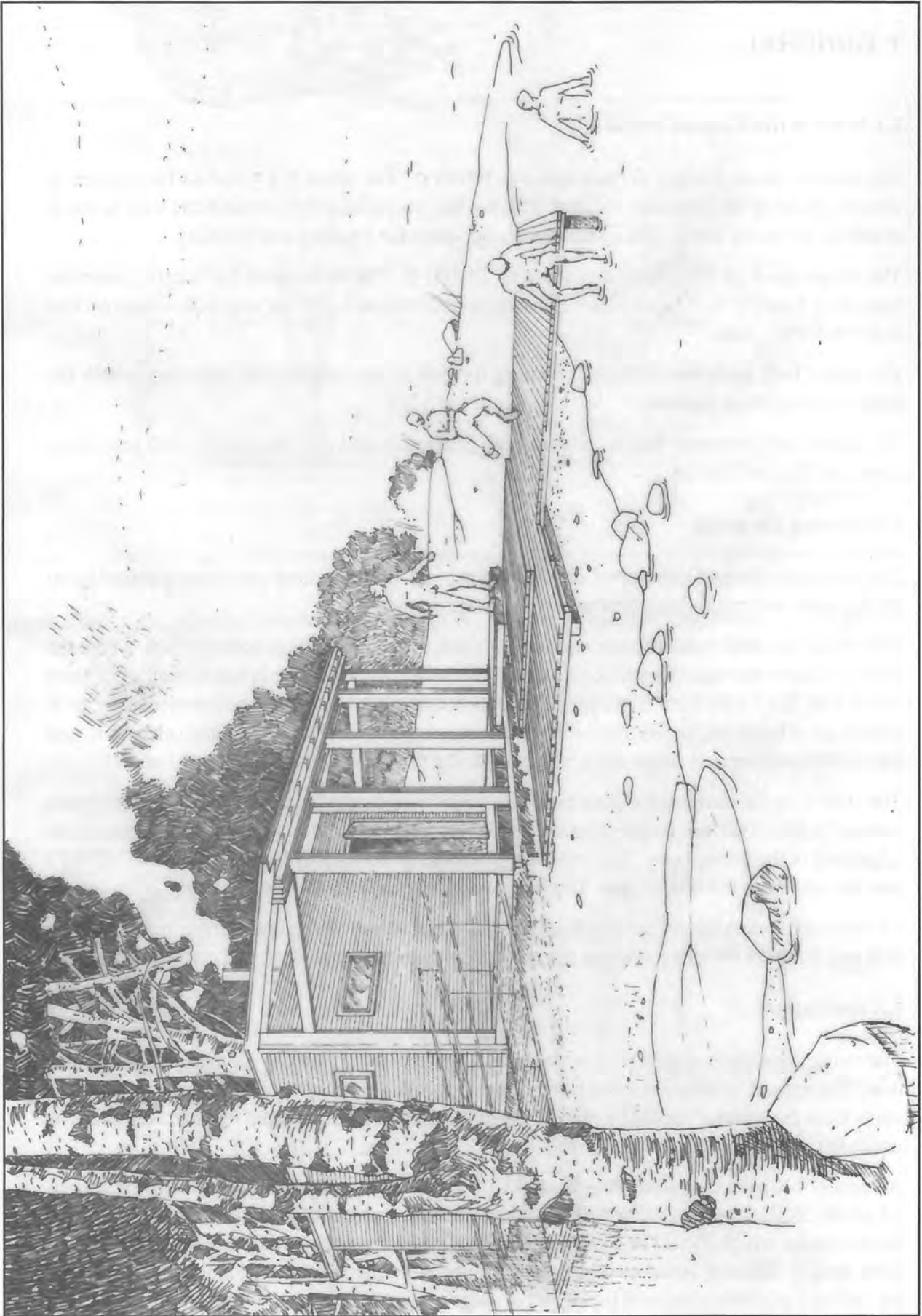
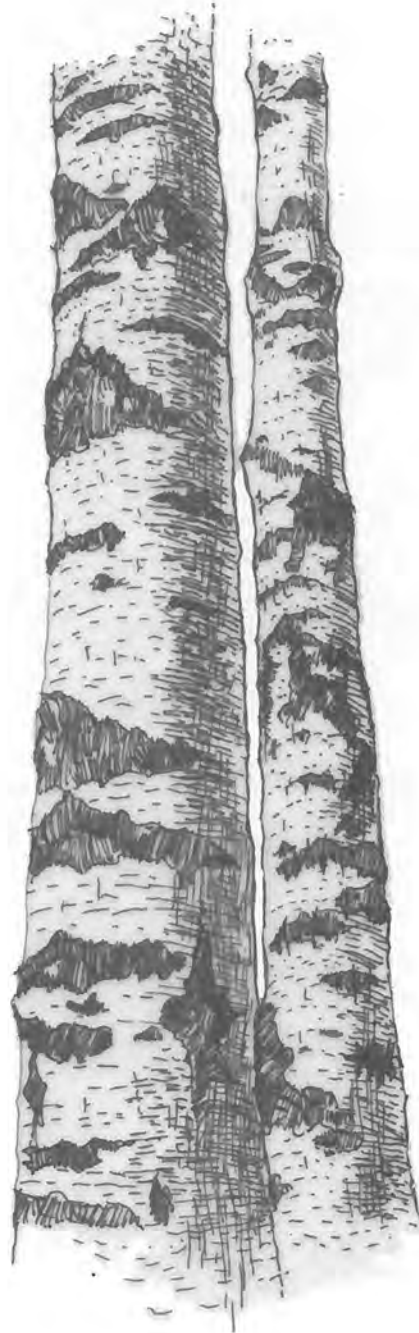


Illustration 3: The lakeside sauna and a refreshing swim

If the ventilation is poorly arranged, the hot air mass in the upper section of the sauna room does not mix with the oxygen-rich cooler air of the bottom section of the sauna. The critical elevation of the ventilation process is the same as the sauna heat distribution level, or the hot stones of the stove.



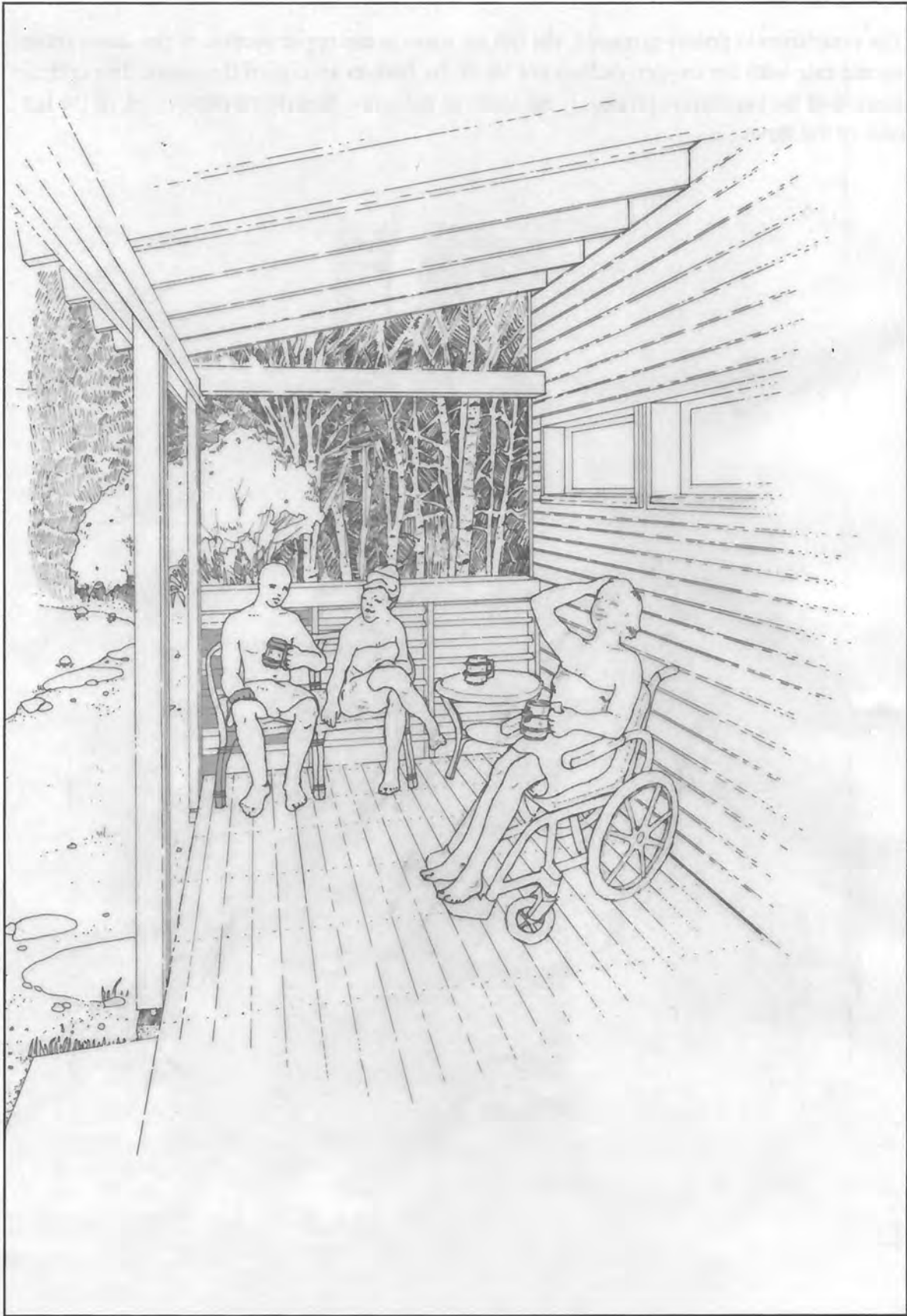


Illustration 4: Relaxing on the sauna terrace



2 BATHING IN THE SAUNA

2.1 The Sauna Bath

The sauna is a sweat bath. In order for the sweating process to begin and to remain pleasant, one must sit quietly for 8 to 12 minutes in the sauna heat, allowing an effective and full sweat to form, before dashing water on the stove stones. At this moment it is appropriate to throw water onto the stones. Water is usually kept in a small wooden bucket, and a long-handled wooden ladle is used to dash small amounts of water onto the hot stones. The water vaporises as it hits the stones, and the relative moisture in the sauna rises. The hot sauna steam, "löyly", feels sharp and hot to the skin, although the temperature has not risen. This is the high point of the sauna steam bath.

2.2 Whisking

The sauna steam bath process can be enhanced by whisking. Whisking encourages the flow of blood in the skin surface. The whisk is made of fresh birch branches, or a dried bunch that is softened in warm water.

2.3 Washing

The sauna bath includes washing in the steam room itself if there is space, or in a separate washroom.

2.4 Cooling off

Between sauna sessions, one must 'cool off'. Normally one takes a cool shower, or a swim in a public sauna, if possible. In the countryside, the traditional sauna includes a swim in the local lake in the summer, or a quick rolling in the snow in the winter.

2.5 Swim suit

The authentic sauna experience does not include a swim suit, but it could be necessary for a swim, depending on the location.

2.6 After sauna

After the sauna bath and before dressing, it is customary to sit quietly for a moment. In the dressing room or fireplace room, a refreshing cold drink or beer is customary, while you chat with others, wrapped only in a towel or robe. It is also possible to sit outdoors on a veranda. Only after your skin has dried and sauna effects have returned to normal, do you dress in clean clothes. The after-sauna feeling is relaxed and refreshed both physically and spiritually.

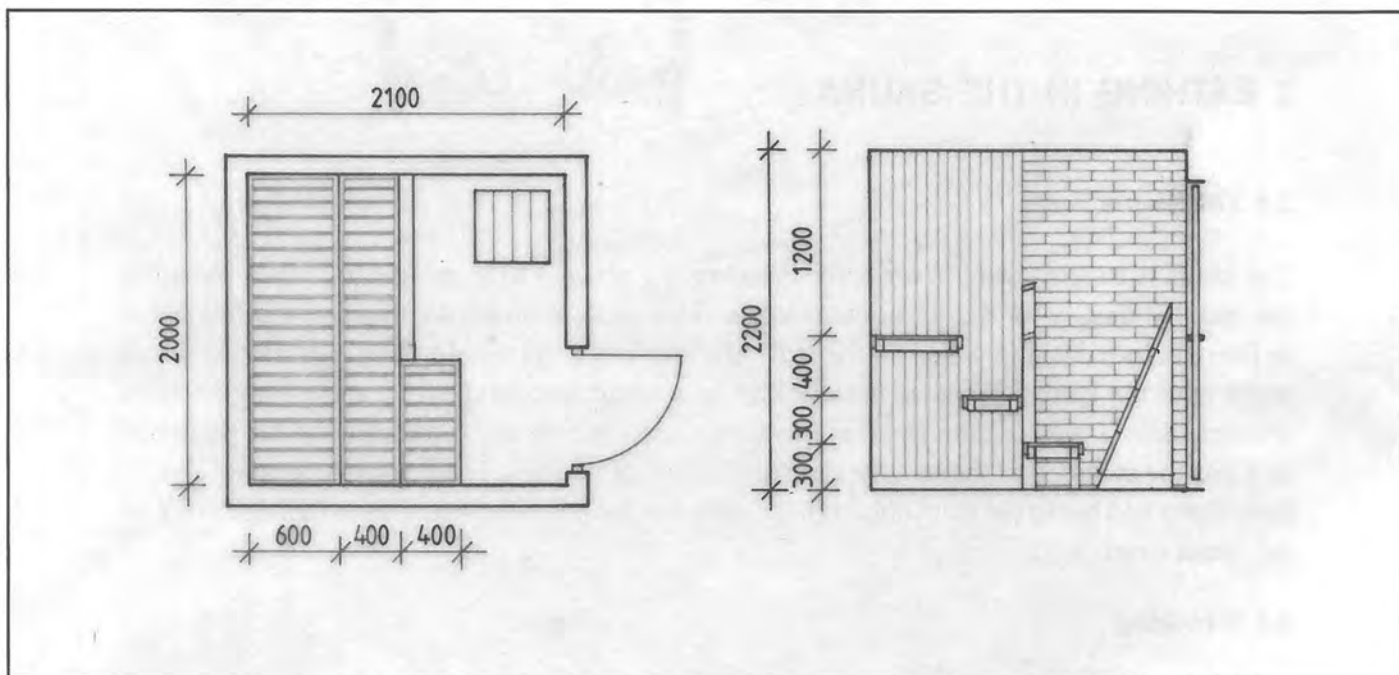


Illustration 5: A typical private sauna that a person in a wheelchair cannot use, plan and section. Instead of a typical stove, there is a flat soapstone stove, where the heat is more evenly distributed to the lower areas.

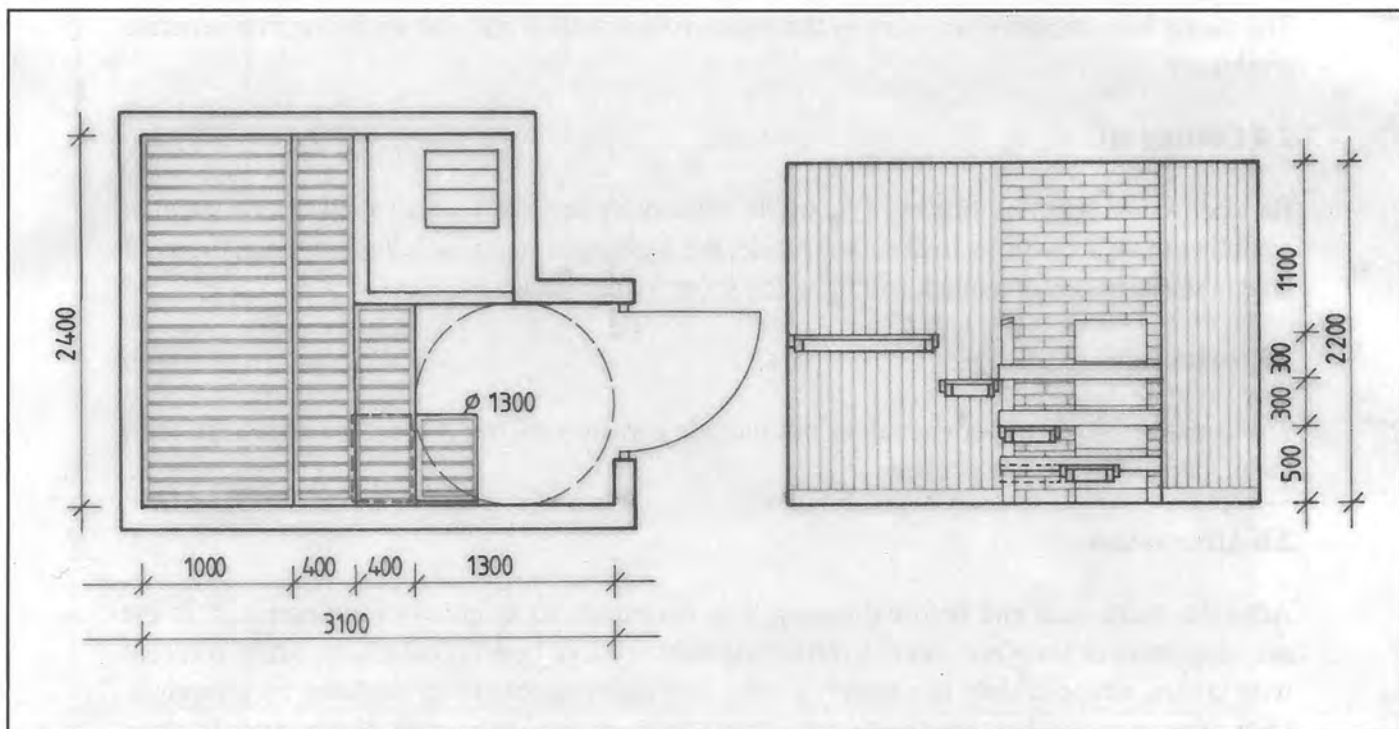


Illustration 6: A private sauna, where a wheelchair moves freely, plan and section.

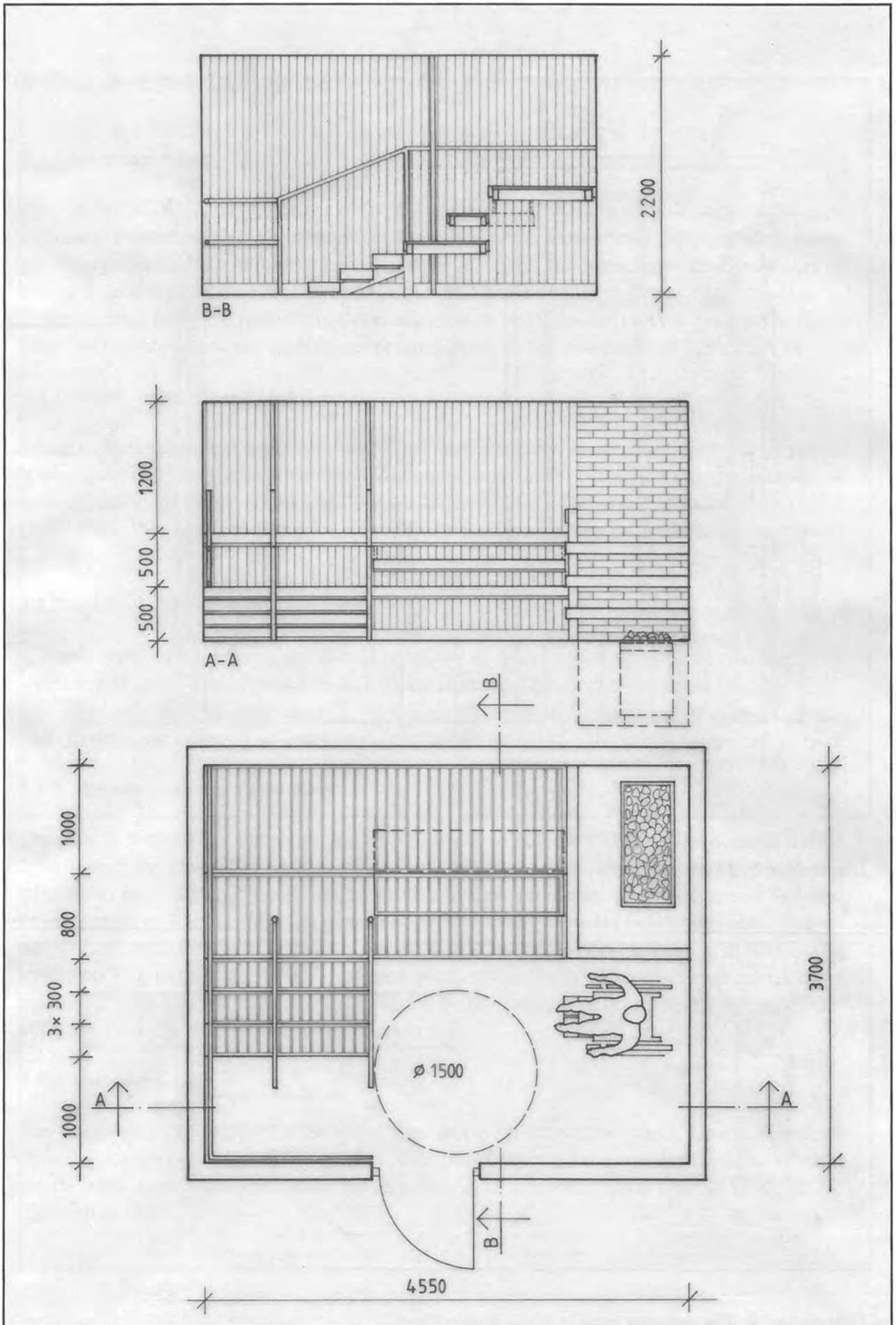


Illustration 7: A public sauna room, plan and sections

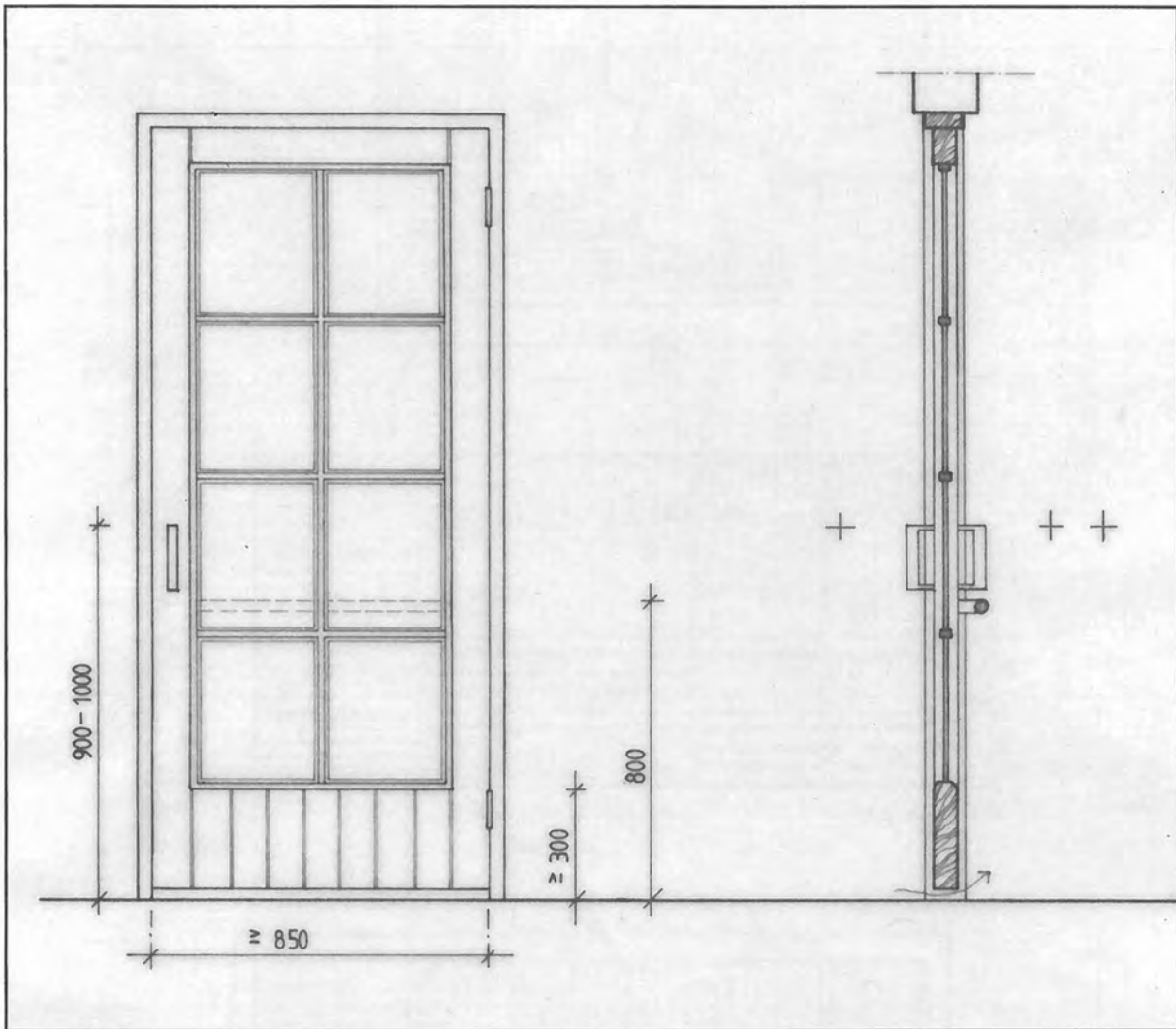


Illustration 8: The sauna door

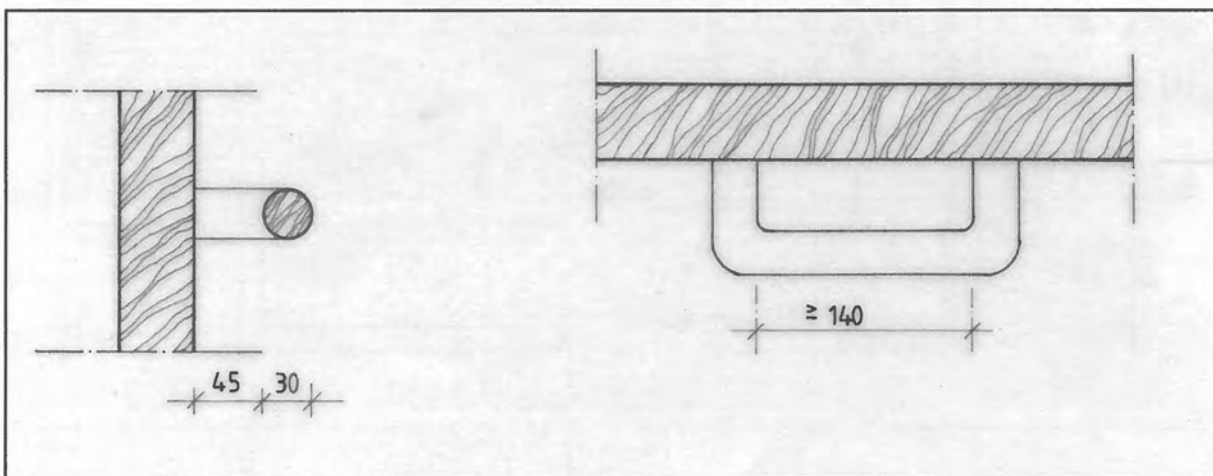


Illustration 9: The wooden handle of the sauna door

3 THE SAUNA BUILDING



3.1 The sauna room

The nucleus of the sauna building is the actual sauna room, which in a smoke sauna is actually the sauna. For the sauna to be economical, the actual sauna room should be as small as possible. A large sauna room requires a large sauna stove, which requires a considerable amount of energy if heated properly. For a sauna to be accessible, the challenge is how to be raised up to the sauna deck for steam from the hot stones, or how to bring the steam level down to the floor. In normal saunas, the steam level does not come down to the lower decks (illustration 5).

3.1.1 Sauna room dimensions

When normal sauna deck and stove heights are used for mobility-impaired persons, the sauna space must be much larger than normal. The sauna room must be large enough for a shower or sauna wheel chair to turn around, or floor space 1300 mm x 1300 mm minimum. For a public sauna room, there must be room for at least two wheel chairs at the same time (illustrations 6 and 7).

3.1.2 A wheel chair suitable for sauna

A wheel chair suitable for sauna should be of wood, where metal sections are covered with wood to protect possible burns. Plastic bath chairs cannot be used in the sauna because of the heat, although they are quite suitable for the shower. However, the constant changing from chair to chair can be tiring, so a wooden chair should be used for the whole sauna bath period.

3.1.3 The sauna steam room door

The door is without any threshold, with a free width of at least 850 mm. The door should be light to open and close. The door may have small glass panes, but must have wooden sash and transom to be easily recognised and to protect against accidents. The door should be solid wood minimum 300 mm from its bottom edge. The handles should be wooden also. To shut the door, a handle should be placed also on the hinge side of the door, at a height of 800 mm. It should be 30 mm thick and at least 140 mm wide, with a finger space of 45 mm between the handle and the door. The normal handle to open the door should be installed at a height of 900-1000 mm from the floor (illustrations 8 and 9).

3.1.4 The sauna floor

The floor cannot be slippery even when wet, and must be easy to clean. Unattached floor coverings on tile floors should not be used. The space between fixed wooden floor slats should not be more than 5 mm, and their corners should be rounded. Floor heating is suggested (illustration 10).

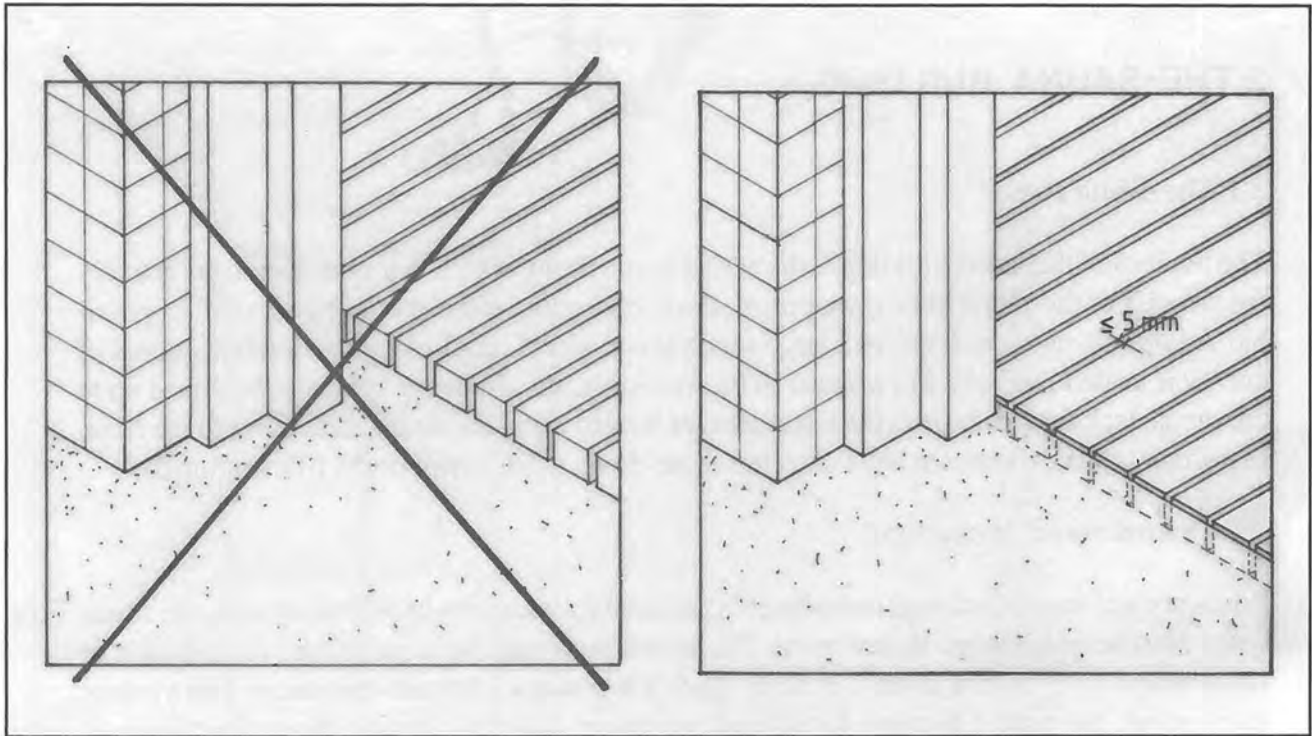


Illustration 10: On the left the incorrect and on the right the correct sauna floor lattice

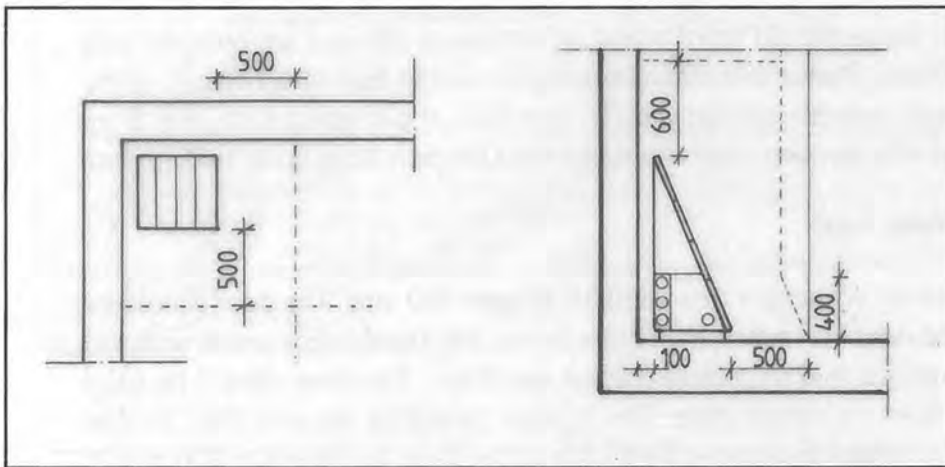


Illustration 11: An example of the flat stove fire safety distances to flammable materials (behind non-flammable wall materials).

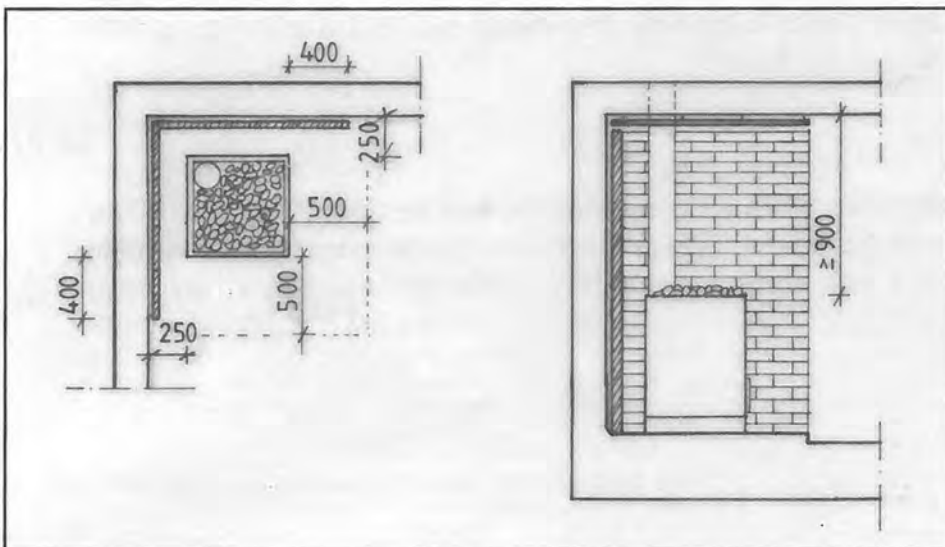


Illustration 12: The typical wood-burning stove safety distances to flammable materials (note: the stove safety dimensions are given by the stove manufacturer, according to the stove type and sauna layout)

3.1.5 The sauna stove

When using a normal sauna stove, it must be possible to step up to the upper deck level. In order to achieve a lower sauna heat level, and to allow for more room, a wall-mounted soap-stone sauna stove can be used (illustration 6).

The sauna stove must be protected by wooden barriers to prevent burn accidents. In particular, low barriers must be also installed to protect the feet of wheelchair users (illustration 18).

3.1.6 The sauna deck dimensions

It is normally possible to lie horizontally on the upper deck platform. The deck length is minimum 2000 mm. In dwellings, the decks are usually constructed to meet the needs of the owner. The deck width is wider than normal, ca. 1000 mm, if the bather wishes to stretch out with feet straight ahead. The wheel-chair bather can more easily shift from the chair seat to the first deck at the same height, or about 500 mm. Shifting to the higher deck is easier if the difference in height is not more than 300 mm. Normal sauna deck heights can be 450 mm (illustrations 13, 14 and 17).

3.1.7 The sauna decks

The front edge of the deck must be rounded. The bench construction cannot have sharp edges or protrusions. Also not allowed are visible metal edges, screws or nails, that might create a risk of burns when hot. The deck should be constructed of porous, unfinished wood species, that are free of knots.

3.1.8 The sauna deck towel

The porosity of the wooden deck may cause them to darken and collect dirt. It is more pleasant to sit on the hot deck if a personal linen deck towel is used. This is recommended for personal hygiene use, as well as to help keep the benches clean. For mobility-impaired persons, a large deck towel covering the entire deck and it's front edge is recommended (illustrations 15 and 16).

3.2 Stepping up to the sauna deck

3.2.1 Ramps not appropriate for wet spaces

The upper sauna bench height is usually one metre. The recommended ramp slope is 5 %, maximum 8 %. Also, the ramp must have a two-metre landing every six metres, which in this case means a ramp over 14 m long, using the maximum slope. This is not possible normally, and the ramp could be slippery when wet. Generally ramps should not be built in wet spaces. Level changes should be handled in other ways.

3.2.2 Steps to the deck

The width of the steps should be 600 mm when the bather is grasping handrails on both sides of the step. When elbow or axillary crutches are used, the width should be 900 mm. For those

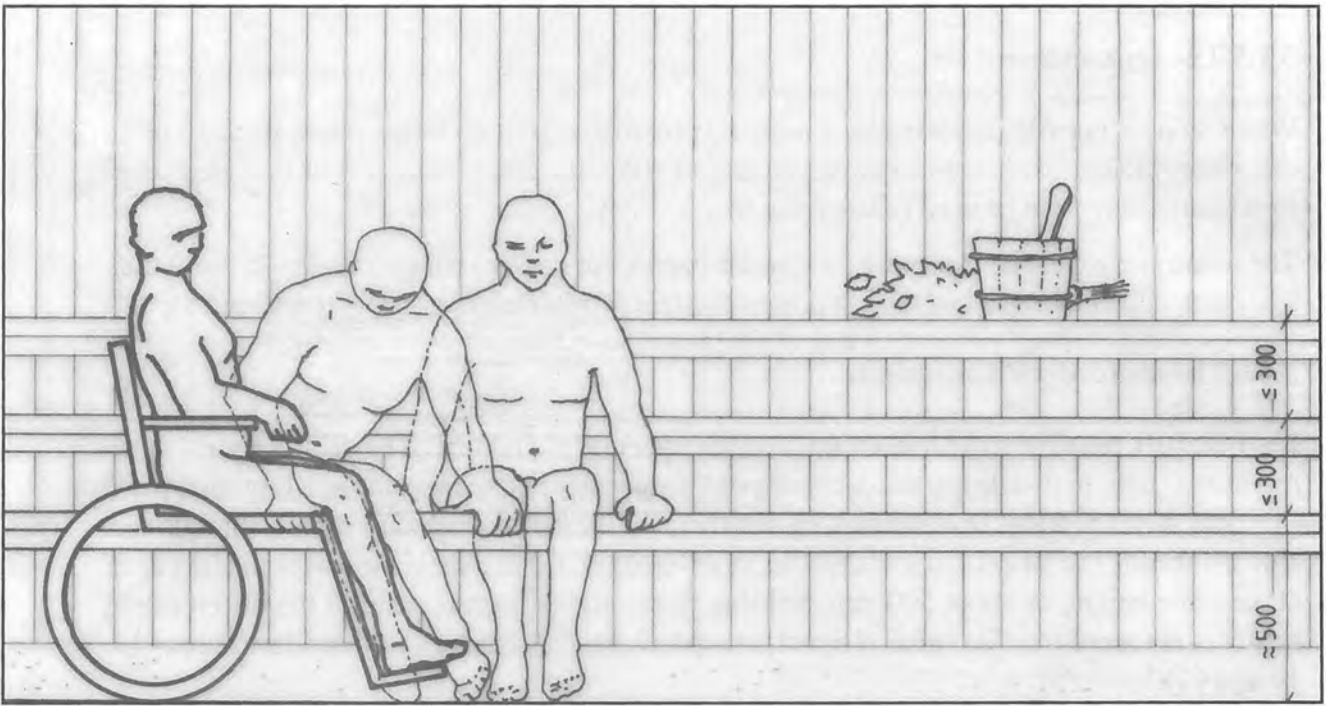


Illustration 13: The manual shift from wheelchair to sauna platform

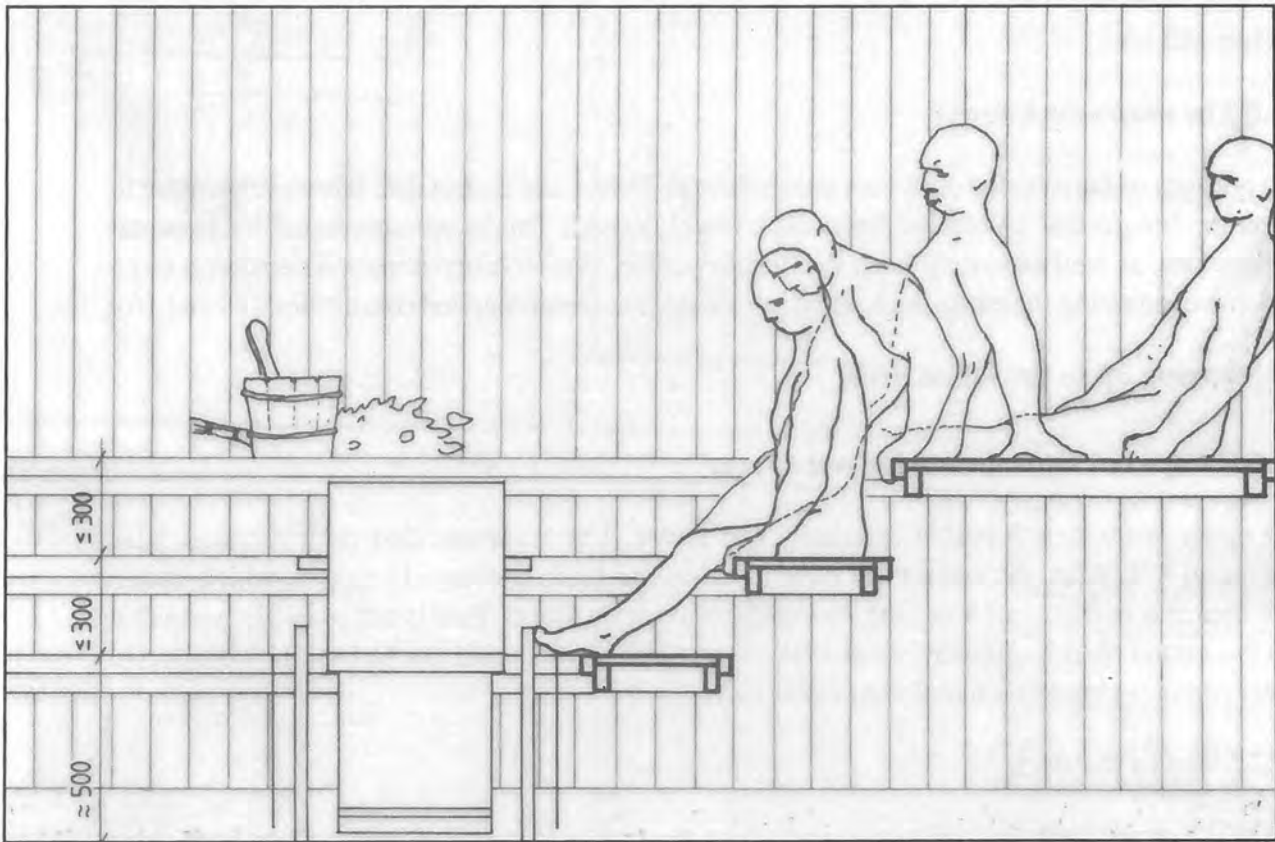


Illustration 14: The manual transition from one platform to another



Illustration 15: Typical platform



Illustration 16: A platform that is 1000 mm wide with a platform towel.

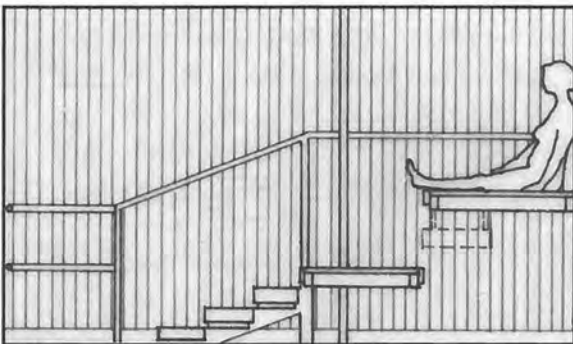


Illustration 17: Feet straight out on the upper platform

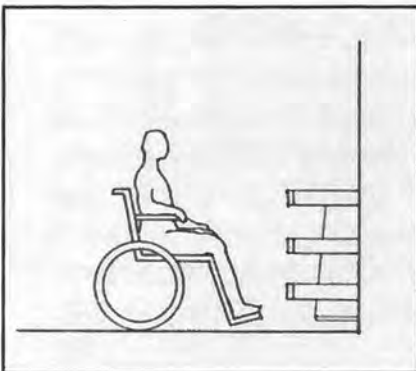
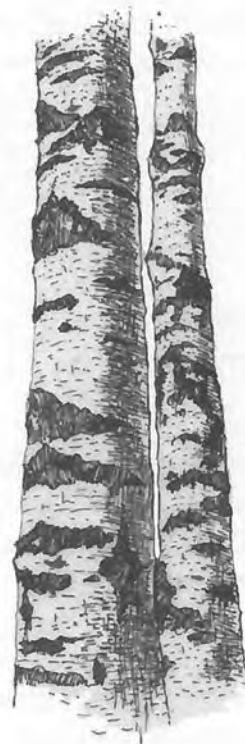


Illustration 18: The sauna stove protective railing



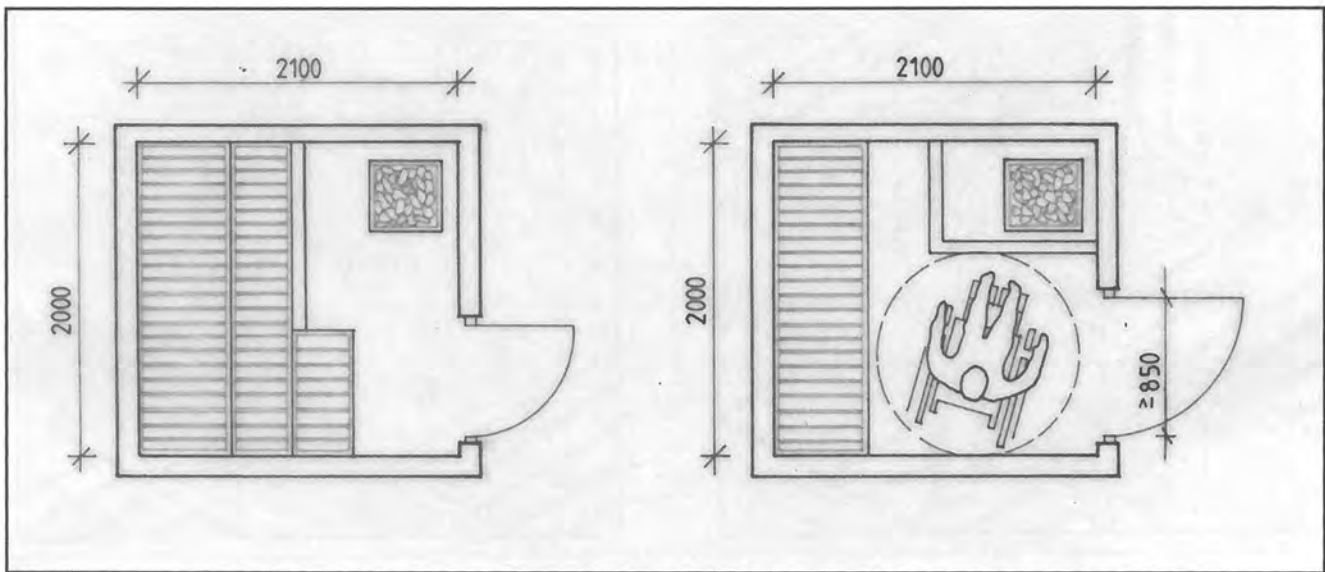


Illustration 19: The plan for two similar sized saunas: on the left the traditional interior, and on the right the stove recessed and furnished with a floor drain; the platform is a wide bench, the door opening is at least 850 mm, and there is a protective rail around the stove

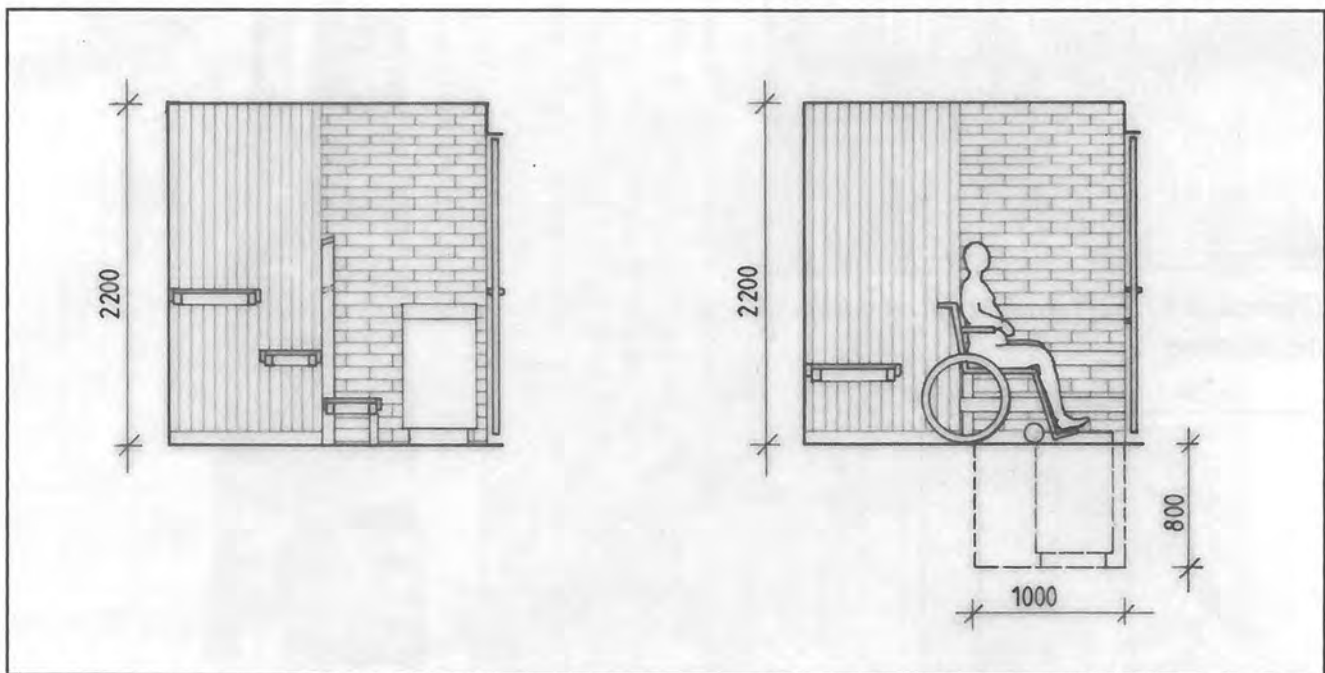


Illustration 20: The sections of the saunas shown in illustration 19

with stiff hips and knees, the step height should be 120 mm maximum, and minimum depth 300 mm. The sitting height for hip- and knee-impaired persons is 500-550 mm.

3.2.3 Handrails

Handrails ease shifting to the sauna bench. The normal height for walking persons is 900 mm, and the low sauna roller board handrail height is 500 mm from the floor. Handrails for stairs are 900 mm from the front edge of the step. The handrails should be covered with unfinished wood, without visible metal surfaces. They should be shaped in such a way that the bather can get a firm grip. A round handrail dimension can be 30-40 mm, with a gap of 45 mm to the wall. The handrail shape may also be oval or square with rounded edges, with the shorter dimension being 25 mm. The circumference of the handrail should be max. 180 mm.

3.2.4 Vertical supports

Good balance and safety can be enhanced by a floor-to-ceiling vertical support at the top of the stairs. This support could be made from a naturally curved branch, which allows for a better grip than a straight, planed support. This could become a distinguishing piece of art, as well as a good support.

3.2.5 Deck lift

Stepping up to the sauna benches in an accessible sauna requires a motorized deck lift, which is at the moment very rare and expensive. The deck lift mechanism may be a platform that rises to correct deck level during the sauna, using a wood-surfaced sauna wheelchair. Another alternative could be a long, solid wooden sofa that is pneumatically powered. The bather sits on the sofa while at floor level, and rises up to the proper sauna deck level using a toggle control switch. Special care must be taken to ensure safety during its use.

3.3 Other sauna steam solutions

3.3.1 Sauna stove stones at the floor level

Another solution for the sauna room/stove design problem is allowing the hot steam to flow to the lower deck, eliminating completely the need for higher decks.

This also eliminates the steps to the higher decks. This solution allows in the same floor space either the traditional deck system, or single decks, allowing more room because the steps and middle decks are left out. This solution was used in a service home for mobility-impaired persons, where the ground-floor sauna had the stove recessed in the floor so that the stones are at the floor level, allowing the steam heat to flow at the floor level. The recessed electric stove requires sufficient space underneath the floor. This solution requires a floor drain however, and somewhat complicates the cleaning of the sauna, if extra space is not allowed. A similar ground floor sauna with recessed stove could be used also in detached dwellings (illustrations 19 and 20).

3.3.2 Two floor levels

The previous solution has been further developed so that the entire sauna is lower than the

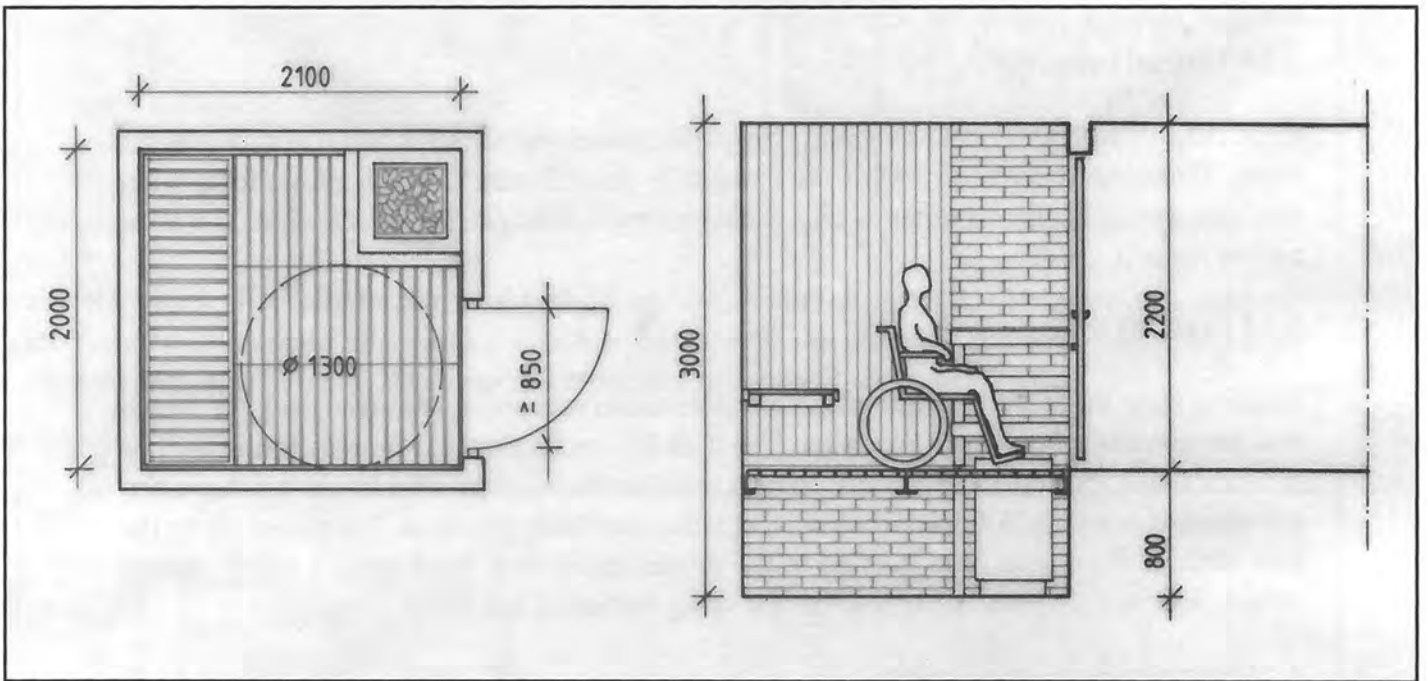
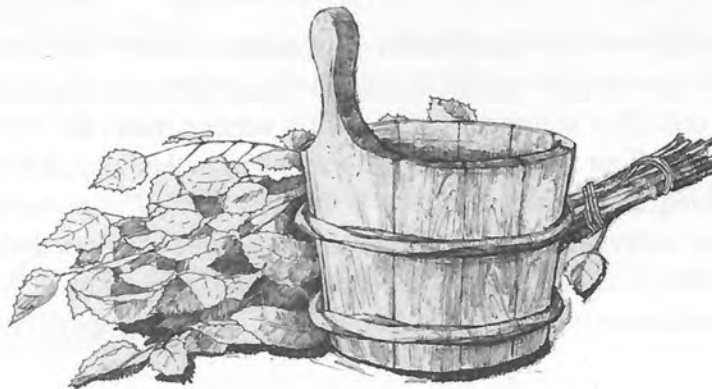


Illustration 21: Plan and section of a two-level floor solution



washroom, equal to the stove height. The new washroom floor is a grill made of wood, which can be removed for cleaning. Below the grill is air space. The lower floor is waterproof and has the normal floor drain (illustration 21).

3.3.3 Sauna on a slope

The problem of stepping up to the upper sauna deck can also be eliminated by locating the sauna room on a slope below the washroom. In this way the bather can come into the sauna from the washroom in the shower chair, and shift to the sauna deck at the same height. This has been realised in a detached dwelling, where the users are very satisfied. The sauna stove can be either electric or wood-burning (illustrations 22 and 23).

3.3.4 New ventilation techniques

The lower sauna deck steam flow mentioned above requires the ventilation to have the intake vent above the sauna stove, and the exhaust air at the floor level at the opposite corner. This helps the sauna ventilation in general. Saunas have traditionally had problems with moisture in the wooden framework, and the above-mentioned ventilation system would help to prevent this problem (illustrations 24, 25 and 26).

3.4 The washroom

The washroom should be dimensioned so that it is suitable for wheelchair users and an assistant, with shower stalls for one or several users. The shower stall should be 1300 mm x 1300 mm or 900 mm x 1600 mm, with sufficient space to maneuver to the next space (illustrations 27, 28 and 29).

3.4.1 Shower seat

The shower stall may have a hinged seat that tilts up from the wall, at a height of 500 mm for public saunas, and according to the user for private dwellings (illustration 30).

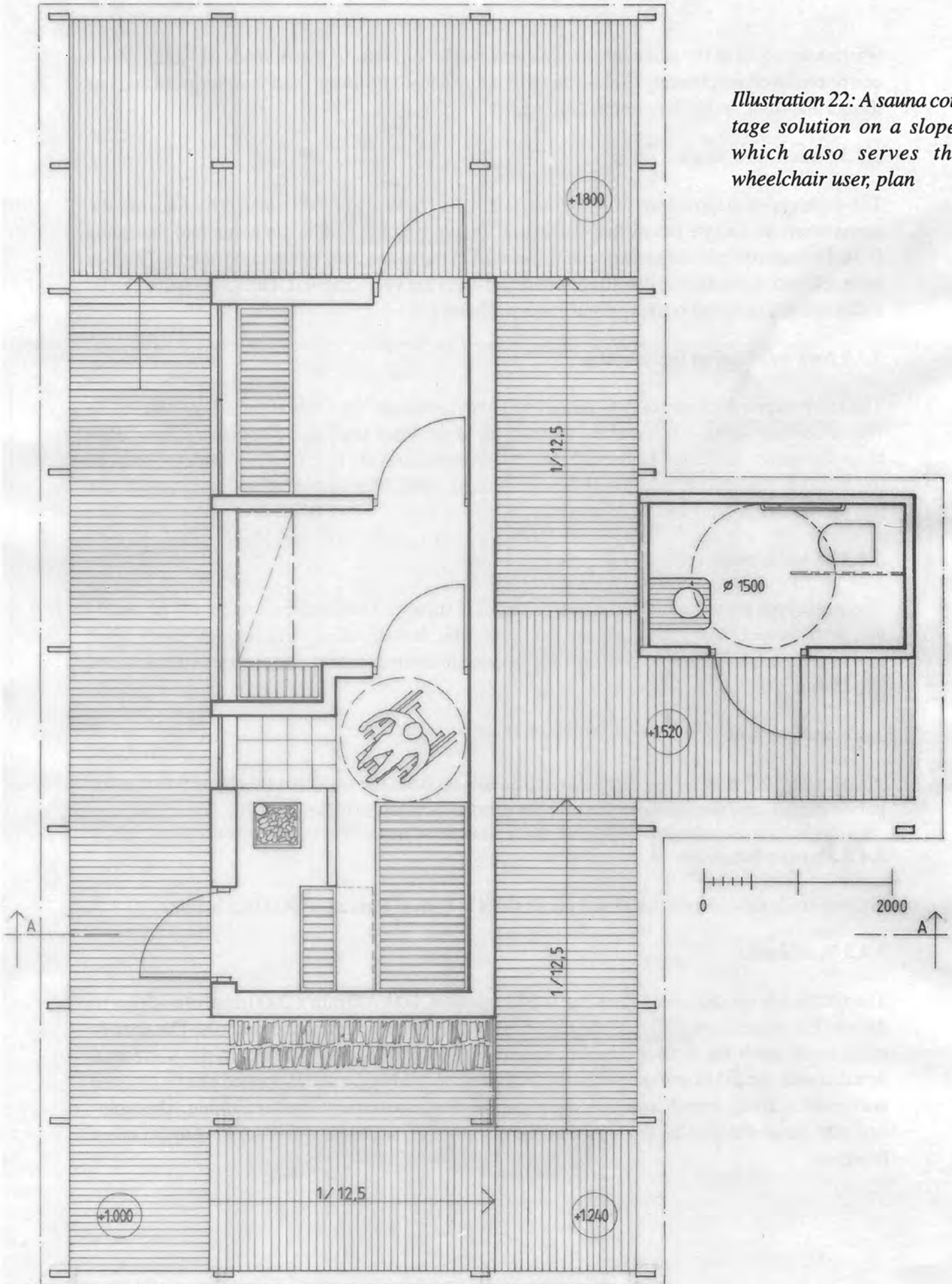
3.4.2 Shower handrails

Shower stalls should have handrails on all sides at both 500 mm and 900 mm heights.

3.4.3 Washbasin

The washroom should have a grill-like washing bench, 600-700 mm x 2000 mm, in addition to the smaller normal bench. It must be possible to reach the shower and the controls. The shower cable must reach the washing bench, and allow the bather to be washed in the horizontal position with the aid of another person. For horizontal washing, a metal-framed plastic covered perforated washing bench may be used. It can be tilted up to the wall after bathing. This solution may be used above the tub in a detached dwelling, if the washroom is adjacent to the sauna room.

Illustration 22: A sauna cottage solution on a slope, which also serves the wheelchair user, plan



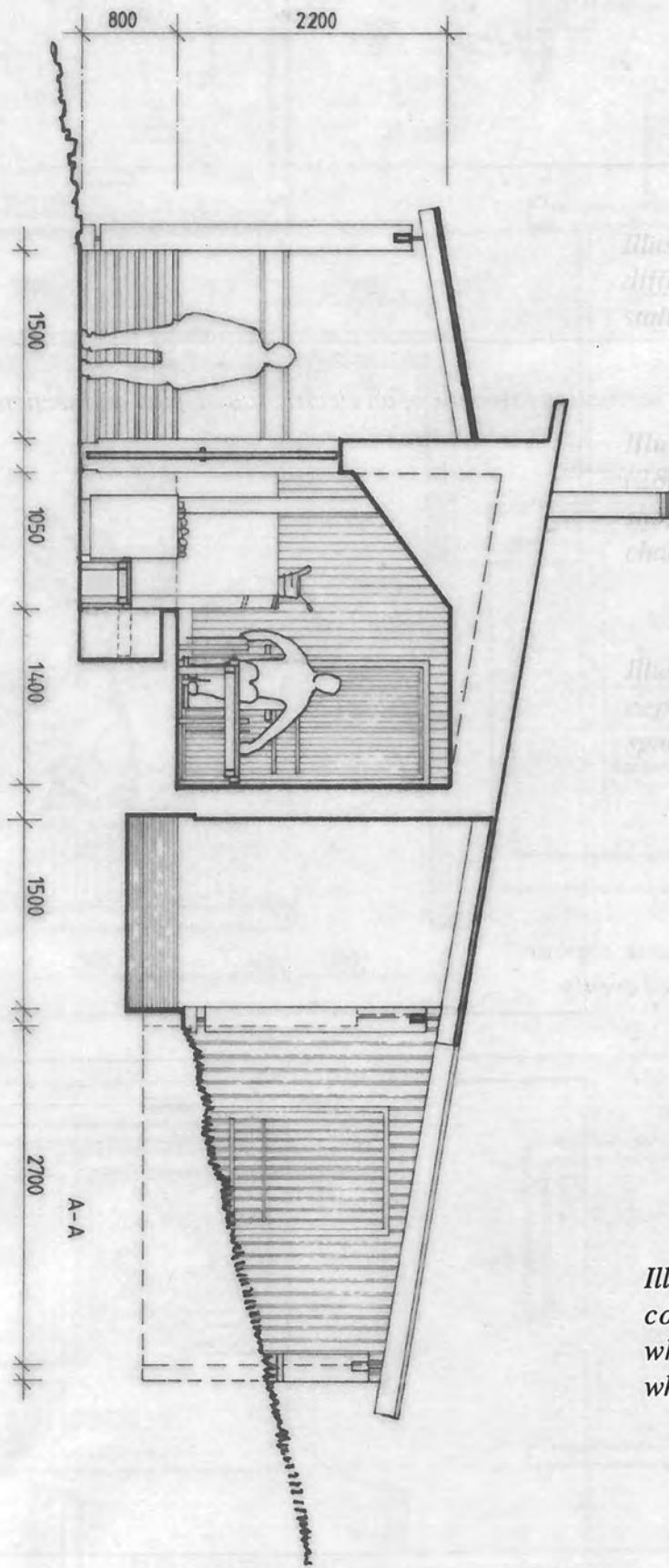


Illustration above (27): Two different types of shower stalls for wheelchair users

Illustration in the middle (28): Acceptable public shower space for a wheelchair user

Illustration below (29): Acceptable private shower space for a wheelchair user

Illustration 23: A sauna cottage on a slope, which also serves the wheelchair user, section

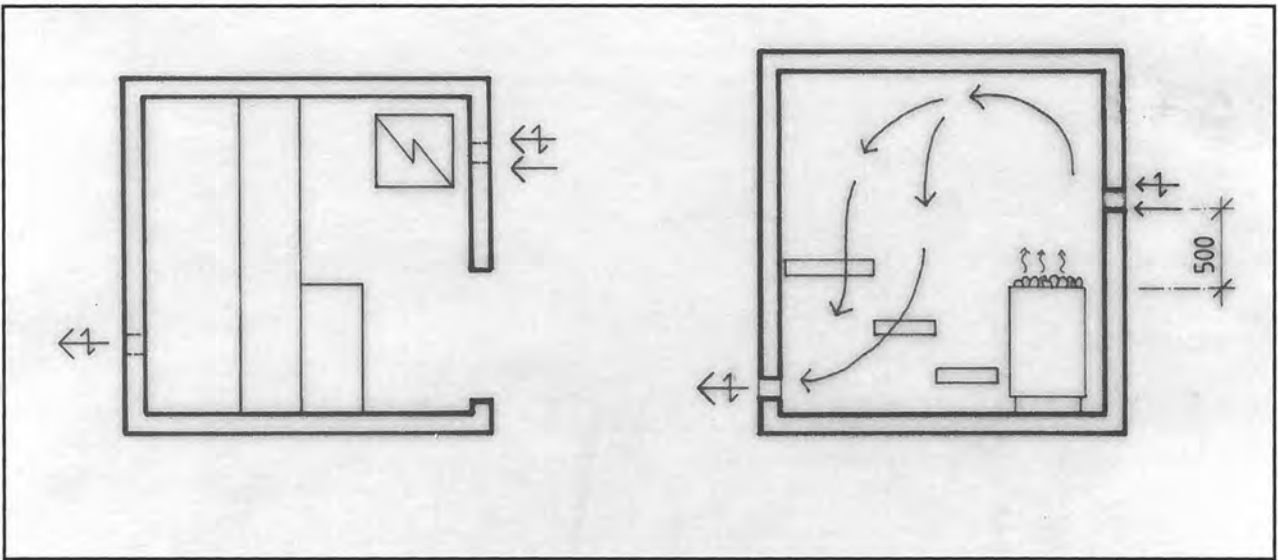


Illustration 24: The basic ventilation principle of an electric sauna, plan and section

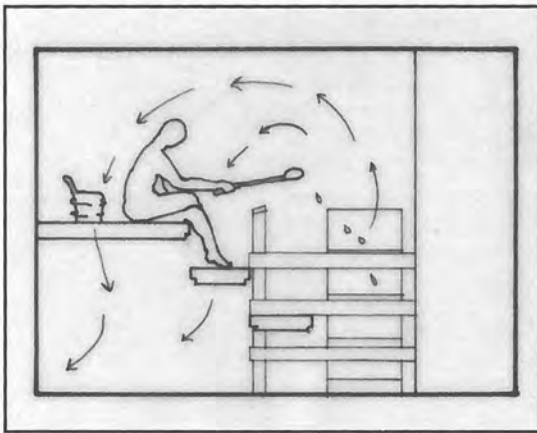


Illustration 25: The sauna vapour movement, when distributed evenly

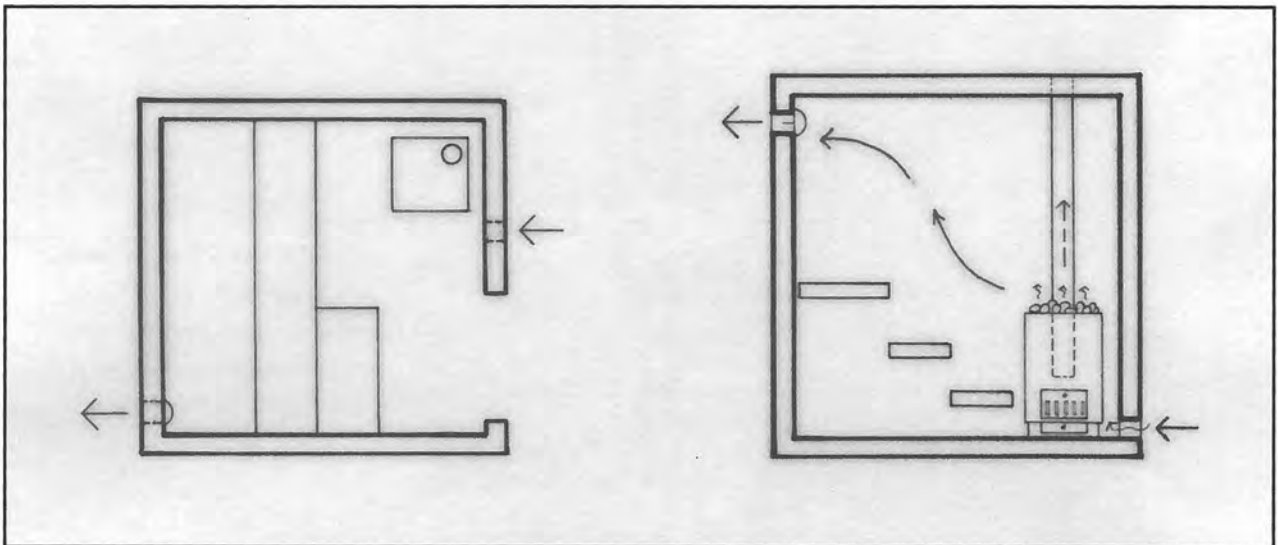


Illustration 26: The traditional sauna ventilation method for wood-burning stoves. The air below the stove stones stratifies, forming a cool zone, i.e. heat is unevenly distributed.

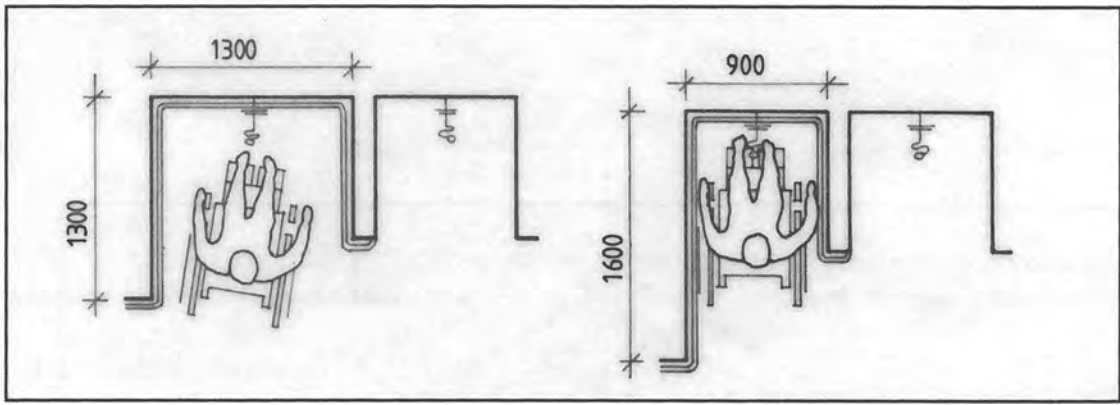


Illustration above (27): Two different types of shower stalls for wheelchair users

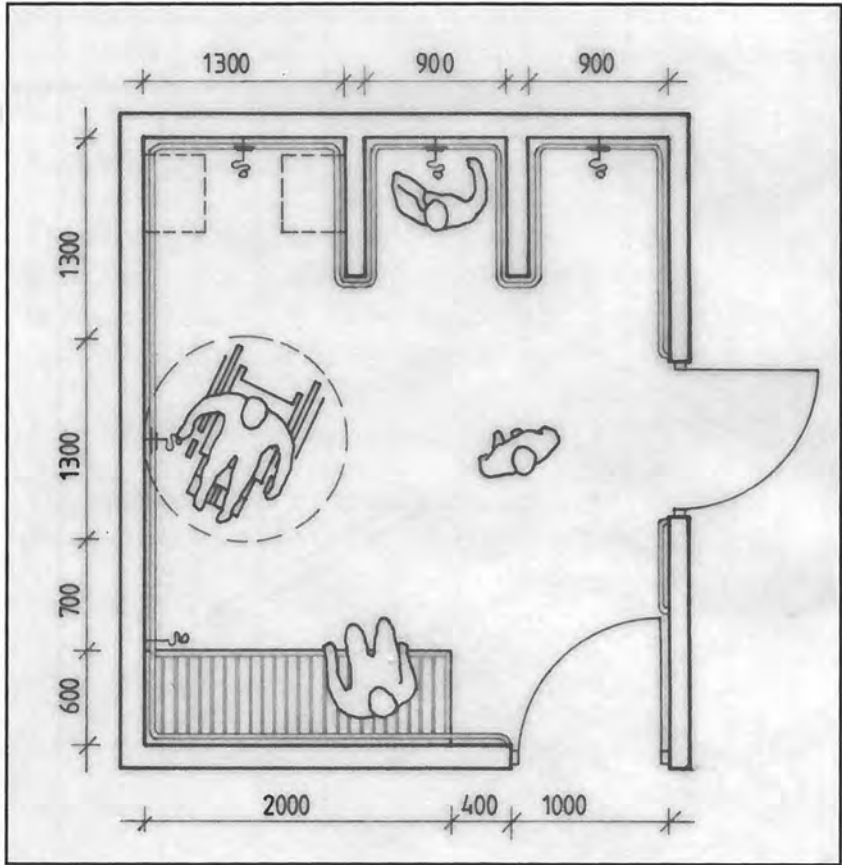
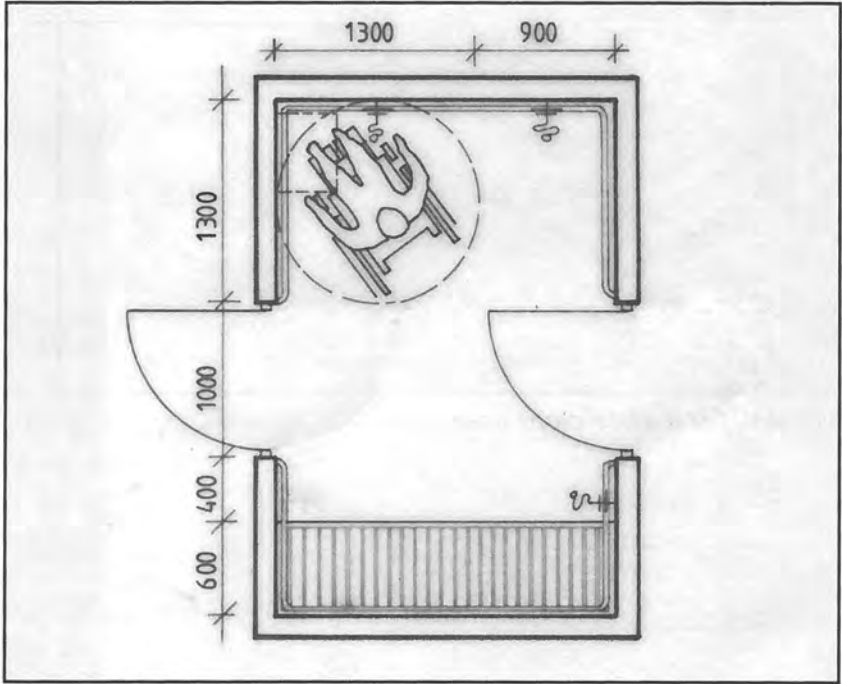


Illustration in the middle (28): Acceptable public shower space for a wheelchair user

Illustration below (29): Acceptable private shower space for a wheelchair user



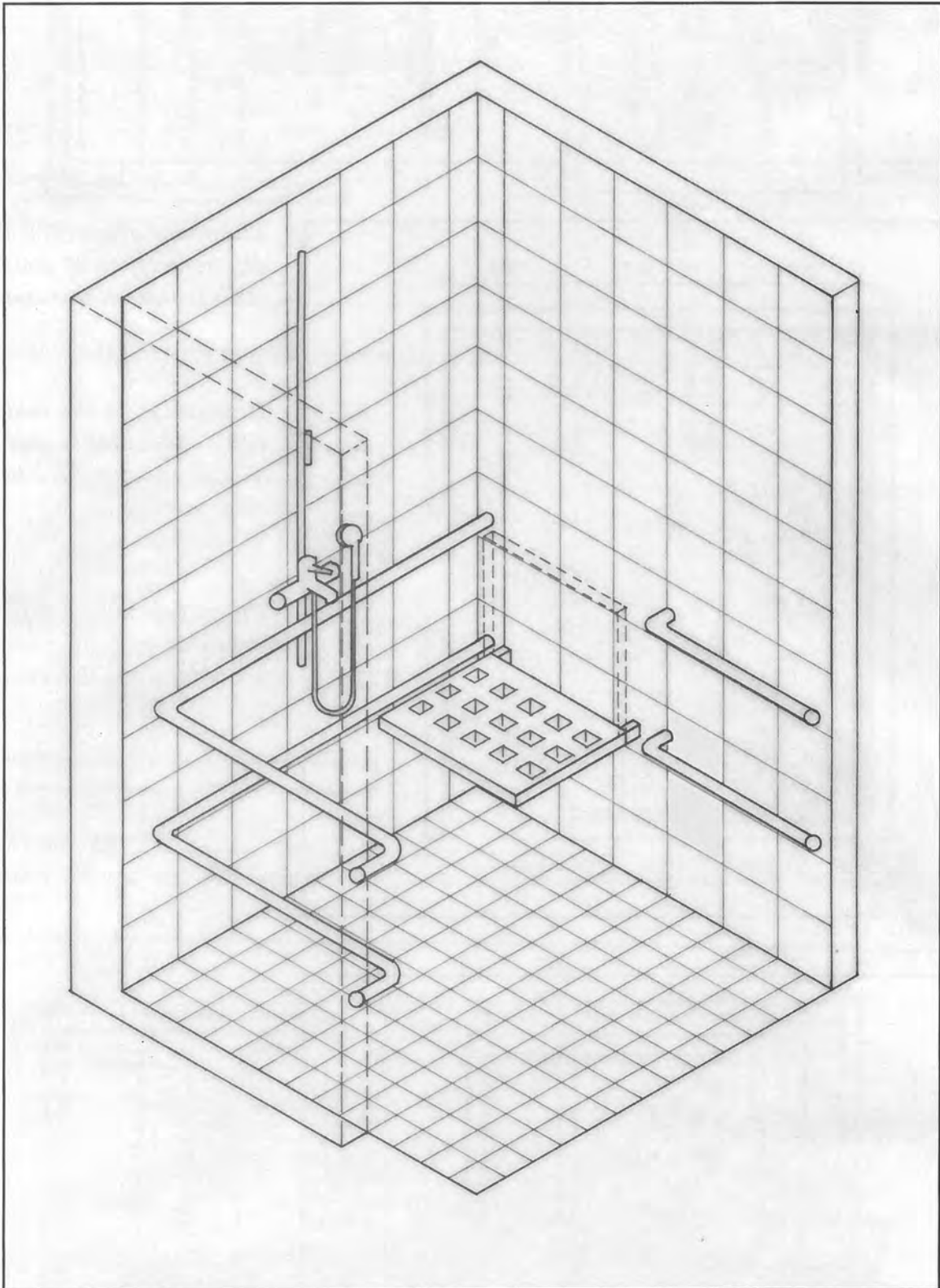


Illustration 30: Suitable shower stall for a wheelchair user

3.4.4 Washroom handrails

The washroom handrails are continuous on all walls, with dimensions as given in the sauna section. The material should be matt finish, not chrome or nickel, to avoid contact allergies.

3.4.5 Shower fixtures

The shower fixture should be the one-handed type, complete with thermostat and adjustable shower height, 900-1900 mm. The distance to the nearest wall should be min. 400 mm. Next to the shower there should also be a deep tray for washing articles at the wheelchair user's height of ca 900 mm, also 400 mm from the corner.

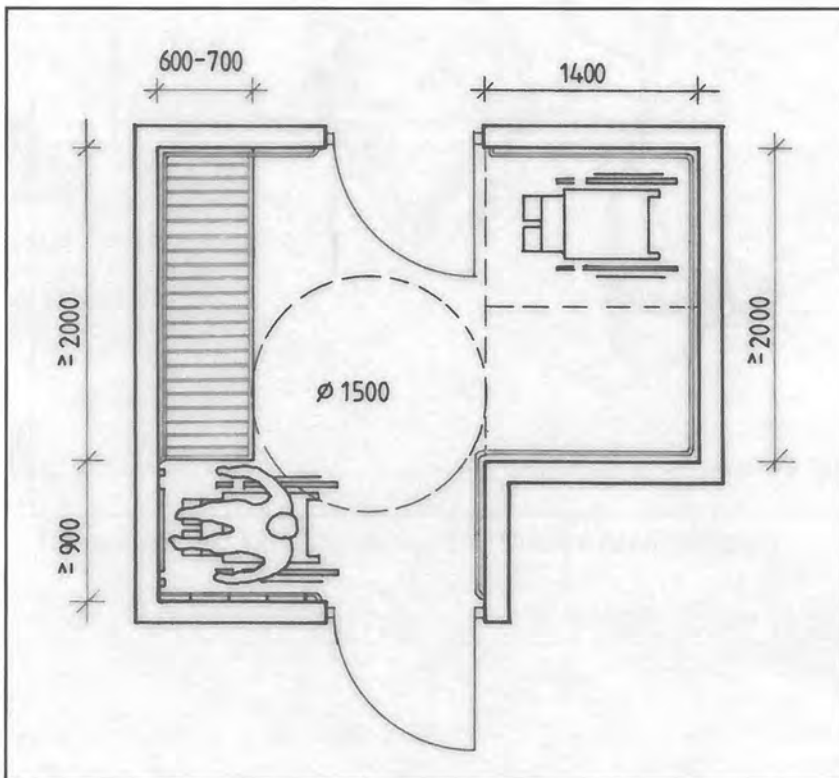
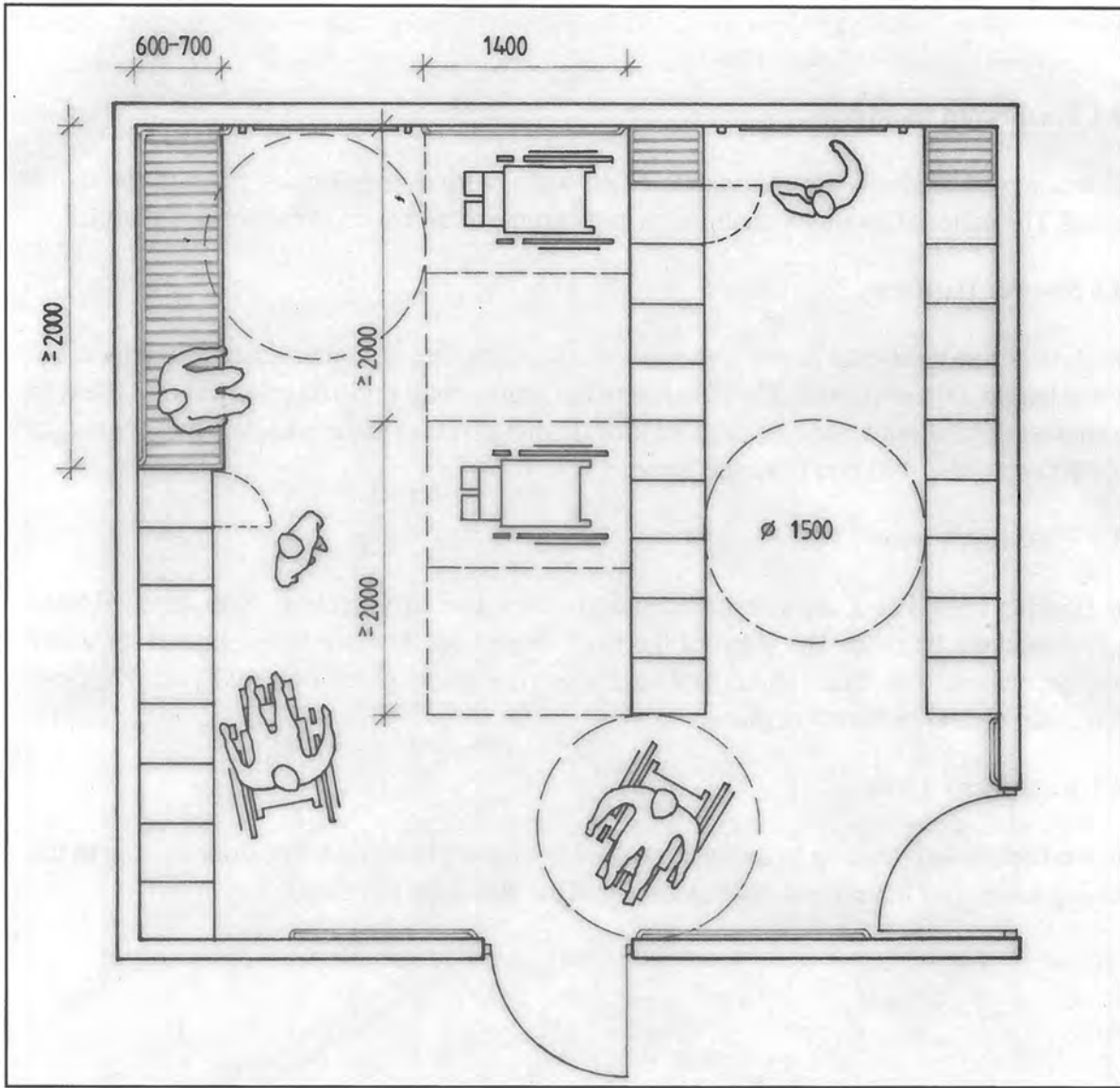
3.4.6 Washroom floor

The flooring should be a slip-resistant material that is also easy to clean. Non-attached floor grills should not be used. The slope of the floor should not be more than required for water drainage, or about 2 %. There should not be changes in floor height at thresholds, etc. The floor drain cover should be firmly in place.

3.4.7 washroom doors

The washroom door leading to the sauna should not have a threshold. The door leading to the dressing room may have a soft, rubber threshold, or thin drain threshold.





*Illustrations 31 ja 32:
Two different-sized
dressing rooms, suit-
able also for wheel-
chair users*

4 OTHER SPACES



4.1 Wheelchair maintenance

A space reserved for wheelchair washing and battery recharging should be available. The floor drain should be equipped with a sand trap.

4.2 Dressing room bench

The dressing room bench should be long enough for users to dress in the lying position. The bench should be 2000 mm long, 600-700 mm wide, and height from the floor 500 mm. In some cases, the bench may be covered with a plastic covered mattress (illustrations 31 and 32).

4.3 Wardrobe

Wardrobe areas must be designed for wheelchairs users also. The wardrobe area must be in a recessed or protected area, to prevent blind persons from injuring themselves on hooks or shelves.

4.4 Dressing stalls

If lockable dressing stalls are provided, a mobility-impaired person must also be able to reach the hooks or shelves from the dressing bench. The lock should be openable easily with one hand, and the stalls must have contrasting, raised numbers.

4.5 Mirror

The mirror should be high enough so that both a person sitting in a wheelchair and standing may see themselves. The minimum height is 300-900 mm and the appropriate top-edge height 2000 mm. Lighting is better fixed to the sides of the mirror than the top.

4.6 Electrical outlets and switches

Next to the mirror should be an electric outlet for a hair dryer, and an extra outlet that is earthed at a height of 850-1100 mm from the floor, and 400 mm from any corner. The same location standards hold for switches, which should be large, 50 mm x 50 mm, and of the swing-switch type with a clear colour contrast against the background colour. These switches and outlets should not be placed behind furniture that will prevent their use.

4.7 Dressing room floor

The dressing room floor should be a slip-resistant material even when wet, and easy to clean. Throw-rugs and floor grills should not be used. Floor heating is recommended.

4.8 Dressing room door

The door must be without a threshold. The clear opening must be at least 850 mm wide, and be easy to open and close, and to lock with one hand. The door must also be closable from the

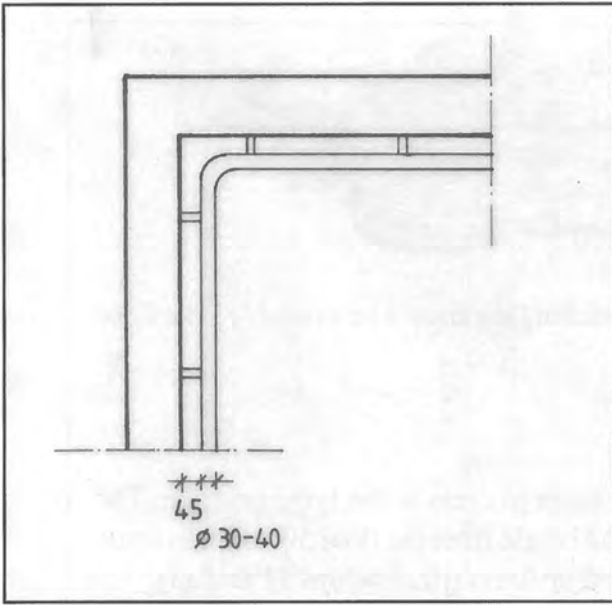


Illustration 33: Wall handrail as seen from above

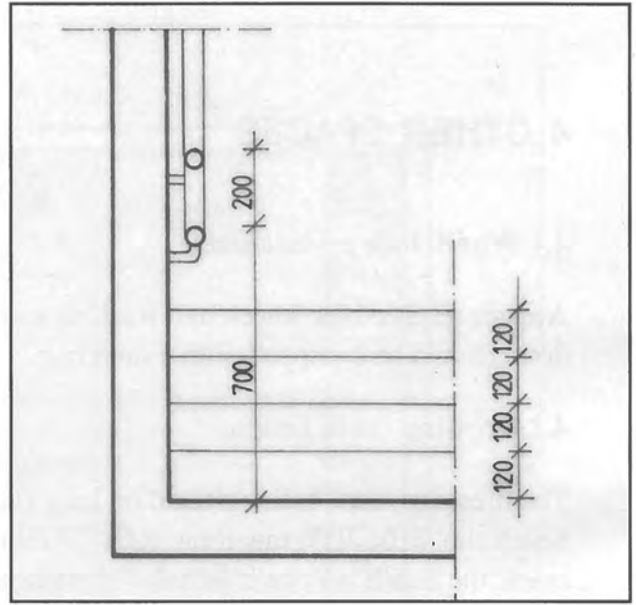
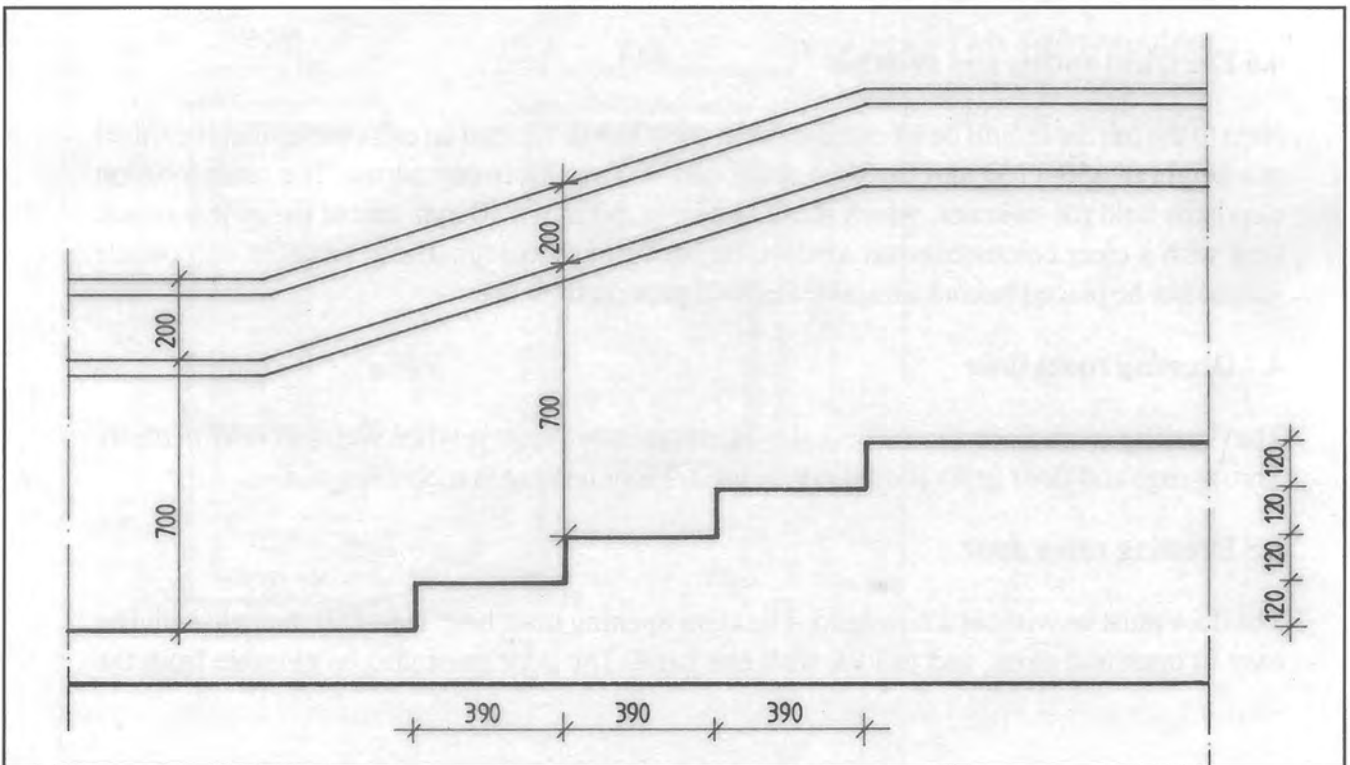
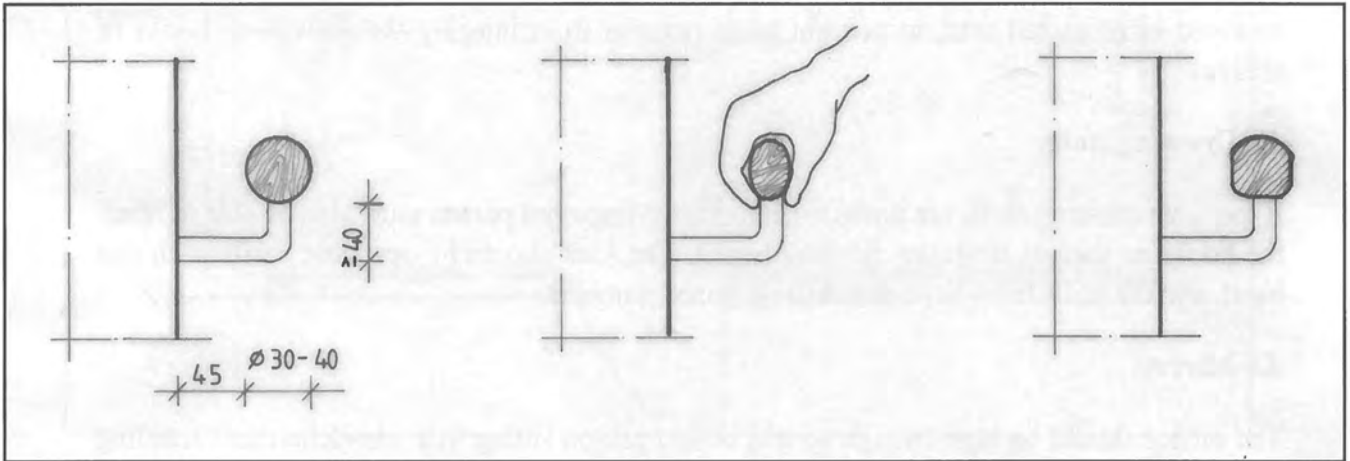


Illustration 34: Wall handrail for shallow stair seen from the front



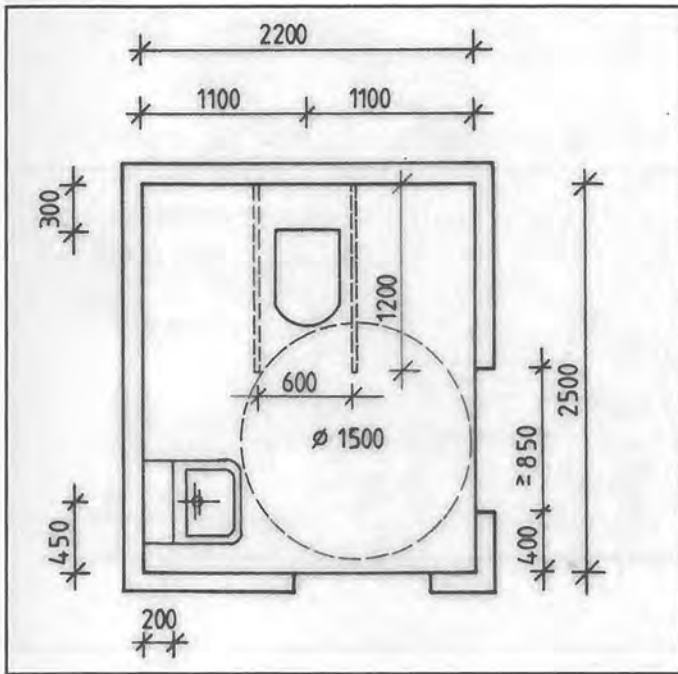


Illustration 37: Suitable WC for wheelchair user

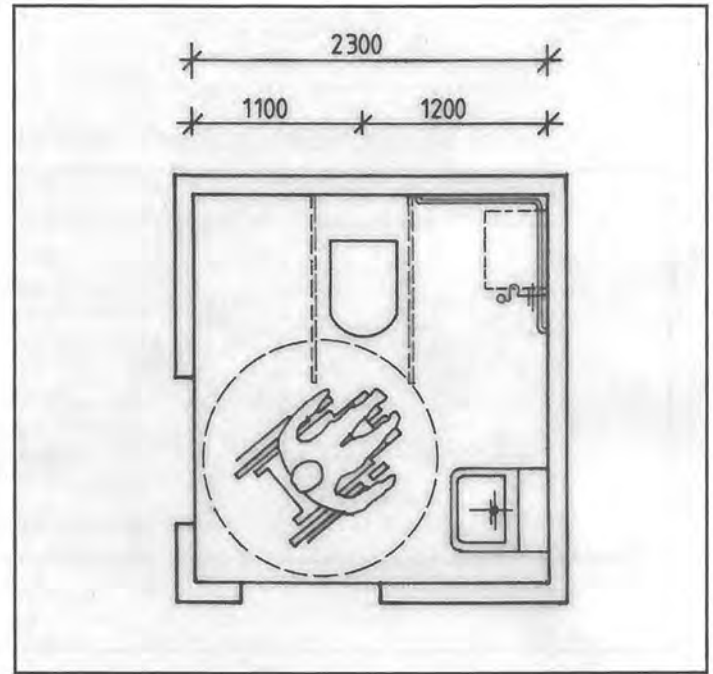


Illustration 38: Suitable WC for wheelchair user with a shower

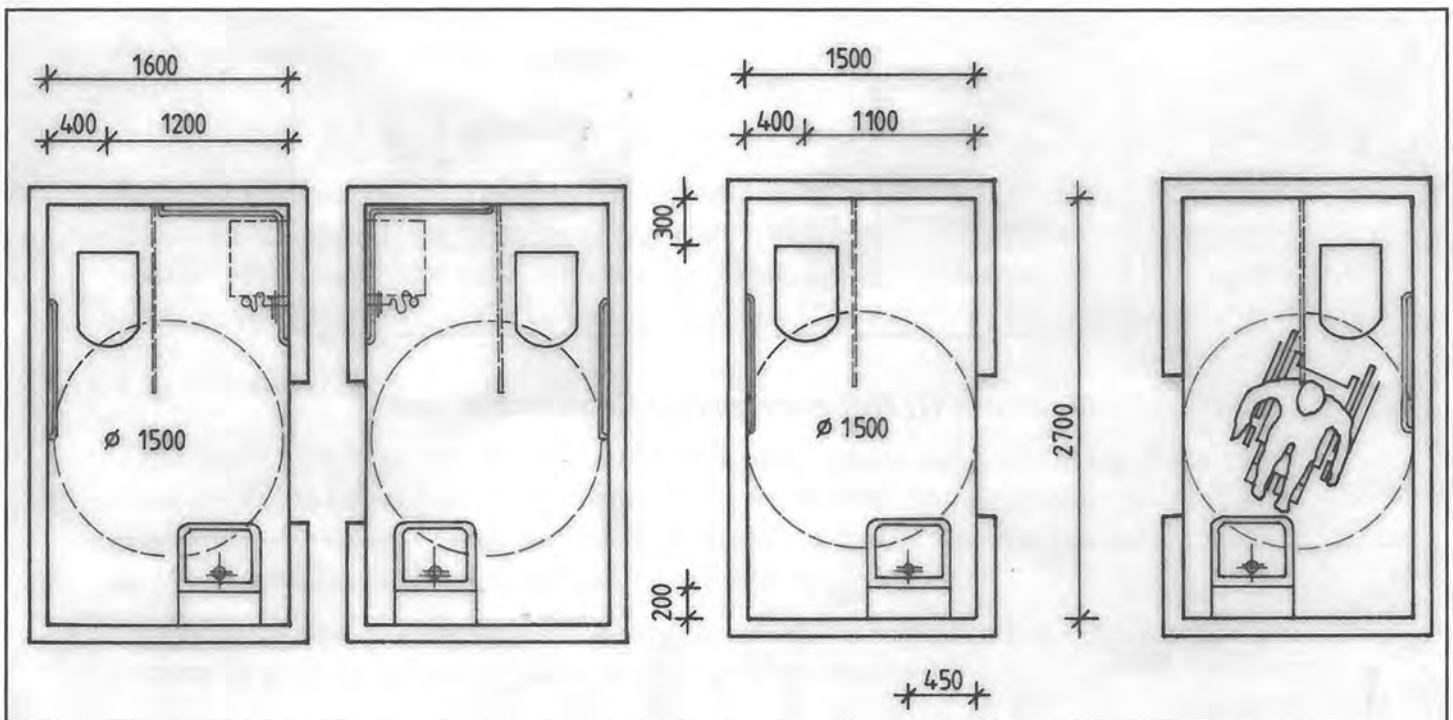


Illustration 39: Left- and right-handed WCs with and without shower as mirror image pairs. In the left-handed WC free space is on the left side, and in the right-handed on the right side seen when sitting on the toilet bowl

Left page, middle illustration (35): Different types of handrails; round, oval and rectangular with rounded edges

Left page, lower illustration (36): handrail with shallow stair

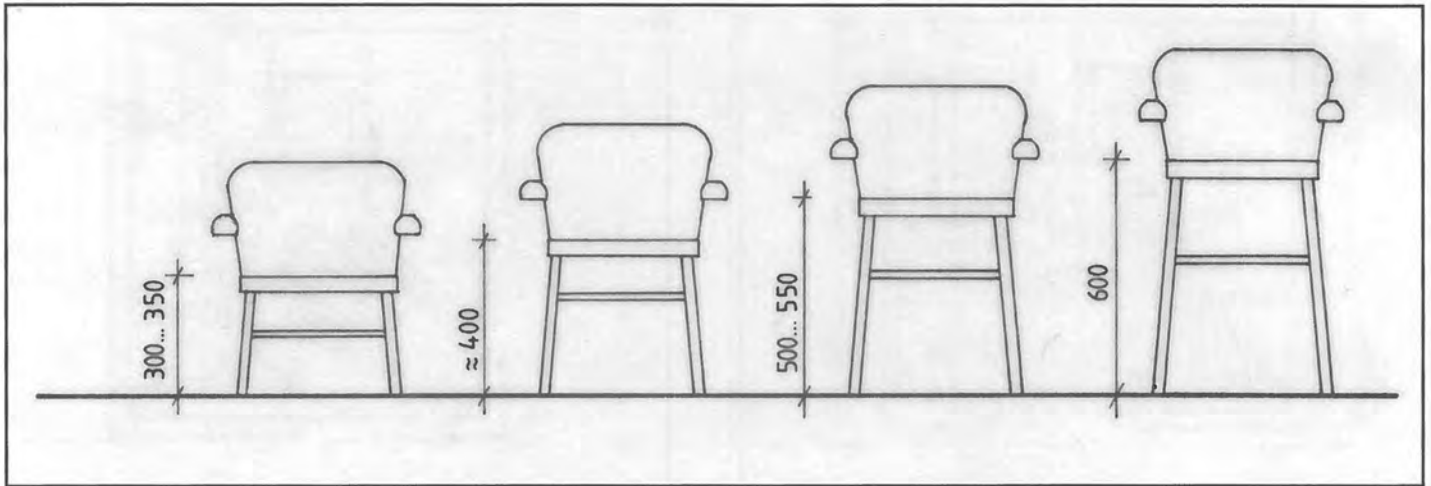


Illustration 40: Examples of different chair heights

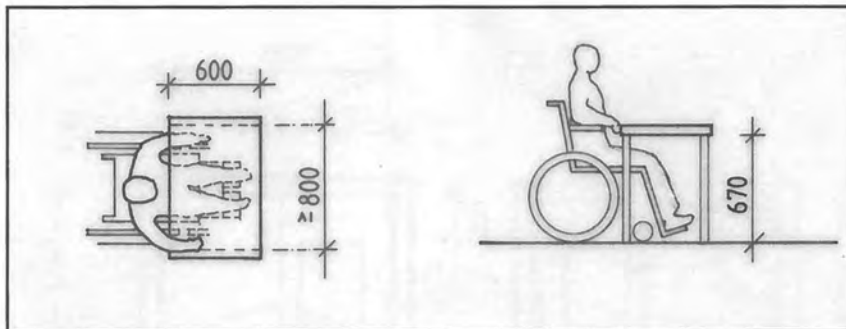


Illustration 41: Foot space required for wheelchair user



hinge side with a handle mounted 800 mm from the floor. The door handle may be normal height, or 900-1000 mm from the floor. The door handle must be accessible from both sides, which means at least 400 mm from a corner, and 700 mm from washbasins and steps or ramps that lead downwards.

4.9 WC space

The sauna area must have an accessible WC space. The interior dimensions are 2200 mm x 2500 mm, so that the water closet is in the middle of the short wall, with a 300 mm space from the wall. If a solution where only one side of the water closet is free, then another WC space must be provided, with a mirror image plan. The dimensions are then 1500 mm x 2700 mm. A shower may be provided if the space is widened by 100 mm in the shorter dimension (illustrations 37, 38 and 39).

4.10 Furniture

Furniture may not have sharp corners, or protrusions or easily breakable or removable parts. In order for persons in wheelchairs to sit at a table and wash in a wasbasin, the foot space width must be 800 mm, height 670 mm, and depth 600 mm. Suggested tabletop height is 750-800 mm. If normal chairs are available, they must be both higher than normal, or 500 mm, and lower, 350 mm in height (illustrations 40 and 41).

4.11 Materials

Materials that can cause allergies, such as chrome, nickel or rubber, must not be used in furniture or construction that might come into contact with the skin. Panelling should be installed vertically to avoid dust that collects in the ridges of horizontally applied panelling, causing dust allergies. Also panelled doors in clothes cabinets should be vertical for the same reason.

4.12 Colours

The sauna atmosphere includes medium dark or dark colours especially in the sauna steam room itself. The colour scale for the sauna area is warm, with natural materials such as unfinished wood and natural stone and red brick. Different shades of colour can be used to visualise spaces, shapes, furniture and their background materials.

Of special importance is the visualisation of changes in floor heights such as steps, using colour contrast or appropriate lighting, taking advantage of the shadows.

4.13 Lighting

Lighting should be pleasant, strong enough to visualise the spaces, and without glare. Light should not reflect directly or indirectly from glossy surfaces. Matt surfaces should be used. Transparent surfaces, with their risk of allowing accidents, must be avoided.

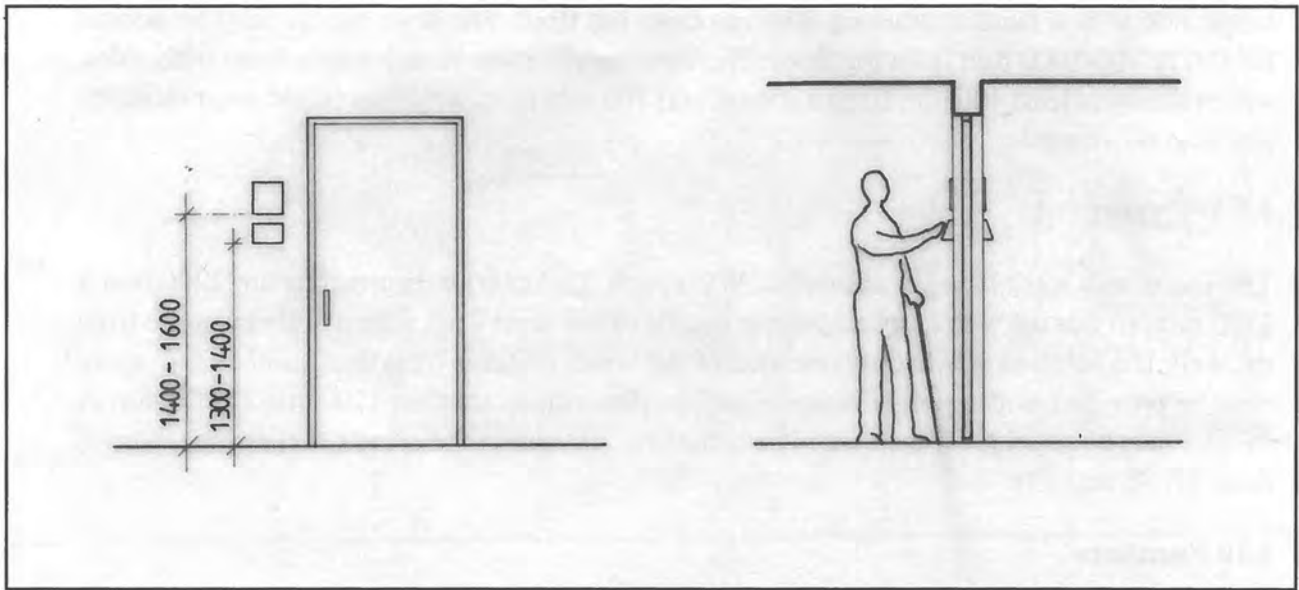


Illustration 42: Door and sign dimensions; the blind read the sign with their fingers

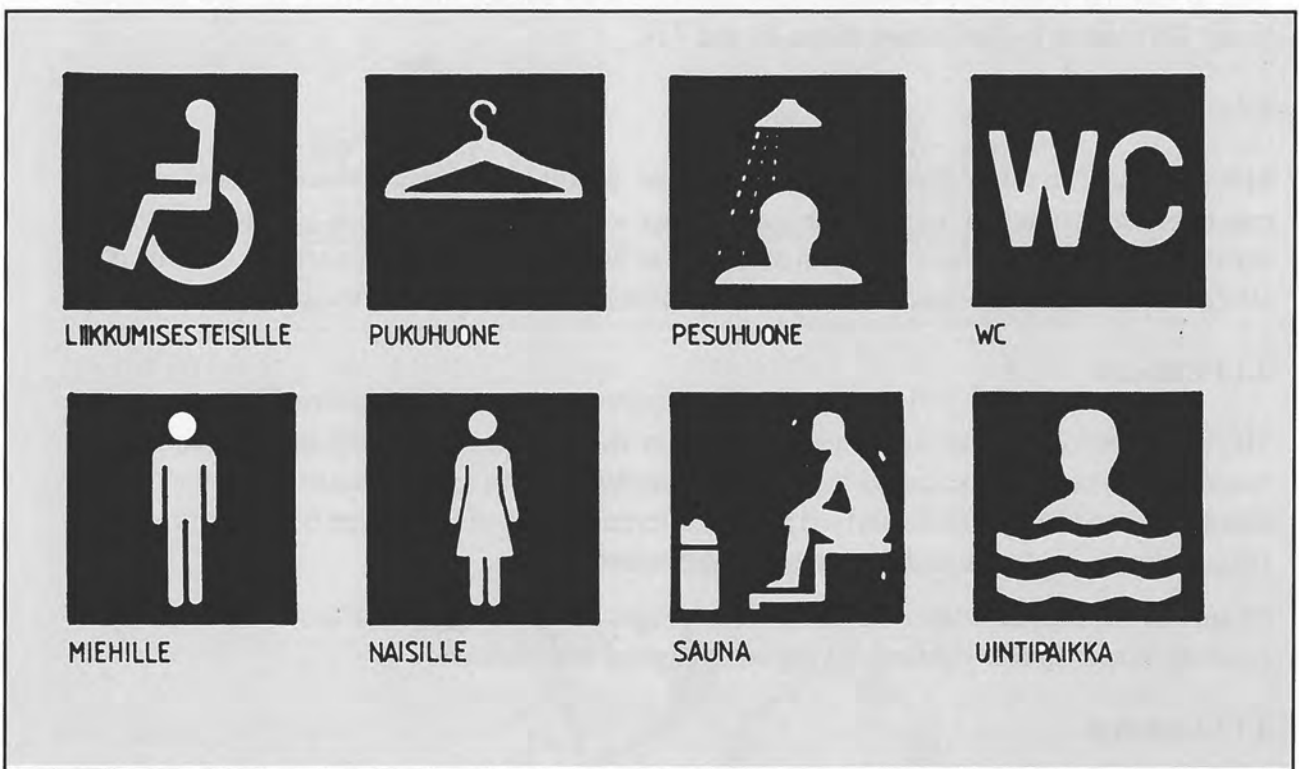


Illustration 43: Sign examples

4.14 Signage

In public saunas spaces should be marked with clear directions that are suitable also for blind persons. Dressing-room and WC doors must have signs on the door-handle side wall at an eye height of 1400-1600 mm. In particular the washroom doors must be marked clearly, when there is a swimming pool in the sauna area, with the doors clearly marked on the pool side also. When using Braille letters, they should be placed just below the normal signs or 1300-1400 mm, slightly slanted (illustrations 42 and 43).

4.15 Raised or recessed text and symbols

In addition to the text or in their place, symbols should be used. Signs should be made using raised or recessed figures, and clear, contrasting colours. Signs must be clearly lighted. Black text is seen best on a white background. If the sign is lit from the inside, the text should be light in colour, and the background dark. Raised text lettering should be 15-40 mm in height and figures 1 mm from the base. The cross-section of raised text should be in the shape of an inverted v-letter, with rounded upper edges. Recessed text should be 30-60 mm in height, 6-10 mm in width, and with a depth minimum 1 mm.

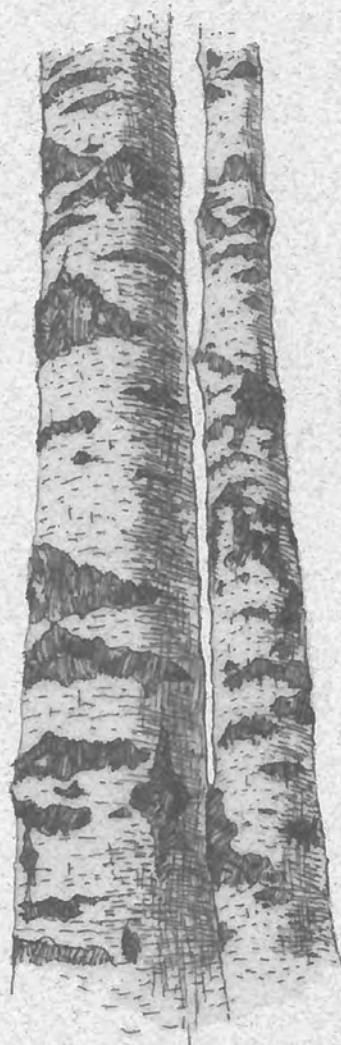




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