

Jon Christophersen

# Varieties of Barrier Free Design

Accessible Housing in Five European Countries  
– a Comparative Study



Norwegian Building Research Institute (NBI)

Jon Christophersen

# **Varieties of Barrier Free Design**

Accessible Housing in Five European Countries – a Comparative Study

Project report 211 – 1997

Project report 211  
Jon Christophersen  
**Varieties of Barrier Free Design**  
Accessible Housing in Five European Countries – a  
Comparative Study

ISSN 0801-6461  
ISBN 82-536-0564-1

100 eks. printede by  
S. E. Thoresen as  
Recirkulated paper:  
Cover Cyclus 200 g  
content Fortuna 100 g

© Norwegian Building Research Institute  
1996

Address: Forskningsveien 3B  
P.O.Box 123 Blindern  
0314 OSLO  
Phone: 47 22 96 55 00  
Telefax: 47 22 69 94 38 and 22 96 57 25

**Key words:**

Barrier free design  
Accessibility  
General needs housing  
Building legislation  
Housing planning

Front cover photo:  
from Sauerland, Wiesbaden

## Foreword

Funding for this study has been made available by the Norwegian State Housing Bank, which has been instrumental in promoting barrier free design in Norway. The chief aim has been to see how specifications for accessibility influence the design of general needs housing.

The study has been carried out with kind assistance from Dr Antje Flade at the Institut für Wohnen und Umwelt in Darmstadt, architects Luigi Prestinzenza Puglisi at INAIL in Rome, Linda Sheridan of the Liverpool University, Jane Darbyshire (OBE, BA, B.Arch), Newcastle, and Judith Pickles at the Scottish Homes association.

The author also wishes Dipl. Ing. Ulrike Wolff of the Gemeinnützige Bau- und Siedlungsgenossenschaft in Wiesbaden, Dipl. Ing. Celine Fries of the Hessisches Ministerium für Wirtschaft, Verkehr und Landesentwicklung, Dr Arch Antonino Saggio of the Rome University, Architects Fabrizio Vescovo and dr Paolo Quarantelli in Rome, Kathy Johnson Marshall (B.Arch Hons) of the Riverside Housing Association in Liverpool, B. Jardine (MCIOB) of the Joseph Rowntree Housing Trust and Alasdair Alldridge (RIBA, ARIAS) of Wittets Architects, Isle of Skye. Torstein Nilsen, Oslo, has translated essential parts of the Italian legislation and guide lines,

The Norwegian Building Research Institute, January 1997

Thorbjørn Hansen  
Housing Research Director

Jon Christophersen  
Researcher

# Contents

Introduction .....	5
Summary .....	7
<b>Part 1. The framework and the effects: Comparisons .....</b>	<b>11</b>
1. Into barrier free design .....	11
New perspectives: a note on the present housing situation.....	11
Similar ideologies, theories and political aims.....	12
Barrier free design is a compromise.....	13
Different levels of statutory requirements.....	15
No radical changes to established planning traditions.....	16
2. Applying the criteria, norms and standards.....	18
Italy and Germany .....	18
England, Scotland and Norway.....	19
3. Designing barrier free housing: architectural implications.....	21
Safeguarding dwelling standard through barrier free design .....	21
Effects on layouts and dimensions .....	22
The individual rooms.....	29
A dichotomy: The case of housing for the elderly.....	33
The minimal dwelling unit.....	35
Getting up the hill: External circulation .....	36
4. The basic specifications .....	41
<b>Part 2 The Five Countries.....</b>	<b>43</b>
1. Norway.....	43
Political policy .....	44
Legislation.....	44
The life span standard.....	45
2. England and Scotland .....	47
The lifetime homes criteria.....	49
Differences between England and Scotland .....	50
3. Germany .....	53
Theoretical and political basis.....	53
The DIN-Norm .....	54
Legal requirements .....	54
Implementation, control and promotion.....	56
4. Italy .....	58
Background: The legacy of le Corbusier.....	58
Italian legislation and norms.....	59
Design of barrier free housing .....	61
Appendices .....	62
1. Table of specifications .....	62
External .....	62
Internal.....	63
Italian specifications for free floor space at a door.....	64
2. Literature .....	65



SHORE PLACE ELEVATION

The Scottish example above illustrates a present day problem: building new, economic low rise barrier free housing on a gap site in an historical setting. (Shore/Tolbooth Wynd, Leith, designed by Matthew, Hamilton, McLean, Edinburgh.)

## Introduction

This study looks into the background, the requirements and the design of barrier free housing in five European countries: Norway, Scotland, England, Germany and Italy. The object, apart from listing and comparing norms, standards and requirements for barrier free housing, has been to see how these affect the actual design of new dwellings. The emphasis is on the structure and composition of barrier free dwelling plans in general needs housing, particularly how dwelling plans from the five countries compare.

There are a number of obstacles to such comparisons. Not only do the legal aspects of building vary considerably from country to country - the centralised system in Italy and the decentralised German administration representing the extremes - there are also considerable and obvious differences of climatic conditions, in the ways of living, of traditional plan forms and types of housing. Climatically, the harsh Norwegian winters and the wet and windy conditions in Scotland contrast with the hot Italian summer. As for ways of building, the Italian multi-storey blocks of flats which have dominated the public housing sector since the second world war have little in common with the single and two storey, timber frame houses found in Norway. On top of this, Norway has hardly any public housing in the sense that the term applies to the other five countries.

Legal requirements for barrier free design in the built environment have been dealt with in several other European studies. The legal aspects are therefore not covered in detail but are included chiefly as a background. Interestingly, it will be seen that there are considerable differences in the legal systems and structures, whereas the specifications for barrier free design vary only slightly - whatever legal status the specifications may have. No attempt has been made to study social conditions or the ways in which people use their dwellings. The study is strictly limited to the architectural questions of design and layout.

### The choice of countries

Contacts made through the European Network for Housing Research's Housing Quality Working Group made the study possible. The group gave a possibility for establishing contacts and gaining insight both into the variety of European housing traditions and the ways in which barrier free design has been adapted to fit in with these traditions. A thorough analysis of the various traditions is not possible within the scope of this study - the focus here being barrier free design - but some glimpses into the subject are necessary. In this respect, Norway represents the Scandinavian tradition of low rise, timber frame medium density housing. Germany may be seen as an illustration of suburban and urban central European housing, while Italy shows examples of a brutalist style in the tradition of Le Corbusier. With regard to England and Scotland, the 1960ies and '70ies tradition of multi-storey construction seems to be discontinued and falls consequently outside this study. Instead, the English and Scottish samples are rather more of an answer to the present day problem of building economic low rise housing and of adapting new projects to existing and historical settings.

There are two main reasons why both England and Scotland are included. One, which is often forgotten in the rest of Europe, is the different traditions of the two countries, the other is the political current situation. The prospects of the Labour party winning the next general election and their promise of a possible devolution makes a point for highlighting some differences between Scotland and England. As for traditions of building, the differences are rather obvious - the Scots use stone where the English use bricks, and both the rural style of building and the city tenements of Scotland have distinctive features that set them apart from traditional English housing. The fact that England and Scotland each have their own, separate building legislation further underlines the different traditions.

### **The structure of this report**

The report is presented in two main sections and an introductory summary of the main findings. Part one, which makes up the bulk of the report, is the comparative section. It focuses on dwelling layouts and the sizes and dimensions of the individual rooms, using a comparison of theories, political aims, legislative systems and the basic requirements and specifications for barrier design as background.

Part two is intended to fill in the background for each country. Albeit only in outline, it affords a few more details on the local situations as regards promotion and legislation than part one allows. A simplified but relatively comprehensive comparison of the specifications for barrier free design is given in the form of tables in appendix one.



## Summary

### Main findings

The main findings of this study can be briefly summarised in four points. The first two concern similarities; the others point to differences between the five countries:

- The political policies and intentions as well as the main aims of barrier free planning and the theories behind it are almost identical in all five countries
- The specifications for barrier free solutions are similarly structured and similar in content; only the details differ
- The legal systems and the ways and means of implementing barrier free design have little in common.
- Dwelling types and layouts differ greatly, but conform to traditional house and dwelling plans in each country.

### The theoretical basis and political policy statements are almost identical

The dominating theoretical approach is the same everywhere. It stresses the relationship between individual capabilities and the built environment; lowering or doing away with architectural barriers is seen as a way to make the built environment more functional for everybody. Politically, the main aims of the central authorities are normalisation, integration, equality and a high quality of life regardless of age or capability. Thus, there are practically no differences of political rhetoric, stated aims of policy or the governing principles in any of the five countries.

### Similar requirements for barrier free housing

All five countries specify their requirements in much the same way, detailing the necessary (minimum) free floor space, maximum gradients and changes of level relating to passage by a manually powered wheelchair. In all cases the requirements aim to make wheelchair users able to enter a dwelling and move around inside it without assistance. The dimensional specifications differ.

### The differences: problems of comparing diverse countries

There are considerable differences both in the organisational structures and the architectural conditions: The former are governed by legal systems, established ways and means of dwelling provision and to some extent by detailed requirements for wheelchair accessibility, while the latter is closely linked to prevailing construction methods and traditional types of housing and dwelling plans. Nevertheless, enough similarities exist to be able to make meaningful comparisons. The basic human requirements for dwelling functions such as living, eating, sleeping etc. are accommodated in the same ways in all five countries (as opposed to Japanese-style multi-purpose rooms or the subdivisions of the plan that can be found in Muslim countries). Furthermore, the strength and techniques required to negotiate the built environment by wheelchair - being dependant on a combination of human conditions and wheelchair technology - hardly differ among the five countries in this study.

### **A diversity of organisational structures and systems**

Although largely outside the scope of this study, legal systems and the ways in which housing are provided make up a framework for the implementation of barrier free design. The variations, both as regards legal systems and housing provision are considerable. The Italian requirements for barrier free design are laid down by the central authorities and apply to the whole of the country - although the most rigorous of the accessibility requirements apply only to public housing. However, Italy has no comprehensive building code or building regulations; the legal requirements are contained in a succession of different laws and ministerial decrees or directives. The latter have the same status as building regulations in other countries. The German system, being designed to work in a *federation* of states is almost totally decentralised; the responsibility for upholding standards and setting demands are left to the individual German states (Länder). With the possible exception of Berlin, the state of Hessen seems to be the one that has the most comprehensive sets of requirements for barrier free housing. The German case in this study is therefore limited to Hessen.

In Norway, economic incentives for barrier free dwellings are provided by the Norwegian State Housing Bank. These have proved a successful way of promoting the Norwegian life span standard over the last 15 years. The system of state financing is peculiar to Norway - the Bank has financed some 80% of all new dwellings in Norway since the second world war. A central building code and regulations exist but the accessibility requirements have marginal effect on housing design - at least for the dominating types of construction: The bulk of the statutory requirements in the building regulations apply to multi storey housing. Although relevant in urban settings - particularly the city centres - most new construction in Norway is and has for a number of years been in the form of low rise, timber frame buildings. It may also be noted that public housing as found elsewhere hardly exists in Norway.

The British legislative system for buildings is basically the same as the Norwegian - the building code and building regulations being the central documents. Scotland and England do not share the same set of regulations but neither country has statutory requirements for barrier free housing, whether private or public: In both countries, the statutory requirements for accessibility specifically exclude dwellings; England does not even require lifts in multi storey developments (!) (The requirements for lift apply only to buildings where lifts are installed.)

Neither do the British have any form of incentives, economic or otherwise, for barrier free construction. Building barrier free housing in both Scotland and England is thus wholly dependant on information and the idealism of local housing providers such as builders, housing associations or voluntary organisations.

### **The built results: Barrier free design does not imply radical innovations**

The only distinguishing features of barrier free layouts are slightly larger bathrooms and somewhat wider halls or corridors than in traditional dwelling plans. (For England and Scotland, an additional feature, a downstairs toilet in two storey houses is significant.) The rest of the rooms conform to long established norms. A main aim of barrier free design - that barrier free dwellings should not deviate from ordinary dwellings - would therefore seem to be achieved in all five countries: *Barrier free dwellings are accommodated in ordinary types of housing and the barrier free layouts are achieved with only a minimum of alterations to standard plan and house types.* German designers do, however, have some problems with accommodating the space demands and room dimensions that are necessary in order to comply with the DIN norm. In Norway, a popular plan or house type<sup>1</sup> practically disappeared at the same time as barrier free design was introduced. It is, however, likely that this shift had a more to do with changes of fashion and greater attention to the cost of building than with the requirements for barrier free design.

### **Layouts differ**

Traditions in the five countries differ in major ways. The differences in the dwelling plans are noticeable whether the layouts are barrier free or not. Some main features of the plans can be summarised as follows:

In Italy and Germany, a central corridor runs like a spine through the entire plan, giving access to all or most rooms. The German corridor usually connects to the entrance door, whereas the entrance door in Italian plans may open directly into the living room. The rooms, both in the Italian and in the German plans, are all of approximately equal size, although Italian living rooms are particularly small. In contrast, Norwegian plans have small entries/halls and some rooms cannot be reached from a central circulation area. The Norwegian plans also have small bedrooms and singularly large living rooms, the latter often connecting to a fairly large kitchen. The size of the German kitchen is similar to the Norwegian; the Italian being smaller. The British plans have particularly small rooms; the need to make the requirements fit the traditional narrow frontage terraced house would seem evident; England and Scotland are the only countries in this study where all main dwelling functions do not have to be situated on the entrance level; bedrooms are commonly found on the upper floor, and in the case of a motion disability may be reached by means of an internal lift for which space is provided and constructional preparations are made.

### **Statistics are lacking**

None of the five countries produce statistics or reliable estimates on the distribution of barrier free dwellings. Neither is it possible to get hold of figures showing what numbers of new, accessible dwellings are being built. Of the five countries, the statistics from the Norwegian State Housing Bank seem to be the most reliable (see chapter 2.1) - partly because of the detailed scrutiny to which the Bank subjects all proposals - but the statistics cover only the housing

---

<sup>1</sup> A single storey house with a central corridor connecting all rooms and the main entrance

projects financed by the bank. Projects financed through other sources (presently some 50% of all new construction) are not included in the Bank's statistics.

**A common problem: External access**

The impossibility of negotiating steep slopes by wheelchair has particular architectural implications: Long unsightly ramps are often the simplest way of scaling the differences of level between entrance doors and car parking facilities. Topographic characteristics aggravate the problem. So too does some forms of construction; it is far easier to achieve level access to a concrete or brick building than to a timber house. English and Scottish builders have given considerable thought to the problem and generally seem to achieve good results; Italian planners have been struggling and the Norwegians have had to make compromises. In the comparatively flat region in the German state of Hessen level access does not seem to be much of a problem.

## Part 1. The framework and the effects: Comparisons

### 1. Into barrier free design

#### **New perspectives: a note on the present housing situation**

Relating the provision of barrier free housing to the overall production and refurbishment of homes in a comprehensive manner is well outside the scope of this study. As background, however, two well known but important traits common to all five countries in this study must be noted. One is that the building of large scale (often high rise) suburban housing estates is less popular than before; refurbishment, conversions and in-fill of gap sites have taken over. The other is the shrinking volume of production in the past 15 years, particularly as regards public housing. This state of affairs seems to be most pronounced in Germany and Britain. In Britain, it is most likely caused by a shift in political priorities during the Thatcher era, when the restructuring of the manufacturing industries lead to an unprecedented depopulation of the cities. As those that had the means to do so moved out of the cities, the less fortunate stayed behind - many in increasingly impoverished "fringe estates" built in the 1960's. At the same time, both long established industrial areas and inner city housing areas fell out of use. Several cities have had their populations reduced by one half, and demolition of both inner city housing and the 1960's housing estates is taking place at a scale and pace unparalleled elsewhere in Europe. The unpopularity of the 1960's high and medium rise dwelling projects has meant that most new British construction now takes the form of one or two storey semi-detached or terraced housing. Curiously, this applies even to housing in the inner city. In the private sector, detached housing is popular.



An example of new, two storey lifetime housing that has replaced older tenements on an inner city site in Liverpool.

In Germany, the shortage of land available at an affordable cost for public housing is particularly scarce and hardly any new construction of public housing has taken place for several years (although, as shown by Bartholomai 1995, the private sector has seen plenty of activity). In Italy, the problems of changing the production methods from large scale suburban housing schemes to other forms of building has only just started. In Norway, where public housing hardly exists, detached and semi-detached timber frame construction is the dominating form of construction everywhere except in the big cities. However, new inner city housing - mainly on gap sites - and in-filling of sites in areas with lower density are gradually becoming important forms of new construction.



Although change is under way, blocks of flats is still the dominating form of construction in Italy (from «Tor Bella Monica, Rome)

### **Similar ideologies, theories and political aims**

Theoretically, philosophically and politically, the ideologies hardly differ from country to country. Lawton's model, describing the interplay between individual capabilities and the demands posed by the environment, forms the theoretical basis in all five countries: The Norwegians and the Germans quote Lawton and the Italian and the British use of terminology clearly reveals a debt to him. In Lawton's model, disabilities are seen as a mismatch between the demands posed by the environment and the individual's abilities. Thus, the idea of handicapping environments - rather than handicapped people - has come to dominate theoretical and analytical thinking. The logical consequence is obvious: Handicaps can be minimised or eliminated by removing architectural barriers.

The political aims and ideals found in the five countries are almost as similar as the theoretical basis. The quality of life - and the notion that the built environment should not hinder anyone in pursuing a meaningful life - is a focal point of central government statements in all four nations. The political goals, in keeping with the ideals of equality, are also practically identical, *normalisation and inte-*

*gration* being central policy aims - although there is the obvious and seemingly ubiquitous problem of quality versus quantity (of the five countries, this appears to be a particularly difficult problem in England, as outlined in 2.2.)

### **Barrier free design is a compromise**

The content of the technical specifications is much the same in all five countries. This might seem odd, as most of the research on which the norms, standards and specifications are built has been carried out independently in each country, and both the development of the norms and the means used to implement requirements for barrier free design in housing vary considerably. To illustrate, Germany, England and Norway may be contrasted to Italy: The first four started early but have been comparatively «slow movers». The Italians started late but have moved ahead rather faster.

The German DIN norms were already established in the early 1970's, and most of the basic research in Norway and England was well under way in the 1960's. Both of the latter countries had fully developed standards by the late 1970's<sup>2</sup> - lately however, the English have realised that some fundamental research is lacking; the data have been copied from other countries, particularly USA.

Although standards have been in existence for twenty years or more, legislation to ensure that barrier free housing gets built is hardly exists in any of the three countries: The British lifetime homes concept is a very recent invention, created on the basis of recommendations made as recently as 1992 by the Access Committee for England. Construction of barrier free, general needs housing in England and Scotland has consequently only just started. Few German states have statutory requirements for barrier free housing. Norway's most important move has been to create a system of economic incentives for barrier free housing which has proved fairly successful (see p. 45-46) since its inception the early 1980ies, but the Norwegian access legislation for housing has little effect on the dominating low rise, timber frame construction. No building regulations for accessibility in housing exist in England and Scotland (although the English Housing Corporation have some accessibility requirements - see p. 51).

In Italy, work on standards for barrier free design got under way some ten years later than in the other three countries. The distance in time - seven years - between the first Italian law on architectural barriers and a corresponding ministerial decree<sup>3</sup> (regulation) provides an interesting illustration of the speed of development in Italy. The law is a statement of intent; no standards existed at the time. The decree is in reality a standards document. Thus, the Italians managed in seven years that which took 10-15 years in the other three countries.

---

<sup>2</sup> The British Standard 5810, «Access for the Disabled to Buildings» from 1979 draws on an even earlier standard, BS5619 «Mobility housing. The first German DIN norms date from the early 1970ies. The earliest Norwegian attempts were made in the 1960s (Boysen 1965).

<sup>3</sup> Law no 118 of 1971, decree no 384 of 1978

In some respects it is safe to say that later legislation<sup>4</sup> has brought Italy up to and possibly in front of the others; current legislation require barrier free design in *at least 5%* of all new public housing and may effect the removal of barriers in existing public housing. It is also noteworthy that the Italians are producing new, thorough research on accessibility, combining laboratory research with field studies (Fontana 1993). In contrast, Norwegian and the ongoing British research have been limited to evaluation of severely limited samples, whilst German research seems to concentrate on dwellings for the elderly.

#### *Considerations and concessions*

The need for compromise has clearly been instrumental to the development and determination of norms, standards and detailed specifications in all of the countries in this study. Everywhere, considerable effort has been made to minimise space consumption and simplify the dimensional requirements; a need to combat conservative attitudes in the construction industry and the planning profession has clearly been felt in all five countries. The final sets of norms are thus the result of a fine balancing act - reaching an acceptable level of accessibility with the least possible opposition. The main considerations seem to have been:

- little or no extra cost (all five countries)
- minimal use of space, i. e. realising barrier free solutions within normal dwelling areas (a central problem in Norway, Italy and England and Scotland, and one which has been thoroughly investigated in the first two but seemingly less researched in the latter, although most barrier free British designs are executed within the constraints of traditional forms of housing - see chapter 3.)
- as few complications to the design process as possible (important in Italy)
- built results that do not deviate from, but closely resemble ordinary dwellings (all five countries; a logical consequence of the ideals of normalisation)

#### *Further development of norms and standards.*

Feedback from built results are sought to amend and improve the requirements:

- In Norway, the Norwegian State Housing Bank financed an evaluation study (Christophersen 1988) of 22 homes built in accordance with the life span housing standard. The study took place when the standard had been in use for 6-7 years, and the results were used to amend the requirements.
- In Italy, a particularly thorough study combining laboratory research with checks in actual dwellings was carried out as recently as 1993 (Fontana).
- Germany has had several large research programs concerning dwellings and living conditions for the elderly. The DIN norms were last amended in 1992-94.
- The English requirements for lifetime housing were developed in two stages. The first stage saw the publication of recommendations by the Access Committee for England. Using these recommendations in the second stage of the process, the housing experts in the Joseph Rowntree Lifetime Homes Group developed the lifetime homes standard. Recent evaluation studies look into built results both in terms of accessibility and user satisfaction and recommendations for amendments are presently being considered.

---

<sup>4</sup> Notably the law no 13 of 1989, the ministerial decree of no 236 of 1989, and the recent law stating aims and intentions, no 104/1992.



- Strongly resembling the English lifetime homes standard, but differing in detail, is the recent Scottish Homes standard (1995). Some homes are already being built according to the Scottish norms and evaluation studies are in process. The studies are expected to lead to the requirements being amended.

### Different levels of statutory requirements

All five countries have systems of building codes and regulations supplemented by recommendations and guide lines. Together, these form a basic framework for accessibility in the built environment in general and in housing in particular.

The countries' technical requirements are remarkably similar both in structure and content. For instance, with the exception of England, all countries demand lifts in multi-storey residential buildings. Only the number of storeys (and the way the storeys are counted) at which lifts become mandatory varies; the effects of the requirements for lifts are similar: Generally, lifts must be provided in residential buildings upwards of four storeys. The specifications for barrier free housing are everywhere based on and detail the amount of free floor space needed to move around unaided in a medium sized, manually powered wheelchair. Other approaches, as for instance specifying minimum room sizes (the normal way of securing a general standard) is not used for barrier free design; instead, it is the relationship between space demands and the problems of being dependant on mobility aids that forms the analytical basis.

The legal and legislative systems, the means of implementation and the use of recommendations (details in part 2) vary greatly. Nevertheless, there are common areas to which the accessibility regulations apply. These include requirements for accessibility in public buildings and buildings that are open to the general public (outside the scope of this study) and the German, Italian, Norwegian and Scottish requirements for lifts already referred to. Importantly, both Italy and the German state of Hessen *require* barrier free designs in a proportion of public housing. The others either lack requirements for barrier free housing (England/Scotland) or have requirements that apply only to a small proportion of new housing (Norway). In both cases, attempts to provide barrier free housing rest on incentives and guide lines. The table below summarises the situation.

	Norway	Scotland	England	Germany*	Italy
<b>Code/regulations</b>	Requirements for multi storey developments.	none	none	Federal level, none. Legislation in some Länder	Statutory req. for barrier free design
<b>Legislation for barrier free design</b>	Life span standard required for state funding of special needs housing	requirements for housing assoc. financing	Local authorities may demand barrier free design	extra legislation for special needs/public housing	percentage of barrier free designs required in public housing
<b>Incentives</b>	Grants and extra loans for life span standard	Some incentives through building association financing	Housing corporation requirements**. Guide lines	public financing; grants/loans	grants for public housing

\* Varies between the individual «Länder»

\*\* Two sets of requirements, one for general needs housing; one for wheelchair houses

## No radical changes to established planning traditions

Whether statutory, as in Italy and the German state of Hessen, or in the form of guide lines and incentives as in Norway, England and Scotland, it seems possible to design and build according to the criteria for barrier free design without compromising the four main issues: (1) little or no extra cost, (2) low space consumption and (3) simple design process. Everywhere, the examples show that (4) barrier free design is easily accommodated in ordinary types of housing. This may well explain why both dwelling plans and buildings vary considerably from country to country: Established national traditions prevail in all cases. (Chapter 3 describes the built results in more detail.)

### *Extra cost*

Getting hold of reliable cost studies has not been possible in this project<sup>5</sup>. However, in order to qualify for central authority grants, English providers of public housing will be required to provide estimates of extra costs in lifetime housing schemes. This requirement is just coming into force and no results are available.

There are considerable difficulties involved in estimating possible extra costs. It is therefore doubtful whether the new English estimates will be accurate. The figures will most likely be too high (and may provide those in the construction industry that are resisting change with arguments against barrier free design):

The required estimates involves calculating accessibility features as additions to a «normal», i. e. a non barrier free scheme. The problem with this method is that additions - «extras» - always turn out to be costly. In normal tendering, the costs are calculated as the total for the entire project, and interested builders will try to minimise cost as much as possible in order to get the contract.

Generally, cost is of course a factor which largely depends on space consumption plus special installations, finishes and complexities of architectural detail. In Norway and Italy, barrier free dwelling designs are generally executed within the limits of ordinary space demands; in Scotland and England a little extra space is needed on the entrance floor (to accommodate a toilet downstairs). Thus, for four of the five countries, extra space is not a major issue. The exception is Germany (Hessen) where accessible dwellings consume more space than other dwellings. This leads to problems that are not easily overcome: Barrier free and non barrier free dwellings are commonly built in the same block of flats, but, as the barrier free dwellings are usually found on the ground floor and the other flats on the upper floors, floor plans cannot be repeated throughout the building. A uniform construction grid throughout the building is therefore close to impossible. In the worst cases, the positions of load bearing walls on the ground floor will not correspond to the load bearing walls on the upper floors.

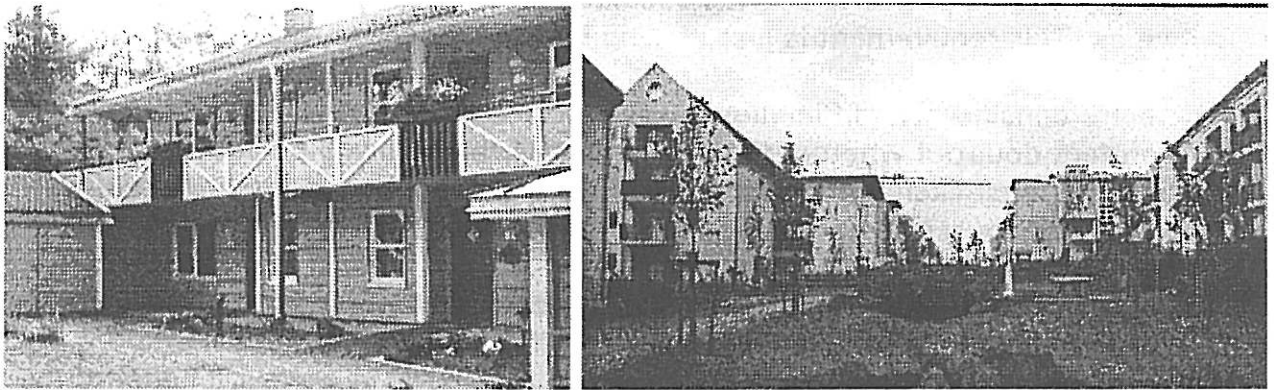
---

<sup>5</sup> The exception being a severely limited study of Norwegian life span housing by the present author. Christophersen 1990.

### *The design process and barrier free dwelling plans*

British, Norwegian and German (DIN norm) requirements for barrier free design can be summarised in simple and well defined terms, creating few problems for planners except at the outset: The implications of the requirements have to be understood and assimilated into the designs - a somewhat demanding process for most architects, seemingly regardless of nationality. The Italian requirements do, however, differ from the others in one respect. The detailed requirements relating to variants of circulation patterns on plan have a complexity not found elsewhere. However, the Italian specifications are comprehensive, and due to this, the implications for any dwelling plan are so limited that barrier free designs can be realised with only minor deviations from ordinary plan types. Compared to this, the changes needed to accommodate barrier free design in Norwegian plans demanded a critical approach to the existing plan types.

### *Architectural form*



New lifetime homes in Bærum, Norway (left) and blocks of flats with barrier free dwellings in Wiesbaden, Germany (right). Both conform to well established building types and look no different from ordinary housing.

Viewed in isolation, buildings containing barrier free housing look no different from other housing in any of the countries. In many cases - although not by necessity - one feature is conspicuous: external access. Barrier free design requires gently sloping access paths with no stairs. The solution has all too often been large, often excessively long ramps. These do not only seem costly, they are also far from functional. Traversing such ramps demand a lot more physical strength than most wheelchair users are able to muster (though some ramps provide popular entertainment for teenagers on skateboards and the Italian scooter fraternity). The problems of external access are dealt with in more detail at the end of chapter three below.

## 2. Applying the criteria, norms and standards

### The legislative situation

All five countries have statutory legislation covering all (or most) forms of new construction, refurbishment and conversions. The build up of the legislation and the ways in which it is implemented are fairly similar in Norway and England, Scotland, whilst Germany and Italy differ considerably, both from the north European countries and from each other. It is therefore somewhat surprising that the *application* of the requirements for barrier free housing differs little between Germany and Italy. It may also be noted that the Germans and the Italians adopt the most space consuming plan solutions (details in chapter 3).

### Italy and Germany

The legislative systems in these two countries are organised in completely different ways: one is centralised, the other decentralised.

*The Italian* system relies heavily on the powers of the central authority, i. e. the state: The requirements for barrier free housing are laid down by the state in the form of laws and detailed directives/decrees. The latter carry legal power in much the same way as building regulations in other parts of Europe. Importantly, all legislative power rests with the central authority; regional (county) authorities are required to follow the central authority's demands in detail and without any form of deviation. The county officials do, however issue permits to build and carry out control of buildings and works. A municipal level does not seem to exist in Italy.

*Federal German* legislation<sup>6</sup> is limited to planning in urban settings. Thus, the federal authorities do not deal with legislation regarding accessibility; legislative powers relating to *buildings* - such as the building code (Bauordnung) and regulations (Technische Richtlinien) - rest with the individual German states (Länder). These may in turn delegate powers of control and implementation to the counties and municipalities within the Land. Requirements for barrier free housing are laid down by the Land, but refer to the national DIN norm for specifications. There is thus a *national standard* for barrier free housing. Its application is, however, a matter for the individual German state or Land.

*The similarities* are firstly that both in Italy and Germany<sup>7</sup> the legal requirements for barrier free solutions apply to public housing and secondly that both countries use more than one set of requirements. The Italians specify three levels of barrier free design (accessibility, visit-ability and adaptability), whereas the Germans have two levels: fully accessible for wheelchair and a somewhat lower level of general accessibility (DIN norm parts 1 and 2). In both states, a propor-

---

<sup>6</sup> Baugesetzbuch

<sup>7</sup> In this case the state of Hessen; with the possible exception of Berlin, other German Länder seem to require less in the way of accessibility than Hessen.

tion of public housing must conform to some level of barrier design. (For a more detailed description, see the sections on the individual countries and chapter four for a summation and comparison of the specifications.)

The significant effect both of the German and Italian efforts is of course that the legislation *guarantees* a minimum of barrier free dwellings - at least in public housing. The disadvantage is, on the other hand, the rather more lenient treatment of the private housing sector. Both Italy and Germany (Hessen), however, have legislation requiring more in the way of accessibility in private housing than Norway, England and Scotland: The Hessen building code requires barrier free access to one storey in private housing, whereas the Italian three levels of accessibility (see p 59-60) apply equally to private and public housing - the private sector being exempted from the 5% rule referred on page 14.

### **England, Scotland and Norway**

With regard to barrier free housing, one feature common to Scotland, England and Norway differ significantly from Italy and Germany:

- There are no legislative requirements for barrier free designs in either public or private housing
- In Norway and Scotland, where barrier free design requirements apply, only one set of requirements (guide-lines) exists. (England also has The Housing Corporation's requirements for accessibility in general needs housing. These do not, however, conform fully to the lifetime housing criteria.)

Similarities between England, Scotland and Norway can be found in the structure of the legislation, the way it is implemented and the relationship between legislation and criteria for barrier free design:

- The legal framework in all three countries include a building code and a set of building regulations. The code and the regulations are laid down by the central government. There are thus only two sets of legal documents for the whole of the countries.
- Implementation and control are matters for the local authorities - generally on municipal level. In addition to these responsibilities, the local authorities are empowered to exempt from the building code and regulations or to impose stricter requirements in individual cases or in fixed geographical areas within a municipality.

### **Recommendations and incentives in Norway, England and Scotland**

All three have well defined, set standards for barrier free housing design. The standards have not, or only partially and with little effect (Norway), found their way into the building legislation: The *lifetime housing* (England and Scotland) and the Norwegian *life span housing* standards exist *only* in the form of guide lines. Attempts at implementing the lifetime standards in new construction in England and Scotland include a concerted effort in Scotland, notably by the Scottish Homes and the Edinvar Housing Association, some experimental coun-

cil housing projects in England and a few projects by individual English builders. The Joseph Rowntree Lifetime Housing Group monitors most projects in England. A movement towards better accessibility in public housing is thus under way, but comparatively few barrier free (lifetime) dwellings have been built as yet.

In contrast to the somewhat sparse effort by the British, the Norwegian life span housing concept has enjoyed considerable success, chiefly through the economic incentives provided by the Norwegian State Housing Bank (although recent figures, see statistics in the chapter on Norway in part 2, indicate a downward trend in the past three years).

The Norwegian situation is singular in two respects. One is that a public housing sector as found in the other three countries hardly exists. The other is the dominating position of the Norwegian State Housing Bank. The Bank provides low interest, long term loans and grants for all types of dwellings (whether in private or co-operative ownership, general or special needs housing), and has financed some 80% of all dwellings built in Norway since the second world war.

Since the early 1980ies, the Housing Bank has awarded projects which conform to the life span dwelling standard an extra loan - thus providing a popular form of additional money - and effecting lower house prices - where it is most needed: in costly areas and for people of modest means. Since the beginning of 1996, an additional incentive is provided as a grant which does not have to be repaid. There is little doubt that the Housing Bank incentive has been instrumental in effecting a comparatively high proportion of barrier free housing to be built. (Due to strict conditions, the effects of the grant will probably be limited.) To some extent, the Housing Bank initiative has been backed up by some local authorities: Some have made life span standard a condition for planning permission in whole or parts of new housing areas, others have provided economic incentives by subsidising the cost of land when constructing life span housing.

### **The effects on building**

A general assessment of the effects of the legislative efforts, incentives and guide lines cannot be given; neither of the five countries produce statistics on barrier free housing, nor are there any reliable sources on the state of general accessibility in housing. The Norwegian State Housing Bank seems to be the only agency that publishes statistics on barrier free housing - but their figures (see part 2) only cover the state funded sector.

### 3. Designing barrier free housing: architectural implications

The norms and standards for barrier free housing must be seen in the context of other national requirements for housing. As detailed in part 2 of this study, both Italy and Germany (Hessen) have well defined minimum as well as maximum standards for public housing. In England, Scotland and Norway, such standards are no longer in force<sup>1</sup>.

#### **Safeguarding dwelling standard through barrier free design**

The free floor space and wide doors that are necessary to achieve barrier free solutions have obvious consequences for the size and dimensions of individual rooms. Thus, the requirements for barrier free design do not only take care of accessibility but influence other functional aspects of the dwelling plan - in some cases profoundly. The Italians seem well aware of this; some Italian planners welcome the requirements for barrier free design as a means of securing dwelling quality. (In spite of the rigorous standards in Italian public housing.)

In England, Scotland and Norway, the criteria for barrier free design may have particular importance; studies in these countries have given grounds for speculation that deregulation may have caused a decline of dwelling quality in new construction in recent years. Space demands for accessibility can contribute towards maintaining functional qualities or in some cases enhance them<sup>2</sup>.

The feelings of planners in Hessen (Germany) may contradict the attitudes referred above. Space consuming issues relating to barrier free design will frequently cause problems in multi-storey development and it is being felt that solutions which make it possible to plan barrier free flats inside the same dimensional framework as ordinary dwellings must be sought. Whether this implies exemptions to the DIN norm or the development of new plan types is not clear. (The reason being that new construction of German public housing is at presently at a low ebb.)

#### **Effects on layouts and dimensions**

The following paragraphs describes and compares examples of typical solutions. For a summary, see the table on page 29.

##### **The need for floor space**

The Italian and the German solutions are more space consuming than the Norwegian and the British. The English and the Scottish examples are by far the smallest of the five countries. The differences of dwelling size can be attributed

---

<sup>1</sup> Norwegian building regulations require rooms to be at least 15 m<sup>3</sup> - roughly 6,5 m<sup>2</sup> at the standard ceiling height of 2,4m. Britain has no requirements for minimum ceiling height, room sizes or total floor area.

<sup>2</sup> Christophersen 1994, Karn 1996

to a sum of several causes, some of which are direct results of planning in accordance with the requirements for accessibility:

- National standards for bedrooms are larger in Germany and Italy than in Norway, England and Scotland.
- Italian and German dwelling plans are commonly structured along fairly long, central corridors, the widths of which have to be generous in order to satisfy the specifications for barrier free design (while the DIN norm demands a minimum of 1,5m between walls in an apartment, the Italian requirements do not actually *demand* wide corridors).
- Norwegian and British designs seek to minimise the use of corridors (sometimes to the detriment of other rooms).
- Fairly large kitchens in the German dwellings
- High standard of toilets and bathrooms in Italy
- Compared to Norway and Germany, the British have a tradition of narrow frontage houses and small living rooms

Italian architects seek to balance the space demands resulting from large bedrooms, wide corridors and space consuming toilets and bathrooms by reducing the size of the living rooms. Thus, Italian living rooms and to some extent kitchens are smaller than those found in the other countries - a fact which also the Italian planners are keenly aware of.

#### **Sufficient frontage - a problem in Germany**

Whether low rise or high rise, narrow frontage is a usual solution in high density developments. Several hundred years ago, early industrial housing employing narrow frontage were used both in England and Germany. Similarly, the flats in Le Corbusier's «immeubles» were extremely narrow by present day standards.

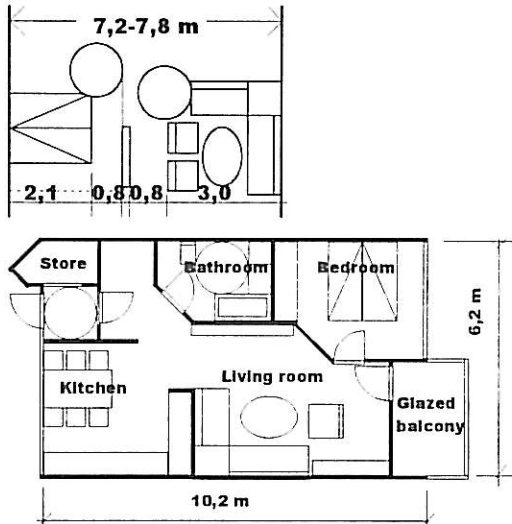
The width of the frontage has grave consequences for the qualities that can be obtained in a dwelling plan. This does not only concern daylight but is just as important for the dimensions of the rooms, particularly hallways (circulation space), bedrooms and, although to a lesser extent, kitchens and bathrooms. By extension - as internal dimensions are a determining factor for barrier free solutions - width of frontage plays a crucial role in barrier free designs for terraced housing and blocks of flats. Common solutions to the problem of narrow frontage are cramped entrance lobbies and living spaces that double as circulation space. Both are obviously unacceptable in barrier free dwellings. Thus, a discussion of the demands barrier free solutions may make on the frontage, and particularly of whether barrier free plans can be accommodated without extending the normal width of frontage is of interest here.

There is no standard or «normal» European width of frontage. Traditional house types, plan types, construction methods, normal spans and expectations among the public vary. The British are used to living in narrow houses. The Norwegians are not. German traditions may be similar to the British in the cities but Germans seem to expect more from modern dwellings. In Italy, conceptions are so different that the problems relating to the width of frontage hardly exist.



### Norway

Frontages in the region of 7,2 - 7,8 m have been almost standard in concentrated developments for a number of years. The reason is simple: Free spans of approximately 3,6 m ( $2 \times 3,6 = 7,2$ ) are economical for the timber constructions which dominate Norwegian housing. Frontages of 7,2 - 7,8 m thus gives two bays - or two rooms: either bedroom + living room or living room + kitchen.



7,2-7,5 m frontage can accommodate rooms that satisfy the requirements for barrier free design. Most importantly, there is enough space for passages at the end of the bed and the back of the chairs in the living room (the 2,1 m bed and 3x3m seating in the living room are agreed standards). Note: The sketch shows minimum wheelchair passage at the end the bed. (In practice, the life span dwelling requirements allow a passage of 0,6m, although this does not admit wheelchairs.)

As indicated by the plan, barrier free solutions are possible even when the frontage is reduced to approximately 6 m. (Architect:Asplan prosjekt)

### England and Scotland

Possibly in accordance with the British traditions for narrow frontage housing, the requirements in England and Scotland make less demands for frontage than the Norwegian and the German standards. There are several reasons for this:

The lifetime criteria do not require all main dwelling functions to be situated on the entrance floor; upstairs rooms are in order as long as there is a space for an internal lift and necessary constructional preparations for lift installation are made. Where this is done, neither a bedroom nor a fully equipped bathroom is required downstairs. The bedroom may be on the first floor level and a small downstairs toilet - preferably large enough to accommodate a shower - is sufficient. It must be noted, however, that the downstairs toilet is perceived as a major innovation in England and Scotland; this is the feature that more than any other (possibly with the exception of the level entrance) distinguishes lifetime housing from traditional houses. The downstairs toilet is also said to be popular in private sector housing.

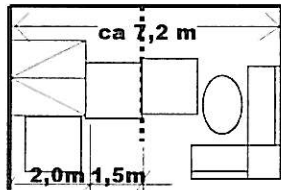
In addition, turning space for wheelchair is not required in the entrance and the hall. Halls and entrances may thus be made narrower than in any of the other countries; approximately 1,0 m (plans on page 28 and 36).

The reasoning behind these concessions must have to do with two linked factors: tradition and cost. Narrow frontage terraced housing has been common in Britain for centuries; space fronting the street has been and still is particularly valuable. Challenging such a tradition would be to invite failure. For present day development, the cost of land is still crucial, and narrow frontages maximise the

number of units that can be built on a given plot of land. Consequently, the criteria for barrier free design are made flexible enough to apply in extremely cramped conditions. (There is no evidence that the effects barrier free designs might have on the width of frontage were analysed when the criteria were drawn up.)

### Germany

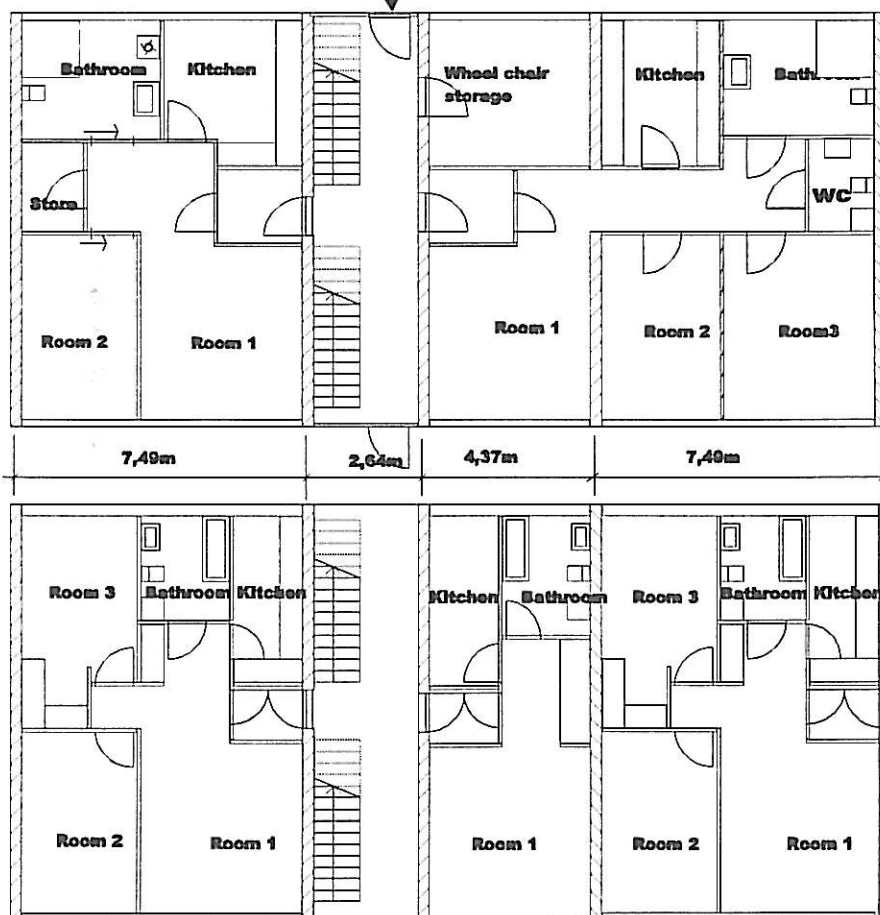
The comparatively large bedroom standard (see part 2) for two people seems to have serious consequences. Although a frontage of approximately 7,5 m is theoretically possible, it is difficult to achieve in practice.



An example based on the DIN norm shows the possibility for accommodating living room and bedroom within a frontage of approximately 7,2 m. The generous dimensions of the bedroom do, however, adversely affect the living room, where very little space is left for furniture once the requirements for free floor space have been satisfied. The overall effect is not unlike the Norwegian example above, but note that the requirements for the bedroom take up 3,5m of frontage

- leaving considerably less for the living room than in the Norwegian example, in which the minimum width of the bedroom is only 2,7m (or 2,9m for passage by wheelchair). Note also that the German turning space for wheelchairs is square rather than circular.

In practice, barrier free German flats take up more of the frontage than non barrier free dwellings. This creates problems in production and construction:

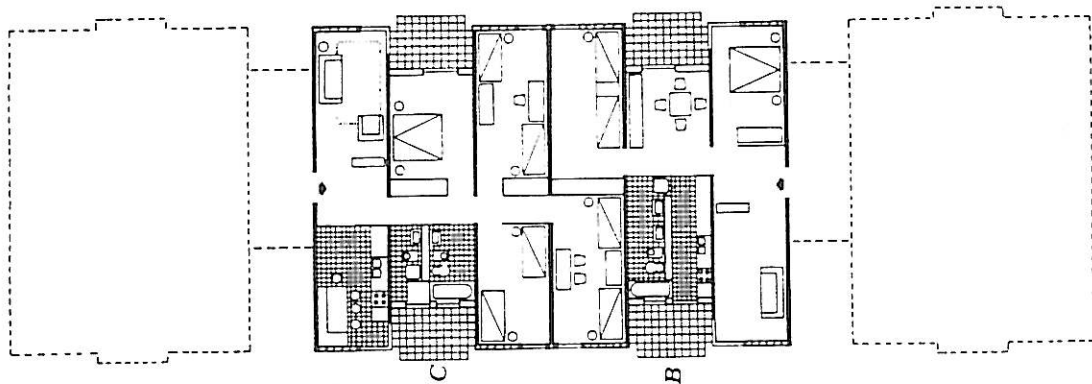


Ground floor (top) and 1<sup>st</sup> floor (bottom) plans of a new German block of flats. Due to the DIN norm's requirements, the large barrier free dwellings on the ground floor take up considerably more frontage than the non barrier free flats. This has several adverse effects on costs: (1) The barrier free dwellings reduce the total number of flats in the development. (2) Identical floor plans cannot be used for an entire building. (3) A uniform planning grid/equal spans, cannot be used throughout the building. The example shows spans varying from 4,37 to 7,49 m. (The Germans also mention examples where the load bearing cross walls on the upper floors could not be positioned directly above the load bearing walls on the bottom floor.) Note also the small kitchens in the non barrier free flats.

### Italy

Interviews with Italian architects brought out a singular fact about Italian planning tradition: The question of frontage, which is basic to northern European dwelling planning, is almost totally disregarded. It is difficult to understand why this is so. Indeed, one would think that the frontage occupied by each flat is of particular importance in the planning of the long, rectangular, high rise blocks of flats which dominate Italian post war housing - a planning tradition which rests, the Italians admit, heavily on the theories developed by Le Corbusier.

A proper explanation will demand a lot more space and thorough investigation than is possible here. It does, however, seem likely that the key to the problem has to do with the way Italian blocks of flats are put together: A basic unit may consist of two identical flats linked by a common stair. The rectangular blocks of flats are simply constructed by adding on new pairs of flats and stairs - as many as the planning authorities allow on a given site. It would also seem, judging from the scale of the Italian housing schemes, that land for building has been in plentiful supply until very recently.



An example of Italian housing<sup>3</sup> from the late 1970ies. Two identical flats on either side of a common stair make up a basic unit. Further identical units are added to this. The end effect can be described as a wall composed of linked towers.

### An attempt to compare dwelling layouts

Although the national specifications for barrier free housing differ only in minor ways, the floor plans, dwelling designs and building types are strikingly unlike. This may reflect an important point which refers back to the intentions and the philosophical background, i. e. to the aims and ideals of normalisation and integration:

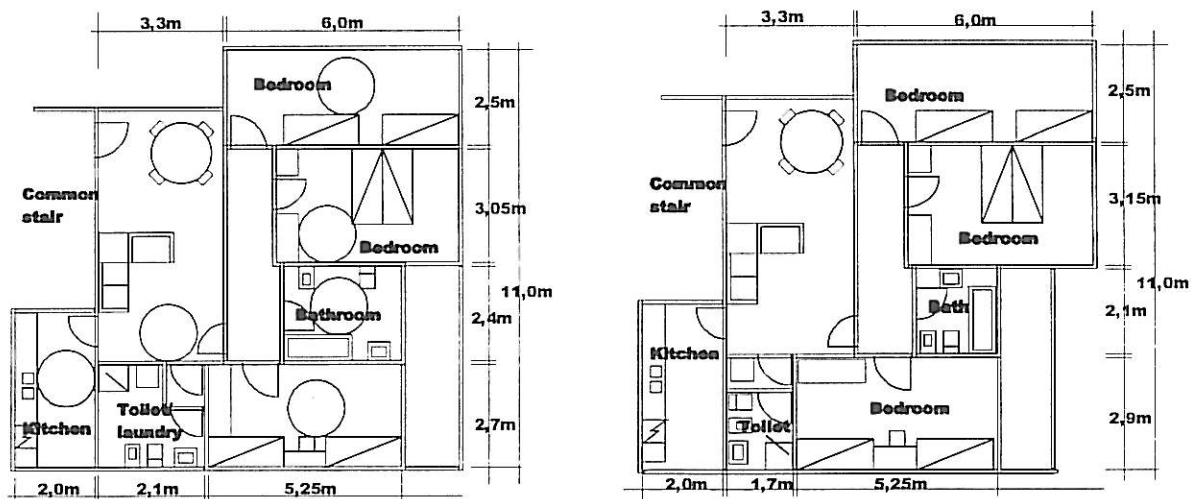
<sup>3</sup> From «Parametro» no 76/77 1979

*Barrier free design is accommodated without compromising traditional post war dwelling layouts; only minor changes are needed.*

Comparing dwelling types and layouts from five different countries is fraught with difficulties. Definitions and ways of measurement differ, as do expectations among the public and the value of the home in relation to other living conditions. There are also considerable differences of building types - from the tradition of multi-storey blocks in Italy to Norwegian timber frame housing - and fundamental differences of plan types which presumably reflects different ways of living. The latter may have some relation to the climate, and receive an expression in the size of living rooms and kitchens. Particularly striking is the contrast between Norway, having the harsher climate and the largest living rooms, and the small spaces afforded for living, eating and food preparation in the warmest country, Italy. As a further example, the space standards found in the dominating British layouts for narrow frontage houses would be exceptional in the other countries (see the chapter on the minimal unit below).

A comparison of Italian and Norwegian barrier free and non barrier free solutions illustrates several important points. First, two Italian plans (accessible left, non barrier free to the right):

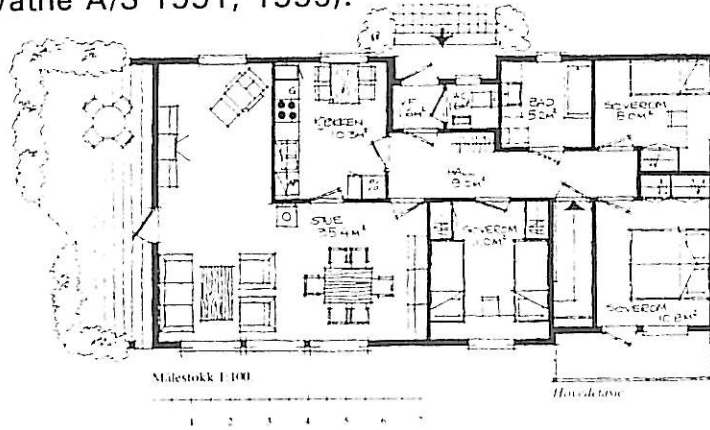
- The two plans resemble each other closely. The areas and dimensions of the rooms, the relationships between them, the total floor area and the external dimensions are almost identical in both instances.
- The larger bathroom(s) required for accessibility is accommodated by a small increase of the floor area (bottom horizontal dimension by 0,4 m) and slight reductions of the size of the two other bedrooms
- Compared to Norwegian (and German) plans, the bathrooms are large and the living room small, the latter being also the point of entry.
- The plan is structured around a central corridor which gives access to most rooms but does not connect to the entrance to the flat



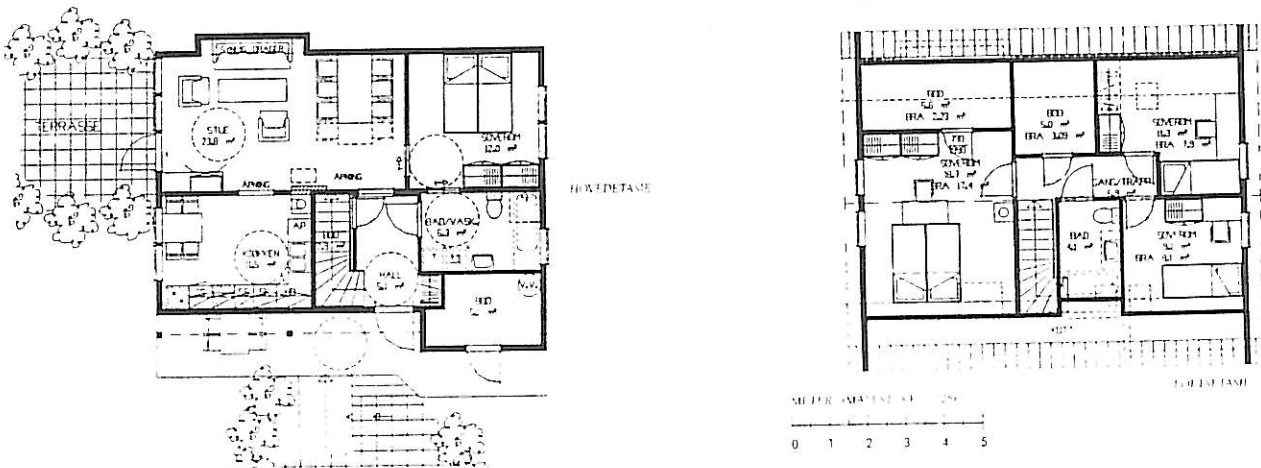
Two Italian plans, one accessible, one not. Importantly, only minor differences are in evidence.

Norwegian planners have paid particular attention to the problem of circulation space: due to cost, the length of corridors (a width of 1,4 m is required for life

span standard) have to be reduced to a minimum. In consequence, a roughly square plan with a short, central hall has come to replace the long central corridors which were common from the 1950's to the 1970's. This development ties in with a shift in fashion, from single storey to 1½ storeys. Issues relating to barrier free design are limited to the entry level, which is required to contain all the most important dwelling functions: living, sleeping, eating, food preparation and hygiene. It must be kept in mind that low rise timber frame construction is the dominating form of construction in Norway, and, due to the high percentage of owner occupancy, that fashions and trends are important. Below are two examples from Norway's largest producer of timber frame houses (Block Watne A/S 1991, 1995).



Typical, popular plan, 1960ies -70ies. Note the narrow central corridor.



To reduce circulation space, a roughly square hall is substituted for the central corridor. The ground floor is barrier free, as indicated by the turning circles for wheelchair.

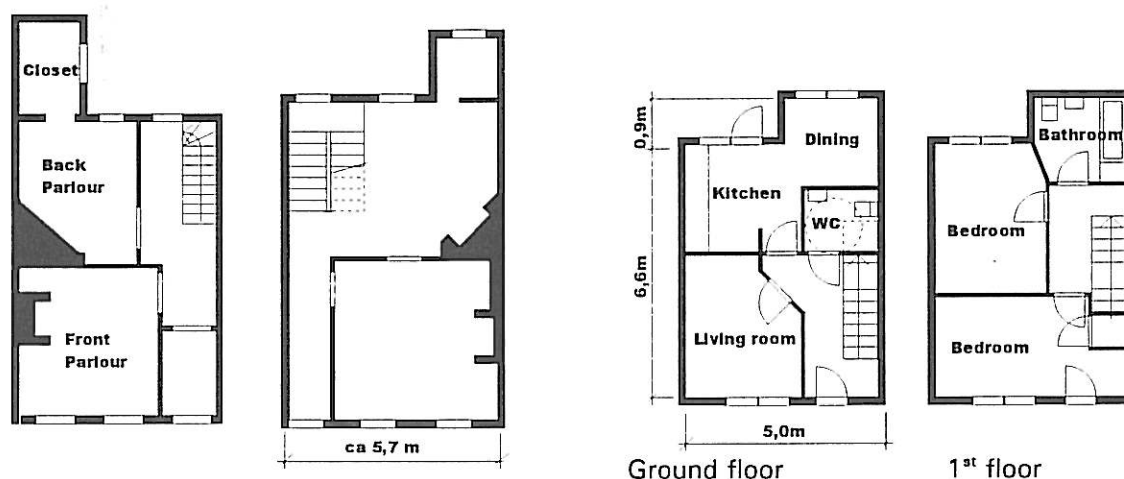
In contrast to the close similarities between the two Italian plans, the Norwegian ones may at first seem radically different. The differences are, however, limited to two features: the bathroom and the circulation pattern. The generous size of the former is of course common to most barrier free designs. As for the latter, all rooms in the single storey house have doors to the corridor, whereas circulation to the main (ground floor) bedroom and the kitchen in the barrier free two storey house goes through the living room. Other features are almost identical in the two designs, including the dining space in the kitchen, the large dining table

in the living room and the comparatively small bedrooms. Both the structure of the barrier free plan and the dimensions of the dwelling spaces (in both plans) set the Norwegian solutions apart from the Italian and the German designs:

- The Norwegian living rooms and kitchens are comparatively large.
- The Norwegian bedrooms are small.
- Internal circulation in the barrier free plan goes through the living room.

In the German designs, the difference between a barrier free and non barrier free solution would chiefly seem to concern space consumption, as evidenced by the examples on page 24: A two room barrier free flat takes up as much floor area as a three room non barrier free solution. On the other hand, the overall structure of the barrier free and the non barrier free plans is roughly the same, with rooms on both sides of a central corridor and an entrance and a store or a toilet at opposite ends. This structure is also the same as in the Italian plans - with one difference; the German corridor connects to the entrance. The Italian does not. A particular, discerning feature of the German plans, and one which is common to both the barrier free and the non barrier free solutions, is the dimensions of the rooms: The area and the dimensions of the bedrooms and living rooms (and to some extent the kitchens) are almost identical. This is due to a peculiarity of the regulations in Hessen, which demand that rooms for living functions should be general, multi purpose rooms. The intention seems to be to allow for a limited form of flexibility; whether a particular room is to be used as bedroom or living room is left to the choice of the occupant.

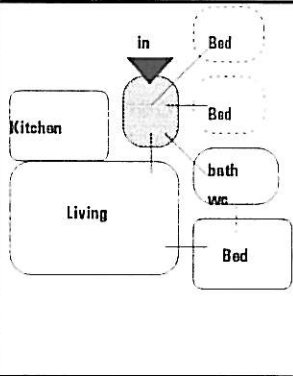
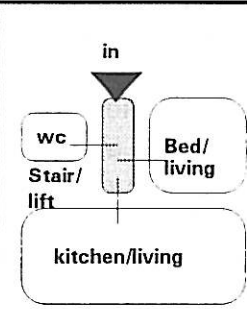
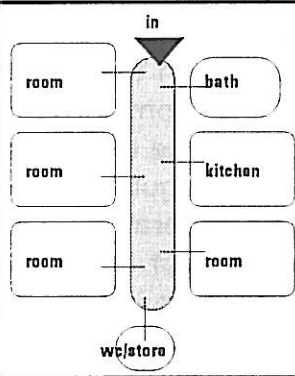
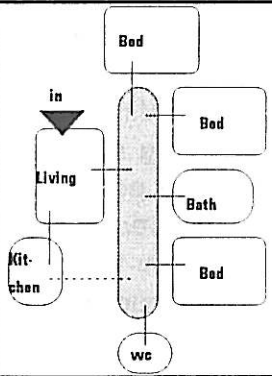
The British lifetime standards requirements make less demands for space than in the other countries. This has the effect that the lifetime homes standard is easily accommodated in traditional settings, i. e. narrow frontage terraced housing. Thus, the differences between barrier free and non barrier free solutions are almost as small as in the Italian examples both with regard to the distribution of rooms and the dimensions of the house and the individual rooms:



Left: two ground floor plans of traditional terraced houses. (Left: A London house ca 1670, after Summerson 1991. Middle, a house in Deptford about 1710, after Quinney 1990 ). Right: A new, barrier free house in York (Jane Darbyshire 1993). All three exhibit the same basic characteristics, both as regards the distribution of the rooms and the geometry and dimensions of the plans. The one really important difference is the downstairs toilet, which in order to be accessible, is large enough to include space for a shower.

The modern, barrier free (lifetime) house does, however, represent a significant functional improvement over the traditional in one respect: the downstairs toilet; even a two bedroom house has two bathrooms. It must also be noted that the toilet in this design has been made large enough to allow space for a shower. Changes of use are possible: In the case of a disabled user, the dining space in the kitchen area could serve as a living room space and the living room could be used as bedroom. Lesser, but not unimportant differences between the two sets of floor plans are the slightly larger hall and the landing half way up the stair in the modern house. The landing is not one of the criteria for lifetime housing; it is put in partly as a resting place, partly to reduce the risk of accidents and partly to break the fall if an accident should occur.

### Plan types\*

Norway	England and Scotland	Germany	Italy
			
Entry through hall	Entry through hall/corridor	Entry to central corridor	Entry through living room
Central hall	Narrow hallway off centre	Long central corridor	Long central corridor
Doors to some rooms off the central corridor. Several rooms can only be accessed from other rooms.	Doors to all rooms off the hallway	Doors to all rooms off the central corridor. No direct access between rooms. All rooms approximately equal size.	Doors to most rooms off the central corridor.
Large living room, small bedrooms	Small rooms. Toilet on the ground floor**; bathroom upstairs	Living room and bedrooms of approximately equal size	Large bedrooms, small living room.
Area of kitchen approximately as main bedroom. Kitchen and living room closely connected	Kitchen/living combined, in one room.	Area of kitchen and bedrooms approximately equal in barrier free solutions; small kitchen in non barrier free flats	Small kitchen. Direct access from kitchen to living room common.

\*The Norwegian and particularly the British types refer to the ground floor of a two storey house

\*\* The downstairs toilet is a particular feature of the lifetime criteria; The Housing Corporation only requires a downstairs toilet in houses for five people or more.

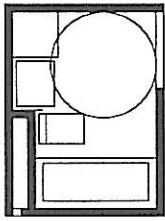
### The individual rooms

The dimensions of three rooms are crucial to the design of a barrier free home: entry/hall, bathroom/toilet and (to a lesser extent) the bedroom. In general, tradition ensures that the area and dimensions of living rooms and kitchens are sufficiently generous to allow unhindered passage by wheelchair; though in the case of the Italian dwellings the dimensions have been pared down to - or possibly below a functional minimum.

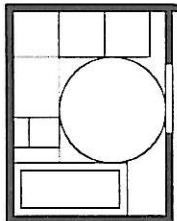
## The bathroom

### *Norway; shrinking standards*

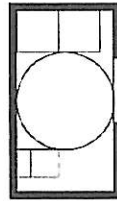
Up until 1996, the Norwegian life span standard required larger bathrooms than previous standard practice. In addition to the usual appliances, i. e. WC, wash hand basin, space for a bathtub and washing machine, the room should be large enough to accommodate turning space for wheelchair and a free floor space 0,8m wide next to the WC. Net area of a minimum bathroom is about 5,5m<sup>2</sup>. Presently, the requirements work in a slightly more complex manner: Dwellings with three or more rooms (excluding kitchen) are advised to have large enough bathrooms to accommodate bathtubs; bathrooms with bathtubs are not required in smaller dwellings; in two room flats, bathrooms may now be reduced to roughly 3,75 m<sup>2</sup>. In this context, it must be remembered that the requirements relate solely to financing through the State Housing Bank and that the life span standard is a prerequisite for grants and a larger loan than normal.



2,1x2,7m



2,0x2,7m



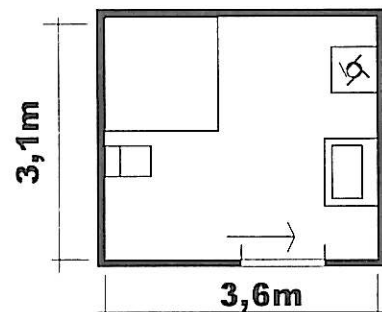
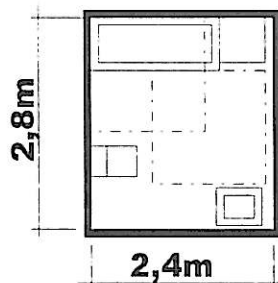
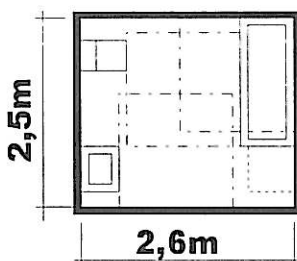
1,5x2,5m

Examples of bathrooms in dwellings with three or more rooms (life span standards prior to 1996)

Current minimum life span standard bathroom for a two room dwelling

### *German norms allows small bathrooms but larger baths seem to be preferred*

To satisfy the DIN requirements fully, 6,5 m<sup>2</sup> is required. The projects in Hessen have considerably larger bathrooms (below right). However, some very recent projects elsewhere in Germany - notably in Bavaria (see Bayerisches Staatsministerium 1995) - shows that work is being done to design flats with smaller bathrooms; some are even smaller than advised by the DIN norm.

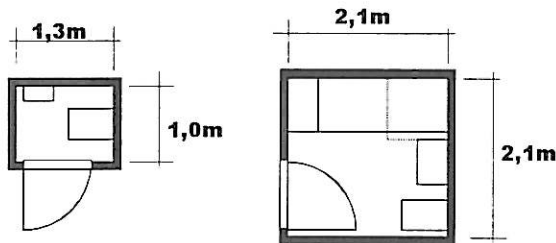


Left: a bathroom based directly on the DIN-norm requirements - 6,5 m<sup>2</sup>. (Large dotted squares indicate the 1,5m free floor spaces required by the norm. The small dotted square indicates a possible position for a washing machine.) Middle: A bathroom in a Bavarian barrier free housing project, 6,7 m<sup>2</sup>. Right: The 7,5 m<sup>2</sup> bathroom from Hessen, used in the example on page 24.



*England and Scotland: cramped toilets are acceptable but not advisable*

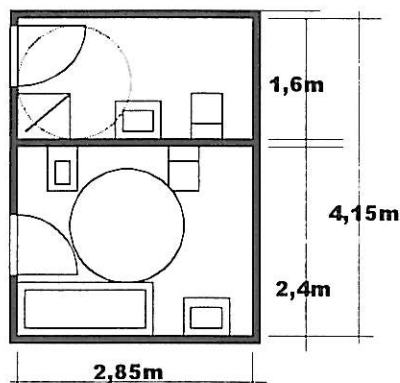
Based on the recommendations of the Access Committee for England, both the English and the Scottish lifetime standards accept an entrance level WC as a minimum. The logic implies that a two storey dwelling must have an accessible bathroom on an upper floor, and that preparations should be made for installation of an internal lift, both in terms of space and construction.



Examples of the English minimum WC and (upstairs) bathroom. Scottish Homes' minimum for toilet is 1,2 x 0,9 m. There seems to be some disagreement as to the understanding of the lifetime criteria; another interpretation is that the downstairs toilet should have a turning space for wheelchair which doubles as a space for a shower. In this case the minimum size of the room will be as illustrated by the plan on page 28.

*Generous Italian standards; a result of supplying bidets*

In Italian dwellings for four or more people, the mandatory standard for public housing requires bathroom *and* a toilet, and the dimensions of both rooms are generous, partly due to the requirement for bidets. The result is that ordinary bathrooms and toilets are large enough to be used by a person in a medium sized wheelchair - particularly if the bidet is removed. For smaller dwellings, Italian research shows that accessible bathrooms can be reduced to sizes that would hardly be acceptable in the other European countries. However, this seems to be more a theoretical result of thorough research than a practical solution for buildings; even the smallest, 45-50 m<sup>2</sup> Italian flats have bathrooms of more than 5 m<sup>2</sup>. Without the bidet, these bathrooms could have been reduced to rooms that would be inaccessible. The fairly generous dimensions of Italian bathrooms can thus be seen as a result of tradition different from the countries in the north of Europe: *bidets are standard*, and the space consumed by the bidet ensures that bathrooms are large enough to be accessible and usable.



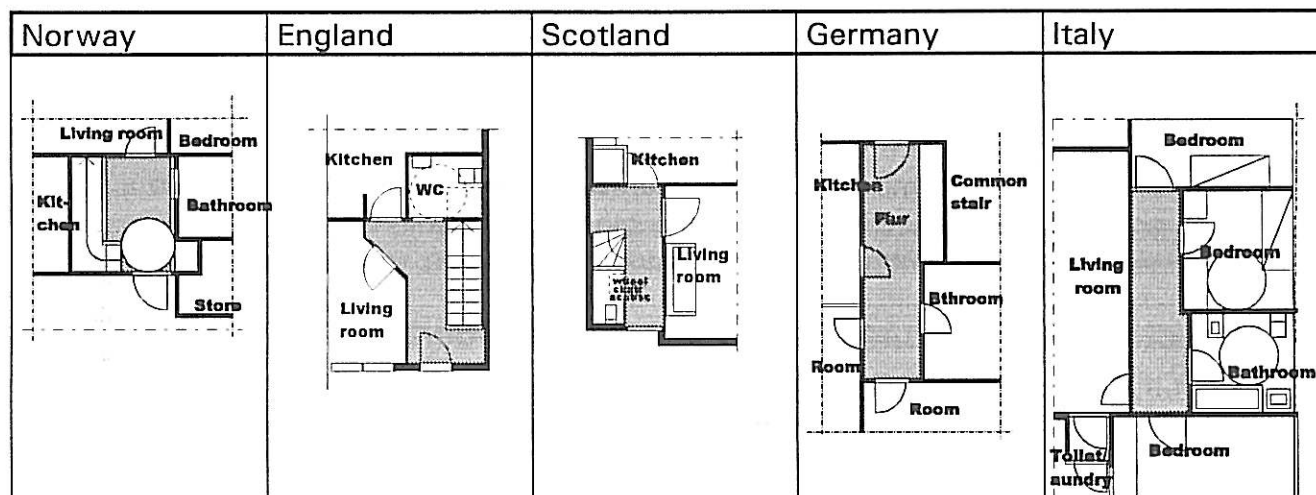
Bathroom and toilet in an accessible Italian two bedroom, four person flat (Triburtino North, Rome). It will be noted that both rooms are large enough to satisfy the criteria for barrier free design in all four countries in this study.

The sketch clearly shows the generous dimensions that are the norm in Italy.

## The entry and the hall

The shape, area and dimensions of these rooms are to a large extent a function of the plan type, the layout of the other rooms in the dwelling and the relationship between them. As the layout is dealt with above, this paragraph is limited to the comparatively long and space consuming internal circulation space in Italian and German barrier free dwellings compared to the less space consuming solutions in Norwegian and British designs.

The Italian plan shown earlier has a more than 5m long internal corridor which - significantly when compared with the North European plans - does not connect to the entrance door. This is has nothing to do with the conditions for barrier free solutions but seems to be a regular feature in Italian plans: The entrance door opens directly into the living room space. The north European needs for shutting out the cold and hanging heavy overcoats is clearly superfluous in Italy. In the German plan, the corridor connects with the main entrance door and there is a wardrobe just inside the front door. Due to the requirements for turning wheelchairs, the area and dimensions of the corridor are larger than in the Italian example. The minimum width of 1,5 m, results in a central circulation space of more than 10 m<sup>2</sup>. The Norwegian and the British designs aim for more compact solutions: The hall in the Norwegian example is only 5 m<sup>2</sup>, the English and Scottish examples about 6 and 4,5 m<sup>2</sup> respectively (excluding the stair).



## The bedroom

*More spacious in Germany and Italy than in England and Scotland and Norway*

The minimum size for main bedrooms in Italian and German public housing is 14 m<sup>2</sup>. In Italy, 14 m<sup>2</sup> also satisfies the specifications for barrier free housing. Not so in Germany: DIN 18025 part 2, requires space for wheelchair on three sides of the bed, i.e. a minimum total of 16 m<sup>2</sup> for main bedrooms in public housing. The Norwegian life span standard requires only one turning space and minimum 0,8m passage on one side of the bed. As passage and turning space may overlap, a minimum bedroom requires only 2,7x3,9 m = 10,5 m<sup>2</sup>. The minimum area required in Norway is almost exactly as in the example quoted in the Scottish Homes' booklet on lifetime housing: 3,2 x 3,4m = 10,9 m<sup>2</sup>. The English criteria do not specify minimum space standards for bedrooms.

Norway	Scotland	Germany	Italy
10,5 m <sup>2</sup>	10,9 m	16 m <sup>2</sup>	14 m <sup>2</sup>

Bedroom dimensions. The Norwegian and Scottish standards are by far the smallest, about 5 m<sup>2</sup> less than the generous German standard for two people. Note also the different sizes of the beds: The German and the Norwegian are the largest 2,0x2,0m and 1,8x2,1m respectively, the Scottish and the Italian are the smallest, only 1,8x2,0m.<sup>4</sup>

### Storage space

Although the need for storage space in dwellings is generally recognised, particularly in solutions meant for disabled people, the samples in this study show that storage space is often disregarded in the actual designs. Standards in Italy, England and Scotland do not require rooms for storage inside the dwelling. In Norway and Germany, a minimum of storage space both inside and outside the dwelling is required but the Norwegian samples show that every attempt is made to reduce the storage area as much as possible. Studies have also shown that the storage space by the entrance to the Norwegian dwellings, which are required by the building regulations, is seldom accessible (a breach of the life span standard requirements). Only in Germany (Hessen) is storage space a standard provision; a feature singular to the blocks of flats in Hessen, is a common, accessible box room intended for wheelchairs adjacent to the main entry.

### A dichotomy: The case of housing for the elderly

Even if limited to the architectural solutions alone, a much wider, separate study than is possible here is needed to cover housing for the elderly properly. However, housing for the elderly represents such a large segment of barrier free dwellings that it would be wrong not to give some comments.

As dwellings for the elderly are special in some respects, they present a paradox: There is on the one hand consensus that dwellings for the elderly should be ordinary dwellings, no different from housing for the rest of the population. So far, the same principles apply as in other accessible (lifetime/barrier free/life span housing). On the other hand, the elderly do receive special attention, partly because the proportion of elderly in the population is expected to rise - in many places dramatically - and partly because the elderly are generally recognised as a *special needs group* which no modern welfare state can neglect.

<sup>4</sup> Examples from the Norwegian State Housing Bank, Scottish Homes, DIN norm pt 2 and Rome project Triburtino nord

The elderly are thus at the same time both ordinary people and a singular group. Housing for the elderly is consequently at once both general and special. It belongs under the general heading of barrier free design, but projects are commonly built and reserved for people over a certain age; the designs will often exhibit some special features such as rooms for therapy, generous lobbies and suites of rooms for common use. Rooms and functions such as these would no doubt add to the quality of ordinary dwelling projects - were it not for the obviously prohibitive costs. In dwellings for the elderly, however, it is usually possible to find the means to include rooms for the benefit of all occupants.

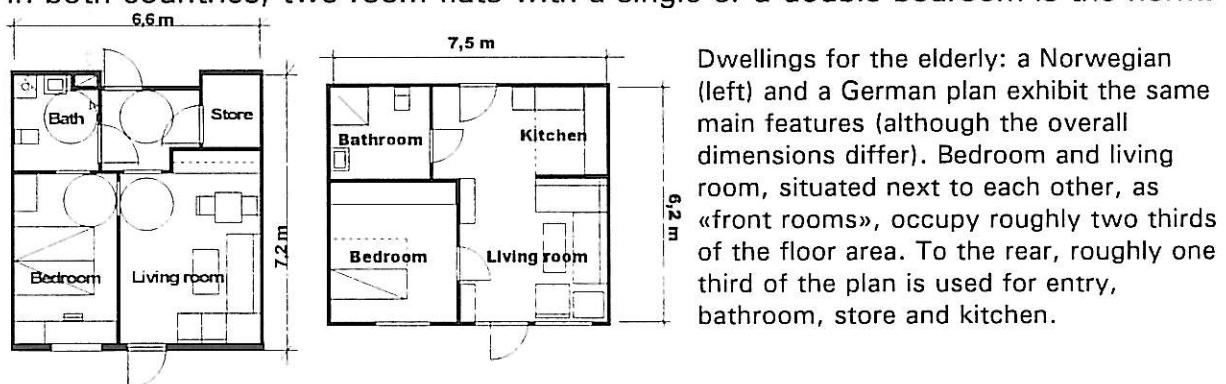
### Dwellings for the elderly in Norway and Germany

Leaving aside the British and Italian<sup>5</sup> solutions, Germany and Norway afford an interesting comparison. The two states have several points in common:

- Demographic conditions: large increases of the proportion of elderly in the population
- Main aims towards flexibility, variety and a combination of measures to tackle the demographic changes
- A bewildering array of terms and forms of housing
- Very similar dwelling plans in both new developments and refurbishments.

The third point above is partly a consequence of the second; there is a clear political will to work for solutions that fit in with the conditions of local communities, whether rural, city centre, suburban or small-town. There is also a will to regard care for the elderly as a totality made up of a variety of efforts - as long as they go towards the main aim: creating conditions whereby elderly people can go on living at home. Thus, advice to the elderly on home improvements goes hand in hand with new construction and provisions for care in the home. (Priority is also given to improve nursery homes and to move young disabled people out of nursery homes intended for the elderly.)

In both countries, two room flats with a single or a double bedroom is the norm:



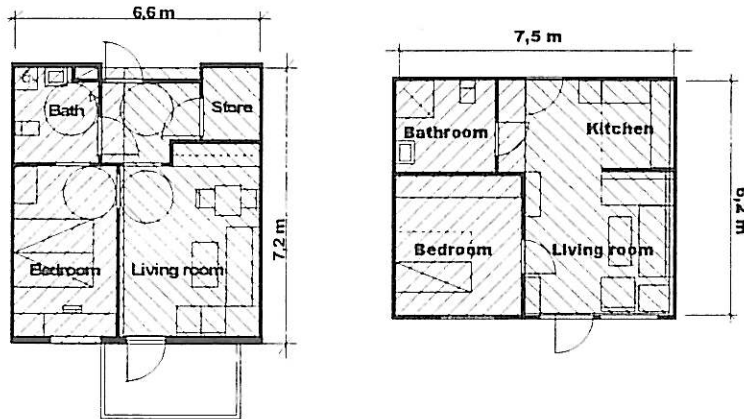
Even Italian plans (quoted by d'Innocento) and small Scottish dwelling plans for «wheelchair houses» (p 36 below) follow the same pattern. The similarities are

<sup>5</sup> For the latter case, the reader is referred to Assunta d'Innocento 1995.

remarkable, considering the significant differences between the layouts of the larger dwellings shown above, but there are good reasons why one plan type dominates the design of small dwellings in all the five countries:

Small flats are expensive in terms of costs per square meter. There is thus plenty of incentive for units that are economical both in terms of construction methods and the use of floor space. To solve these problems, the designer has to aim for short spans and a minimum of internal circulation space.

The logical solution is to pack the rooms closely together behind a relatively limited frontage. The two plans achieve this admirably, by dividing the available space into two pairs of rectangles on either side of a short and stubby central hall/entry space.

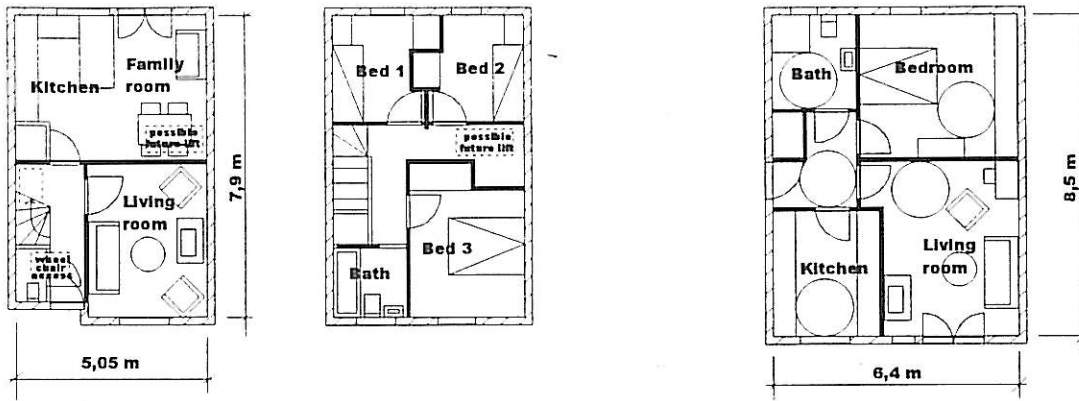


### The minimal dwelling unit

Dwellings for the elderly, such as shown above, are essentially solutions to the problem of the minimum house or flat. The minimal dwelling has of course been a challenge to architects for a great number of years, as witnessed by famous examples like the 1933 «Wohnung für das Existenzminimum» and Reyner Banham's «Environment Bubble» (1965).

None of the norms for barrier free design set a lower limit for dwelling size; only the necessary free floor space relative to the various dwelling functions is specified. However, minimum floor area may be deduced. This demands a thorough analysis of necessary free floor space, including circulation and passages, space for furniture, for fittings and partitions. Admittedly, lower limits for minimum dwelling areas are in force in three of the countries in this study but the limits seem generally unrelated to the requirements for barrier free housing. The only exception seems to be research done by the Norwegian State Housing Bank (Jørgensen 1989). For examples of barrier free solutions on a minimum floor area, one is therefore forced to look for examples that are being built.

The British samples are the smallest in this study. Two Scottish examples bring out several points referred to in the preceding paragraphs. One is a three bedroom, two storey, narrow frontage house (left below). The other is a two room wheelchair flat (right).

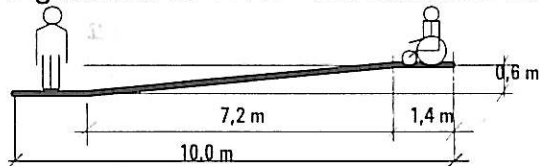


Floor plans of two Scottish houses designed by Thomas Smith, 1995. Left: a three bedroom, two storey house. Right: a two room «wheelchair» house.

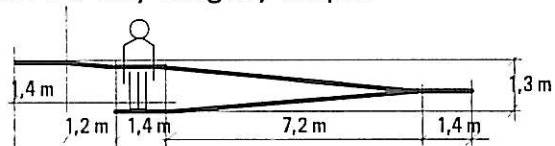
The two storey solution illustrates an attempt to accommodate barrier free design in a traditional, narrow frontage plan: A ground floor toilet is included and preparations for future installation of a through the floor lift are made; the dimensions of the traditional plan are insufficient to accommodate all main dwelling functions on the ground floor. All rooms are minimal: the ground floor toilet, the upstairs bathroom and the circulation spaces are hardly big enough to admit wheelchairs. The upstairs bathroom and circulation can, however, be enlarged by removing two cupboards. The two room wheelchair house, ca 54 m<sup>2</sup>, illustrates a minimum for a two person flat. Interestingly, it consumes roughly the same floor area as arrived at by in the Norwegian State Housing Bank<sup>6</sup>.

### Getting up the hill: External circulation

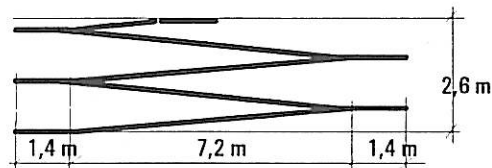
Reaching the entrance to the dwelling is largely a problem of tackling sloping ground. The maximum gradient required for barrier free solutions vary slightly from country to country, but one similarity exists: slopes have to be gentle indeed. Thus, considerable lengths of sloping paths are needed to scale comparatively small changes of level. The sketches below indicate distances needed for a gradient of 1:12 - the absolute maximum for any lengthy slope.



Scaling a vertical drop of 600mm requires a minimum of 7,2m ramp



To take up approximately half a storey height, 1,3m, requires 15,6m of slope. Note the need for landings as resting points on the way up and speed breakers on the way down

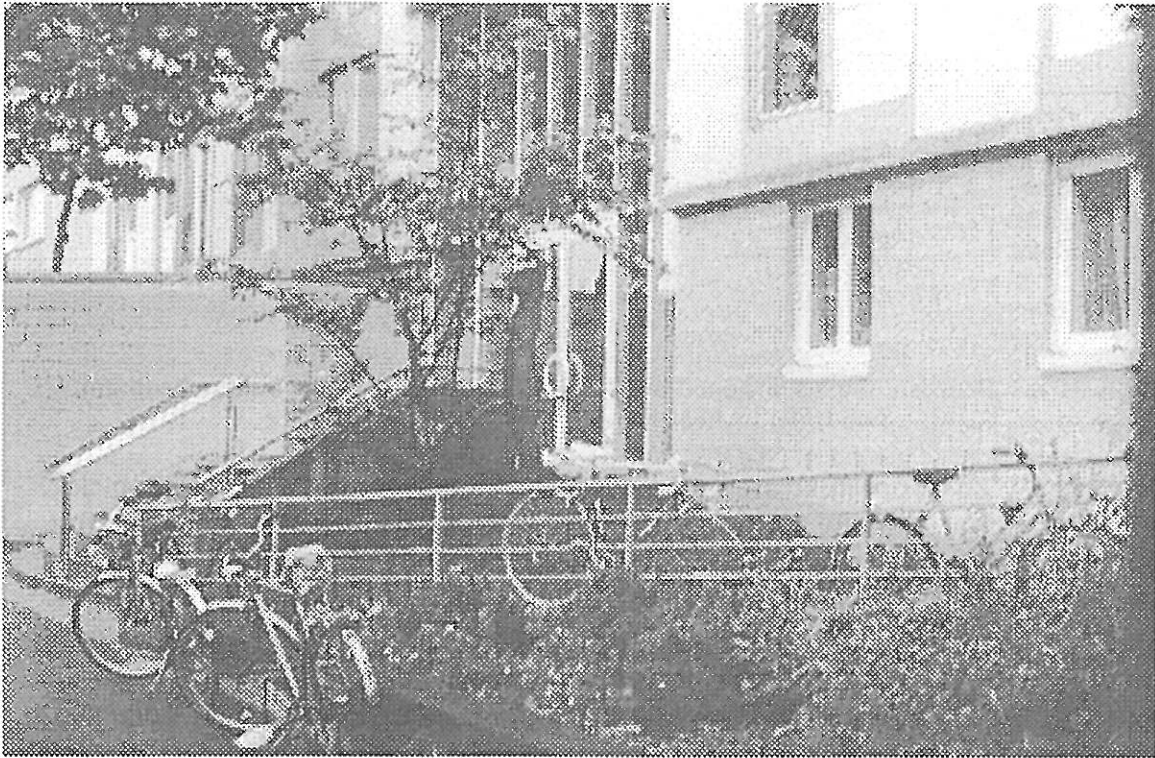


A full storey height - as between a basement car park to the ground floor - requires large, complex and obviously costly systems of ramps<sup>7</sup>.

<sup>6</sup> Jørgensen/Husbanken 1989

<sup>7</sup> Diagrams from Bjørneboe and Christophersen 1995

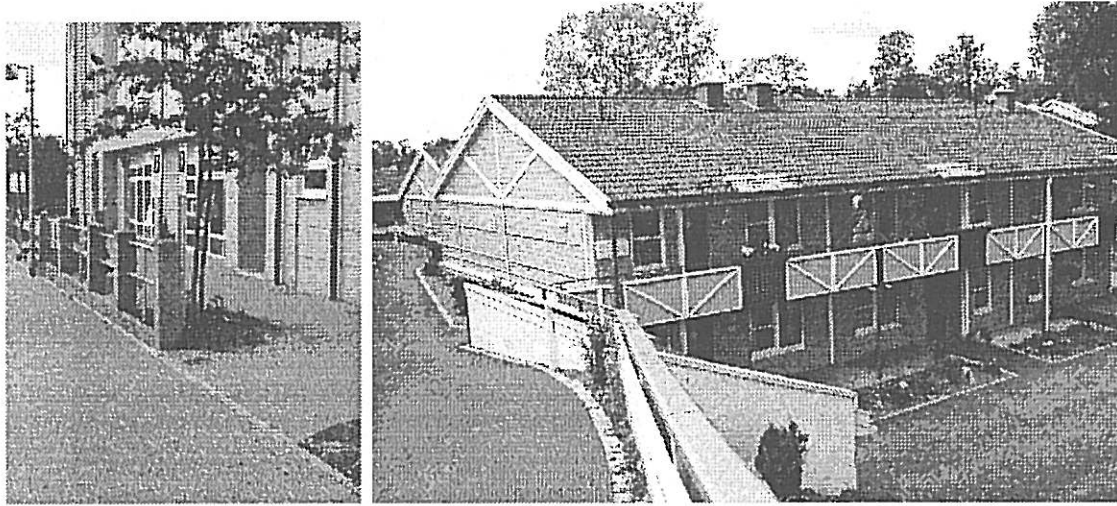
## Solving the problem



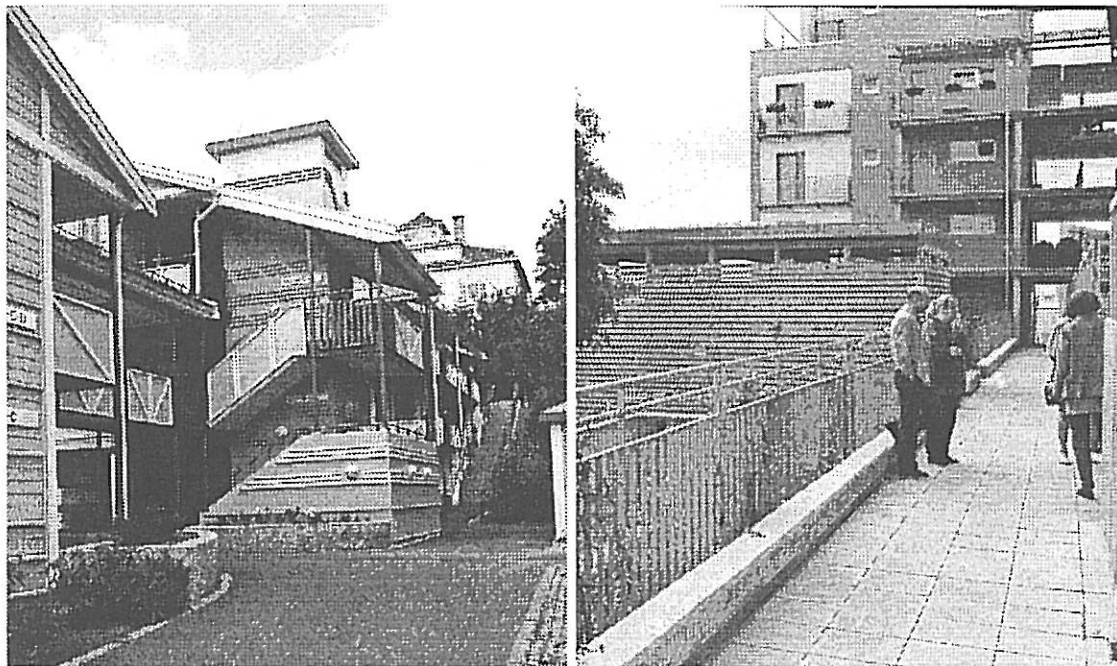
Even when using up most of the front garden, the ramp to block of flats in Darmstadt, above, is steeper than it ought to be. Similar, less than satisfactory solutions may be found on all types of buildings in most European countries. Below: A comparison between a ramp and a short flight of steps: The length of the ramp is considerable. From Tor Bella Monica, Rome.



Generally, the solutions are either a ramp, a sloping path with a bridge at the end or a gently sloping access path leading right up to the entrance door. Ramps are in most cases the least successful solution both architecturally and functionally; when going up, long, sloping access routes are too tiresome for most handicapped people, and, when wheeling down, the speeds are almost impossible to break.



Letting the main access path or road take the slope as in the example from Wiesbaden (left), or using the natural ground to provide access on two levels as in the Norwegian example (right), may prove quite acceptable both functionally and architecturally.



Access decks and bridges may work - providing both barrier free access and architectural variation - but these systems have a tendency to become elaborate (Bærum, Norway left, Wiesbaden right; Italian bridges and decks overleaf). In England and Scotland, such systems are presently associated with high crime areas in housing estates from the 1960's, and are consequently highly unpopular.

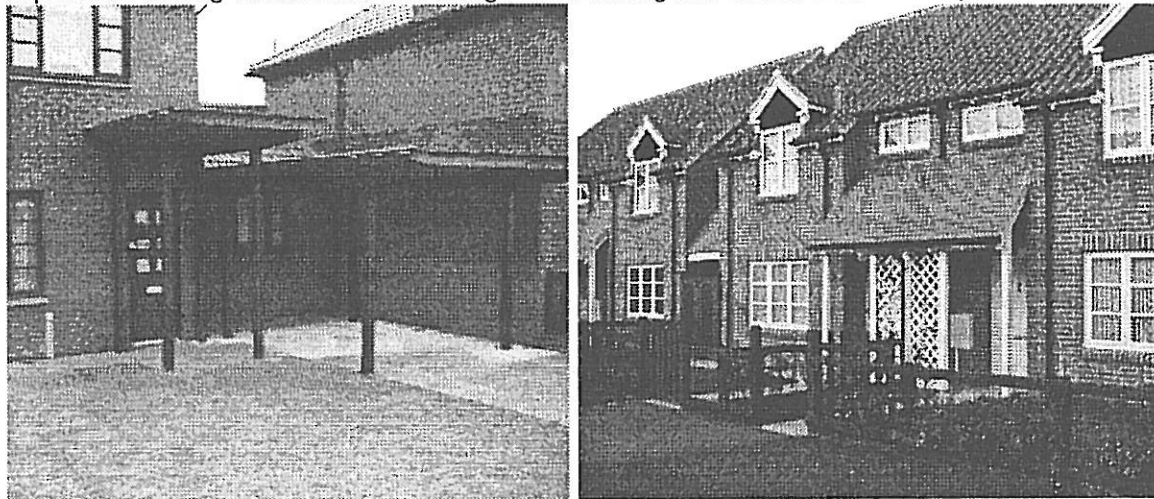


Two Italian examples of access decks and bridges (from «Tor Bella Monica»), illustrating how the ground level can be manipulated to reduce the length of the ramp - the photo at the top showing the preferred solution.





The preferred and functional English solution: A paved, gently sloping path with a level landing at the front door. It may be noted that the architecture of suburbia is now entering the inner city: The above Liverpoolian (Riverside Housing association) examples are situated on an inner city site (!) Note also the car parking areas by the front door to all of the houses and the security aspects of having front doors and living rooms facing the street. Below Liverpool left, York right

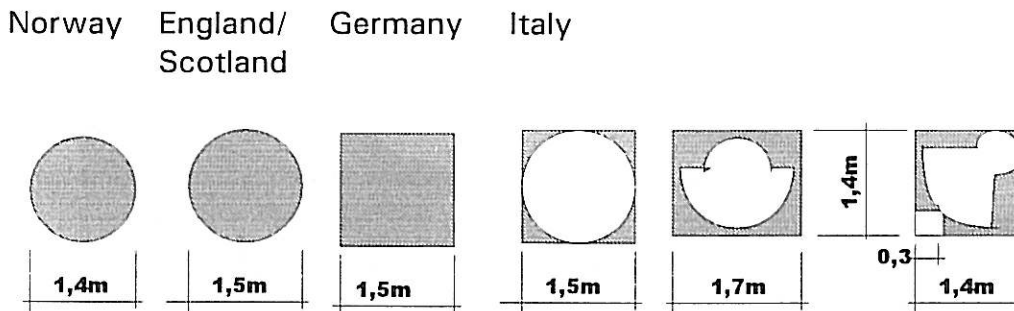


Summing up, the Norwegian, British, German and Italian problems of external access and the solutions to it are all similar. Long, disfiguring, non functional ramps may be found in every country and the same efforts are made to overcome the difficulties, whether it be through careful selection of building materials and architectural details (Darmstadt above) or through site planning, as in the English and the better of the Norwegian and Italian examples.

## 4. The basic specifications

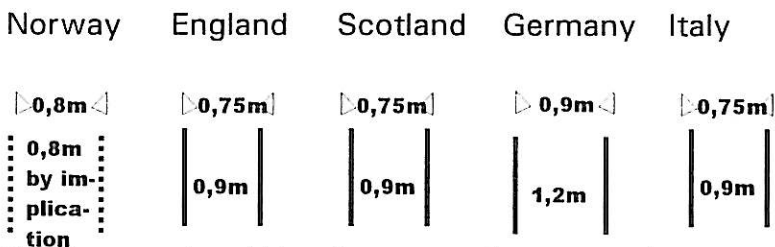
The approach is identical in all five states: The conditions for barrier free design are specified as necessary free floor space<sup>8</sup>, complemented by maximum gradient and maximum change of level. The dimensions required for barrier free solutions are also remarkably similar, although details vary - for no apparent reason.

Turning space for wheelchair is the basic dimension. The German requirement is specified as a square, basically 1,5 m, in some cases 1,2m. The British, the Norwegians and the Italians base the requirement for turning space on a circle. The Norwegian circle is the smallest, 1,4m in diameter. The British and Italian is 1,5m. In the Italian case, the basic turning circle is supplemented by a quarter- and a semi-circle, to be used depending on the conditions on the plan.



Comparison of requirements for turning space

The other basic requirement for free floor space is the width of passages. All countries specify two minimum dimensions: continuous and at a point. Of all specifications this is the one that varies most, from 0,75 to 0,9m at a point and 0,9 to 1,2m for a continuous passage.



Requirements for widths of passages. Bottom, continuous passage; top, at a point

Requirements for the widths of doors and the height of thresholds are important supplements - the latter being also the maximum change of level. It ranges from 15mm in the English criteria to 20mm in Scotland and 25mm in Germany, Italy and Norway. The wording of the requirements for door widths varies but the basic dimension - the free space - is remarkably consistent, 0,8m in Norway, Germany and Italy. Only the British require less: 750mm free space. The

<sup>8</sup> German: Bewegungsfläche, Norwegian: Manøverplass or Betjeningsflate, Italian: spaze di manovra. An exact English translation of this term is not in use.

Germans have an additional requirement for 0,9m free passage through external doors to afford passage with larger wheelchairs than those used inside a dwelling. In all countries a consequence of the requirement for free passage through a door is that external door frames have to be wider than internal doors.

The German and the British criteria also list specifications for the positions of door and window furniture, as well as the strength required to open doors and windows. Both are well known to cause problems in the other countries but requirements are so far lacking.

For further listing of the detailed requirements, including parking spaces, lifts, gradients etc., see the table of dimensions in appendix 1.

## Part 2 The Five Countries

### 1. Norway<sup>1</sup>

In terms of population, Norway is comparable to Scotland; these two are by far the smallest countries in this study. Another important, basic fact is that the Norwegians have always been predominately owner occupiers; the norm has been for Norwegians to own their land as well as their dwellings. Privately owned houses on private land is the tradition. City tenements where occupiers rented their flats from private landlords, were once common but most have been converted to some form of owner occupancy during the last thirty to forty years. Many are now run as co-operative housing, and large housing co-operatives dominate in many parts of the cities. In rural areas, most housing is and always has been privately owned.

#### Financing of housing

The system of state financing through the Norwegian State Housing Bank, which was introduced shortly after the last war, is peculiar to Norway. The bank offers low interest, long term loans which may be supplemented with grants to all new construction and rehabilitation, whether the projects are privately owned, built by housing co-operatives, private contractors or local authorities. The main requirements are that financing may only be given to projects with self contained dwellings for full time occupancy and only to dwellings with a limited floor area. Exceptions are made for short-term accommodation for students and hospital staff and for some forms of housing for the elderly.

The Housing Bank's operations have never been limited to banking alone. For many years, the Housing Bank had the authority to scrutinise projects and to refuse financing to projects of low architectural or functional quality. This is no longer so - instead the Bank awards grants to projects which satisfy specific sets of quality specifications. The requirements for barrier free design, the life span standard, is the oldest and best known of these.

#### Housing providers

Rented accommodation provided by local authorities has never been a significant part of housing in Norway. Nor, indeed, have rentals ever been common outside the cities. (The reasons are clearly historical.) The political attitude has always been that housing by and large is a private responsibility. There are three principal ways in which housing is provided:

- *Private initiative.* Most commonly, each household will select a catalogue house from one of many suppliers of standardised timber frame house types,

---

<sup>1</sup> This chapter is based on and quotes the Norwegian State Housing Bank's publication «The Growth of Good Housing». 1995

and will have the house constructed on a privately owned piece of land laid out for housing by the local authority or a private land owner.

- *Builders' initiative.* Most common in and around cities, builders/contractors may acquire a piece of land and proceed with planning and building for later sale to occupants. As for privately initiated building, these are usually owner-occupied.

- *Housing co-operatives.* Most city regions have a housing co-operative, and these have organised a major part of mass produced housing since the second world war. The co-operative will usually acquire land and oversee planning and construction. Upon completion, individual households buy shares in project co-operatives. The shares give right of occupancy in much the same way as other owner occupied housing. The large percentage of co-operative housing (14%), is believed to be particular to Norway.

## Political policy

Policy aims are stated in several government papers during the last 10 to 15 years. The wording has differed in minor ways, but the goal remains: "*suitable, affordable dwellings and good housing areas for all*". The inclusion of housing areas is recent, and is presumably to be understood as encompassing both area and environment. In addition, *good* has lately been substituted for *suitable*.

In order to comprehend the context of housing policy in Norway, it is important to note that Norwegians pride themselves on having the best dwellings in the world. There is some truth in this. Detached, spacious housing dominates. There has, therefore been a firm belief that market forces is sufficient to safeguard dwelling quality. Although central control and requirements have never been particularly strong, there has been a significant period of de-regulation. Thus, since the 1990's, the few statutory requirements for housing quality which had existed previously were no longer in force. Only two developments were significant for improvements in housing quality control during the last decade:

- Introduction of accessibility requirements: Central policy documents now state that dwellings and housing areas should not hinder but be fully accessible to the disabled. Another general policy aim goes toward integration of the elderly and the handicapped in ordinary housing areas.
- The Norwegian State Housing Bank's initiative for "life span standards", their minimum standard and the "new loan system" which includes dwelling quality grants.

## Legislation

The central documents are the building code and the building regulations. Both are in force throughout the country.

*The building code* requires that dwellings have a fairly sound plan. This does not apply to accessibility but implies that the plan should not be downright hazardous.

*The building regulations* demand accessibility public buildings, in buildings that are open to the public and in most places of work. For housing, requirements in the building regulations apply mainly to multi-storey development. As most Norwegian new construction is timber frame, mainly detached, single family houses, the statutory demands for accessibility apply only in minor ways. Only one issue in the building regulations - accessibility to toilets - covers all housing. This is, however, worded in very general and vague terms, such that toilets spaces should be capable of alteration to admit wheelchair users. Proposed changes to the accessibility regulations are mainly editorial; requirements which were formerly distributed over several chapters are now being concentrated in one section. However, the technical content of these requirements remain unchanged. The grants and loans for life span dwellings through the Housing Bank are thus the only concerted effort to supply barrier free housing in Norway.

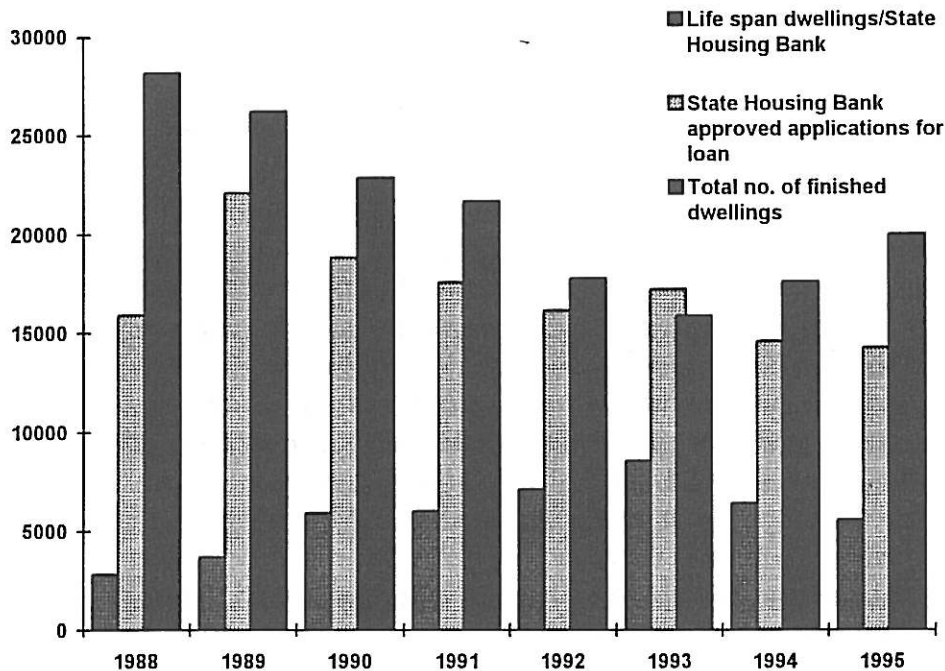
*Local and regional authorities* are responsible for local and regional planning, and for ensuring compliance with the building code and regulations in all new construction as well as major alterations. Regional authorities also have the role of settling complaints over and above the local (municipal) councils. Local authorities may, and often do attach specific demands to planned areas. These have to do with restrictions on building types and heights, densities, distances between buildings, car parking facilities and, in some cases, that a certain percentage or all of an area should have housing with life span standard and/or be of types that may be financed through the Housing Bank.

### **The life span standard**

The life span standard is not an official Norwegian standard and has no statutory status. It was developed by the Norwegian Society for the Handicapped in collaboration with the Norwegian Building Research Institute, and launched by the former in a booklet entitled «The Life Span Dwelling» in 1981. The publication marked the conclusion of a development which started nearly twenty years earlier, when the Norwegian Building Research Institute started its research on accessibility in the built environment.

The Norwegian State Housing Bank quickly adopted the life span standard; accessibility requirements as a basis for a larger than normal loans were introduced at the same time as the publication of the booklet mentioned above. This system was gradually developed further, in series of stages throughout the 1980's and early 1990's. Grants for life span dwellings were introduced for the first time in 1996.

The Housing Bank's initiative proved successful for a number of years. Statistics are only available onwards from 1988, but show a steady increase in the numbers of life span dwellings being built. In the last two years, however, the proportions of life span dwellings are decreasing.



The proportion of life span dwellings compared to the total numbers of dwellings financed by the Norwegian State Housing Bank and the total numbers of dwellings in new construction.

### Requirements for life span dwellings

Being based on minimum dimensions for wheelchair accessibility, the life span standard was developed primarily as a standard for the mobility impaired. However, as the life span standard gained wider acceptance, the organisations for the mentally handicapped and the visually disabled have also adopted the life span standard as a minimum requirement for their members. Thus, the life span standard now serves as a general standard for barrier free housing.

The standard's central dimension is a requirement for turning a wheelchair 360 degrees: a circle of 1,4m diameter. Supplementary specifications include minimum free floor space for opening and closing doors, minimum widths of doors and passages, maximum change of level, maximum gradient/length of ramps, minimum dimensions and numbers of car parking spaces. Requirements for lifts are not included, as lifts conform to the Norwegian standard, which is satisfactory for residential buildings. (See the table in appendix 1 for the dimensional requirements.)



## 2. England and Scotland

### Political policy

Housing is the responsibility of the Department of the Environment in England and the Scottish Office in Scotland. A recent statement<sup>2</sup> from the former describes the will to develop the role of Government and departmental policies to meet the challenges of social change that are driven by people living longer, «often in their own home». The objective is clearly to help the elderly and the disabled to stay on in their own homes. Central government strategies include making advisory services available and the provision of improvement grants. Rumours of proposed changes to the building regulations (see below) would seem to be in keeping with these goals. A wider application of the lifetime standard than today seems, however, highly unlikely; a decline in the production of accessible housing is a stronger possibility: «It is an open secret in Whitehall that the Cabinet has no interest in social housing. On the rare occasion it comes up there are yawns across the table.»<sup>3</sup> As no statutory requirements for accessibility in housing exist, the declining public sector is the only agent working in this field.

### Legislation

Compared with the other countries in this study, Britain's requirements for accessibility in housing are particularly weak. A few requirements exist in Scotland; the English building regulations specifically exclude housing, and cover only accessibility to public buildings and buildings that are open to the public. The absence of legislation in England means that it is legally possible to build high rise blocks of flats without lifts. Lift requirements only come into force when lifts are planned and installed. Although requirements for accessibility in housing are weak in most places, the other countries in this study have regulations demanding lifts in tall residential buildings.

There is, however, discussion to amend the building regulations - and to include accessibility requirements for external access as well as barrier free solutions internally. Changes will be implemented in both Scotland and England (by the Department of the Environment and the Scottish Office respectively). However, the house builders are reported to be contesting the proposed amendments as being a disproportionate response to the problems of the elderly and disabled.

### The housing providers

Without the impetus of statutory regulation, private sector developers are reluctant to introduce accessibility features. Given the depressed nature of the building industry, it is, however, unlikely that the proposed requirements for accessibility will be come into force. The growing self-build sector (which built more than the housing associations in 1995) seem generally uninterested in accessi-

---

<sup>2</sup> Department of the Environment 1996

<sup>3</sup> Barry Hugill. 1997.

lity. The forces working for accessible, general needs housing are consequently concentrated in the public sector, particularly the housing associations. The publicly funded sector is, however, no longer a dominant force in the production of housing. Since the 1960's, when the public sector production far exceeded the private sector, the public sector's share of the production has been declining steadily - reaching 18% in 1995.

#### Housing production 1975-1995\*

	Local authorities and new towns	Housing assoc.	Private builders**	Total
1975-79	641	-	667	1308
1980-84	230	86	676	992
1985-89	102	175	884	1161
1995	0,6	25	110	136

\* Figures 1975-1989 include Wales. \*\* Housing associations were classed as private builders until 1980.

The figures illustrate the dramatic effect of the Thatcher policy on the state funded sector<sup>4</sup>. The low production figures for 1995 also indicate the depressed state of the industry at present.

As accessibility features are only incorporated in public sector housing, the percentage of current housing production meeting any accessibility standards is very low - and is expected to fall: «The provision of new social housing now entirely rests with housing associations - but their capacity to continue after another round of swingeing cuts is seriously at risk<sup>5</sup>.» The cuts in the November 1996 budget, which slashed the amount of funding allocated to the Housing Corporation, are seen as an expression of the Major government's lack of interest in housing policy - except to extend the Thatcherite privatisation policies. After 17 years, this has created such a shortage of social rented housing that any change of government will have to sacrifice quality for quantity for years to come. A wider application of the lifetime criteria therefore seems unlikely.

The English housing associations must satisfy the criteria for accessibility laid down by the Housing Corporation. General needs housing designed since 1993, when the Scheme Development Standards were introduced, should therefore fulfil some basic accessibility standards, although these are not sufficient to provide barrier free solutions (details on p 51).

Getting barrier free housing financed and built can be and often is a complicated process (more so in England and Scotland than in the other countries in this study), mainly because of the way public housing is funded. In principle, a proportion of the total cost may be covered by central authority grants - 50-55% in England, 70% in Scotland. The rest has to be financed locally, by the housing associations, usually through loans that are taken up on the private lending market - state lending funds (as in Norway) do not exist.

The housing associations may to some extent lay down their own, specific requirements for the quality and composition both of new housing and for rehabilitation of older properties. In practice, this possibility is severely limited, for se-

<sup>4</sup> Figures 1975-1989 from Anne Power 1993

<sup>5</sup> Will Hutton 1996

veral reasons: (1) It is unclear whether housing associations have legal powers to set strict requirements for dwelling quality. (2) In some cases, barrier free design is not an option unless the prospective occupiers agree. Getting agreement may require a somewhat strenuous and time consuming effort of "selling" barrier free design to the prospective tenants. (3) The principal obstacle is cost:

English housing associations compete for government grants and the competition is fierce; only the most economical projects obtain grants. (To become more competitive, there is presently a movement to merge smaller housing associations with already existing larger units.) Dwelling qualities - accessibility or any other kind - do not feature as an issue in the competition; physical qualities, in so far as they cause increased costs, may in fact be an impediment towards obtaining grants.

Additional costs also mean higher rents, possibly making lifetime homes unaffordable. "Social housing (provided by either a local council or a housing association) is now wholly the preserve of the poor with over 60% of tenants receiving housing benefit."<sup>6</sup> On the other hand, lowering standards to save costs may make a scheme more competitive and will help to keep rents down. It must be kept in mind that there is no theoretical limit to the lowering of dwelling standards. England and Scotland, as opposed to the other countries in this study, have no minimum standards for housing, whether public or private.

### **The lifetime homes criteria**

As described in part one of this report, the lifetime homes criteria was developed by specialists in the Joseph Rowntree foundation on the basis of the recommendations of the Access Committee for England. The lifetime homes concept is thus the central set of criteria as regards accessibility in general needs housing in the UK; the Scottish standard of the same name is based on and only differs in minor detail from the English standard.

The lifetime homes' recommendations contain three particularly important points on which lifetime dwellings will differ from ordinary, non barrier free British houses (for more detailed comments see part one pp 28-29, 31-32, 35-36):

- level external access,
- downstairs toilet in two storey dwellings,
- constructional preparations for installation of an internal, through the floor lift.

However, as the lifetime criteria have no official status in neither Scotland nor England, the application and the practical use of the recommendations in the standard are wholly the responsibility of local housing providers. Thus, the built results vary, both between the various housing associations and between housing projects done by one housing association - in some cases even within single projects. The variations illustrate that there is an element of uncertainty when designing in accordance with the lifetime housing requirements: Wider usage has given architects and housing associations experiences on which they

---

<sup>6</sup> Hugill 1997

can base new solutions and compromises. At the same time, partly as a consequence of the discussions on the proposed amendments to the building regulations, there is renewed pressure to reduce the space requirements.

As a combined effect of these uncertainties, the background to the lifetime recommendations is coming under scrutiny. The findings so far indicate that basic research is lacking - several of the dimensions and the specifications have been copied from research done elsewhere, mostly in the USA. This has in turn given grounds for criticism, particularly with regard to the dimensional requirements. In consequence, new British research may have to be undertaken.

The topics for discussion seem to centre on three issues:

- the need for free floor space at the side of doors,
- the need for wheelchair turning space in the downstairs toilet,
- whether to have a straight stair with a landing or not,
- whether the lifetime homes standard should include preparations for the internal, through the floor lift.

The first two topics have been researched in several countries; both Norway and Italy have done laboratory research as well as on site testing. The debate on stair lift versus through the floor lift may have particular importance in England and Scotland, as the lifetime concept is singular in not requiring bedrooms on the entry floor. A stair lift on a single, uninterrupted straight stair is the cheapest solution, but the vertical lift has been recommended elsewhere; travel between floors take more time on a stair lift than on the other type of lift, and stair lifts may be more prone to breakdowns, thus requiring more maintenance. Given time, wider use of through the floor lift may bring the price down - although the cases where a house has to be adapted to the needs of a wheelchair user are infrequent, and possible savings consequently small. There may also be little incentive to produce the simplest solution, because tenants in need can get grants to install lifts from the local authority - although there seems to be rather long waiting lists. From the planners' and builders' point of view, the main argument against the through the floor lift concerns the use of floor space: Stairs require only small spaces at the foot and top for wheelchair transfer, whereas through the floor lift require floor space to be taken from rooms that are already at a functional minimum.

### **Differences between England and Scotland**

Scotland differs from England in two major respects:

- the content of the building regulations
- the way in which grants for public housing are allocated and the size of the grants

In addition, the specifications for lifetime housing differ on a few minor points. These seem, however to be of little impact, as they do not influence layout or design in any noticeable way but seem to be concerned more with finer points of interpretation.

## **Building regulations**

As mentioned, the English building regulations are particularly weak as regards housing. The Scottish regulations demand more: There are requirements both for lifts and for the maximum length and minimum width of access paths.

In most countries the lift requirement relates to the number of storeys (which may be defined in a number of ways) and/or the number of dwellings served by one entrance. The Scots have chosen a slightly different approach: A lift is required where the entrance door to a dwelling is more than 10 m above the principal entrance to a building. The lift does not, however, have to give access to the floor on which the dwelling is situated, but to a level not more than 3 m above or below the entrance to the dwelling. Consequently - and rather curiously - the lift requirement does not ensure barrier free access to all or indeed any of the dwellings in a building.

External access, i. e. a road, a footpath, ramp, stair or balcony must not exceed a length of 45m. The required minimum widths are 0,9m where the access serves one or two dwellings, and 1,2m where it serves more than two dwellings.

Lacking requirements for changes of level and gradient, Scottish building regulations for external access do not, of course, do much for barrier free design. However, the mere existence of requirements for access to dwellings is important: Safeguarding a minimum width of access paths has obvious implications for functional qualities - and by extension, also for accessibility. In addition, getting new regulations accepted is a lot more difficult than amending existing ones. Thus, the Scots may have a better chance of adopting requirements for barrier free external access in the future than the English.

## **Allocation of grants; requirements and recommendations**

Grants for public housing (excluding the small minority of new housing provided by local government authorities) are allocated through the Housing Corporation in England and the Scottish Homes in Scotland. The former have some requirements for accessibility, the latter merely encourages barrier free design.

The Housing Corporation (England) requires<sup>7</sup> that «external and internal environments should provide access for user groups and visitors with limited mobility». The requirements are based on the recommendations of the Access Committee for England, and include minimum widths of entrance doors, internal doors (respectively 775 mm and 750 mm clear openings), minimum width of paths, gateways and, car parking spaces, as well as dropped kerbs and gently sloping access paths. The requirements cannot, however, be regarded as requirements for barrier free design: Neither maximum gradients for sloping paths or maximum changes of level are stated, nor are there requirements for free floor space such as passages, turning circles etc. Seen from the outside, the effect requirements may have on accessibility therefore seem dubious; adequate door widths seem rather pointless if changes of level, narrow passages and insufficient room

---

<sup>7</sup> Scheme Development standards 1993/95

dimensions create barriers. An additional set of requirements for *wheelchair housing* are more comprehensive, but these do not apply to general needs housing. Wheelchair standard housing are eligible for additional grants - no additional subsidy is available for lifetime housing, and the production of wheelchair standard housing is very limited.

Scottish Homes, having produced Scotland's Lifetime Homes standard, is an important promoter of barrier free design in Scotland. However, Scottish Homes does not have the power to demand accessibility, barrier free design or lifetime standard in new construction or publicly funded refurbishment. Its presence is, on the other hand, powerful; it is the central authority for the allocation of public funding in Scotland.

Therefore, although the Scottish Homes lifetime standard only has advisory status, its recommendations carry considerable weight. The present aims as regards barrier free housing are clearly stated:

- The design of all houses should make allowance for the possibility of their future adaptation for the permanent use of a severely disabled person.
- When existing houses and flats are being refurbished barrier free features should be incorporated where feasible.<sup>8</sup>

Given the power and influence of the Scottish Homes, it is more than likely that local Scottish housing associations will attempt to follow the Scottish Homes' recommendations wherever possible. Discussions with English planners in the course of this study indicate that the situation as regards barrier free housing is more promising in Scotland than in England; references to the Scots as having achieved more than the English were frequent.

---

<sup>8</sup> Scottish Homes 1995

### 3. Germany

#### Theoretical and political basis

As mentioned in part one, Lawton's model of the interplay between the demands of the environment and individual capabilities forms a theoretical basis, both with regard to psychological well being (Flade 1995) and in the design of dwellings and dwelling areas (Boeminghaus 1994). Although the philosophy of what can be loosely termed "handicapping environments" seem to a large extent accepted by policy-makers, the planning profession is criticised for a lack of understanding and interest (Blankenfeld 1994).

German literature describing the need for barrier free dwellings, housing areas and public buildings focus on the importance of the home environment - especially as regards the elderly and disabled: They spend more time at home than other people and their radius of activities is more limited. On top of this, elderly people are understood to have a particular need to be able to stay on in their home environment regardless of disabilities.

The political aims are contained in the motto "integration rather than delineation". As expressed by the German minister for the Family and the elderly<sup>9</sup>, this motto embodies the safe-guarding of human values in all of life's phases, respect for personal wishes and conceptions as well as creating conditions for social integration and autonomy. Central to these political ideals is the notion of sustaining a high degree of "personal competence" - defined by the central government (Bundesregierung) as "keeping up self-sufficiency, personal capabilities and meaningful life in a stimulating, supportive and effective interplay with an environment which is at once both testing and stressful"<sup>10</sup>.

Although the political aims quoted above are stated mainly in the context of care for the elderly, most seem to apply equally to policies for the disabled; as in most other countries, the policies for the elderly and disabled are often combined.

#### The legal background<sup>11</sup>

By virtue of its constitution, the Federal Republic of Germany is a federal state. Under German law, the concept of «State» (Bund) therefore includes not only the Federation but also the sixteen constituent states (Länder) and many thousand municipalities (Kommunen). In certain fields the Länder may act independently of the Federation as autonomous units. For instance, the Federation, the

<sup>9</sup> "Betreutes Wohnen - Lebensqualität sichern", Bundesministerium für Familie, Senioren, Frauen und Jugend, 1994

<sup>10</sup> The author's translation from German: "Aufrechterhaltung eines selbständigen aufgabenbezogenen und sinnerfüllten Lebens in einer anregenden, unterstützenden und die effektive Auseinandersetzung mit Aufgaben und Belastungen fördernden Umwelt". Bonn 1990.

<sup>11</sup> The following two paragraphs have been supplied by Dipl. Ing. Celine Fries in Hessen

Länder and the local authorities each have their own financial management. German building and planning laws are in accordance with this principle:

Town planning and urban development under the Federal Building Code (Baugesetzbuch) is regulated uniformly throughout the Federal Republic. Its main issue is the permissibility of projects in an urban setting. The actual granting of a building permit (Baugenehmigung) by a building authority is subject to the various building regulations of the Länder. To obtain the permit, the specific building regulations of the Land in which the construction is to take place must be adhered to. These may (and do in Hessen) contain regulations concerning structural stability, fire prevention and protection, admissible building materials, health protection, traffic safety and social justice. The Bauordnung also provides the details of the procedures required for the issuing of a building permit.

### **The DIN-Norm**

German standards are contained in the Deutsche Industrie-Norm (DIN), which is common to the Federal Republic as a whole. The current standards for barrier free design are the results of a 1992-1994 revision of the very early (in terms of) accessibility norms from the start of the 1970's.

DIN has two norms for barrier free design: nos 18024 and 18025. The former details the norms for public buildings, including buildings to which the public have access, covering barrier free design requirements for all types of disabilities, although mobility impairments make up the bulk of the requirements. DIN 18025, which is in two parts, concerns housing. Part one gives details on design for full wheelchair accessibility, while part two concerns a more general accessibility - targeting all types of disabilities, but, again, the specifications are geared primarily towards mobility impairments.

Both norms are structured around specifications for necessary free floor space relative to the various dwelling functions. The basic functional dimensions, representing 360 degree turning space for wheelchair, are a set of squares defining free floor areas - 1,5 m or 1,2 m depending on the setting. Supplementing the basic requirement for free floor space, there are minimum dimensions for passages, lifts, the widths of doors and parking spaces, as well as maximum gradients. German legal requirements frequently refer back to the DIN norm.

### **Legal requirements**

As mentioned, responsibility for the building regulations is left to the individual states; most seem to lack definitive measures to ensure barrier free design in general needs housing. Studies (H.P. Sundh 1994, Schnieder and Weiss, 1996) listing the legislation in the German states show only two areas - Berlin and Hessen - where barrier free housing is wholly or partly required. As the present study is limited to the state of Hessen, the paragraphs below refer to requirements that are in force there.

The legal documents are divided between a building code ("Bauordnung"), which applies to all new construction, reconstruction and refurbishments in the



state, and a set of technical guide lines for dwellings ("Technische Wohnungsbau-Richtlinien") which are legally-binding for all public housing. A few years ago, the Hessische Bauordnung was amended to include new ecological regulations concerning conservation of energy, soil and water. In addition, a stronger consideration of social interests was included, as for instance, regulations concerning the disabled.

The code<sup>12</sup> demands that all public buildings and buildings to which the public have access must be barrier free. This includes provision of toilets suitable for wheelchair users. For dwellings, the code also requires a degree of barrier free access and barrier free dwelling design:

- Buildings with more than three dwellings must have barrier free access (DIN 18025) to one storey, if the site conditions are not prohibitive
- Buildings with five storeys or more must have lifts that can be accessed by and used by wheelchair users
- Detailed dimensions for lifts
- Dwellings that are required to have barrier free access must contain a living room, kitchen or kitchenette, toilet and bathroom that is accessible to wheelchair users.

These requirements do not, however, (as is explicitly stated in the code) require that the whole or parts of any residential building must be barrier free. The choice is left to the owner of the prospective building.

The technical guide lines for dwellings (TWBR)<sup>13</sup> are stricter than the code, both as regards accessibility/barrier free design and general requirements for individual rooms. The guide sets standards for living rooms, 18-20 m<sup>2</sup>, and minimum areas of bedrooms: 10 m<sup>2</sup> (single) and 14 m<sup>2</sup> (double). The corresponding standards in the code are 10 m<sup>2</sup> for bedrooms and living rooms - with the exception that single bedrooms of 6 m<sup>2</sup> are acceptable; although not in all states. The guide lines further require barrier free design according to DIN 18025 part 1 (i. e. fully wheelchair accessible) for all ground floor dwellings in buildings that contain three or more dwelling units. Barrier free design is also required throughout multi storey blocks of flats where the code demands lifts, and all doors are required to be wide enough to permit passage by wheelchair. In addition, the technical guide lines set standards for maximum dwelling sizes, and recommends multi-purpose rooms. The latter can be seen to have affected the choice of room sizes and dimensions (see page 24). As mentioned above, it must be kept in mind that these sets of specifications - the code and the technical guide lines - are in force in Hessen only, and may differ considerably from the requirements that are in force in other German states.

---

<sup>12</sup> Hessische Bauordnung 1993

<sup>13</sup> Technische Wohnungsbau-Richtlinien - TWBR-1993

### **Dwelling size**

The guide lines set standards for floor area, related to the number of persons for whom the dwelling is intended.

- Dwellings for two people, 40-57 m<sup>2</sup>
- Dwellings for three or more people: increase of 14 m<sup>2</sup> per person

Deviations (above and below) are permitted, provided the overall dwelling quality (Wohnwert) does not drop below the intentions of the set standard, or when particular social reasons apply. The term social reasons refers particularly to large households, i. e. six people or more.

The standards demand further that dwellings should have entry and hall, kitchen, bathroom, WC, living room and storage space both inside the front door and outside. Bathroom with toilet and a separate WC must be provided in dwellings for four or more persons. Kitchens in dwellings for three or more persons must have space for a dining table. Every dwelling must also have direct access to a private open space.

In addition, the regulations give specifications for minimum outdoor space, play areas for children etc.

### **Implementation, control and promotion**

The German systems for implementation and control are more than a little bewildering; the non-existence of a central building legislation is known to cause problems even to Germans, particularly firms that construct dwellings in more than one state. There are four legislative levels: (1) the federal level, which concerns city and regional planning, (2) the state (Land), which takes care of building codes (Bauordnung) and statutory guide-lines, (3) a county level which audits applications for public housing grants and issues permits to build, and (4) a municipal level ("Kommune"), which exercises control.

Promotion of barrier free design may thus be seen to belong partly on the state (Land) level and partly on the county level - statutory requirements being the responsibility of the former, while the latter sees to programming and the acquisition of land for building. Presumably some feedback and co-operation between the two take place on a regular basis. To complicate matters further, a variety of local housing organisations work with the state and the county, acquiring, constructing and running public housing estates.

At present - at least in the state of Hessen - the main and very serious problem concerning the promotion of barrier free housing is the shortage of land; new land for building is available, but not at a price that will enable public housing to be built. The cost of land is particularly high in industrialised areas. Thus, organisations that were formerly actively constructing new and refurbishing older stock have now restricted their activities to the running of existing estates. In Hessen, the only future possibilities will lie in refurbishing and converting buildings left behind by the American army.

### **Studies and evaluation**

In response to forecasts of a dramatic rise in the proportion of elderly in the population, Germany has conducted several large scale research and evaluation studies. Both existing and fairly new housing areas in central locations, suburban and rural settings have been subjected to scrutiny, assessing the qualities of life for the elderly population. The studies have looked into subjective (on the part of the elderly) and objective issues, using a combination of quantitative and qualitative methods<sup>14</sup>, studying not only the design of the dwellings and individual needs for alterations but also the setting, including roads and paths, public open space, shops and public services, as well as the needs and provision of services and help directed specifically at the elderly.

---

<sup>14</sup> See *Ältere menschen ... 1993*, Bundesministerium für Familie, Senioren, Frauen und Jugend 1994 and *Selbständigkeit durch ... 1993*.

## 4. Italy

In one important respect, Italy differs from the other countries in this study: Voluntary norms or standards for universal design, lifetime or adaptable housing are not in use. Instead, the Italians have chosen to work for barrier free housing through legislation. As will be shown in the paragraph on social and co-operative housing below, peculiarities of Italian housing policy seem to be the main reason.

### Background: The legacy of le Corbusier

Italian planners recognise that their post war housing rests on the tradition of multi-storey blocks set in green fields as advocated by le Corbusier. As is the case in many other European countries, most post war housing construction took place on virgin land, in the form of high rise, often high density satellites to the existing cities. Where Italy differs somewhat from the other countries in this study, however, is that the Corbusier tradition lasted longer and may have been carried out more consistently.

In recent years, the volume of new construction has decreased and found new forms: new construction is now mainly taking place as in-fill between existing blocks of flats, whilst older, substandard housing is being rehabilitated, often through the construction of extensions which bring small flats up to present day space standards.

Recent attempts to build low rise, high density housing have so far been unsuccessful, chiefly due, it is said, to a lack of flexibility in the planning process. The design of buildings comes late in the planning process and is totally divorced from the earlier stages; all major decisions, including the number of dwellings, types of building and even external dimensions of the buildings are laid down at an intermediate planning level and cannot be reversed or revised at the building design stage.

### Rigorous standards for public and co-operative housing

The standards specify both the *minimum* floor areas of bedrooms - single 9 m<sup>2</sup>, bedrooms 14 m<sup>2</sup> - and the *maximum* total floor area. The latter is laid down in steps relating to the numbers of people for which the dwelling is intended, indicated by the number of beds shown on the floor plan<sup>15</sup>:

No of beds/persons	2	3	4	5	6	7
Maximum floor area in m <sup>2</sup>	48	56	74	83	89	93

There are no requirements for private housing, nor, curiously, are there requirements for the minimum size of kitchens and living rooms.

---

<sup>15</sup> It may be noted that the Norwegian State Housing Bank used the same method prior to 1982.

### **The effect of the standards**

The bedroom standards are rather high, and the established Italian bathroom standards likewise - two rooms being a minimum in dwellings for four or more people. In addition, the central corridor around which the typical Italian dwelling plans are commonly structured (p 26) demands a fair amount of space. Seen in this context, the limits to the total floor area impose severe restrictions indeed: Little is left for the kitchen and the living room. The kitchens found in Italian public housing are consequently mere work spaces; there is no space for even the smallest dining table. The living room is tiny and often has more than one function, being also the point entry and taking care of the circulation to the central corridor and the kitchen. Space for normal living room functions is thus severely restricted; the functional value of the Italian living rooms seems to be the lowest among the countries in this study.

### **The importance of time in the planning process**

Italian planners complain of a painstakingly time consuming planning process. Time is thus a major cost factor, and requirements which may complicate or increase the time spent on planning will be met with fierce opposition. The makers of the Italian accessibility legislation have consequently had to tread with particular caution so as to avoid any sort of planning delays. This may again explain why the existing legislation has little effect on the layout of individual dwellings (although the effects of barrier free design are noticeable externally).

## **Italian legislation and norms**

### **The structure of the legislation**

Fundamental to the Italian building legislation is the combination of law (legge) and decree. The relationship between the two resembles the building code and regulations found in other countries. There are, however several important differences. The Italian building legislation comprises several laws (building codes), each with an attached decree (regulation). To complicate matters, there is sometimes - though not always - a considerable time lag between the passing of a law and the accompanying decree. Somewhat surprisingly, neither the political colour of individual governments nor the frequent changes of government in Italy seem to have had any decisive effect on the passing of laws and decrees for accessibility in the built environment.

The laws and decrees apply to all public (social) and co-operative housing in the country. Individual regions may have additional requirements. However, as outlined in the paragraphs on the 1989 legislation and the «three levels of accessibility» below, the private housing sector is treated more leniently than the public: The three levels of accessibility apply to private housing but the requirement for 5% fully accessible dwellings is limited to public housing. There is thus a legislative split between public/co-operative housing and private housing.

Parts of the existing (1989) law on accessibility in public housing was for instance first introduced in the region of Rome. It must be noted, however, that

the nature of the legislation gives little opportunity for promoting or regulating the standard and quality of dwellings on a regional level. A local or municipal level of government does not exist.

### **The laws and decrees**

There are presently three laws that regulate accessibility in Italy:

- Law no 118/1971 and presidential decree no 384/1978 require accessibility in public buildings. The law is a statement of intent; the decree contains the specifications and standards. The documents apply both to new construction and to improvements, but give a possibility for leniency as regards the latter. A further decree, no 28/1986 gives an indication that the former law and decree did not have the effect intended; it not only threatens to withdraw state financing for projects that does not comply with the law and decree of 1977/1978, but gives possibilities for state financing of plans and building work for the removal of architectural barriers.
- Law no 13/1989 and decree no 236/1989 extends the principles and standards of 1971-78 beyond public buildings: now, accessibility is required in *all* buildings that are open to the public. The law and decree apply in equal measures to the private and public sectors - whether new construction, refurbishments or conversions. Importantly, the 1989 legislation also includes housing: 5% of all new, public sector housing must be fully accessible. Furthermore, both the remaining 95% of public housing and private sector housing must provide documentation showing that a lower level (see below) of accessibility is possible.
- Law no 102/1992 updates and extends the earlier laws. Most important is the part relating to conversions and refurbishments. The former legislation only covered major works. After 1992, the requirements for accessibility also applies to minor construction work and straightforward changes of use.

### **Three levels of accessibility**

The law and decree of 1989 lays down a concept of three levels of accessibility. These have particular relevance to housing<sup>16</sup>: As mentioned earlier, 5% of all public housing has to satisfy the highest level. The rest of the public housing *and* housing in the private sector must satisfy the two lower levels.

#### *Accessible («Accessibile»)*

Briefly put, this implies that a wheelchair user should be able to enter the building, move about in it and use all functions unaided. In effect, an accessible dwelling is designed for permanent occupancy by a wheelchair user; the need for individual adaptations should be as near to none as possible. Significant requirements are free floor space next to the WC and wide internal corridors.

---

<sup>16</sup> See Prestinenza 1992 and Prestinenza (1)

*«Visitable» («Visitabile»)*

At this, the second level, a wheelchair user should be able to enter the building and the individual apartments. A wheelchair user must also be able to get to the bathroom as well to enter and move about in the living room. As the accessibility level is limited to entering the bathroom, no free floor space next to the WC is required, and the corridors in the individual dwellings are only required to be 1,0 m wide. There is, however, a paradox as regards the possibilities for entering the individual units in a block of flats: lifts are not required in buildings of three storeys or less.

*Adaptable («Adattabile»)*

Being the lowest level, adaptability gives the designer the possibility to postpone all accessibility features. At the outset, no part of the building actually has to satisfy the requirements for accessibility, but the planner has to show how the building can be made accessible later. (Presumably, the adaptations for accessibility should be fairly limited.)

**Design of barrier free housing****Limited effects on the dwelling plan**

As is shown on the plans on page 26, even the most ambitious of the three Italian levels can be realised within the total floor areas allowed for public housing, and without deviating much from «normal», non-accessible plan types. This is no doubt due to the comprehensiveness of the Italian accessibility requirements. They contain a large number of specifications relating to a multitude of conditions and circulation patterns - far exceeding anything used in the other countries. The complexity must, however, be demanding to the average architect; assimilating the specifications to the degree needed when designing a dwelling or a block of flats would seem to require a great deal of practice and intimate knowledge of the problems of the disabled.

**Noticeable external features**

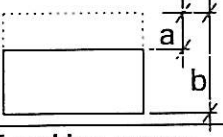
External access - particularly to blocks of flats - has caused problems in Italy. Long ramps have been seen as disfiguring as well as impractical on several recent designs; they are at once dominating on the exterior and strenuous to negotiate. (Some examples are shown on p 37-39)

## Appendices

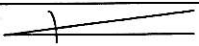
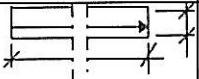
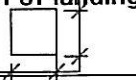
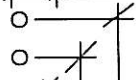

### 1. Table of specifications

#### External

##### Parking spaces

	Italy	German, DIN	England	Scottish H	Nor.HB
Min. width of parking space 	a: 1,3 m b: 3,2 m	a: 1,5 m b: no req.	b: 3,3m	no req.	b: 3,8m
Provision of parking spaces	1 per 50 dwellings	no req.	no req.	no req.	5 per x 100 dwellings
Max distance from front door	no req.	no req.	30 m	Building reg	100 m
Footpaths	as ramps	no req.	gate 0,85m	Building reg	as ramps

##### Ramps

	It	DIN	Eng.	Scottish H	Nor.HB
Max. slope 	1:6*	1: 15	1:12	1:12	1:12
Max. length Min. width 	3m 0,9m	6m 1,2 m	5m** 0,9 m	5m** 1,0 m	6 m 1,2 m
Min. width x depth of landing 	0,9x1,2m top/bottom 1,5x1,5m	1,2x1,5 top/bottom 1,5x1,5 m	At main entrance 1,2x1,2m	top/bottom 1,0x1,2 m	1,2x1,2m top/bottom 1,4x1,4 m
Handrail 1 Handrail 2 	1: 0,9/1,0m 2: 0,75 m	1: 0,8-0,9 m 2: no req.	no req.	Both sides No height requirement	no req.***
Edge board 	E: 100 mm	E: 100mm	E: 10 mm	E: 50 mm	

\* Short ramps. Ramps of 6-10m, 1:10-1:12

\*\* When steeper than 1:15

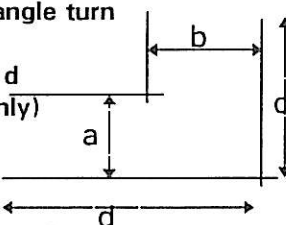
\*\*\* Building regulations require railing on both sides h = 900mm

##### Private open space

	It	DIN	Eng.	Scottish H	Nor.HB
Minimum area	no req. but must be accessible when provided	4,5 m <sup>2</sup>	no req.	no req.	3,0 m <sup>2</sup>



## Internal Circulation

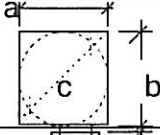
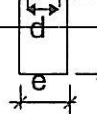

	It	DIN	Eng.	Scottish H	Nor.HB
Min. turning space	circle Ø 1,5m*	square 1,5m	Housing Corp 1,5m***.	no req.	circle Ø 1,4m
Passages, min. width - continuous - at a point	0,9m** 0,75m	1,2m 0,9m(0,8)	0,9m 0,75m	0,9m 0,75m	0,8m
Max. change of level (incl. thresholds)	25mm	25mm	15mm	20mm	25mm
Right angle turn  (c and d Italy only) 	a: 0,9m b: 0,9m  c: 1,4 d: 1,7	no req.	a: 1,2m b: 0,9m (at doors off a passage a: 0,75m b: 1,2m)	no req. (at doors off a passage a: 0,75m b: 1,2m)	a + b: 2,2m any leg min 0,9m

\* 1,4x1,7 for 180deg turn or 1,1 x 1,04 for 90deg turn

\*\* 1,0m preferred

\*\*\* in hall and bathroom


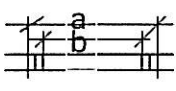
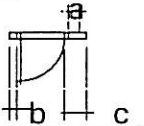
## Lifts

	It	DIN	Eng.	Scottish H	Nor.HB
Landing 	a x b: 1,5x1,5m*	a x b: 1,5x1,5m	a x b: 1,5x1,5m	no req.	a x b: 1,4x1,4m
Door min. width 	d: 0,8m	d: 0,9m	d: 0,8m	no req.	d: 0,8m
Car 	e x f: 1,1x1,4m	e x f: 1,1x1,4m	e x f: 1,1x1,4m	no req.	e x f** = 1,1x1,4m

\* refurbishments/and rehabilitation: a x b 1,4x1,4 m

\*\*Norwegian standard

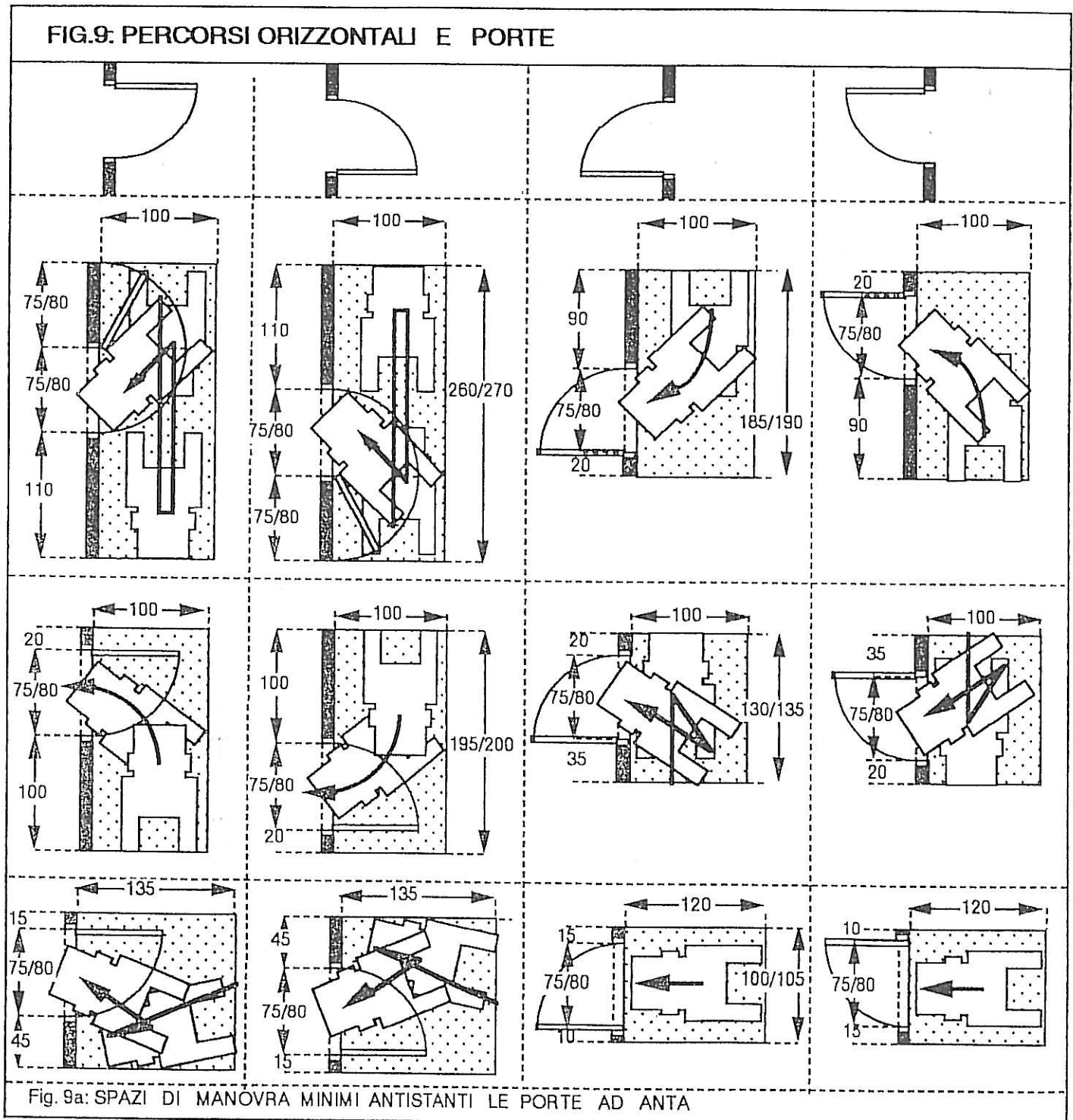
## Doors

Circulation	It	DIN	Eng.	Scottish H	Nor.HB
Main (entrance) 	b: 0,8m	b: 0,9m	b: 0,8 m	b: 0,75m	a: 1,0m b: 0,8m
Internal 	b: 0,75m	b: 0,8 m	b: 0,75m	b: 0,75m	a: 0,9m b: 0,8m
Free floor space 	a: 150mm* b: 150mm c: 0,45m	a: ** b: ** c: **	a: none b: none c: none	a: 0,3m b: none c: 0,3 m	a: 0,3m b: no req. c: 0,5 m

\*several specifications are given for a, b and c, depending on the situation on plan; see illustration on the following page

\*\*space to manoeuvre/turning space is required; see min. turning space above

# Italian specifications for free floor space at a door<sup>17</sup>



<sup>17</sup> From Prestinenzza (1) p. 44

## 2. Literature

### General

Access Committee for England. *Building Homes for Successive Generations*. 1992.

*Ältere menschen und ihr Wohnquartier*. Bundesministerium für Raumordnung, Bauwesen und Städtebau. 1993

Banham, Reyner. *A Home Is Not a House*. Art in America N.Y. 1965

Bartholomai, Bernd. *Wohnungsbau 1995 Weiter auf hohem Niveau*. Paper 1996

Blankenfeld, Christine. *Wohnen im Alter*. Der Architekt 6/1994

Block Watne A/S. *Husboken*. 1991 and 1995

Boysen, Carsten. *Boliger for eldre* (Dwellings for the elderly) Norwegian Building Research Institute. 1965

*Betreutes Wohnen - Lebensqualität sichern*. Bundesministerium für Familie, Senioren, Frauen und Jugend, 1994

Bjørneboe, Jens og Christophersen, Jon. *Trinnfri atkomst* (Barrier free Access) Husbanken HB-3062. 1995

Christophersen, Jon. *Livsløpsboliger, fungerer eller feiler*. (Life Span Dwellings - do They Function or Fail) Norwegian Building Research Institute. Project Report no 70. 1990

Christophersen, Jon. *Rimeligere enn ventet. Kostnader for livsløpsboliger*. (Cheaper than expected. Costs for life span dwellings.) Norwegian Building Research Institute. Project Report no 69. 1990

Christophersen, Jon. *Alleviating Adverse Effects of Deregulation*. ENHR Conference Paper. 1994

Christophersen, Jon. *The Growth of Good Housing*. The Norwegian State Housing Bank. 1995

Department of the Environment (England). *Our Future Homes*. 1996

*Erster Teilbericht der Sachverständigenkommission*. Bonn 1990.

Flade, Antje. *Wohnen im Alter aus Psychologischer Sicht* 1995

Fontana, Gaetano. *Sperimentare la norma*. Laboratorio tipologico nazionale. 1993

Hugill, Barry. *Rich and Poor Will Live together*. The Observer January 5. 1997.

Hutton, Will. *Trick from a Losing Hand*. The Observer. December 1. 1996

d'Innocento, Assunta. *La residenza degli anziani*. The Italian association of Housing Co-operatives. 1995.

Jørgensen, Ivar. *Funker femti'n*. (Does 50 m<sup>2</sup> function?) The Norwegian State Housing Bank 1989

Karn, Valerie. Trends in the Regulation of New Housing Quality in Western Europe. Editorial ENHR Newsletter. 1996

Parametro no 76/77 1979

Power, Anne. *Hovels to High Rise*. Routledge. London 1993

Prestinzenza, Luigi. (1) *Manuale per una progettazione senza barriere architettoniche*. Edil Stampa.

Prestinzenza, Luigi. (2) *Casa per la terza età*. Edil Stampa.

Prestinzenza, Luigi. (3) *Progettare la Sicurezza*. La Nuova Italia Scientifica. 1992

Quinney, Anthony. *The traditional Buildings of England*. London 1990

Schnieder, Bernd and Weiss, Christine. *Richtlinien für die Wohnversorgung*. Justus Liebig Universität Giessen 1996.

*Selbständigkeit durch Betreutes Wohnen im Alter*. Wüstenrot Stiftung. 1993

Summerson, John. *Georgian London*. Pimlico Edition. London 1991

Sundh, H.P. *Tekniske byggebestemmelser i Tyskland*. The Norwegian Building Research Institute. Project Report No 161. 1994.

*Wohnen ohne Barrieren*. Bayerisches Staatsministerium des Innern, Oberste Baubehörde 1995

## Laws, Regulations, Standards and Guide Lines

### Norway

#### *Statutory requirements*

- Byggeforskrift 1985

#### *Advisory*

- Krav til livsløpsboliger. The Norwegian State Housing Bank. 1996 (Minimum requirements for state loans and grants for special needs housing)

### Britain

#### *Advisory*

- British Standard 5619. Mobility housing
- British Standard 5810. Access for the Disabled to Buildings. 1979

### England

#### *Statutory requirements*

- Building Regulations Section M. 1992

#### *Advisory*

- Lifetime Homes. Joseph Rowntree Foundation.
- Scheme Development Standards. The Housing Corporation. 1993 revised 1995. (Minimum requirements for housing corporation grants)

### Scotland

#### *Statutory requirements*

- Building Regulations Parts A, Q and T. 1994

#### *Advisory*

- The Design of Barrier Free Housing. Scottish Homes Research and Innovation Services. 1995

### Germany

#### *Statutory requirements*

- Hessische Bauordnung 1993
- Technische Wohnungsbau-Richtlinien 17. August 1992. Staatsanzeiger für das Land Hessen, p 2153, changed 11. October 1993, Staatsanzeiger für das Land Hessen p 2771.

#### *Advisory*

- DIN 18024 and 18025 parts 1 and 2

### Italy

#### *Statutory requirements*

- Law no 118/1971, decree no 384/1978
- Law no 13/1989, decree no 236/1989
- Law no 104/1992

#### *Guide lines (guides to interpretation)*

- Prestinenza, Luigi. La Legislazione Italiana sulle barriere architettoniche. Ordine degli architetti della provincia di Catania. 1994
- Quarantelli, Paolo. Assessorato opere, reti di servizi e mobilità', Regione Lazio

