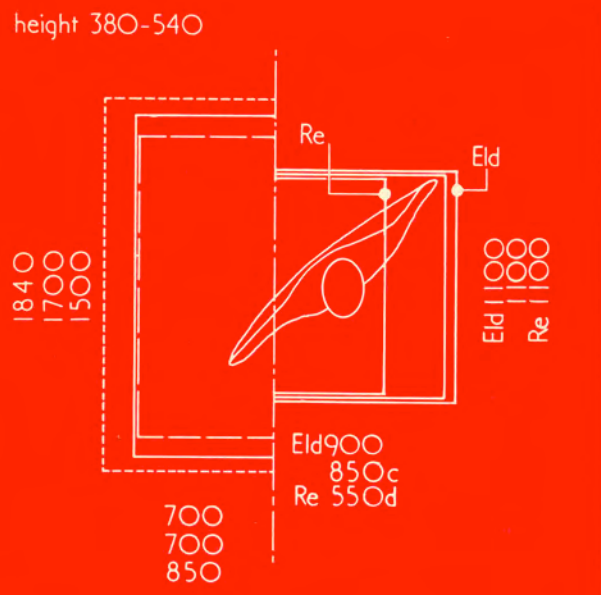
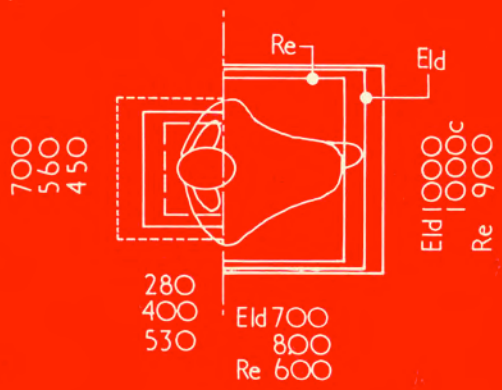
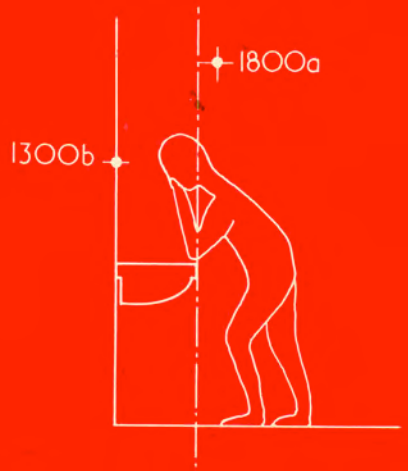
ACTIVITIES AND SPACES

DIMENSIONAL DATA FOR HOUSING DESIGN







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John Noble

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Introduction

'Activities and spaces' is a compilation of data for housing design on sizes of furniture and equipment, and on the spaces needed to use them. Produced by the DOE, it does not confine itself to the recommended minimum sizes of Parker Morris and *Space in the home*. It ranges both up to the 'executive' dwelling and down to the tight spaces of starter homes.

So 'Activities and spaces' will be useful to both public and private sector housing designers, and to those responsible for preparing design criteria for the future. It is intended primarily as a reference document. Most of it consists of dimensional data presented in diagrams and tables. These data are grouped under seven main headings, as set out in the contents. They are preceded by an explanation of the purpose, scope and sources of data, and followed by statistics on furniture ownership among local authority tenants.

The material in this book was first published in *The Architects' Journal* of 15 December 1982.

This document was prepared by John Noble, while at the DOE. It is based on the results of studies undertaken at the DOE by Keith Elvin, Rory Mainwaring, Serena Mason, Michael LePelley and Ron Whitaker; at the Furniture Industry Research Association by Elizabeth A. Tooley and Jane Dillon; and at the Institute for Consumer Ergonomics, Loughborough University, by J. R. Wilson, S. E. Cooper, J. S. Ward and A. M. Rennie. John Noble is now in private practice.

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Dimensional data for housing design

Comparisons with 'Space in the home'

When Design Bulletin 6 *Space in the home*[1] (DB6) was first published in 1963 it was intended mainly for use in design of new general needs housing to meet the standards recommended by the Parker Morris Committee.[2] Part 2 of the bulletin, *Space requirements related to activities*, gave dimensional data to help designers plan dwellings to accommodate the most commonly owned items of furniture and equipment, with enough space around for normal activities. This article presents new more up-to-date information to suit the more diverse housing that is now being designed in both the private and public sectors; in particular dealing with the special constraints of converting older property, planning for the elderly and designing for first-time purchasers.

Now that the DOE's mandatory and advisory design standards for public sector housing schemes have been revoked, authorities are having to consider what steps, if any, to take to fill this gap. The Housing Corporation has already produced revised design criteria for housing associations' new-build and rehabilitation schemes. They do not set standards for space but do refer to the need to show furniture on plans, using DB6 as a guide. This approach seems likely to be emulated by others, and so DB6 is still relevant.

In this document several possible dimensions are given for each item of furniture and equipment, and for each activity space. This means that designers can choose the best sizes to suit the purpose and overall quality of accommodation to be provided. The new data will also be relevant to those who need to prepare design guidelines that differ from those given in DB6.

The following paragraphs on sources of data and how to use this document make broad comparisons with DB6.

(Data relating to the needs of ambulant disabled people and wheelchair users are available elsewhere.[3])

Space for furniture and equipment—sources of data

FIRA data

The Furniture Industry Research Association (FIRA) was commissioned by the DOE to produce information about ownership patterns, trends, market sizes and the dimensions of goods.[4] Furniture sizes were collected from the catalogues of all the major furniture firms, that is, those with an annual turnover of more than £3 million. This ensured that the popular models were included. Other catalogues in each product group were selected at random to help ensure that unusual types of furniture were not missed—although most smaller firms emulate the products of the larger companies. Information on appliances and other items of equipment was obtained either from manufacturers' catalogues, by direct enquiry to manufacturers or, in the last resort, by measuring goods at retailers. Most of the items in DB6 were included, with others added such as wall units, freezers and dishwashers.

As well as all the dimensions given in DB6, the FIRA data also gives the height of furniture and equipment. This is essential in assessing whether items are available that are small enough to fit into very restricted spaces on plan, or under sloping ceilings, for example.

Local authority survey data

Data gathered by the DOE during a recent survey[5] of local authority (LA) housing demonstrates the choices made by occupants of houses designed to minimum Parker Morris standards, and therefore could be relevant when predicting what choices might be made under similar circumstances in future. Schedules of the furniture owned by the residents are included on pages 25-26, with comments drawn from the FIRA study of ownership patterns.

As might be expected, the range of items is far greater than that in DB6, although those most frequently found in individual rooms are very similar to the ones recommended in DB6 as a basis for design.

DOE data

FIRA and LA survey data were supplemented by a DOE study of relevant BSI and ISO standards and results from furniture design and storage studies undertaken both in the UK and abroad. These can help in deciding what sizes to use for built-in and custom-built furniture, and what spaces to allow for furniture with a very wide range of dimensions, such as dining tables and wardrobes.

Information was also gathered on aids to assist the elderly in bathrooms and WCs, and the sizes of sanitary fittings, cars and caravans. None of this information is covered by DB6.

Space for domestic activities—sources of data

The Institute for Consumer Ergonomics (ICE) at Loughborough University was commissioned by the DOE to recommend horizontal and vertical dimensions of the spaces required for over 30 groups of domestic activities.[6] These were to be in terms of the needs of the general population and, for some activities, to meet the needs of the elderly.[7] They cover more activities than DB6, provide new dimensions for designing accommodation for the elderly, and give headroom heights and smaller dimensions than in DB6 for use where space is very restricted, such as in some conversions and starter homes.

The ICE's activity data were derived from two main sources. The first was a review of all the relevant UK literature, and as much foreign literature as possible. The information obtained was interpreted by ICE in the light of the activities and populations which would be relevant in the UK. The second source was a programme of experimental research carried out by ICE, using furniture and equipment of average sizes. This provided space dimensions for those activities where there is little or no information in the existing literature, where the information is from abroad and possibly not applicable to the UK, and where the literature does not specify the criteria upon which the recommended spaces are based, *1*. Inevitably there are some gaps in these data that remain to be filled.

Guide to using 'Activities and spaces'

Data are grouped under seven main headings, such as kitchens and utility rooms, living areas and dining areas. With a few exceptions where data is not available, or extra data is added, the format of each of the seven is:

- general arrangement plans, eg, kitchen layouts
- subdivision into specific items of furniture and equipment, eg, cooker, dishwasher. For each one there is a quick-reference dimensioned diagram giving sizes of furniture and equipment and their related activity spaces. Some diagrams also give dimensions for circulation. The diagrams for each item are accompanied by two tables of 'FIRA data' and 'LA survey data' for sizes of furniture and equipment.

Organising the data began with these tables. From these, and the ICE data, the quick-reference diagrams were derived, and thence the general arrangement plans. For clarity they are explained here in that order, but on the following pages of data the sequence is reversed for design use—general arrangement plan (and section), quick-reference diagram, then tables.

FIRA survey data tables

The FIRA survey data describe the different amounts of space on plan required to accommodate 100, 90, 75, 50 and 10 per cent of the sizes of products being manufactured.

LA survey data tables

The LA survey data give dimensions of the different spaces that would be required to accommodate 90, 75 and 50 per cent of the items owned by the residents. All '90 per cent' items and half of the '75 per cent' items were larger than those given in DB6, whereas almost three-quarters of the '50 per cent' items were smaller.

Dimensioned reference diagrams

These diagrams are in two halves: the left-hand half contains dimensions of furniture and equipment; and the right-hand half contains activity space dimensions, *2*. All measurements are in millimetres. (Note that full activity space data are not available in every case.) Data have been condensed down into three alternative sizes for items and for activity spaces. These dimensions relate to tables and ICE data as follows.

Furniture and equipment

Three widths and depths for each item were selected, (left half of figure 2).

- The *large* dimensions for depth and width describe spaces of such a size that there would be no great advantage in providing for anything larger. These spaces would accommodate about 90 per cent of the furniture and equipment manufactured today. (Almost all the spaces are larger than those in DB6, as would also be the case if the dimensions were based on 90 per cent of items owned by local authority residents.) *Large* dimensions are shown by a fine broken line.
- The *medium* dimensions could provide an appropriate starting point for design in most circumstances. The spaces described would accommodate around 50 per cent of the furniture and equipment manufactured today and, in many instances, between 75 and 90 per cent of the items owned by residents in the LA survey. (About two-thirds of the spaces are larger than those in DB6, compared with half that would be larger if the dimensions were based on 75 per cent of items owned by LA residents.) *Medium* dimensions are shown by a solid line.
- The *small* dimensions describe spaces which might be considered by most households to be just adequate. These spaces would usually accommodate about 10 per cent of the furniture and equipment manufactured today and, in most instances, 50 per cent of the items owned by residents in the LA survey. (Around two-thirds of the spaces are smaller than those given in DB6, as would also be the case if the dimensions were based on 50 per cent of items owned by local authority residents.) *Small* dimensions are shown by a dashed line.

Note that these dimensions are derived from products on the market, rather than from the results of ergonomic studies related to the design of furniture and equipment.

Furniture and equipment are drawn at a scale of 1:50.

Space for domestic activities

Three spaces are given for each activity whenever the data is available.

- The space required by an *elderly* person.[11] Compared with DB6 most of these spaces are deeper and narrower, those that are shallower are usually wider. Dimensions for the *elderly* are marked 'Eld' (right half of *2*).
- The *unrestricted* space required by an able-bodied adult, usually men of 95 percentile stature and above.[9] Two-thirds of these spaces are larger than those given in DB6, but most by no more than 50 mm in width or depth. Dimensions for *unrestricted* space are not distinguished.
- The *restricted* space required by an able-bodied adult where some restriction on movement would be acceptable[10]. These spaces are usually shallower than those in DB6, mostly by at least 100 mm. Dimensions for *restricted* space are marked 'Re'.

1

Note that ICE considered safety as well as comfort to be important—especially in dimensional recommendations for activity spaces in kitchens and bathrooms.[8]

Activity spaces are drawn at 1:50.

General arrangement plans

A few examples of furniture and equipment layouts are given to illustrate how the selected dimensions can be applied, and how overall widths and depths can differ according to which dimensions are used.

The layouts illustrated take the form shown in figure 3. They all accommodate 'medium' size furniture and equipment, have 'unrestricted' activity spaces, and, in most instances, allow for easy circulation, that is, *not* moving sideways. The larger overall depths and widths given would accommodate the 'large' selected dimensions for furniture and equipment, and either the 'unrestricted' of 'elderly' activity spaces, whichever occupies the greatest area. The smaller overall depths and widths would accommodate the 'small' selected dimensions for furniture and equipment, and 'restricted' activity spaces when these are available, and usually allow for some constrained circulation, that is, moving sideways.

The same quantities and types of furniture and equipment are accommodated in each case, in the same configuration and with the same allowances for overlapping activity spaces. No allowance has been made for the space occupied by skirtings, architraves or mouldings on furniture.

It is emphasised that these are only examples, and that there are many possible configurations—some of which may occupy smaller or larger areas than those illustrated. The number of alternatives is even greater when variations are made in the quantities and types of furniture and equipment used, and with different room shapes and window and door positions. More examples for kitchens and bathrooms are given in Design Bulletin 24 Parts 1 and 2.[8]

General arrangement plans are drawn at a scale of 1:100.

Sections

Sections are drawn at 1:100 and accompany the general arrangement plans. They give the minimum ceiling angles required to allow 50 mm more headroom than is shown on the activity space diagrams, and to accommodate items of furniture, equipment and appliances that would require the steepest ceiling angles, 4.

Data for design

This range of data could provide three different sets of guidelines for use in the design of high quality 'executive' dwellings; 'middle-income' dwellings with space standards similar to those recommended by the Parker Morris Committee; and smaller dwellings suitable for first-time purchasers.

large

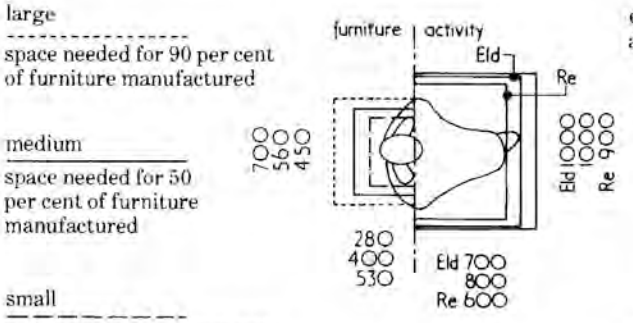
space needed for 90 per cent of furniture manufactured

medium

space needed for 50 per cent of furniture manufactured

small

space needed for 10 per cent of furniture manufactured; but 50 per cent of furniture owned by LA tenants

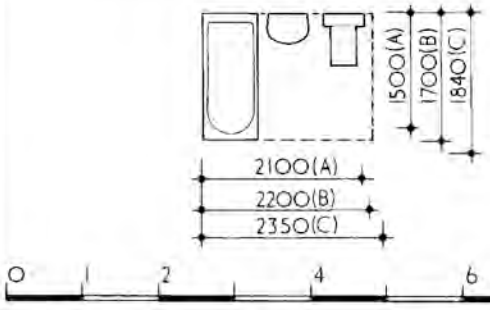


elderly—space needed for activity by old person: Eld

unrestricted—space needed for activity by able-bodied adults: no marking

restricted—space needed for activity where restricted space is acceptable: Re

2



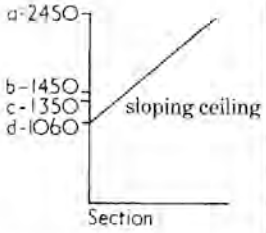
(B) dimension for 'medium' sized furniture and equipment, and 'unrestricted' movement

(A) dimension for 'small' sized furniture and equipment, and 'restricted' movement

(C) dimension for 'large' sized furniture and equipment, and 'elderly' or 'unrestricted' movement

3

heights of furniture or activities for checking low ceilings



a Wardrobe.
b Dressing table mirror; sitting up in bed with mattress maximum 600 mm above floor.
c Chest of drawers.
d Wall alongside bed (for bedmaking) 40° ceiling angle minimum.

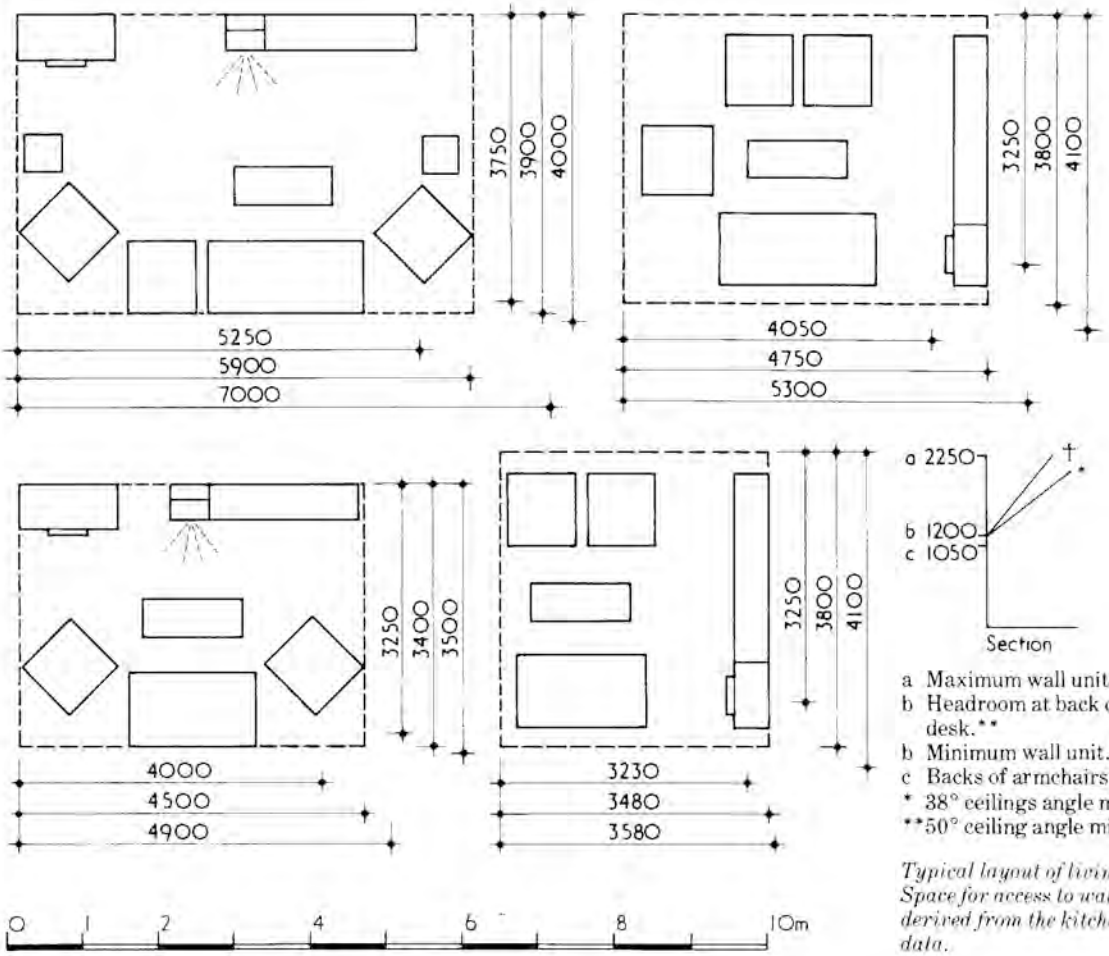
4

1 Laboratory studies of spaces for domestic activities at the Institute of Consumer Ergonomics.
2 Typical quick-reference diagram. To left of chain dot line is space occupied by furniture and equipment, categorised into three sizes—'large', 'medium', 'small'. To right of chain dot line is the activity space, the space needed to use the furniture or equipment. Activity spaces are in three categories, for the 'elderly' (Eld), 'unrestricted' and 'restricted' (Re).
3 Typical general arrangement plan. It is drawn to the middle of the three dimensions, for 'medium' sized furniture and 'unrestricted' activity space. Other dimensions show generous and tight room areas, as detailed in the notes on the drawing.
4 Typical section which accompanies general room arrangement plans, useful for checking space required where headroom is restricted near wall.

Key to drawings

FURNITURE SIDE OF DRAWING:	Large dimensions = fine broken line Medium dimensions = solid line Small dimensions = dashed line
ACTIVITY SIDE OF DRAWING:	Space for elderly = Eld Unrestricted space has no marking Restricted space = Re

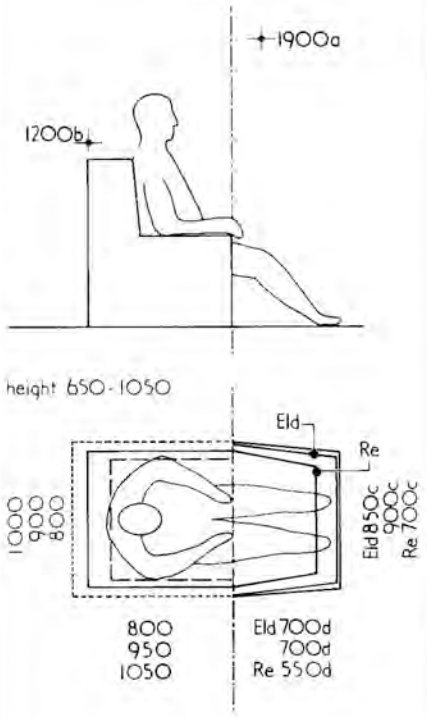
Living areas

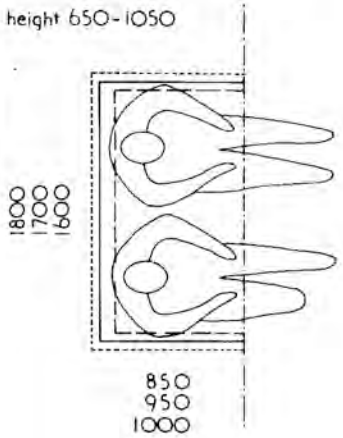


a Maximum wall unit.
b Headroom at back of armchair* and desk.**
b Minimum wall unit.
c Backs of armchairs and sofas.
* 38° ceilings angle minimum.
**50° ceiling angle minimum.

Typical layout of living areas. Space for access to wall units has been derived from the kitchen storage access data.

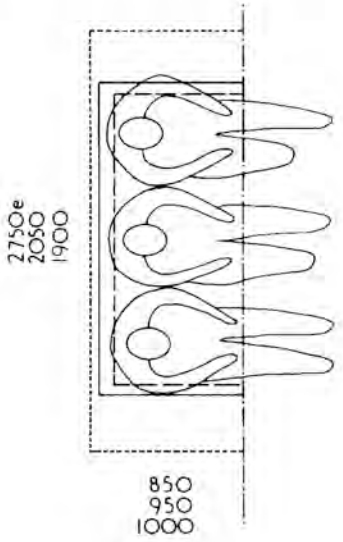
Armchairs and sofas





Minimum height for sofas conforms with that selected for armchairs (ie, 650 mm). The two-seater dimensions are based on findings from another study.[12]

a Headroom 200 mm in front of chair.
b Headroom at back of chair.
c Width in front of chair for getting up and sitting down: 1050 mm is needed across the chair arms to allow for elbow movements.



d Depth needed for sitting down and getting up. A depth of 550-650 mm is required for sitting normally. A depth of 800-850 mm is needed for putting legs up on a footstool. When seated at a low (500 mm high) coffee table, a depth of 450 mm (300 mm restricted) would suffice.
e Suitable for four people.

FIRA survey data: 309 items—upholstered armchairs*

Per cent	*Width (mm)*	*Depth (mm)*	*Height (mm)*
100	1680	1070	
90	990	1070	
75	990	980	640-1040
50	910	970	
10	760	810	

* In a FIRA sample of 82 'unit seats' (without arms) the width was generally about 100 mm less than items in the armchair sample. The depth was about equal. In a FIRA sample of 28 pouffes and footstools, 70 per cent were 600 × 600 mm or less.

LA survey data: 661 items—armchairs*

Per cent	*Width (mm)*	*Depth (mm)*	*Height (mm)*
90	1000	900	
75	900	850	600-1200†
50	800	800	

* Excluding unit seats.
† The highest were probably wing chairs.

FIRA survey data: 322 items—sofas*

Per cent	*Width (mm)*	*Depth (mm)*	*Height (mm)*
100	2740	1200	
90	2740	1010	
75	2220	980	530-1100
50	2030†	960	
10	1600	890	

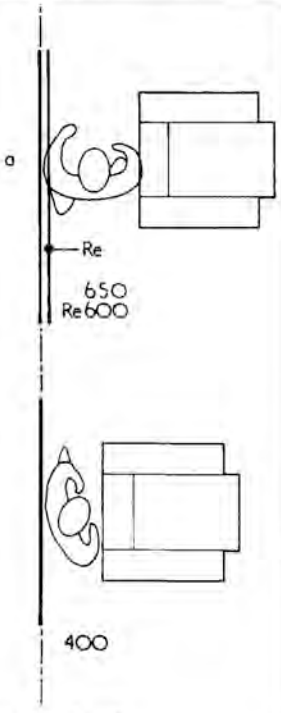
* Two- and three-seater sofas were not differentiated.
† About 30 per cent of items were less than 1800 mm wide (ie two-seaters). In a FIRA sample of 16 sofa beds, about 70 per cent were 1900 mm long × 900 mm wide or less.

LA survey data: 475 items—sofas*

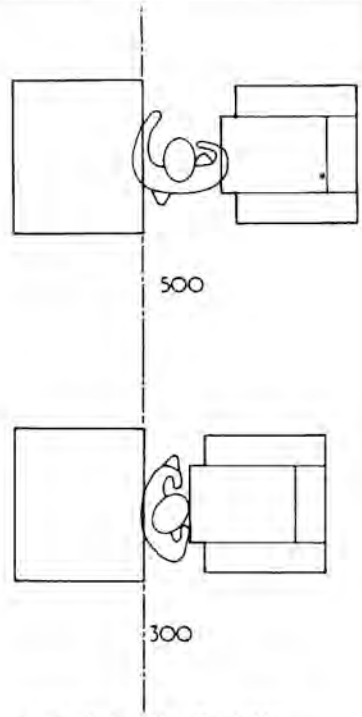
Per cent	*Width (mm)*	*Depth (mm)*	*Height (mm)*
90	2100	1000	
75	2000	900	600-1040
50	1900†	850	

* Two- and three-seater sofas were not differentiated.
† About 50 per cent of items were less than 1800 mm wide and 25 per cent were less than 1500 mm wide (ie two-seaters).

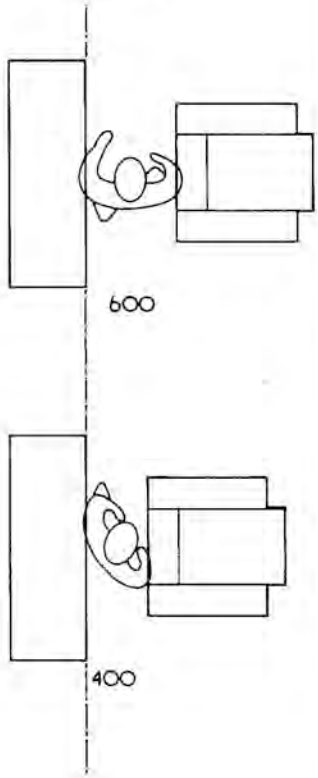
Circulation around armchairs



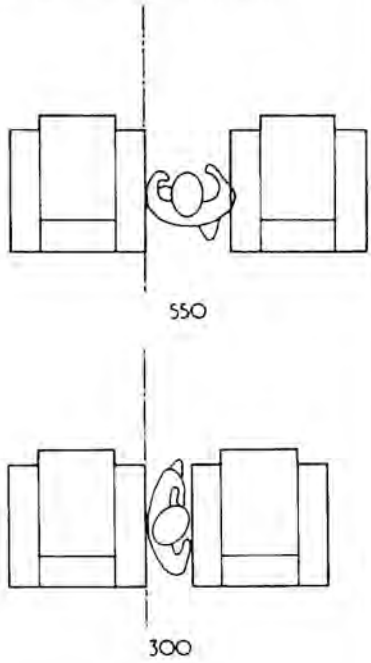
Between chairback and wall.



Between armchair and coffee table.



Between chairback and dining table or sideboard.

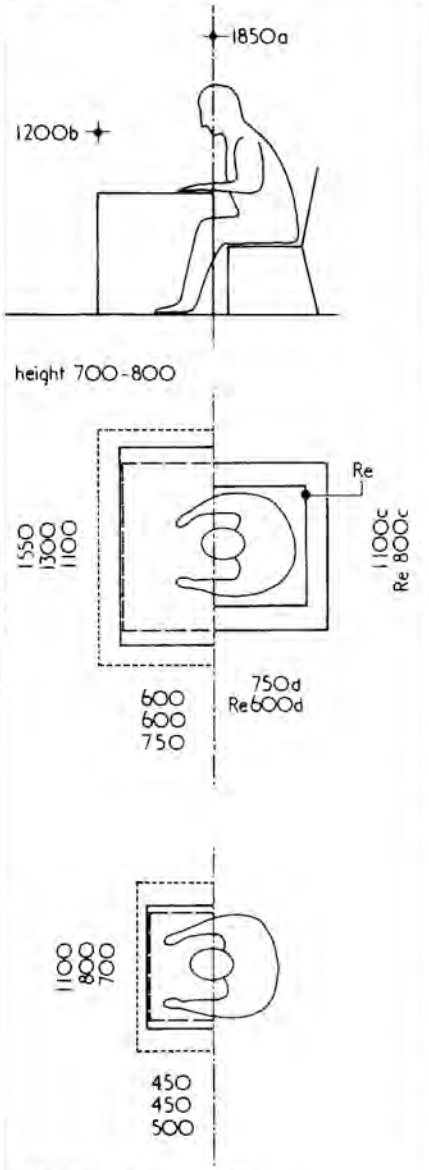


Between sides of armchairs.

Key to drawings

FURNITURE SIDE OF DRAWING:	Large dimensions = fine broken line Medium dimensions = solid line Small dimensions = dashed line
ACTIVITY SIDE OF DRAWING:	Space for elderly = Eld Unrestricted space has no marking Restricted space = Re

Desks and bureaux



a Headroom at edge of desk.
b At wall.
c Width for getting up and sitting down. Width when seated 750 mm (minimum 650 mm).
d Depth for getting up and sitting down. Depth when seated 550 mm.

FIRA survey data: 10 items—desks*

Per cent	Width (mm)	Depth (mm)	Height (mm)
100	1530	900	
90	1530	760	
75	1290	760	720-780
50	1280	610	
10	1220	540	

* Although the FIRA sample represents items on the market, research[13] suggests that 750 mm wide × 600 mm deep is the smallest convenient desk-top size if no space for storing paper, books, etc, is needed. A depth of 750 mm would give room for writing materials and small items of desk equipment, and 850 mm space for books.

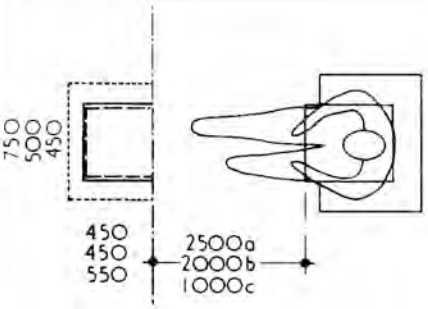
FIRA survey data: 30 items—bureaux

Per cent	Width (mm)	Depth (mm)	Height (mm)
100	1400	550	
90	980	490	
75	860	460	810-1240
50	790	450	
10	760	400	

LA survey data: 81 items—desks and bureaux

Per cent	Width (mm)	Depth (mm)	Height (mm)
90	1100	600	
75	800	450	750-1700
50	700	450	

Television sets



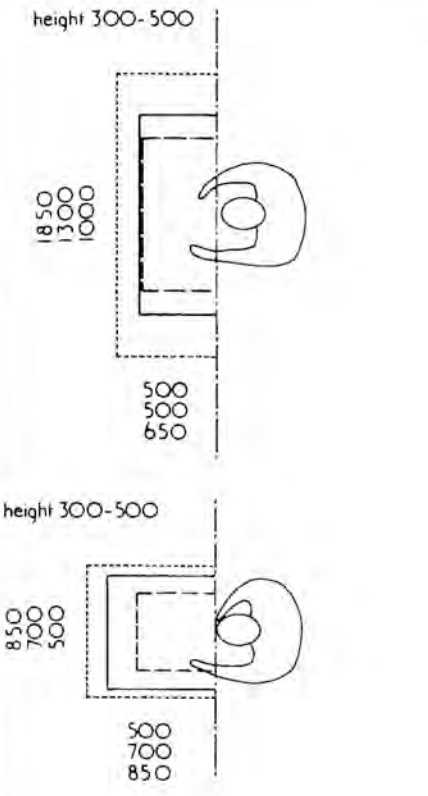
TV screen size (measured diagonally).
a 26in screen.
b 21in screen.
c 12in screen.
There is some evidence[14] that most people prefer to sit at a distance of more than eight times the picture height.

FIRA survey data: 40 items

Per cent	Width (mm)	Depth (mm)	Height (mm)
100	910	560	
90	760	550	
75	600	470	800*
50	480	460	
10	440	460	

*Maximum height from floor (including stand).

Coffee tables



FIRA survey data: 161 items—rectangular

Per cent	Length (mm)	Width (mm)	Height (mm)
100	1830	920	
90	1830	630	
75	1220	550	300-500
50	1040	510	
10	580	400	

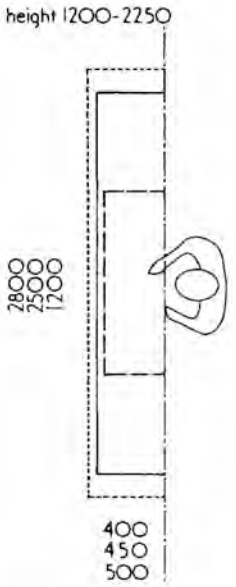
FIRA survey data: 63 items—square and round

Per cent	Length (mm)	Width (mm)	Height (mm)
100	1220	1220	
90	870	870	
75	760	760	300-500
50	700	700	
10	490	490	

LA survey data: 313 items—all shapes

Per cent	Length (mm)	Width (mm)	Height (mm)
90	1300	700	
75	1300	550	300-550
50	1000	500	

Wall units



FIRA survey data: 46 items

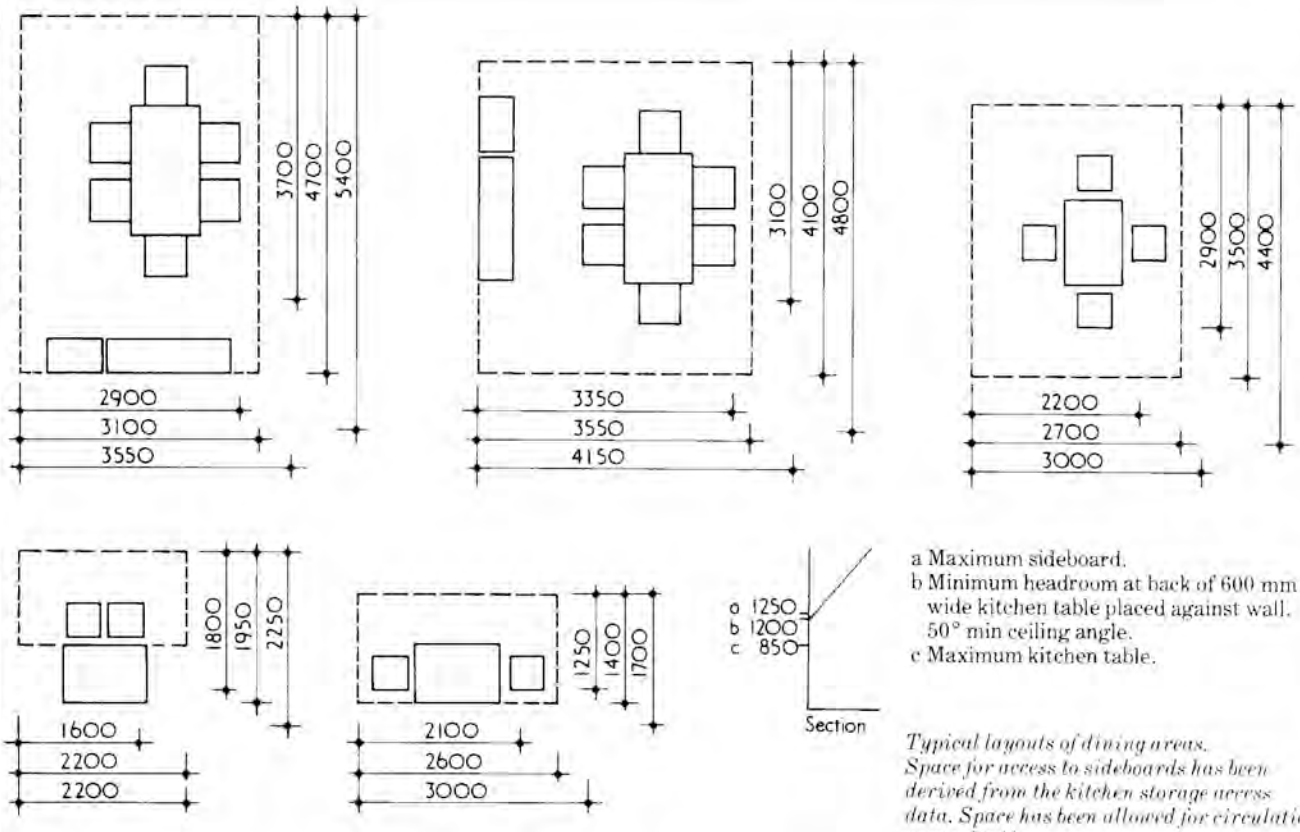
Per cent	Width* (mm)	Depth (mm)	Height (mm)
100	3320	590	
90	2810	460	
75	2710	460	1180-1980
50	2520	450	
10	2050	450	

LA survey data: 303 items

Per cent	Width* (mm)	Depth (mm)	Height (mm)
90	2400	500	
75	1700	450	900-2250
50	1200	400	

* In the FIRA and LA samples bookcases and hi-fi cabinets were not wider or deeper than wall units.

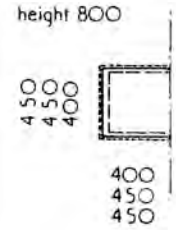
Dining areas

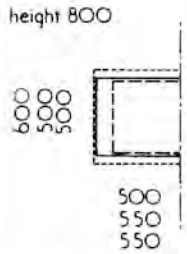


a Maximum sideboard.
b Minimum headroom at back of 600 mm wide kitchen table placed against wall. 50° min ceiling angle.
c Maximum kitchen table.

Typical layouts of dining areas. Space for access to sideboards has been derived from the kitchen storage access data. Space has been allowed for circulation around tables.

Dining and kitchen chairs





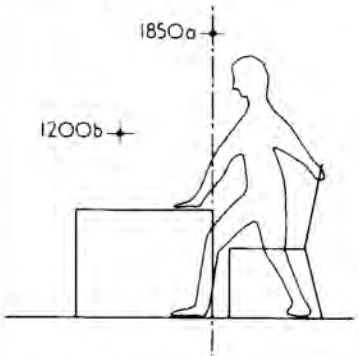
FIRA survey data: 100 items—dining chairs

Per cent	*Width (mm)*	*Depth (mm)*	*Height (mm)*
100	670	610	
90	610	560	
75	550	560	760-1290
50	490	540	
10	460	470	

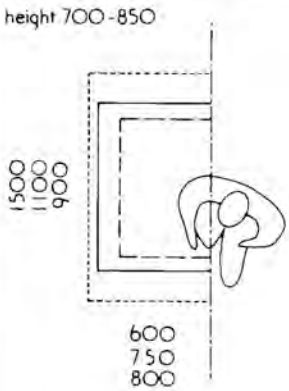
FIRA survey data: 14 items—kitchen chairs

Per cent	*Width (mm)*	*Depth (mm)*	*Height (mm)*
100	530	480	
90	460	460	
75	430	430	770-940
50	430	430	
10	360	430	

Dining and kitchen tables

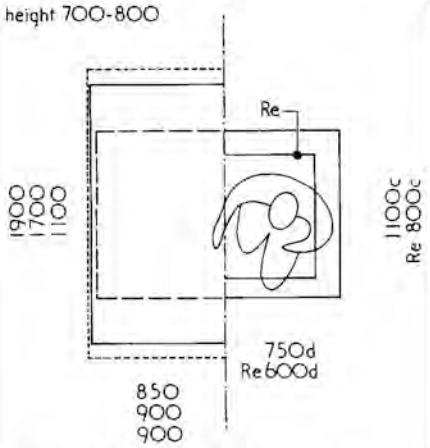


a Headroom at edge of table.
b Headroom 600 mm from nearside of table.



Key to drawings

FURNITURE SIDE OF DRAWING:	Large dimensions = fine broken line Medium dimensions = solid line Small dimensions = dashed line
ACTIVITY SIDE OF DRAWING:	Space for elderly = Eld Unrestricted space has no marking Restricted space = Re



c Width for getting up and sitting down. Width when seated 650 mm.
d Depth for getting up and sitting down. Depth when seated 550 mm.

FIRA survey data: 176 items—dining tables

Per cent	*Length (mm)*	*Width* (mm)*	*Height (mm)*
100	3830	1950	
90	1910	1220	
75	1680	1220	680-800
50	1680	920	
10	1320	810	

*Widths include square and round tables.

FIRA survey data: 27 items—kitchen tables

Per cent	*Length (mm)*	*Width* (mm)*	*Height (mm)*
100	1980	1120	
90	1520	1120	
75	1300	1120	840
50	1120	1120	
10	920	760	

* Rectangular tables were mostly 610-810 mm wide.

LA survey data: 405 items—dining tables

Per cent	*Length* (mm)*	*Width (mm)*	*Height (mm)*
90	1500	1150	
75	1500	850	610-790
50	1100	850	

*Longest table was 2100 mm.

LA survey data: 76 items—kitchen tables

Per cent	*Length (mm)*	*Width (mm)*	*Height (mm)*
90	1200	900	
75	1100	750	650-900
50	900	600	

Swedish data—dining tables[13]

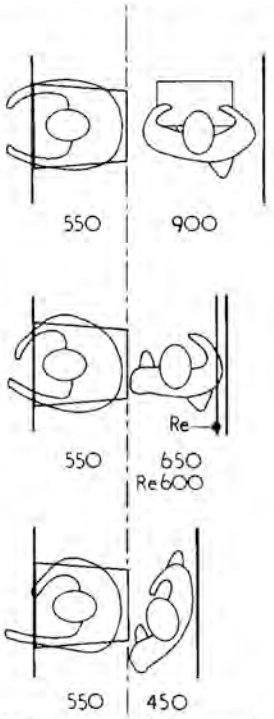
Number of people	*Length (mm)*	*Width (mm)*	*Height (mm)*	*Diam (mm)*
6-7	1800			1200
6	1500			(6p)
5	1350	850	720*	
4	1200			1100
3-4	1050			(4-5p)

*Assumes a seat height of 440 mm.

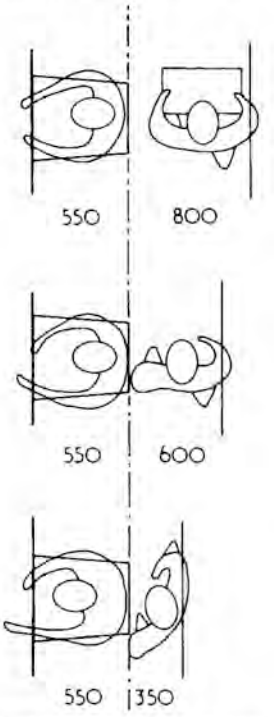
Swedish data—kitchen tables[13]

Number of people	*Length (mm)*	*Width (mm)*	*Height (mm)*
5	1350		
4	1200	750	720
3	1000		
2	750		

Circulation around dining table

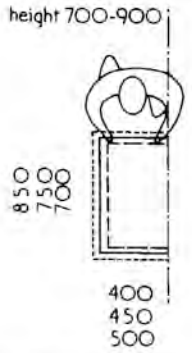


Passing between seated person and wall.



Passing between seated person and sideboard.

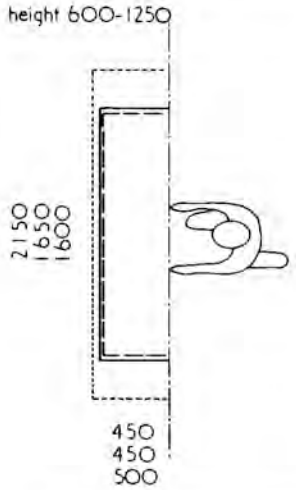
Serving trolleys



FIRA survey data: 26 items

Per cent	*Width (mm)*	*Depth (mm)*	*Height (mm)*
100	1070	510	
90	860	510	
75	820	460	670-870
50	760	440	
10	580	380	

Sideboards



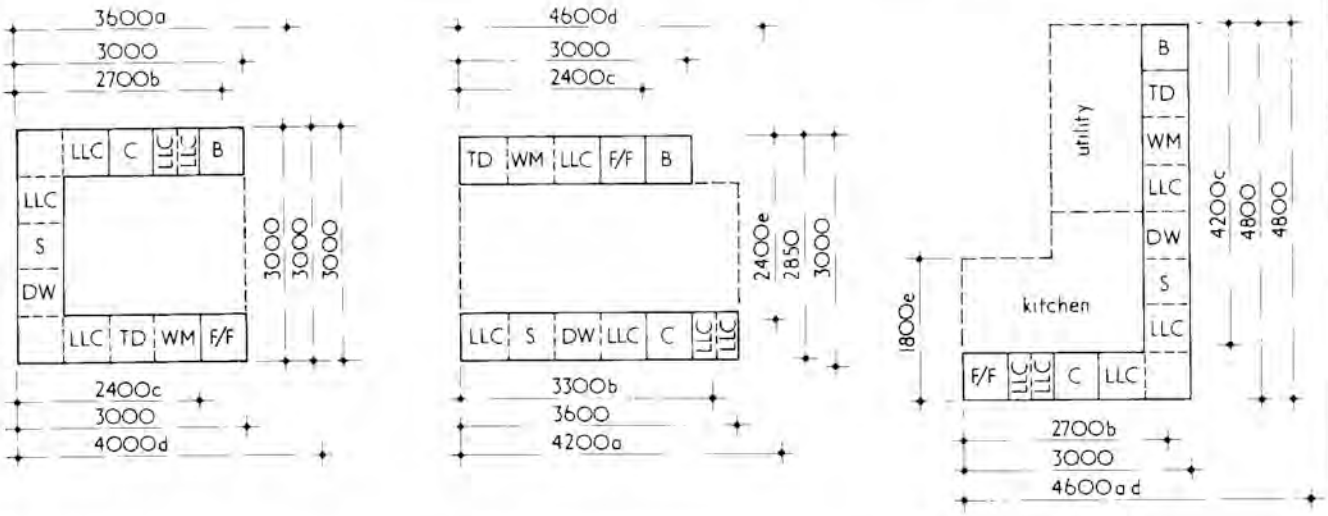
FIRA survey data: 68 items

Per cent	*Width (mm)*	*Depth (mm)*	*Height (mm)*
100	2160	520	
90	2160	520	
75	1830	480	600-1220
50	1630	460	
10	1140	450	

LA survey data: 208 items

Per cent	*Width (mm)*	*Depth (mm)*	*Height (mm)*
90	1900	500	
75	1700	500	600-1550
50	1600	450	

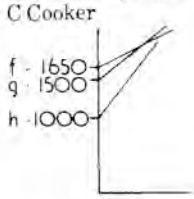
Kitchen and utility rooms



Typical layouts.
Kitchen units, worktops and appliances are located in accordance with recommendations in DOE Design Bulletin 24, Part 2. In each example space is allowed for the full range of kitchen appliances although it is assumed that space for casual meals is available elsewhere. Also it is assumed that plumbing and drainage points are available to serve dishwashers and washing machines and that tumble drier cabinets could be ventilated. Space for four low level storage cupboards is shown and allowance has been made for wall units to be provided with a total length of at least 2100 mm.

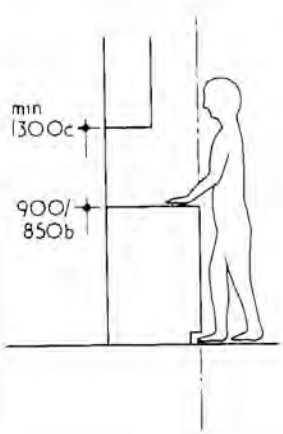
a Allows space for high level oven.
b Reduces possible cooker width from 900 to 600 mm.
c Assumes combined washing machine/tumble drier or stacked appliances.
d Allows 1000 mm width for fridge/freezer and 600 mm width for tall dry goods storage cupboard.
e Assumes minimum recommended width of 1200 mm between low level units.
f Minimum height at back of sink, 27° ceiling angle.
g Minimum height at back of work-top and chest freezer, 38° ceiling angle.
h Minimum height at back of washing machine, 50° ceiling angle.

S Sink
DW Dishwasher
LLC Low level cupboard
TD Tumble drier
WM Washing machine
F/F Fridge freezer
B Broom cupboard
C Cooker

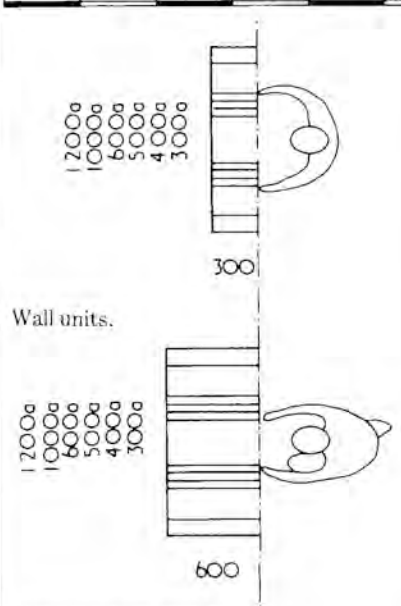


Kitchen fitments

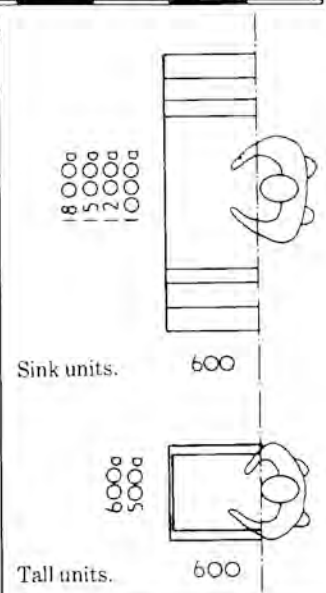
Co-ordinating dimensions from the British Standard specification[15]



a Dimensions given are ranges of commonly available sizes rather than our usual 'large', 'medium' and 'small' sizes.
b second preference;
c Clear height to underside of wall unit. If a zone is required for lighting it shall be included in the wall unit space.



Appliance-housing units have the same co-ordinating dimensions except that there is no second preferred dimension for depth.



Key to drawings

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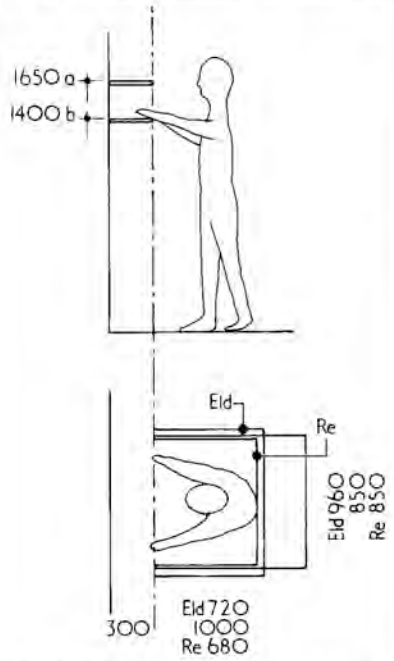
ACTIVITY SIDE OF DRAWING:	Space for elderly = Eld Unrestricted space has no marking Restricted space = Re

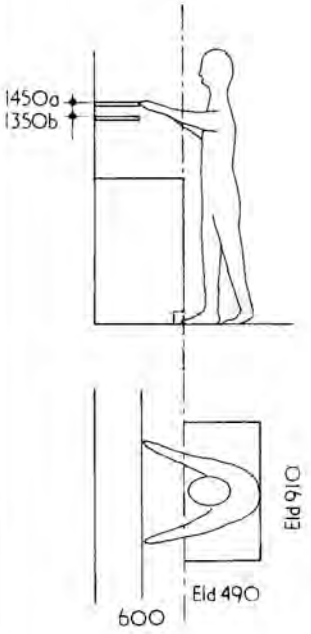
High shelves and cupboards



Unobstructed

a A height of 1650 mm should enable 95 per cent of the general population to reach items at the front of the shelf.

b A height of 1400 mm should enable 95 per cent of the elderly population to reach with two hands items at the back of a 300 mm deep shelf.

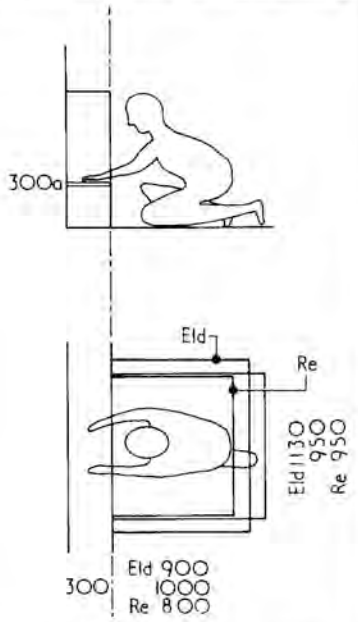


Obstructed

a A height of 1450 mm should enable 95 per cent of the general population to reach items at the front of the shelf.

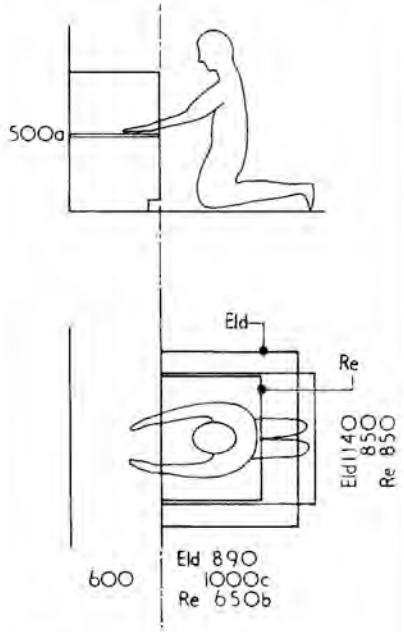
b A height of 1350 mm should enable 95 per cent of the elderly population to reach with two hands items at the back of a 300 mm deep shelf.

Low level cupboards



Shallow cupboards

a For the elderly this shelf should be not less than 300 mm above the floor level to allow for full use with both hands.



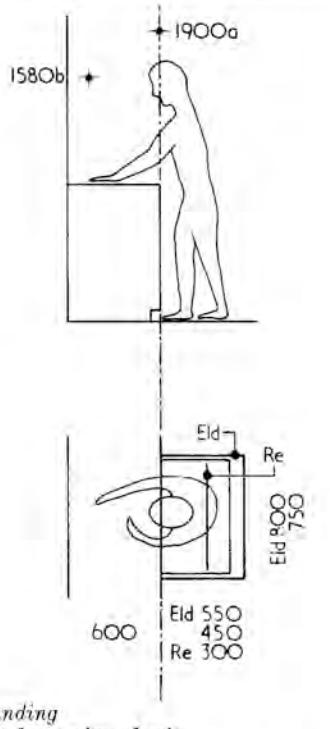
Deep cupboards

a Deep shelves at low level should be avoided for the elderly whenever possible. When necessary the shelf should be not less than 500 mm above floor level. (Even then most elderly people will only be able to retrieve items with one hand.)

b For pull-out racks the restricted depth would be 750 mm and the width 1000 mm.

c Suits pull-out racks but width would be 1000 mm.

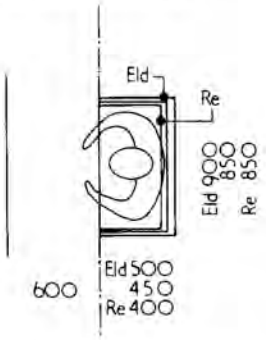
Worktops



Standing

a At front edge of unit.

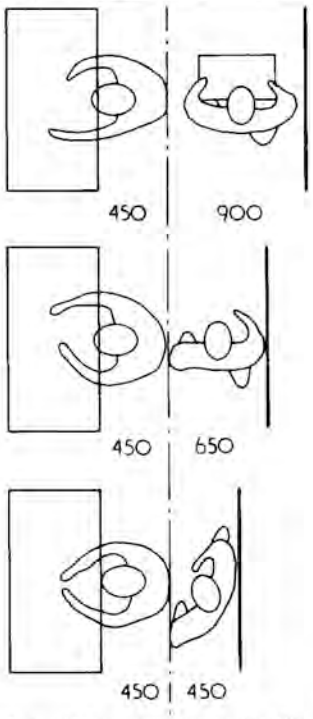
b 490 mm from front of unit—when reaching to back of worktop.



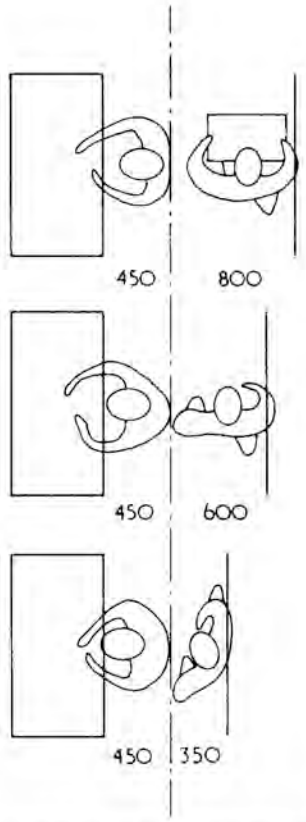
Sitting

See 'Dining and kitchen tables' for space required to get up and sit down.

Circulation in the kitchen

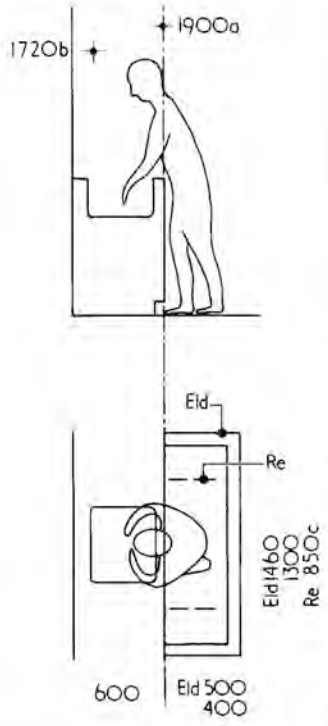


Distance between a person standing or sitting at a worktop and a wall or tall unit.



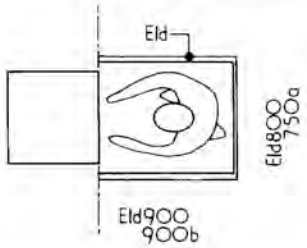
Distance between a person standing or sitting at a worktop and a table or base unit.

Sinks



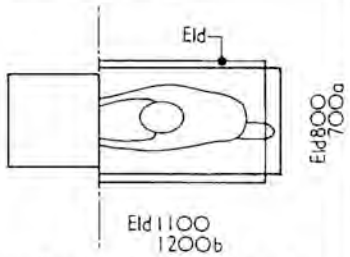
a At front edge of unit.
b 450 mm from front of unit when reaching to clean back of sink.
c Using only the sink bowl.

High level ovens



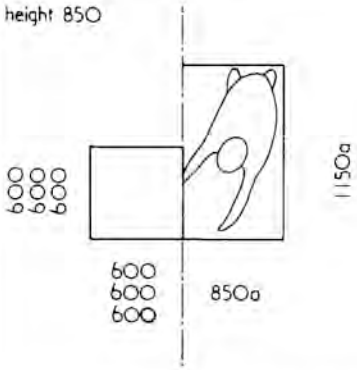
a An overall width of 1000-1200 mm is needed to use both the oven and adjoining setting down surface.
b The same depth is required for both side- and bottom-hung doors.

Low level ovens



a An overall width of 1000-1200 mm is needed to use both the oven and adjoining setting down surface.
b A depth of 1000 mm would be adequate for ovens with side-hung doors.

Dishwashers

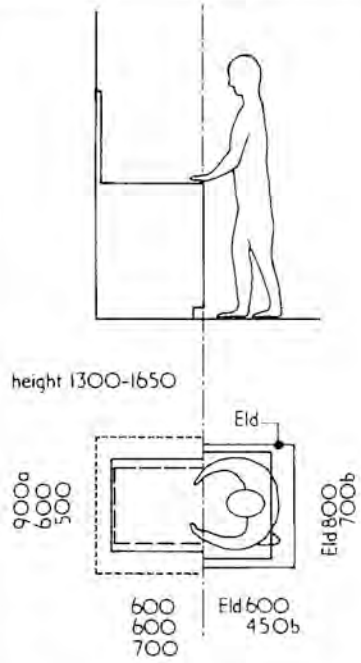


a Dimensions are for side-loading, which most people prefer. The space for front-loading is 775 × 1200 mm.

FIRA survey data: 10 items (floorstanding)

All models would fit within the 600 × 600 mm space.
All were 850 mm high to fit under worktops.
See notes on cookers regarding BS recommended dimensions for appliances, (right).

Cookers



The British Standard specification[15] for domestic kitchen equipment recommends co-ordinating dimensions for spaces to accommodate appliances and appliance-housing units.
A plan space 600 × 600 mm is the preferred dimension, but the depth excludes any space that may be required for horizontal services. It is assumed that in future most freestanding appliances and built-in units will fit within this space.
Built-in ovens range in width from 580-700 mm and in depth from 580-630 mm.
a This width would allow for models with two ovens side by side.
b When using a cooker hob a depth of 650 mm and a width of 750 mm are needed in front of the cooker in order to use a high level grill at a height of between 1250 and 1350 mm.

FIRA survey data: 22 items—freestanding*

Per cent	*Width (mm)*	*Depth (mm)*	*Height (mm)*
100	900†	690	
90	610	690	
75	550	690	1300-1650‡
50	510	600	
10	500	560	

* 10 gas and 12 electric.
† This width would allow for models with two ovens side by side.
‡ The highest are those with eye-level grills or top ovens.

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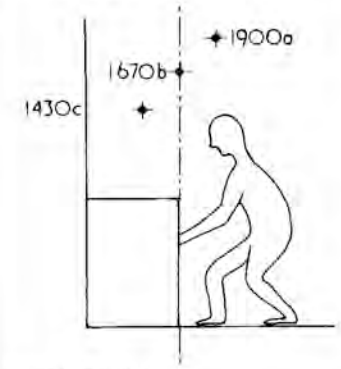
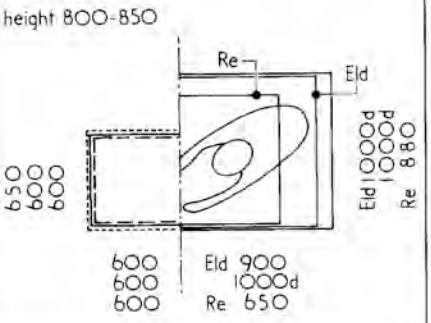
Washing machines





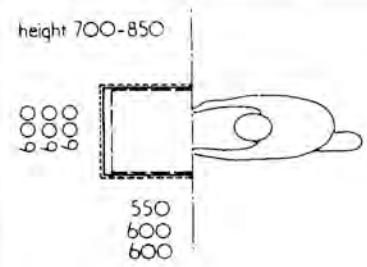
A space 800 mm wide × 500 mm deep × 750-800 mm high should accommodate most twin tubs; in a FIRA sample of five models, the largest dimensions were 830 mm wide × 521 mm deep × 830 mm high.
A space 420 mm wide × 420 mm deep × 750-800 mm high should accommodate most single tubs; in a FIRA sample of three models the largest dimensions were 420 mm wide × 425 mm deep × 787 mm high.
a 250 mm in front of machine.
b At front edge of machine.
c 240 mm from front of machine.
d 1200 mm width × 1100 mm depth would be needed with a laundry basket placed on the floor in front.

FIRA survey data: 20 items—front-loading automatics*

Per cent	*Width (mm)*	*Depth (mm)*	*Height (mm)*
100	800	650	
90	650	600	
75	600	570	760-850
50	590	560	
10	450	420	

* Top-loading automatics plan dimensions were similar to front-loading automatics. The tallest was 1030 mm.
See notes on cookers regarding BS recommended dimensions for appliances.

Tumble driers

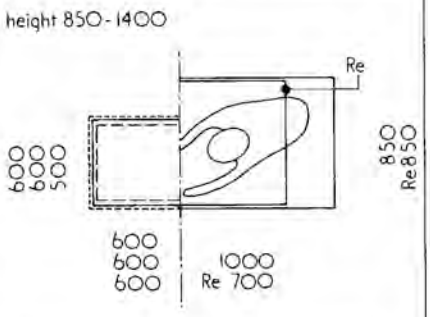


FIRA survey data: 13 items—front-loading

Per cent	*Width (mm)*	*Depth (mm)*	*Height (mm)*
100	610	570	
90	610	560	
75	600	560	670-850
50	590	550	
10	490	490	

See notes on cookers regarding BS recommended dimensions for appliances, previous page.

Refrigerators

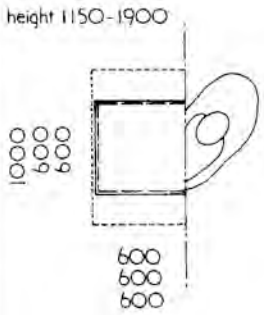


FIRA survey data: 24 items—freestanding*

Per cent	*Width (mm)*	*Depth (mm)*	*Height (mm)*
100	610	710	
90	600	610	
75	560	600	840-1370
50	500	600	
10	460	510	

*Built-in refrigerators range in width from 590-610 mm and in depth from 570-710 mm.
See notes on cookers regarding BS recommended dimensions for appliances, previous page.

Fridge freezers

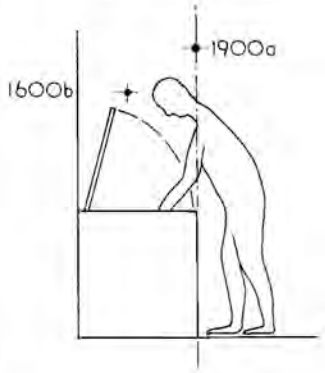


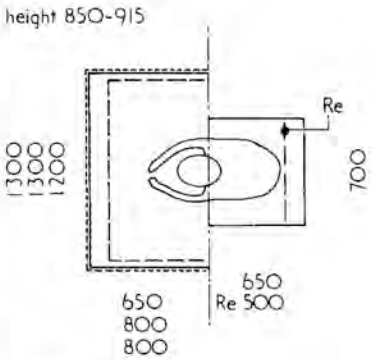
LA survey data: 29 items—freestanding

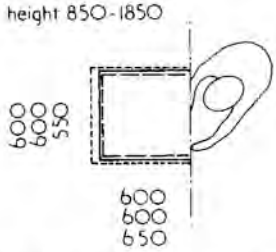
Per cent	*Width (mm)*	*Depth (mm)*	*Height (mm)*
100	1010*	670	
90	610	610	
75	610	600	1140-2050†
50	600	600	
10	500	600	

* This accommodates double door items with fridge and freezer side by side.
† Only one item was 2050 mm high. Others were less than 1890 mm.
See notes on cookers regarding BS recommended dimensions for appliances, previous page.

Freezers







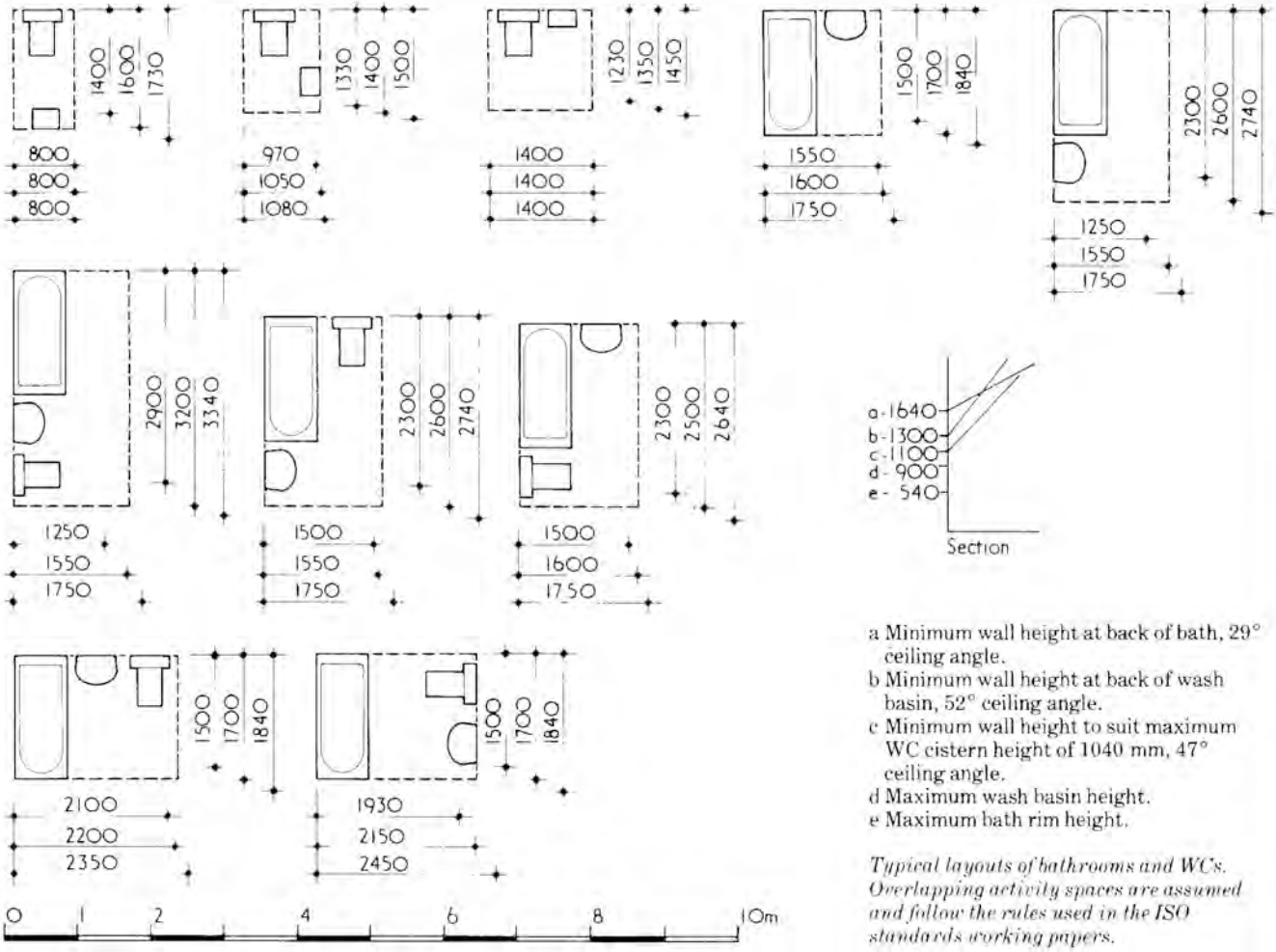
Most FIRA data is for upright freezers, shown in the bottom diagram.
a At front edge of freezer.
b 450 mm from front of freezer.

FIRA survey data: 18 items—upright freestanding*

Per cent	*Width (mm)*	*Depth (mm)*	*Height (mm)*
100	760	720	
90	610	650	
75	600	650	850-1840
50	550	600	
10	500	580	

* In a FIRA sample of four built-in freezers all widths were 600 mm and depths ranged from 570-580 mm.
In a FIRA sample of 15 chest freezers the largest width was 1600 mm and the greatest depth was 735 mm. Heights ranged from 850-915 mm.
See notes on cookers regarding BS recommended dimensions for appliances, previous page.

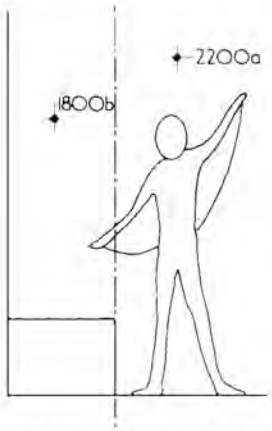
Bathrooms and WCs



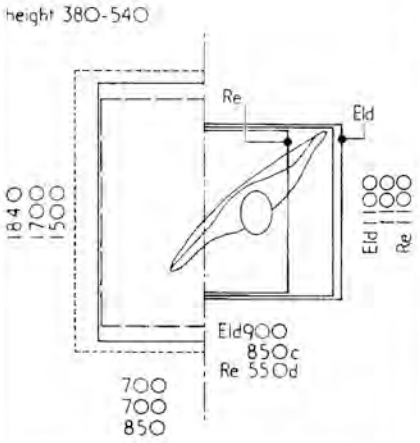
a Minimum wall height at back of bath, 29° ceiling angle.
b Minimum wall height at back of wash basin, 52° ceiling angle.
c Minimum wall height to suit maximum WC cistern height of 1040 mm, 47° ceiling angle.
d Maximum wash basin height.
e Maximum bath rim height.

Typical layouts of bathrooms and WCs. Overlapping activity spaces are assumed and follow the rules used in the ISO standards working papers.

Baths



a Minimum height alongside bath to allow space for comfortable drying.
b 400 mm from front edge of bath.



c 850 mm allows space for drying etc. 800 mm is needed for bathing a child. 650 mm would be ample for getting in or out of the bath.
d 550 mm allows space for drying. 650 mm would be needed for bathing a child. 450 mm would do for getting in and out.

Co-ordinating sizes from British Standard specifications[16]

Length (mm)	*Width (mm)*	*Height (mm)*
1700	700	n x 50

Other dimensions n x 100

Catalogue data*

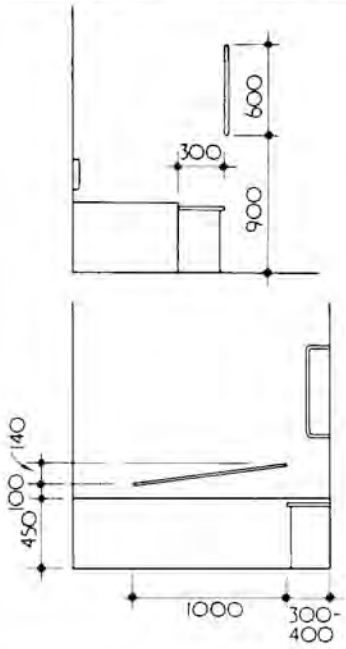
Size	*Length (mm)*	*Width (mm)*	*Height (mm)*
Large	1840	850 †	380-540
Medium	1700	700	
Small	1500	700	

* Excluding special baths such as Sitz. Corner baths have side lengths of at least 1350 mm.
† 800 mm is a common width for 1700 mm and longer baths. Baths in accommodation for the elderly normally should be no longer than 1550 mm and the rim should be 450 mm above the floor.[6, 17]

Key to drawings

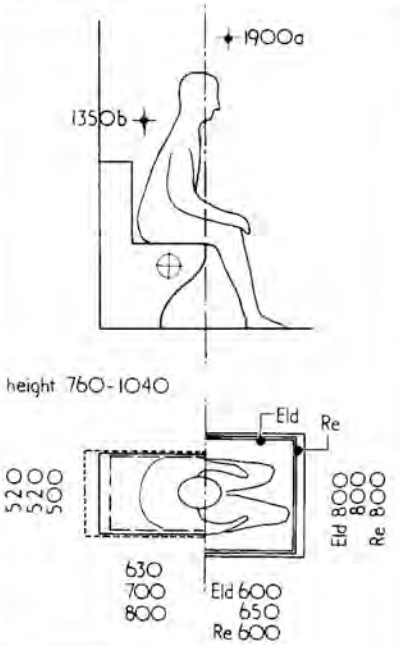
FURNITURE SIDE OF DRAWING:	Large dimensions = fine broken line Medium dimensions = solid line Small dimensions = dashed line
ACTIVITY SIDE OF DRAWING:	Space for elderly = Eld Unrestricted space has no marking Restricted space = Re

Handholds and other aids for the frail and elderly



A ledge at one end helps a person to get into the bath whether transferring from a wheelchair or a standing position. Horizontal and vertical handholds are also needed. Where no ledge is provided support can be given by a vertical pole. Minimum provision would be handholds on the bath rim.

WCs



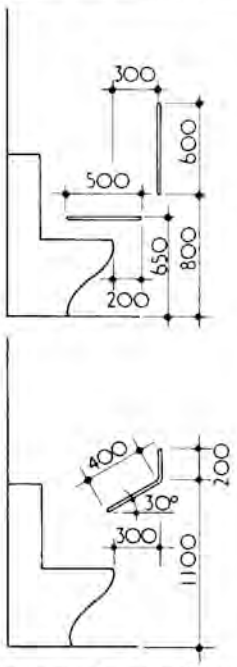
a 150 mm out from front of WC.
b 300 mm in from front of WC.

Catalogue data

Size	*Width* (mm)*	*Depth (mm)*	*Height (mm)*
Large	520	800 †	380-400‡
Medium	520	700	760-1040§
Small	520	700	

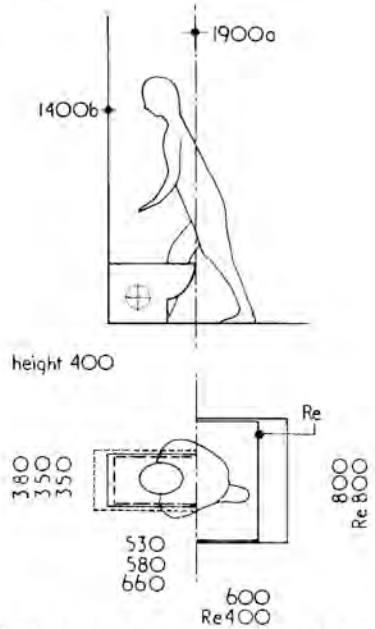
* Width over cistern. Width of pan is around 360 mm.
† Depth allows for a siphonic WC with a duct to accommodate the cistern.
‡ To top of pan.
§ To top of cistern. 1040 mm is height to top of a duct to accommodate a cistern serving a siphonic WC.

Handholds for the frail and elderly[17]



The arrangements shown in the diagrams are alternatives. At least one support rail should be provided. A horizontal rail will give support to a user when sitting down and rising and an additional vertical rail can also help a person when getting up from the WC (top). Alternatively a cranked rail may be provided (above). The inclined section takes the weight of the forearm. A clearance of 50 mm should be allowed between rails and wall surfaces. Ideally, support rails should be provided on both sides of the WC but care should be taken to avoid obstructing access to the fitting.

Bidets

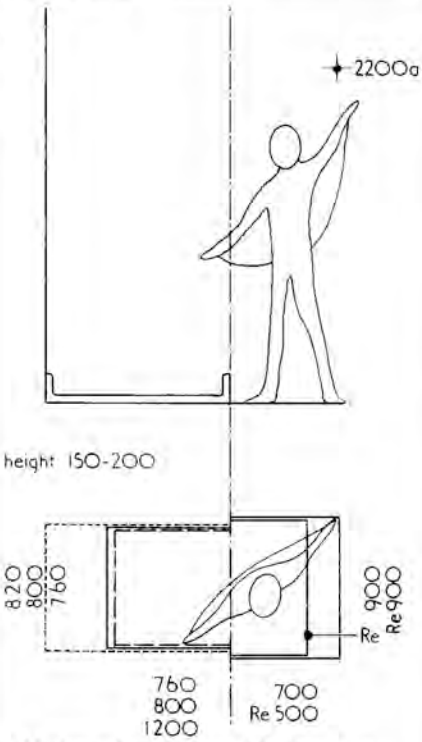


For drying and dressing in front of a bidet a depth of 900 mm and a width of 1100 mm are needed.
a Over front of bidet.
b Against a wall.

Catalogue data

Size	*Width (mm)*	*Depth (mm)*	*Height (mm)*
Large	370	640	
Medium	350	550	400
Small	350	530	

Showers

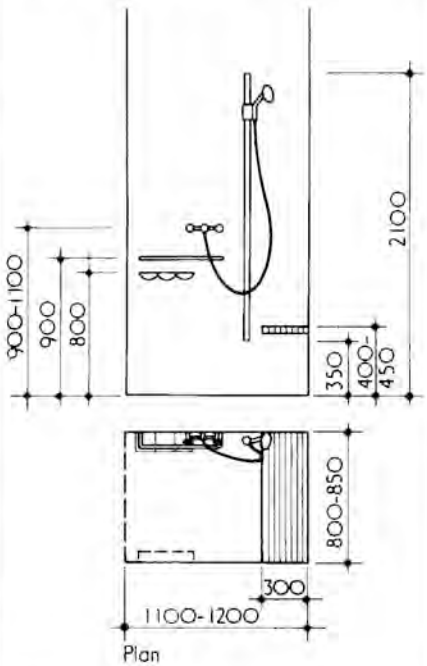


a Minimum height alongside shower to allow space for drying.

Catalogue data—shower trays

Size	*Length (mm)*	*Width (mm)*	*Height (mm)*
Large	1200	820	
Medium	800	800	150-200
Small	760	760	

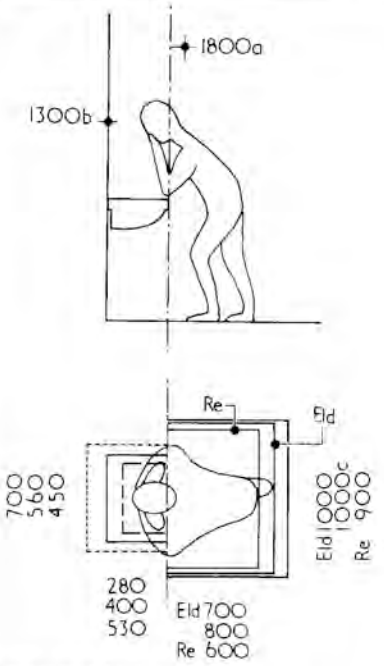
Built-in showers



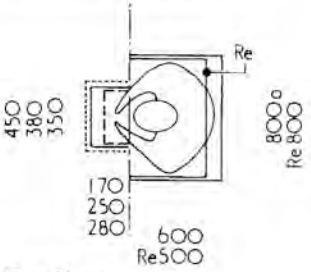
Swedish data for showers[18]

A shower measuring 850 × 1100 mm fitted with a grab bar and a seat would suit 85 per cent of the adult population without serious physical disablement. If width is only 800 then a length of 1200 is needed; 850 × 1200 mm is needed where a shower is not fitted with a grab bar and a seat and rapid control of the water temperature.

Wash basins



Large wash basin
a Height 500 mm out from wall.
b Height at wall.
c 650 mm below the basin.



Small hand basin
a 650 mm below the basin.

Co-ordinating dimensions from British Standard specification[19]

Type	*Width (mm)*	*Depth (mm)*	*Height (mm)*
A	700	500	—
B	600	500	—

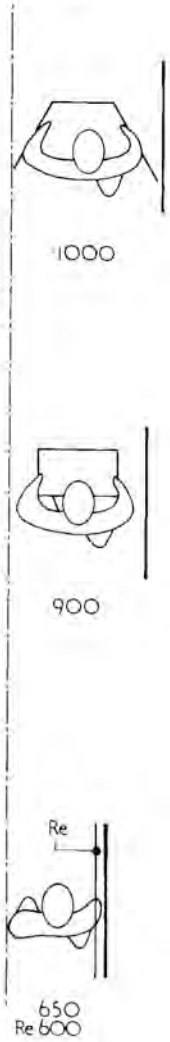
Catalogue data

Size	*Width (mm)*	*Depth (mm)*	*Height* (mm)*
Large	700	530	780-850
Medium	560	400	
Small†	450	280	

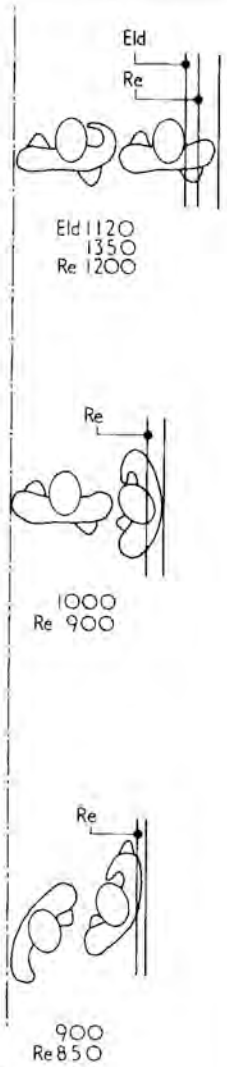
* Range for pedestal types. For wall-mounted types a height of 800 mm is a compromise for family dwellings; 900 mm is more suitable for adults, with a lower height for young children. (850-925 mm rim height for elderly.)
† Suitable for use in WC compartments. Basins for building into walls only project 170 mm or less. 250 mm is the smallest depth of normal basins.

Halls and landings

Circulation in halls



One person.



Two people passing.

Key to drawings

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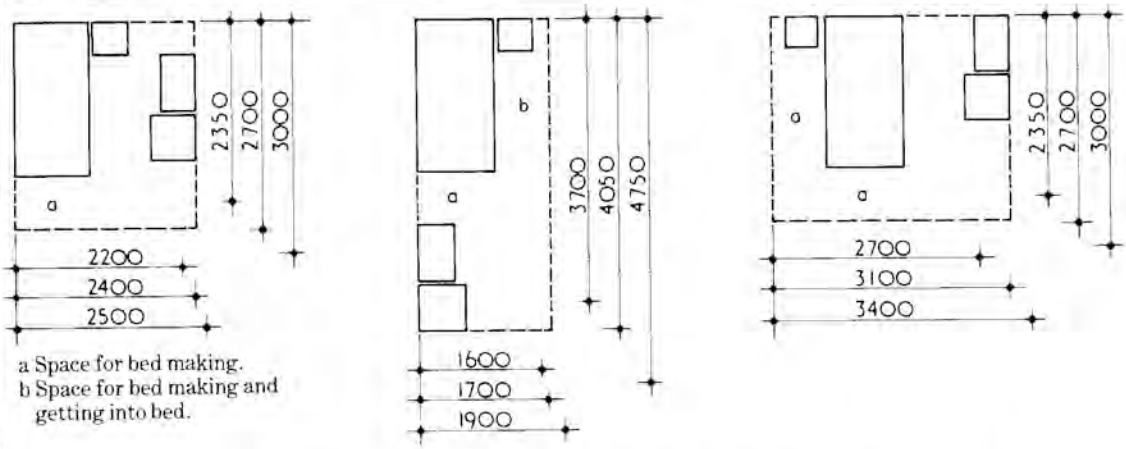
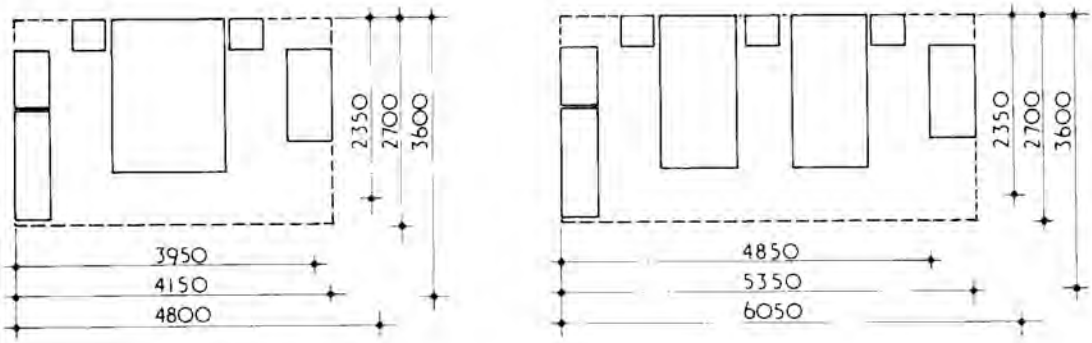
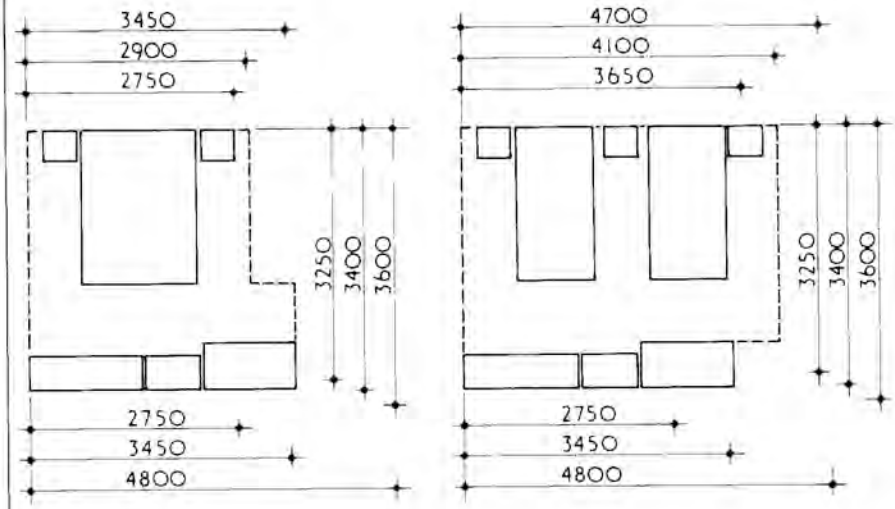
ACTIVITY SIDE OF DRAWING:	Space for elderly = Eld Unrestricted space has no marking Restricted space = Re

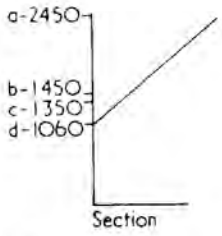
Bedrooms and bed recesses



a Space for bed making.
b Space for bed making and getting into bed.



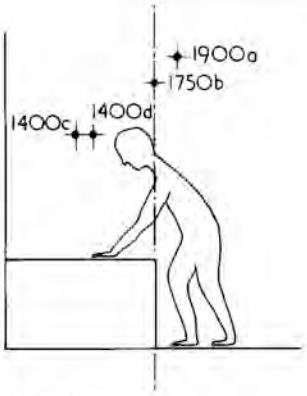




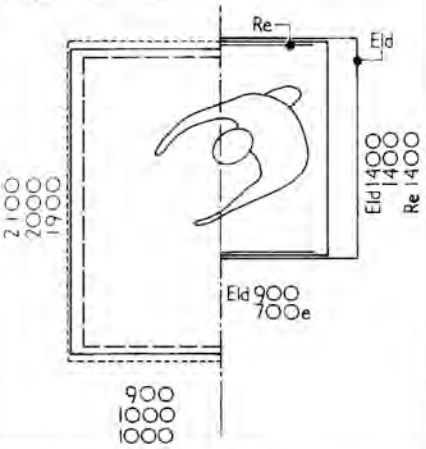
a Wardrobe.
b Dressing table mirror; sitting up in bed with mattress maximum 600 mm above floor.
c Chest of drawers.
d Wall alongside bed (for bed making) 40° ceiling angle minimum.

Typical layouts of single-, twin- and double-bed bedrooms.

Single beds



height 540-560



a 150 mm out from the bed.
b At edge of bed.
c Lowest point—500 mm from front edge of bed for bed-making. See 'Making beds' on next page.
d Headroom required when sitting up in bed, assuming mattress height of 550 mm above floor. 850 mm height required above mattress.
e Also suitable as a restricted depth for the elderly.

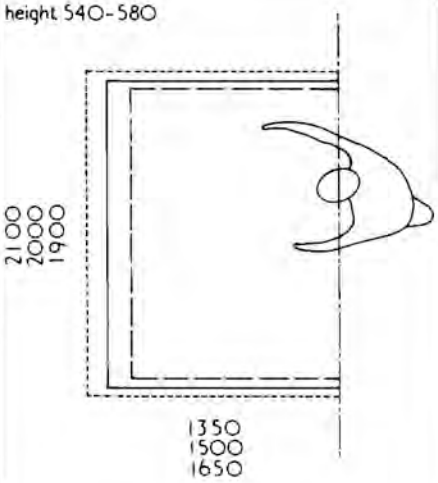
FIRA survey data: 21 items*

Per cent	*Length (mm)*	*Width (mm)*	*Height (mm)*
100	2360	1000	
90	2100	1000	
75	2000	900	540-560
50	1900	900	
10†	1900	750	

* Headboards are excluded.
† The 50 percentile dimensions correspond with the British Standard 'small' mattress size—the 'standard' size is 2000 × 1000 mm.[19]

Double beds

height 540-580

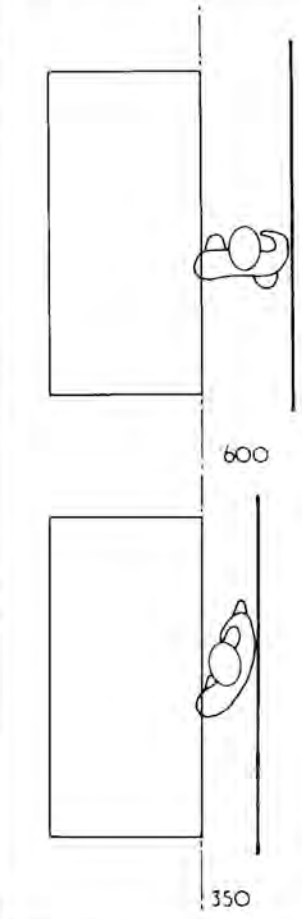


FIRA survey data: 38 items*

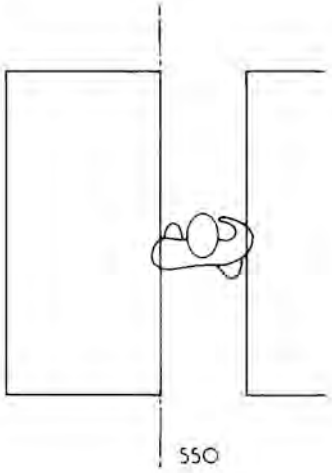
Per cent	*Length (mm)*	*Width (mm)*	*Height (mm)*
100	2360	2000	
90	2100	1650	
75†	2000	1500	540-580
50†	1900	1350	
10	1900	1200	

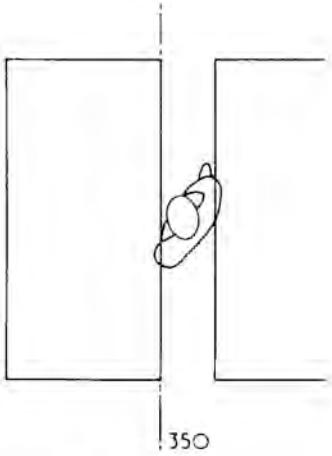
* Headboards are excluded: in a FIRA sample of 26 headboards most were not larger than 2500 mm wide × 50 mm deep × 1000 mm high. Highest was 1270 mm.
† The 75 percentile and 50 percentile dimensions correspond with British Standard 'standard' and 'small' mattress sizes respectively.[19]

Circulation in bedrooms



Between bed and wall, wardrobe or chest of drawers.





Between two beds.

Key to drawings

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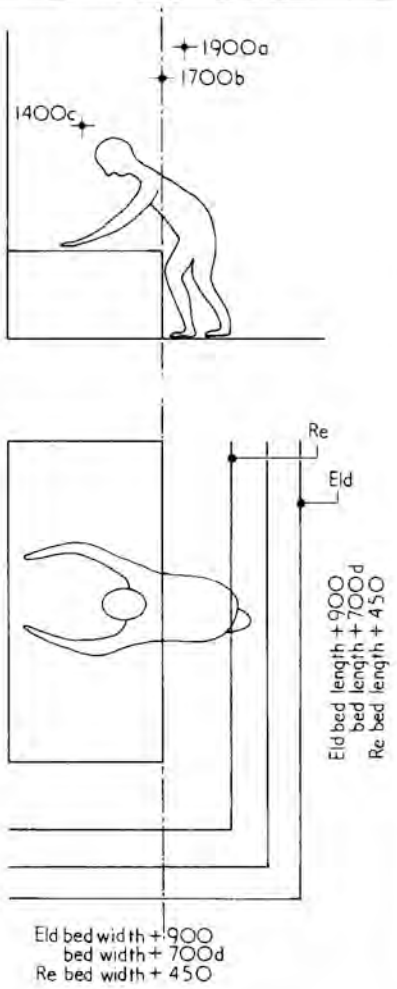
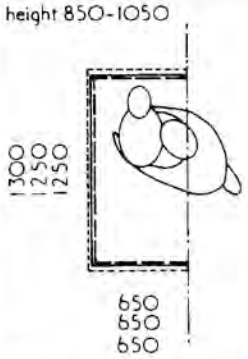
Making beds



a 150 mm out from bed.
b At edge of bed.
c Lowest point 500 mm from front edge of bed.
d A clear 800 mm is needed for vacuum cleaning under a bed, and 1250 mm for sweeping with a broom.
Space on three sides of the bed is desirable in accommodation designed for the elderly.

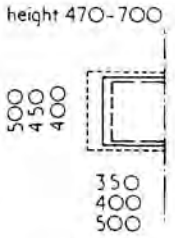
Cots



FIRA survey data: 16 items

Per cent	*Length (mm)*	*Width (mm)*	*Height (mm)*
100	1440	760	
90	1280	650	
75	1270	640	850-1010
50	1250	640	
10	1120	500	

Bedside cabinets



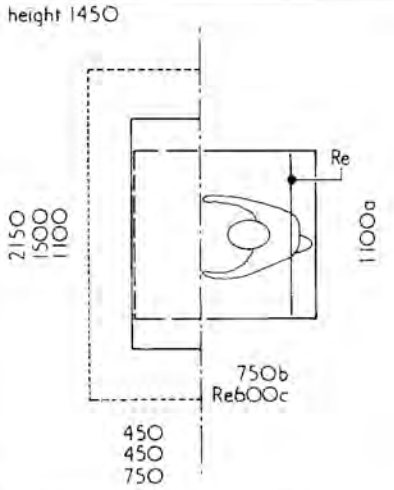
FIRA survey data: 33 items

Per cent	*Width (mm)*	*Depth (mm)*	*Height (mm)*
100	810	480	
90	500	480	
75	480	450	470-700
50	460	420	
10	390	380	

LA survey data: 331 items

Per cent	*Width (mm)*	*Depth (mm)*	*Height (mm)*
90	500	500	
75	500	400	250-910
50	400	350	

Dressing tables



a Or width of table, whichever is the greater.
b Includes space for sitting down and getting up.
c Depth when seated at table and restricted depth for getting up.

FIRA survey data: 106 items

Per cent	*Width (mm)*	*Depth (mm)*	*Height (mm)*
100	2130	770	
90	2130	770	
75	1530	450	1450*
50	1500	440	
10	1070	410	

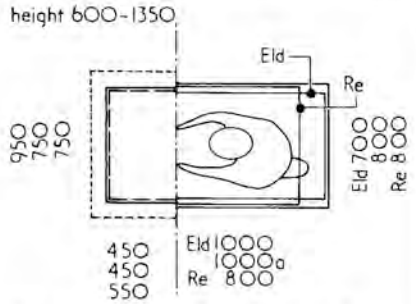
*Maximum to top of mirror.

LA survey data: 456 items

Per cent	*Width (mm)*	*Depth (mm)*	*Height (mm)*
90	1500	500	
75	1300	500	2300*
50	1100	450	

*Maximum including wall mirrors.

Chests of drawers



a 800 mm would be adequate where the space is bounded by a low bed or chair.

FIRA survey data: 177 items

Per cent	*Width (mm)*	*Depth (mm)*	*Height (mm)*
100	1600	550	
90	930	550	
75	860	480	600-1340
50	770	450	
10	610	410	

LA survey data: 530 items

Per cent	*Width (mm)*	*Depth (mm)*	*Height (mm)*
90	1000	500	
75	800	450	350-1520
50	750	450	

Bedroom fitments

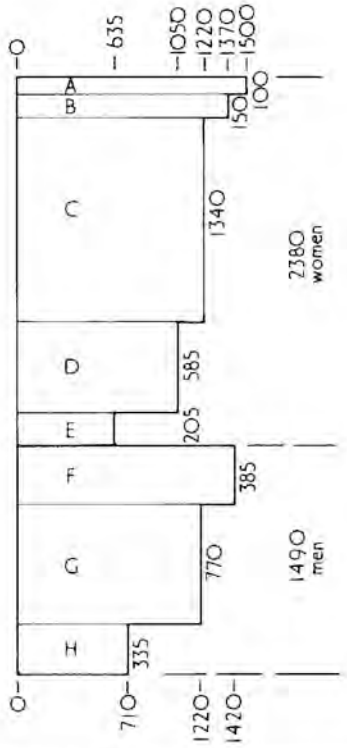


Diagram A: 90th percentile hanging and storage space requirements.

A Evening dresses.
B Dressing gowns and topcoats.
C Heavy topcoats, light topcoats, raincoats, dresses.
D Short coats, anoraks, suits, costumes and skirts.
E Slacks, jeans.
F Overcoats, raincoats, dressing gowns.
G Car coats, anoraks, suits, jackets.
H Waistcoats, trousers.

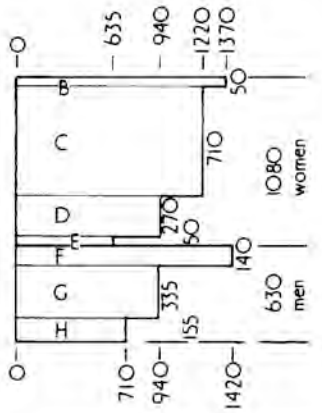


Diagram B: average hanging and storage space requirements.

FIRA and LA survey data were gathered but the results from other FIRA studies which are given below are more relevant for use when selecting bedroom fitments and when deciding what combinations of wardrobes and chests of drawers to allow for.

FIRA technical report[21]

Diagram A: (90th percentile)

Storage	*Women*	*Men*	*Total*
Folded storage (m^3)	0·344	0·291	0·635
Standing storage (m^3)*	0·282	0·132	0·414
Spare bedlinen, luggage, etc, (m^3)			0·573
			1·622
Hanging rail lengths (mm)	2380†	1490†	3870

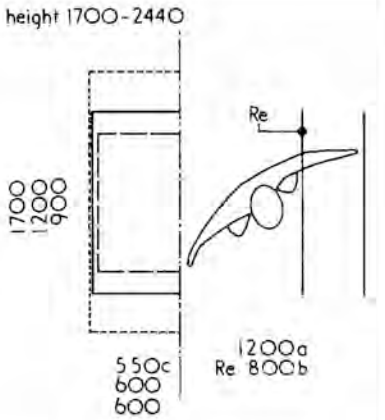
* For shoes, handbags and hats.
†Lengths of 3100 mm for women and 1900 mm for men are needed if shirts, blouses etc, are to be hung.

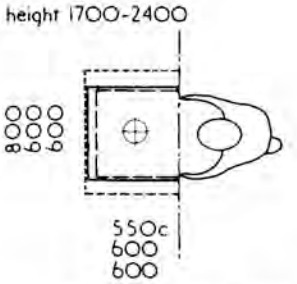
Diagram B: (average)

Storage	*Women*	*Men*	*Total*
Folded storage (m^3)	0·144	0·124	0·268
Standing storage (m^3)*	0·116	0·040	0·156
Spare bedlinen, luggage, etc, (m^3)			0·181
			0·605
Hanging rail lengths (mm)	1080†	630†	1710

* For shoes, handbags and hats.
†Lengths of 1370 mm for women and 870 mm for men are needed if shirts, blouses etc, are to be hung.

Wardrobes





a Space needed to dress in front of wardrobe. An 800 mm depth is adequate if the space is bounded by low furniture.
b Space needed just to use the wardrobe.
c 550 mm is very restricted for some items of clothing such as suits and winter coats.

FIRA survey data: 114 items—double wardrobes

Per cent	*Width (mm)*	*Depth (mm)*	*Height (mm)*
100	1680	640	
90	1680	600	
75	1210	600	1550-2440
50	920	600	
10	860	530	

FIRA survey data: 24 items—single wardrobes

Per cent	*Width (mm)*	*Depth (mm)*	*Height (mm)*
100	910	610	
90	810	600	
75	810	580	1680-2440
50	610	580	

LA survey data: 774 items—single and double wardrobes

Per cent	*Width (mm)*	*Depth (mm)*	*Height (mm)*
90	1500	550	
75	1200	550	2330*
50	900†	550	

* Maximum height.
† About 25 per cent of items were less than 800 mm wide.

Key to drawings

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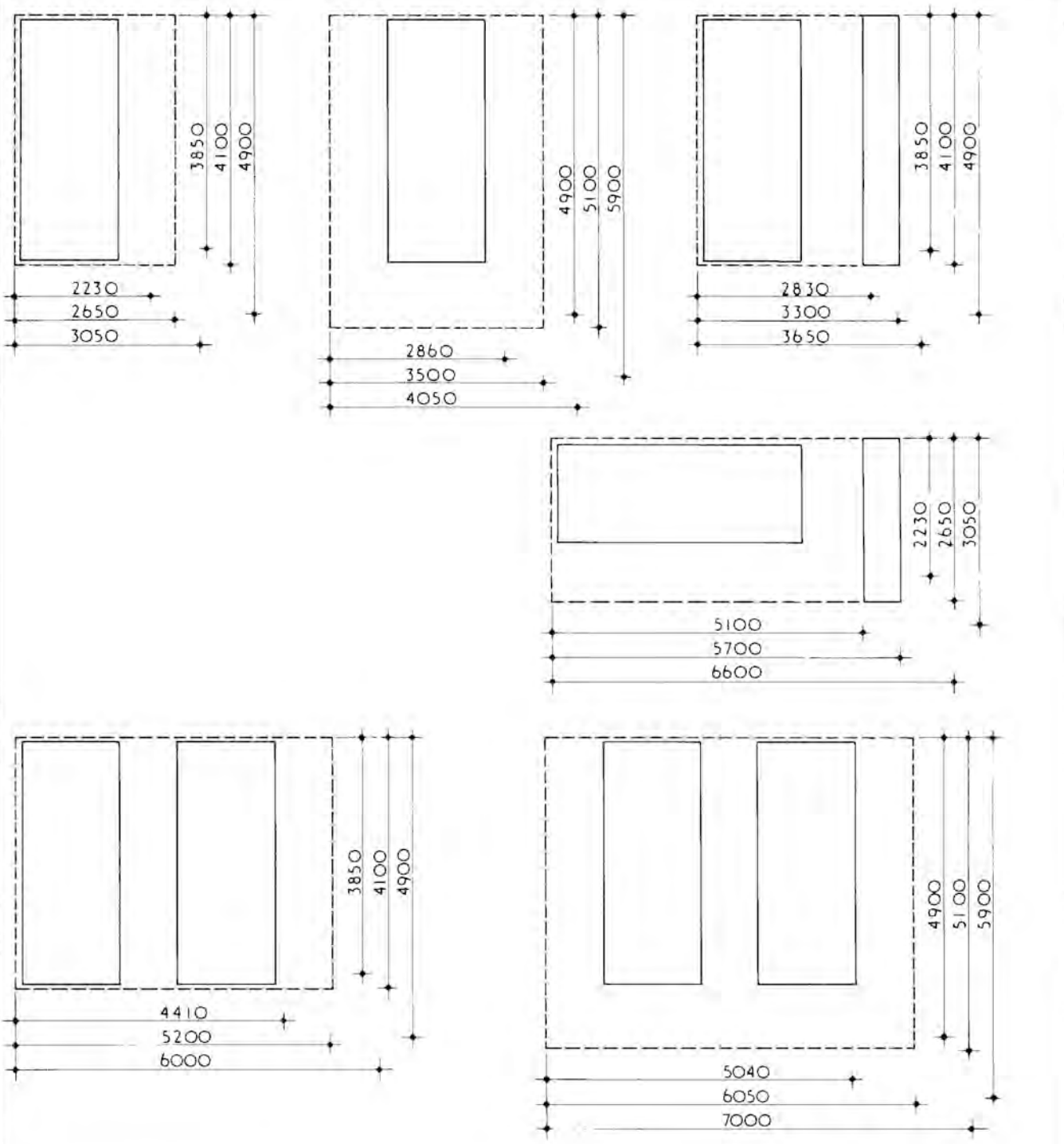
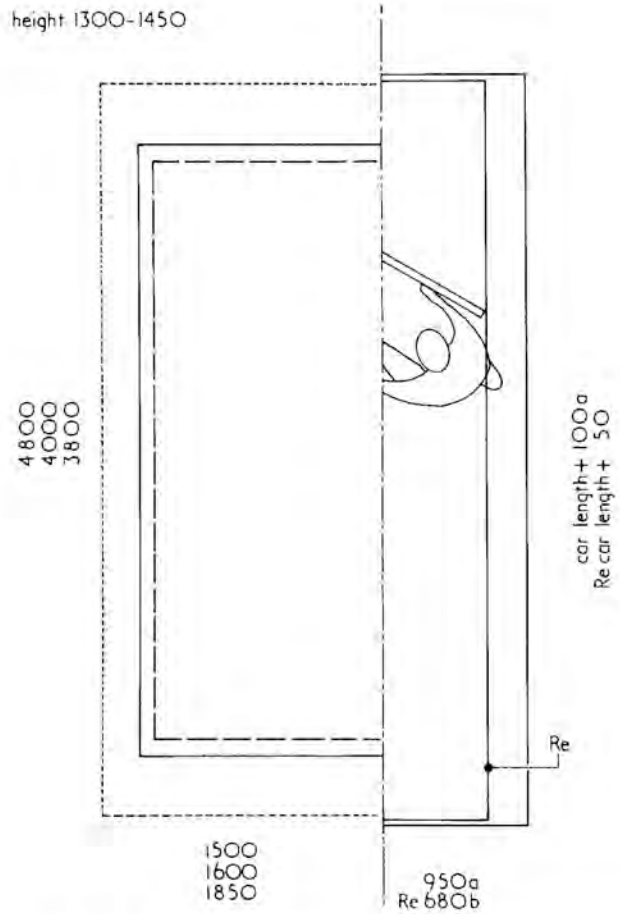
ACTIVITY SIDE OF DRAWING:	Space for elderly = Eld Unrestricted space has no marking Restricted space = Re

Garages and stores



Typical layouts of single and double garages.

Cars



Data from a survey of new cars: 230 items[22]

Per cent	*Length (mm)*	*Width (mm)*	*Height (mm)*
100	5600	2200	2000
90	4800	1850	1450
75	4500	1750	1400
50	4000	1600	1350
10	3800	1500	1300

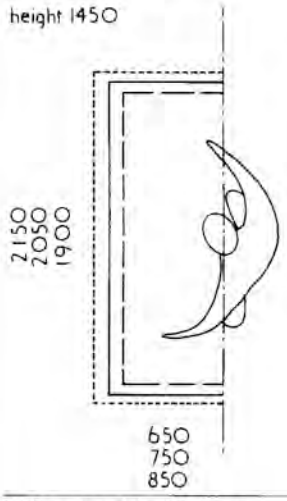
Data for the best selling cars in 1981[22]

Order	*Length (mm)*	*Width (mm)*	*Height (mm)*
1	3970	1640	1346
2	4340	1699	1328
3	3403	1544	1361
4	3566	1567	1315
5	4343	1612	1417
6	3853	1612	1397
7	4234	1651	1397
8	3055	1409	1346
9	3815	1612	1397
10	3944	1569	1308

a 1100 mm would allow for changing a tyre, loading the boot, etc.

b Allows the doors of small cars to be opened partially. 950 mm allows the doors of such cars to be opened fully and doors of large cars opened partially.

Motor bikes

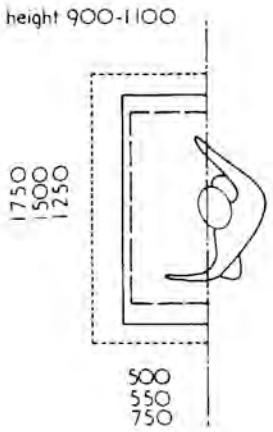


FIRA survey data: 10 items

Per cent	*Length (mm)*	*Width (mm)*	*Height (mm)*
100	2180	840	
90	2150	830	
75	2080	740	1070-1140 a
50	2050	740	
10	1910	640	

a Excluding mirror (allow 300 mm extra) or windscreen.

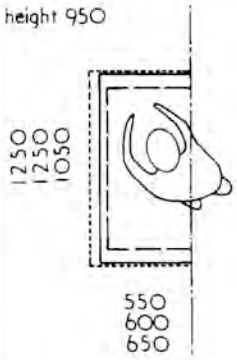
Bicycles



FIRA survey data: 9 items

Per cent	*Length (mm)*	*Width (mm)*	*Height (mm)*
100	1780	740	
90	1740	740	
75	1580	620	890-1090
50	1520	560	
10	1250	510	

Prams



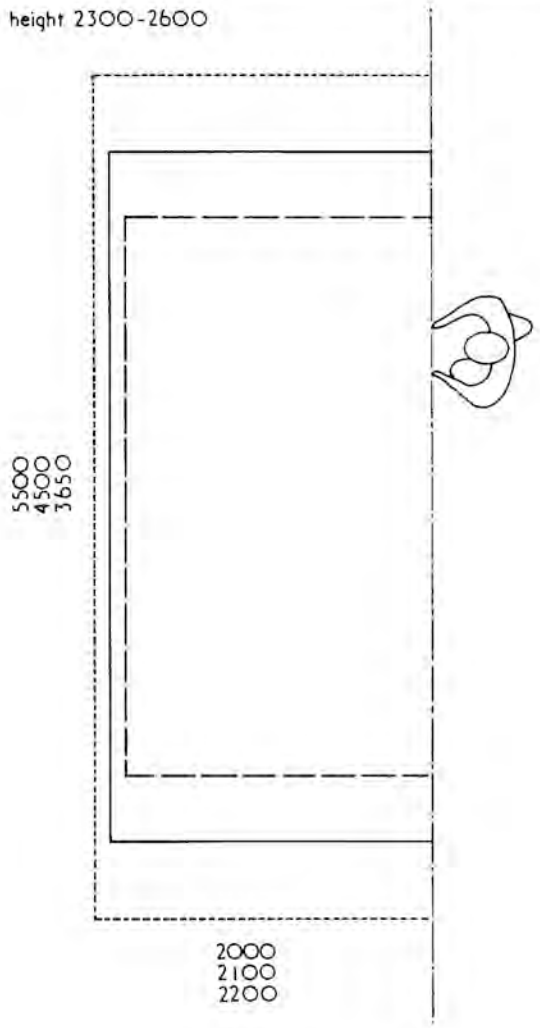
FIRA survey data: 7 items

Per cent	*Length (mm)*	*Width (mm)*	*Height (mm)*
100	1250	630	
90	1250	630	
75	1250	600	940-953
50	1250	600	
10	1240	550	

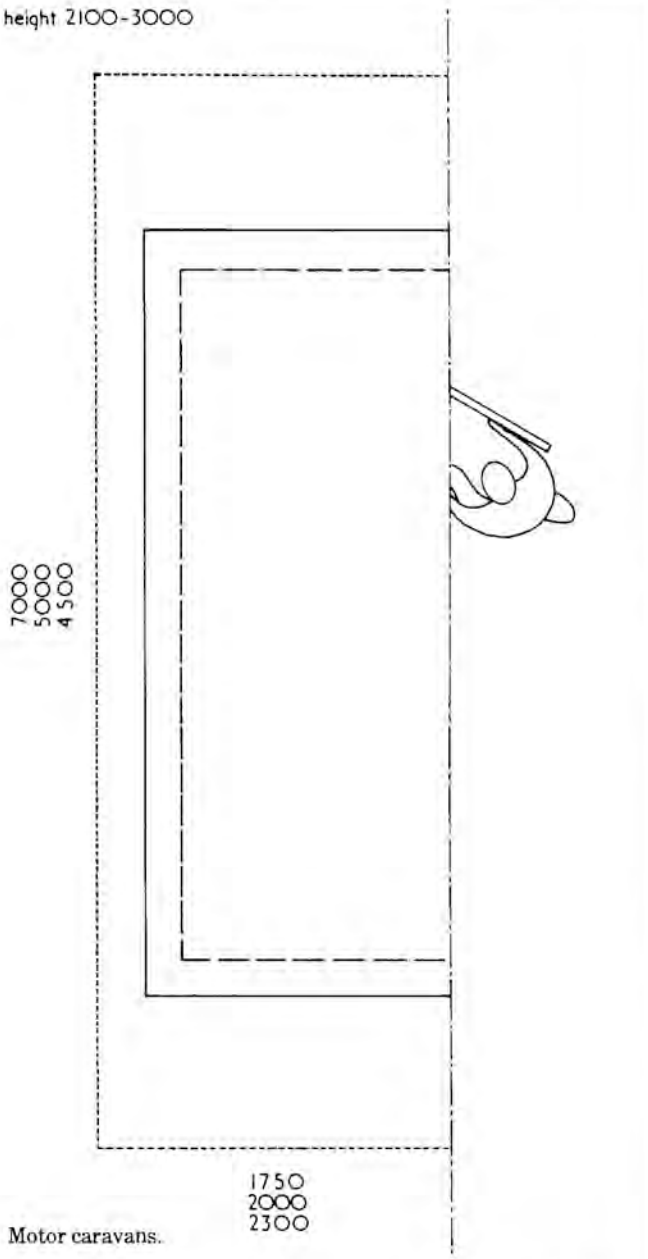
Key to drawings

FURNITURE SIDE OF DRAWING:	Large dimensions = fine broken line Medium dimensions = solid line Small dimensions = dashed line
ACTIVITY SIDE OF DRAWING:	Space for elderly = Eld Unrestricted space has no marking Restricted space = Re

Caravans



Touring caravans.



Motor caravans.

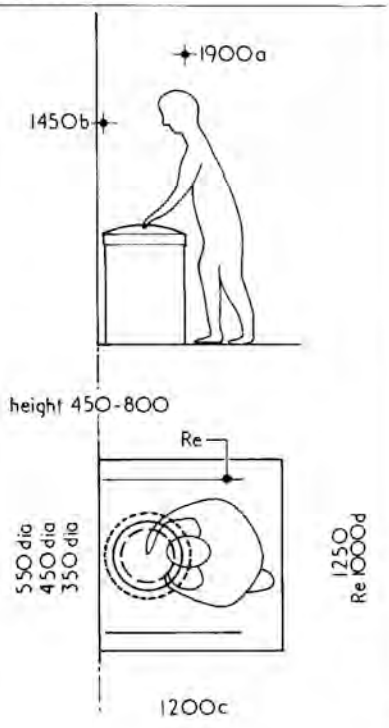
Data from a survey of touring caravans: 275 items[23]

Per cent	*Length (mm)*	*Width (mm)*	*Height (mm)*
100	6200	2300	2700
90	5500	2200	2600
75	4800	2150	2600
50	4500	2100	2500
10	3650	2000	2300

Data from a survey of motor caravans: 92 items[23]

Per cent	*Length (mm)*	*Width (mm)*	*Height (mm)*
100	10000	2450	3250
90	7000	2300	3000
75	5750	2200	2800
50	5000	2000	2750
10	4500	1750	2100

Dustbins



Using a dustbin including removing lining sacks.
a Over front of dustbin.
b At back of dustbin.
c Dimension from the wall.
d Width required when lid is not held but is placed by side of bin.

FIRA survey data: 18 items

Per cent	*Diameter (mm)*	*Height (mm)*
100	540	
90	540	
75	490	440-780
50	460	
10	350	

Key to drawings

FURNITURE SIDE OF DRAWING:	Large dimensions = fine broken line Medium dimensions = solid line Small dimensions = dashed line
ACTIVITY SIDE OF DRAWING:	Space for elderly = Eld Unrestricted space has no marking Restricted space = Re

Furniture and equipment ownership by local authority tenants

Patterns and trends of ownership

The main items of furniture and equipment recorded during the survey of local authority housing[5] are grouped into:

- kitchens and kitchen-dining rooms
- living and living-dining rooms
- dining rooms
- bedrooms.

The percentages of households having at least one of any item of furniture or equipment are given, with brief comments on the findings and references to trends identified by the FIRA study.[4]

FIRA consumer surveys confirmed that most households already own some furniture when they move, and older households in particular may be less willing (or able financially) than others to purchase new items to suit their new homes. A high proportion of purchases are by those in the 16-35 age group. On average, items are only replaced after about 10 years, although it was found that households in social classes A-C1 tend to replace furniture less frequently than others. As might be expected, upholstered items are normally replaced more often than items such as tables.

From the LA survey it was found that the number of items owned by each household was related more to the size of the dwelling than to the size of the household or the age of the head of household. For example, small households occupying a relatively large dwelling tended to own as many items as large households occupying similar dwellings; most rooms were furnished as fully as possible, even when not permanently or fully in use.

Although most people furnished their rooms conventionally to suit a similar range of household activities, there were some exceptions. For instance, 'dining' rooms were used as 'bedrooms', 'main bedrooms' were used by children rather than their parents, and the types and arrangements of furniture and equipment differed greatly between households in similar dwellings.

Kitchens and kitchen-dining rooms

Furniture in kitchens: 294 households

Item	*Per cent*
Dining chair	19
Stool	15
Kitchen table	14
Dining table	13
Other chair	9
Shelving units	2
Armchair	2
Dresser	1
Plant box	1
Cupboard/cabinet	1
Other table	1
TV	1

Appliances in kitchens and kitchen-dining rooms: 410 households

Item	*Per cent*
Cooker	96
Refrigerator	76
Fridge-freezer	20
Freezer	14
Separate oven	1
Hood over cooker	1
Washing machine	72
Spin drier	12
Tumble drier	11
Drying cabinet	1

Furniture in kitchen-dining rooms: 126 households

Item	*Per cent*
Dining chair	78
Dining table	64
Kitchen table	23
Stool	20
Armchair	13
Other chair	10
Dresser	8
Occasional table	6
Settee	6
Cupboard/cabinet	6
Music centre	4
Plant box	4
Shelving units	3
Other table	2
Loudspeaker	2
TV	6

Percentages in tables are for households owning at least one item.

Fitted kitchen units were provided in all kitchens and kitchen-dining rooms—mostly in accordance with requirements given in DOE circulars.

Kitchen tables Only a few households had tables in kitchens. This may have been due in part to some built-in provision having been made, and some kitchens were too small to accommodate any furniture other than the fitted units.

Mixing kitchen/dining/living rooms Not surprisingly, some kitchen-dining rooms were used as second living rooms and some were furnished with 'dining' rather than 'kitchen' tables. Just over 10 per cent of households with kitchen-dining rooms kept their dining table in what in most cases were small living rooms.

Built-in ovens and cooker hoods With the introduction of more modestly priced built-in hobs and ovens (and units to accommodate them), it can be expected that more households will buy them instead of freestanding cookers if space is available in the kitchen. Similarly, the ownership of cooker hoods may increase.

Fridges and fridge-freezers Nearly all households owned a refrigerator or a fridge-freezer. However, ownership was slightly higher among families with children than among adult or elderly households, and comparatively low (85 per cent) among one-person households. Ownership of fridge-freezers and freezers was higher among families with children (particularly the older families) than among elderly and one-and two-person households. Ownership of fridge-freezers and freezers is expected to rise.

Washing machines and tumble driers The proportions of households owning washing machines and tumble driers (72 and 11 per cent) were slightly lower than those found in the national MAS survey,[4] in which 31 per cent of households had an automatic machine (25 per cent front-loading and 6 per cent top-loading), another 31 per cent had twin tubs, 12 per cent had other types such as single tub, and 27 per cent did not own a machine. Ownership of automatic machines was highest among the 25-44 age group (up to 47 per cent). Ownership of tumble driers in the MAS survey was 14 per cent overall and 23 per cent in the 25-44 age group. It is expected that ownership of automatic washing machines and tumble driers will increase.

Dishwashers No household owned a dishwasher, even though over 3 per cent of households nationally own one. Again an increase in ownership can be expected.

Living and living-dining rooms

Living rooms: 221 households

Item	*Per cent*
Settee	95
Armchair	93
Coffee table	57
Shelving units (inc wall units)	40
Occasional table	39
Music centre, hi-fi	37
Cupboard/cabinet	27
Sideboard	20
Pouffe	15
Stool	14
Dining chair	14
Dining table	14
Plant box	12
Loudspeaker	11
Bookcase	9
Nesting tables	8
Other table	8
Other chair	6
Tea trolley	6
Bureau	3
Record cabinet	3
Pram	1
TV	89

Living-dining rooms: 189 households

Item	*Per cent*
Armchair	99
Settee	92
Dining table	89
Dining chair	87
Coffee table	58
Sideboard	58
Music centre, hi-fi	32
Shelving units (inc wall units)	31
Occasional table	30
Cupboard/cabinet	30
Pouffe	21
Stool	19
Tea trolley	17
Other large table	15
Bookcase	15
Other chair	12
Plant box	11
Nesting table	9
Table for plants	7
Other table	7
Loudspeaker	7
Bureau	6
Record cabinet	3
Single bed	2
Bedside table	2
Chest of drawers	2
Chest	2
Pram/pushchair	2
TV	91

Percentages in tables are for households owning at least one item.

Living v living-dining In general, the larger households occupied dwellings with living and dining rooms and the smaller households had living-dining rooms.

Three-piece suites Almost all households had a settee and at least two armchairs in the living or living-dining room.

Omissions Music centres, bureaux, etc, built into shelving units were not recorded separately.

Dining rooms

Furniture in dining rooms: 91 households

Item	*Per cent*
Dining chair	73
Dining table	70
Sideboard	31
Armchair	20
Cupboard/cabinet	20
Settee	14
Music centre	13
Other chair	12
Shelving units (inc wall units)	11
Occasional table	10
Stool	9
Coffee table	7
Bookcase	4
Other table	4
Bureau	3
Tea trolley	3
Plant box	2
Pram	1
Table for plant	1
Wardrobe	1
Record cabinet	1
Loudspeaker	1
TV	7

Percentages in tables are for households owning at least one item.

Use of dining room A high proportion of households (about 30 per cent) did not use the room for dining. Many, as might be expected, used the dining room as a second living room.

Sideboards Less than a third of households had a sideboard, but some used cupboard/cabinets, shelf units or other items instead.

Bedrooms

Bedroom 1*: 410 households

Item	*Per cent*
Bed	
Double	67
Single	26
Cot	3
Couch	3
Bunk	1
Wardrobe	70
Dressing table	59
Chest of drawers	44
Bedside table	42
Dining chair	30
Other chair	21
Chest	21
Armchair	19
Stool	16
Wardrobe units	13
Occasional table	10
Cupboard/cabinet	7
Large table	6
Other table	4
Bookcase	4
Shelving units	5
Bureau	3
Coffee table	3
Music centre	2
Tea trolley	1
Trunk	1
Pouffe	1
TV	13

* Bedroom 1 is the largest bedroom; other bedrooms are numbered in order of decreasing size.

Percentages in tables are for households owning at least one item.

Bedroom 2: 314 households

Item	*Per cent*
Bed	
Double	34
Single	57
Cot	4
Bunk	2
Couch	2
Wardrobe	67
Dressing table	45
Chest of drawers	44
Bedside table	29
Dining chair	18
Other chair	16
Stool	14
Armchair	13
Wardrobe units	11
Cupboard/cabinet	10
Occasional table	8
Shelving units	7
Bureau	6
Music centre	4
Large table	3
Other table	2
Coffee table	2
Dresser/sideboard	2
Tea trolley	2
Trunk	1
TV	6

Bedroom 3: 226 households

Item	*Per cent*
Bed	
Double	9
Single	66
Bunk	6
Cot	8
Couch	1
Wardrobe	49
Chest of drawers	48
Dressing table	23
Bedside table	13
Chair	13
Dining chair	11
Shelving units	8
Bureau	8
Cupboard/cabinet	8
Stool	8
Music centre	7
Armchair	6
Bookcase	6
Other table	6
Occasional table	5
Wardrobe units	5
Chest	5
Large table	4
Coffee table	3
Pram	2
Tea trolley	2
Loudspeaker	1

Bedroom 4: 61 households

Item	*Per cent*
Bed	
Double	10
Single	64
Bunk	9
Cot	4
Wardrobe	50
Chest of drawers	35
Dressing table	20
Bedside table	17
Occasional table	15
Dining chair	12
Shelving units	12
Chair	11
Other table	4
Large table	5
Armchair	9
Cupboard/cabinet	4
Music centre	4
Bureau	2
Bookcase	2
Pram	1
Record cabinet	1
Sideboard	1
Coffee table	1
Wardrobe unit	1
Loudspeaker	1
TV	1

Largest bedroom The largest bedroom was often not used as the parents' bedroom in family houses.

Furniture in bedrooms Some households had armchairs and many had a TV in the first or second bedrooms.

Fitted furniture FIRA forecast that bedrooms, like kitchens, may soon be furnished with fitted cupboards. In the LA survey between 3 and 6 per cent of all bedrooms had wardrobe cupboards built in as part of the design; 13 and 11 per cent of households had installed fitted storage units in the first and second bedrooms respectively.

Storage units According to the FIRA report, 64 per cent of built-in or freestanding bedroom storage units were bought for the main bedroom and 33 per cent for another bedroom.

References and notes

1 Department of the Environment, Design Bulletin No 6, *Space in the home: metric edition*, London, HMSO, 1968.

2 Ministry of Housing and Local Government, Central Housing Advisory Committee, *Homes for today and tomorrow*, (The Parker Morris Report), London, HMSO, 1961.

3 Department of the Environment, HDD Occasional Paper 2/74, *Mobility housing*, London, HMSO, 1974. See also HDD Occasional Paper 2/75, *Wheelchair housing*, London, HMSO, 1975, and Goldsmith, Selwyn *Designing for the disabled*, third (revised) edition, The Royal Institute of British Architects, London, 1976.

4 The Marketing Consultancy Group, Furniture Industries Research Association, *A study of furniture and appliances used in the home*, 1979, unpublished report in three parts. Part 1: catalogues of dimensions with consumer and marketing information. Part 2: analysis of furniture dimensions. Part 3: analysis of ownership of TVs, washing machines, tumble driers, refrigerators and freezers. Prepared by MAS Survey Research Ltd.

5 HDD Occasional Paper 2/81, *A survey of tenants' attitudes to recently completed estates*, London, HMSO, 1981. Data on furniture ownership, arrangements and sizes were drawn from a subsample of dwellings covered by the survey reported in this publication.

6 The following unpublished working papers were produced by ICE.
Wilson, J. R. Cooper, S.E. and Ward, J. S. *A manual of domestic activity space requirements.*
Wilson, J. R. Cooper, S. E. and Rennie, A. M. *The recording and measurement of activity spaces in the home.*
Cooper, S. *Space in the home: a classified bibliography.*
Rennie, A. M. *Design of dwellings for the elderly: a classified bibliography.*
Rennie, A. M. *Dwellings for the elderly: recommended dimensions and space requirements for design.*
Rennie, A. M. *Design of dwellings for the elderly: the measurement of optimum height for shelves and spaces required for various domestic activities.*

7 These data largely supersede those given in Ministry of Housing and Local Government Design Bulletin No 1, *Some aspects of designing for old people*, London, HMSO, 1962.

8 These data supplement those given in Department of the Environment, Design Bulletin No 24 Part 1, *Spaces in the home: bathrooms and WCs*, London, HMSO, 1972; and Design Bulletin No 24 Part 2, *Spaces in the home: kitchens and laundering areas*, London, HMSO, 1972.

9 Here the term 'able-bodied adults' means people who do not suffer from temporary or permanent disabilities which would alter posture or restrict movement. It excludes pregnant women who may require more generous space provision for particular activities. Most of the ICE experiments were undertaken with men of 95 percentile stature and above. A range of body weights, depths and breadths were represented, with particular emphasis given to subjects of large body size.

10 A restricted activity space was specified for many of the experiments, with subjects being asked to perform an activity assuming that there were restrictions on the depth or width of space available. The space specified as restricted is not necessarily the greatest of those measured but is that within which it is anticipated that 97·5 per cent of the population could perform the activity safely, even if cramped. The normal and restricted dimensions could be said to define an acceptable range for that activity, although the larger dimension would always be preferred; even larger dimensions would be required for many activities if the needs of the elderly were also to be met.

11 Here 'the elderly' means those persons over 60 who are less active than 'able-bodied adults' (as defined above) but who walk without the use of an aid. In the experiments the subjects included those who suffered from dizzy spells, had problems with their legs, arms or back, or had some heart/lung condition. Most complaints were of arthritis.

12 Panero, Julius and Zelnik, Martin *Human dimensions and interior space: a source book of design reference standards*, Whitney Library of Design, New York, 1979. A width of 710 mm is suggested to accommodate the 95th percentile male and 660 mm for the 95th percentile female. These widths allow for some movement and change of posture. If 150 mm is allowed at each end for arms, the length of a comfortable two-seater sofa would be between 1600 and 1800 mm.

13 Berglund, Erik *Bord*, Stockholm, Swedish Society of Industrial Design, 1957.

14 Harper, D. MSc thesis, Loughborough University, 1979, unpublished. See also *Which?*, January 1978, January 1980 and January 1981, Consumers' Association. These suggested viewing distances of about 1·5 m for 14in screens, 1·5-2·7 m for 20-22in screens, and 3 m for a 26in screen.

15 The British Standards Institution, BS 6222: Part 1: 1982 *Domestic kitchen equipment: specification for co-ordinating dimensions*. This standard coincides in all essentials with The International Standards Organisation, ISO 3055 *Kitchen equipment—co-ordinating sizes*, first edition 1974. See also ISO 5731 *Kitchen equipment—limit of size*, first edition 1978; ISO 5732 *Kitchen equipment—size openings for built in appliances*, first edition 1978; *ISO planning guide for domestic kitchens*, Part 1, not yet published.

16 BS 1390: 1972 and BS 4305: 1972.

17 National Building Agency, *Sheltered housing for the elderly—design criteria for category 1 dwellings*, 1977.

18 Englund, Marianne and Hallberg, Gun *Space requirements for showers*, Swedish Council for Building Research, Stockholm, 1979.

19 BS 1188: 1974.

20 BS 1877: Part 1: 1971.

21 FIRA Technical Report No 35, *Storage requirements in the main bedroom*, Stevenage, 1969. Restricted publication available to members of FIRA.

22 *What Car?*, December 1981.

23 *Practical Caravan*, December 1981.

24 Other information on parking and garaging can be found in Department of the Environment, Housing Development Note VII, *Parking in new housing schemes*, Parts 1 and 2.

This booklet is a compilation of data for housing design on sizes of furniture and equipment, and on the spaces needed to use them. Produced by the Department of the Environment, it does not confine itself to the minimum sizes recommended by the Parker Morris Committee and Design Bulletin 6 *Space in the Home*. It ranges both up to the 'executive' dwelling and down to the tight spaces of starter homes.

It is intended primarily as a reference document and will be useful to both public and private sector housing designers, and to those responsible for preparing design criteria for the future. Most of it consists of dimensional data presented in diagrams and tables. These data are grouped under seven main headings: living areas, dining areas, kitchens and utility rooms, bathrooms and wcs, halls and landings, bedrooms and bed recesses, garages and stores. They are preceded by an explanation of the purposes, scope and sources of data, and followed by statistics on furniture ownership among local authority tenants.

The material was first published in *The Architects' Journal*.

John Noble is an architect with extensive experience of research and development in the housing field. He worked in the Housing Research and Development Group and the Urban Planning Directorate of the Ministry of Housing and Local Government in the 1960s, and then joined the Housing Development Directorate of the Department of the Environment. He was responsible for several key documents: the most well-known of which were Design Bulletin 6 *Space in the Home*; the *Deeplish Study*; and Design Bulletin 32 *Residential Roads and Footpaths*. He is now in private practice as a much sought-after consultant in housing research and development.

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