
18 Eating and drinking

Fred Lawson, John Rawson and Frank Bradbeer

CI/StB(1976): 51
UDC: 725.71

Fred Lawson is a consultant in the field of hotel and catering design, John Rawson and Frank Bradbeer are architects

Contents

- 1 Introduction
- 2 Basic planning
- 3 Public areas
- 4 Kitchens
- 5 Serveries
- 6 Restaurants
- 7 Cafeterias
- 8 Take-aways
- 9 Transport catering
- 10 Public houses
- 11 Bibliography

1 INTRODUCTION

1.01

Spaces for eating and drinking have to be looked at from two points of view, that of the customer, and that of the proprietor.

- The customer will choose a particular establishment, not only because it sells food or drink but because it also sells:
 - somewhere to entertain a guest in peace: as in good restaurants
 - entertainment: as in nightspots, or dinner-dancing venues
 - fast service: as in cafés and fast-food outlets
- The proprietor is running a labour-intensive business for profit in a competitive environment. Efficiency of every part of the operation must be maximised. Skilful planning can have a big effect on labour requirements, and consequently on the cost of operating.

1.02 Types of facility

Eating and drinking establishments fall into a number of broad categories:

- Restaurants: commercial self-service and waiter service operations, possibly licensed for alcohol. Includes cafés and snack bars
- Canteens: semi- or non-commercial operations in educational, industrial, or government establishments
- Take-aways: fast-food outlets with or without customer seating space
- Transport catering: kitchens providing pre-packed meals in bulk, e.g. for airlines
- Public houses: alcohol sales with or without food service.

The differences between these operations lie in:

- Variety of food offered
- Method of service
- Space and facilities available to the customer
- Amount of food processed on site
- Emphasis on the sale of alcoholic drinks
- Decor and degree of sophistication
- Price level.

Boundaries between these factors can be blurred, and the whole field is constantly changing.

1.03 Location

Location will determine success or failure of a facility. Food service establishments should be located where people need to obtain food, such as:

- Motorway service areas
- Hotels
- City centres
- Tourist attractions
- Main railway stations
- Airports
- Department stores

These are best served by different types of outlets. For instance, chain fast-food outlets suit high street sites in city centres. Up-market restaurants are in less expensive locations in or near good hotels or major up-market residential areas.

A balance has to be found between:-

- The availability of customers
- Cost of the location
- Accessibility: customer parking and goods access

In a major location such as an airport or motorway service station a selection of outlets will be provided. The customers can choose between different types of meal depending on the time and money they have available. In a city centre there will be a number of different restaurants: fast-food, bistros, trattorias, ethnic, up-market, etc. also giving choice.

Self-advertising of the establishment may be vital: those hidden away in basements or on upper floors may not be able to catch much passing trade, and may also have extra costs in goods handling.

1.04 External planning

As in hotels, the external access is crucial. The entrances must be clearly defined, and separated. Customers, staff and goods must each be provided for. Parking must be available for customers and deliveries. External appearance is very important. The building should be self-advertising, and may need to be flood-lit at night.

2 BASIC PLANNING

2.01

Food supply and consumption can be thought of as three overlapping industrial processing circles: for cooking, dishes, and customers. Each circle rotates separately: the product (food) is transferred from circle to circle.

1 The cooking circle. This consists of:

- Goods inwards: food supplies
- Storage
- Processing
 - preparation
 - cooking
 - serving: food transferred to circle 2
 - equipment cleaned and prepared for re-use
- Goods outwards: disposal of waste

2 *The servery circle.* Crockery and cutlery, whether recyclable or disposable, has to be processed:

- Goods inwards; supplies purchased
- Storage
- Processing
 - servery: food added to dishes
 - moved to table; food moves to circle 3.
 - returned from table – dishwashing
 - storage for re-use
- Goods outwards: breakages and disposables.

One of the main decisions in a food system is whether the customers have access to the servery: In cheap establishments they do: it is self-service, though returns may be handled by staff. In higher-class ones, they do not: waiters carry plates from the servery to the table. Consequently, the servery will be placed either outside or inside the kitchen.

3 *The customer circle.* The customer is also processed:

- Customers inwards: parking, reception, cloakroom.
- Storage: bar, waiting area
- Processing
 - food transferred from circle 2
 - drinks provided
 - billing and payment
- Customers outwards, coats returned.

The space provided for the customer varies from very little in fast-food shops to considerable in the highest-class restaurants. The bill will vary too. Food is not the only thing being sold. Part of the charge will go towards space or entertainment.

3 PUBLIC AREAS

3.01

Detailed planning is complicated. Reference should be made to specialist publications such as *Restaurants, Clubs and Bars* by Fred Lawson (see Bibliography). Only the briefest outline can be given here.

3.02 Seating areas and table arrangements

There are significant differences in seating arrangements depending on:

- Types of customer: price level, expectations
- Type of establishment: self-service, waited service, counter seating
- Grouping: table sharing, flexibility of arrangement
- Room characteristics: shape, obstructions, windows.

Furniture falls into four categories:

- Fitted counters or bars
- Fixed tables, usually pedestal or cantilevered
- Movable tables, with legs or pedestals
- Stackable tables

Area required per diner for various table arrangements is given in Table I. Various layouts are given in 18.1. Formal dinner and banquet arrangements are given in 18.2 and 18.3. An area for a band platform is shown in 18.4.

Minimum reasonable sizes for tables are given in Table II and 18.5. Upmarket restaurants will need to be more generous. Table height is about 760mm. Tables just for drinking can be smaller, 18.6 and 18.7.

Arrangements of tables are shown in 18.8 and 18.9. Table legs may inhibit the storage of chairs when not in full use, 18.10. Sizes of chairs are given in 18.11.

Table I Space allowances

Type of seating and service	Area per diner (m ²)
Commercial restaurants	
<i>Table service</i>	
● Square tables in rows	
Parallel seating 2	1.7 to 2.0
Parallel seating 4	1.3 to 1.7
Diagonal seating 4*	1.0 to 1.2
● Rectangular tables in rows	
Seating 4	1.3 to 1.5
Seating 6	1.0 to 1.3
● Circular tables in rows	
Seating 4	0.9 to 1.4
<i>Fixed banquet seating</i>	
● In booths seating 4	
Waitress service	0.7 to 1.0
Including counter for self service	0.9 to 1.4
<i>Counter seating</i>	
Tunnel counters	1.4 to 1.6
Single counters	1.7 to 2.0
Single counters used with wall units	1.2 to 1.5
<i>Banquet groupings</i>	
Multiple rows	1.0 to 1.2
Single row	1.1 to 1.4
<i>Self-service (trolley clearance)</i>	
Rectangular tables in rows	
● Dining area only	
Seating 4	1.5 to 1.7
Seating 6	1.2 to 1.4
Seating 8	1.1 to 1.3
● Including counter area	
Seating 4	1.7 to 2.0
Seating 6	1.3 to 1.8
Seating 8	1.2 to 1.6
<i>Self-service (self-clearance)</i>	
Rectangular tables in rows	1.3 to 1.5
● Dining area only	1.0 to 1.2
Seating 4	1.3 to 1.5
Seating 6	1.0 to 1.2
Seating 8	0.9 to 1.1
● Including counter service	
Seating 4	1.5 to 1.9
Seating 6	1.2 to 1.6
Seating 8	1.1 to 1.5
Canteens (industrial and office)	
Cafeteria service, tables for 4 to 6	1.1 to 1.4
Cafeteria service, tables for 8 or over	0.74 to 0.9
School dining rooms	
<i>Primary schools</i>	
Counter service	0.74
Family service	0.83
<i>Secondary schools generally</i>	
	0.9
<i>Colleges of further education</i>	
	1.1

* Economy in space is obtained with tables at 45°

In self-service restaurants tables will need to be in orderly lines with wide aisles to allow easy circulation access with trolleys for collecting returns. In waited restaurants a more flexible layout is desirable, but circulation flows of staff and customers must not conflict. Typical table arrangements are shown in 18.12; where banquettes are used in 18.13. Service tables, trolley parks and cash desks must also be accommodated.

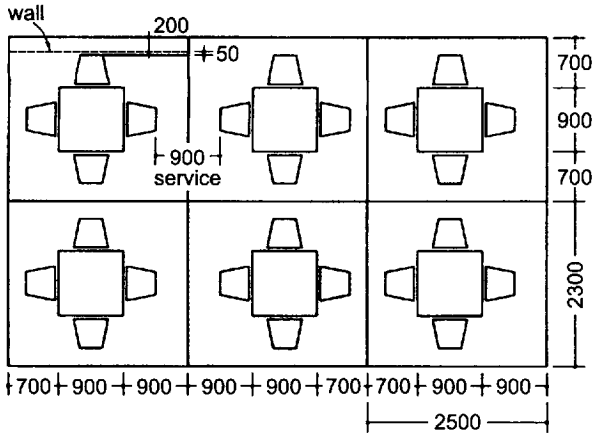
3.03 Snack bars

Where meals are eaten at a counter, dimensional requirements are shown in 18.14. Large short-order facilities can be planned as 18.15.

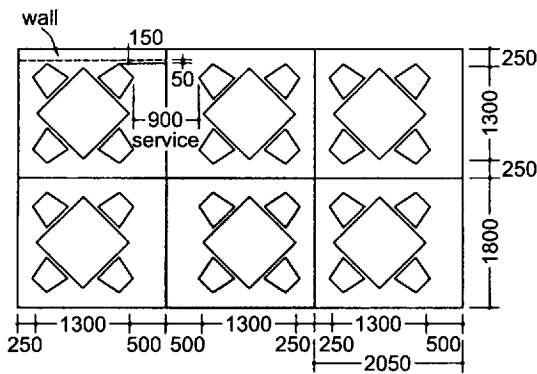
4 KITCHENS

4.01 Size and type

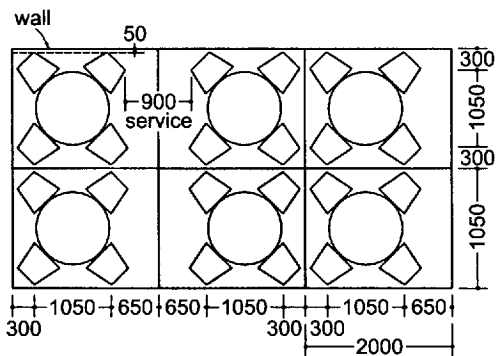
Kitchen sizes depend on the number of meals served at peak periods of the day: normally lunch, but in some cases dinner. A kitchen for a residential or commercial restaurant serving a varied menu over a long period will be larger than a school or factory kitchen serving a limited menu only at set times for the same



a Square tables, square layout, local density 1.4 (in m^2 per diner)

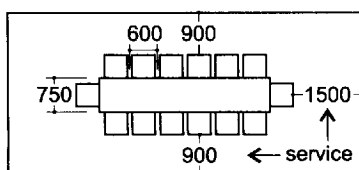


b Square tables, diagonal layout, local density 0.92

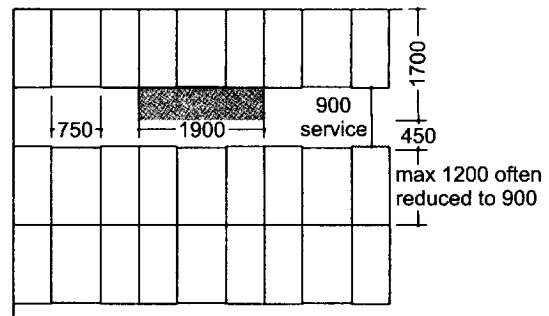


c Circular tables, diagonal layout, density 0.82

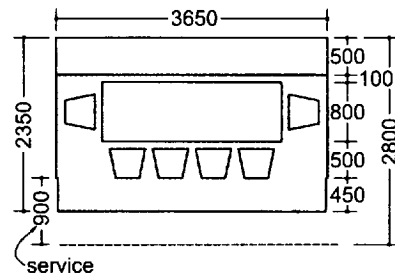
18.1 Layouts for restaurant tables:



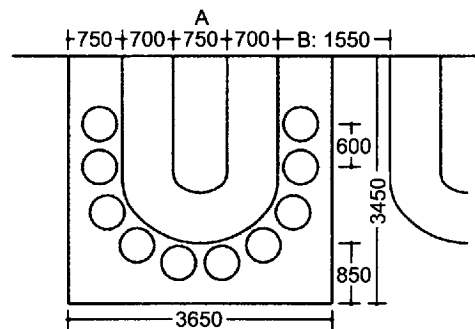
18.2 Small formal dinner arrangement



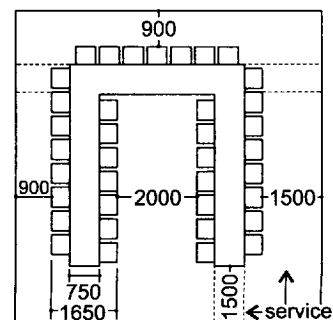
d Banquette seating in booths, density 0.8



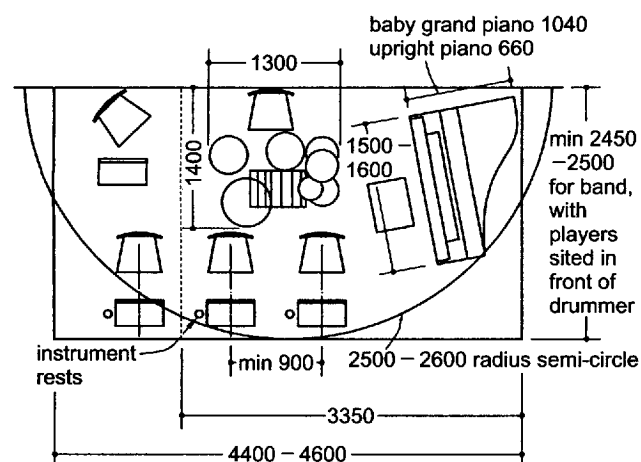
e Large booth in recess, density 0.86 for 10 people, or 1.1 if only two people sit on bench seat



f Counter service, density 1.26. (Dimensions A and B are increased where more than one waiter is employed)



18.3 Banquet layout. The U arrangement can be extended in both directions to the limits of the banquetting room



18.4 A band platform

	number of seats							
	1	2	3	4	5	6	7	8
A		□		□		□		□
B			□		□		□	
C				□		□		□
D	□	□	□					
E		□	□					
F			□					
G		□						
H	□							
I		□						
J								□
round	○	○	○	○	○	○	○	○

18.5 Tables for various numbers of people (to be read together with Table II)

Table II Table sizes for one to twelve diners (to be read in conjunction with 18.5)

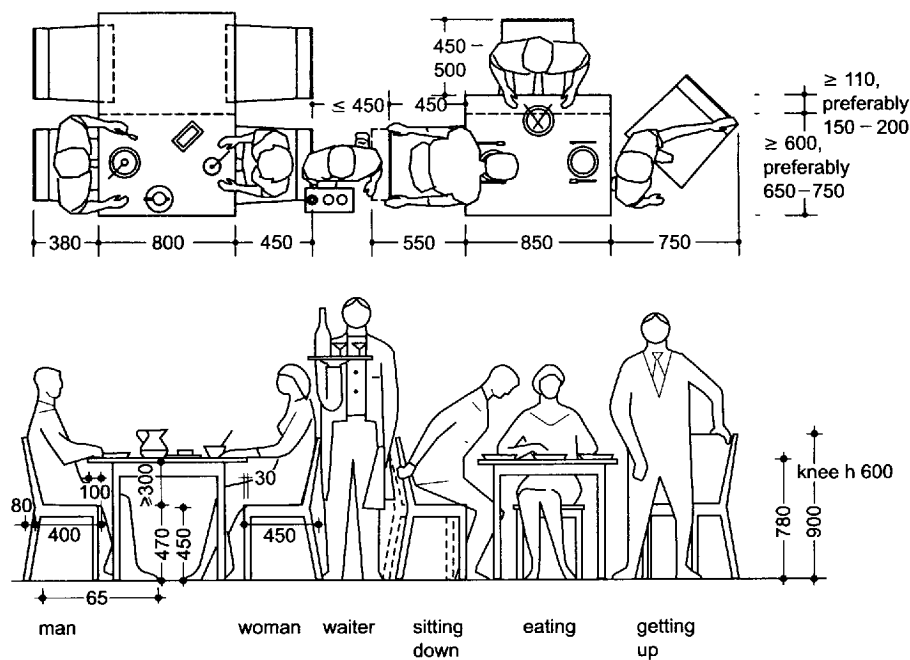
Table type		Length of table in mm for widths of table in 50 mm increments															Round
No. of persons	Row	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	Diam. (mm)
1	D	950	900	850	750	700	650										750
	H				750	700	650										
	Round																
2	A								750								850
	E				950	900	850	800	750								
	D	1350	1250	1150	1100	1100	1100	1100									
	G				950	900	850	800	750								
	I	1300	1250	1050	950	900	850	800									
	Round																
3	B								950	850							950
	D	1800	1700	1700	1700	1700	1700	1700									
	E				1350	1350	1350	1350	1300	1100	1100	1100	1100	1100	1100		
	F				1250	1200	1100	1050	950	900	850						
	Round																
4	A								1150	1100	1100	1100	1100	1100	1100	1100	1050
	C								1100	1050	1000	950	900				
	Round																
5	B								1350	1350	1300	1300	1250	1200	1100	1100	1100
	Round																
6	A								1700	1700	1700	1700	1700	1700	1700	1700	1200
	C								1550	1550	1550	1450	1400	1250	1250	1200	
	Round																
7	B								1850	1800	1750	1750	1700	1700	1700	1700	1300
	Round																
8	A								2300	2300	2300	2300	2300	2300	2300	2300	1500
	C								1950	1900	1850	1750	1700	1700	1700	1700	
	J															1600	
	Round																
9	B								2400	2400	2350	2300	2300	2300	2300	2300	
10	A								2850	2850	2850	2850	2850	2850	2850	2850	
	C								2550	2500	2400	2350	2300	2300	2300	2300	
11	B								3000	2950	2950	2900	2850	2850	2850	2850	
12	A								3450	3450	3450	3450	3450	3450	3450	3450	
	C								3100	3050	3000	2900	2850	2850	2850	2850	

number of seats	table size: drinking mm	table size: eating mm
1	450 to 600	600 to 700
2	600 square	750 square
4	750 square	900 × 950 1500 × 750
6	—	1400 × 950 1700 × 750
8	—	1750 × 900 2300 × 750

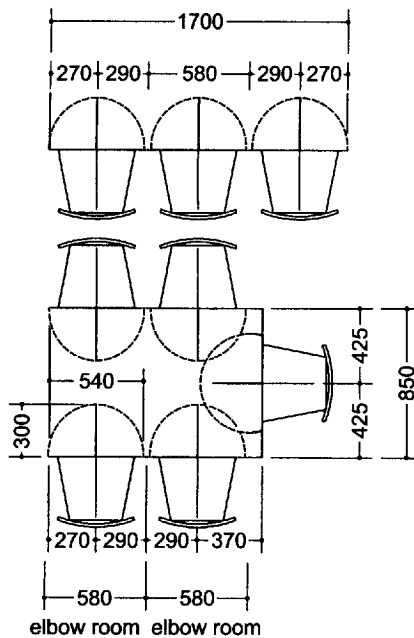
18.6 Recommended rectangular table sizes relating to place numbers

number of seats	table size: drinking mm	table size: eating mm
1	450 to 600	750
2	600	850
4	900	1050
6	1150	1200
8	1400	1500

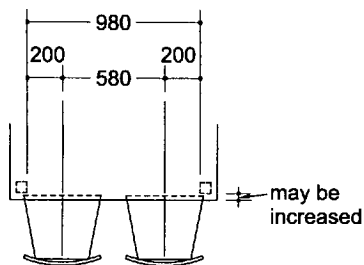
18.7 Recommended circular table sizes for various place numbers



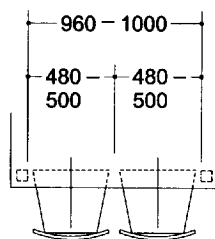
18.8 Restaurant critical dimensions



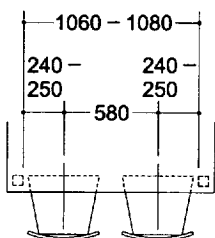
18.9 Area required by an individual diner



a Allows comfort for diners, but chairs cannot be pushed under tables

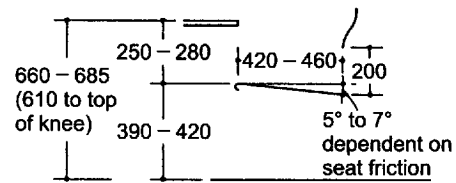


b Allows stowage of chairs

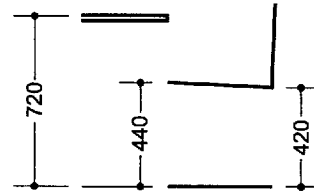


c Chairs can be pushed inside table legs when diner comfortably seated

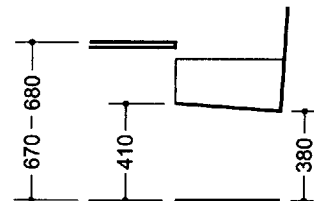
18.10 Obstruction by table legs:



a Dr Akerblom's recommendations



b Chair without arms to Erik Berglund's recommendation



c Chair with arms to Erik Berglund's recommendation

18.11 Heights of chairs and tables:

number of people. As an approximate guide the ratio of dining to kitchen area will vary between:

- 3:1 where only one sitting
- 1:1 where two or three sittings per meal.

A 'finishing kitchen' for the cooking or heating up of 'convenience foods' will be smaller than the equivalent conventional kitchen, in which all the preparation and cooking processes are carried out. Typical requirements for a finishing kitchen are given in Table III. The ratio of total kitchen area to area required for servery, stores offices and staff facilities, 18.16, will vary between:

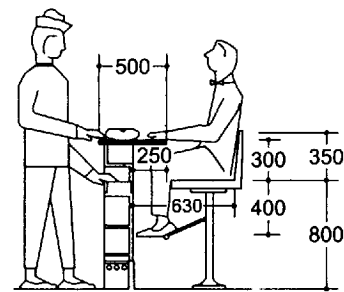
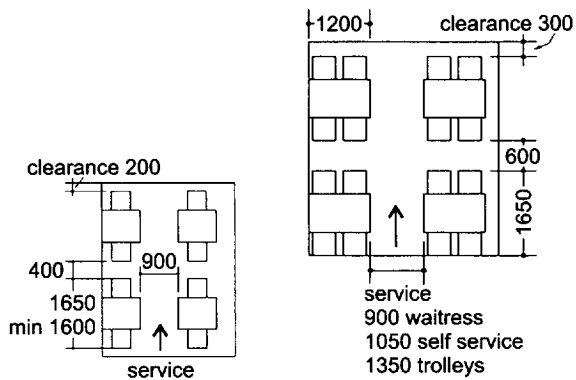
- 2:1 for conventional kitchens
- 1.5:1 for finishing kitchens as finishing kitchens have less preparation space.

4.02 Staff accommodation

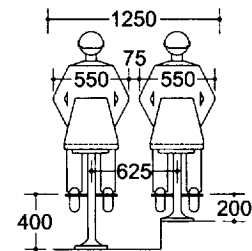
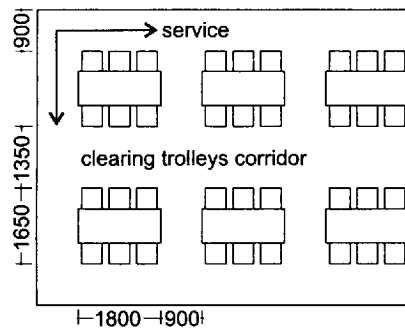
The employee ratios vary widely with the type of establishment. The average for commercial restaurants is 7.6 seats per employee. The number of meals sold per week per employee varies from 62 to 81 for full-menu table service to 151 for limited-menu table service to 234 for fast-food outlets. The peak number of employees may be relevant. The ratio of total employees to meals served over the peak period of is one employee to: 8 meals in full-menu table service, 20 meals in limited-menu table service and canteens, and 33 in fast-food outlets.

4.03 Safety and security

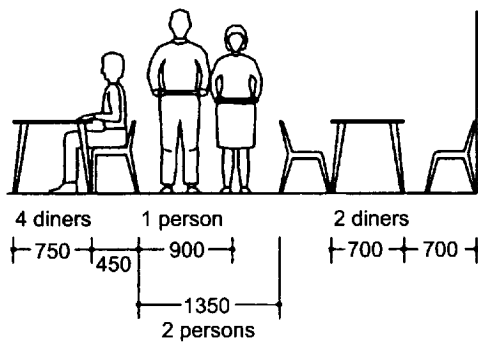
The Safety at Work Act will apply to kitchens. There will be risks to be guarded against from burns, scalds, cuts, bruises, breakages and electric shocks. All the usual fire protection will be necessary: self-closing smoke-control doors will be needed between the kitchen and dining room.



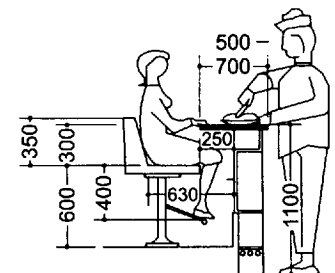
a High bar stool



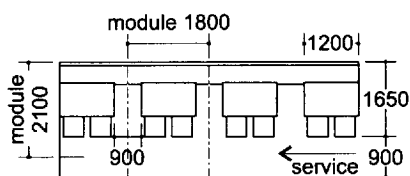
b Bar stool spacing



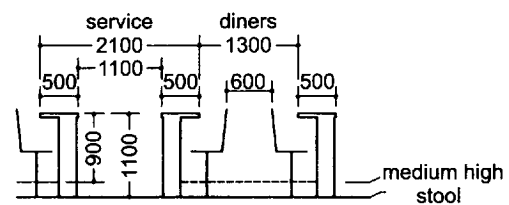
18.12 Minimum space between tables to allow for seating, access and circulation



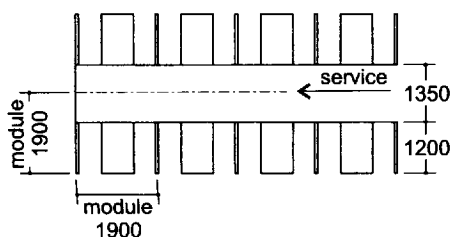
c Medium-height bar stool



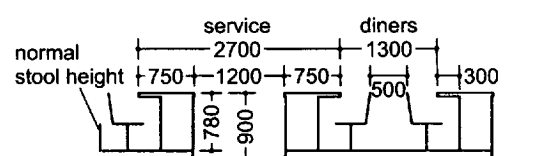
a Banquette seating along a wall



d High-density counter service

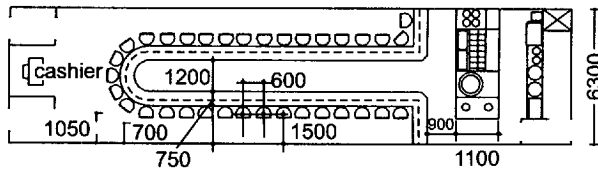


b Booth seating with banquettes

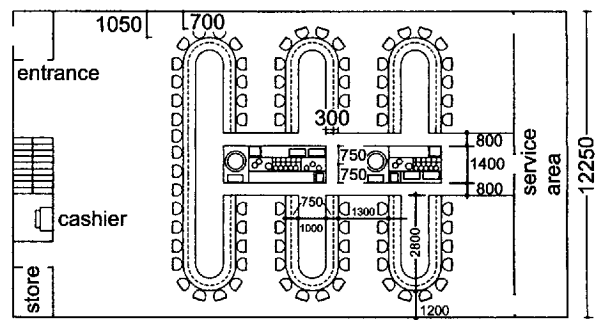


e Medium-density counter service

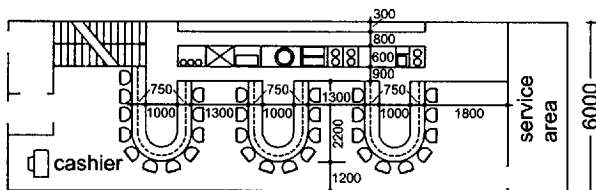
18-8 Eating and drinking



a Long U-form counter



c Paired U-form counters



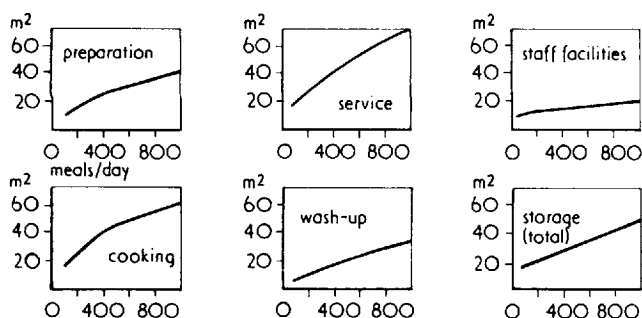
b Multiple short U-forms counter

18.15 Counters for short-order restaurants

Table III Finishing kitchens for pre-cooked frozen meals

Area	Equipment		Meals served per day – based on main meal period						
			50	100	200	400	600	800	1000
Goods entry	Scales capacity	kg	12.5	12.5	25.5	25.5	25.5	25.5	25.5
	Trolleys for frozen meal trays and general use		2	2	3	4	5	6	7
Cold stores	Deep freeze room								
	(based on 7-day stock)	m ³	1.3	2.5	5.0	10.0	15.0	20.0	22.0
	Normal cold room	m ³	0.3	0.5	0.9	1.2	1.5	1.9	2.2
(based on daily delivery of dairy produce, otherwise 3 deliveries per week)									
Dry stores	Shelving – width 450 mm								
	length	m	6.1	9.1	15.2	21.3	27.4	33.5	39.6
(for canned and dried items, 3 deliveries per week)									
Kitchen	Convection oven capacity	m ³	0.09	0.18	0.37	1.02	1.10	1.47	1.84
	(based on reheating all frozen meals in 1 hour, ie 2 reheatings of average 30 minutes each)								
	Boiling tank or pressure steamer								
	(For 'boil-in-the-bag' food where this is to be used. Provision depends on type of equipment, e.g. rotating boiling tank 100 mm (40") diameter produces a total of 120 bags/hour in 4 reheatings of approximately 15 minutes each)								
	Microwave oven								
	2 kilowatt units		1	1	1	1	2	2	3
	(Depends on number of snacks required and availability of alternative call-order equipment. Based on 30-second cycle of reheating with 4 snack items/loading)								
	Supplementary equipment								
	Griller	m ²	0.2	0.2	0.3	0.4	0.5	0.7	0.9
	(For call order grills and toast. Based on surface area)								
Wash-up (crockery, cutlery, etc.)	Griddle	m ²	0.2	0.3	0.4	0.5	0.7	0.8	1.0
	(for snack catering, particularly at breakfast)								
	Fryer	kg/hr	10	25	45	90	135	180	225
	(for 'flashing off' blanched frozen meals. Based on 15 minutes use before and 15 minutes during meal period)								
	Boiling rings	No	2	2	3	4	5	6	7
	(for reheating of canned vegetables, soups, etc)								
	Wash-sterilising unit	m	2.7	3.4	3.7				
	length for dishwashing								
	Capacity of machine	pieces/hr			1200	2400	3600	4800	6000
	Sink for serving dishes, etc								
Wolverhampton, October 1969. Based on equipment by Stotts of Oldham	(length)	mm	600	600	750	900	1050	1200	1200
	Burnishing machine		—	—	—	hand	hand	hand	hand
	Waste disposal units		1	1	1	1	2	2	2
	(based on 550 W machines assuming part refuse collection. For complete waste disposal 2230 W units employed)								

Source: Paper by D. J. Cottam given to Catering Teachers Association Annual Conference
Wolverhampton, October 1969. Based on equipment by Stotts of Oldham



18.16 Kitchen space requirements for various functions

- a Preparation
- b Service
- c Staff facilities
- d Cooking
- e Washing up
- f Storage (total)

Control of all accesses to the building will be advisable to reduce pilferage, owing to the value of the stocks. Substantial locks, doors and door-frames will be needed, and facilities for checking deliveries.

4.04 Goods access

For sizes of vehicles see Chapter 4. Typical delivery arrangements are:

- Dry goods: weekly or fortnightly
- Frozen food: weekly
- Vegetables: twice weekly
- Perishable foods: daily
- Refuse and waste removal: daily

Bulk refuse containers may be used instead of bins. These are 0.57–0.85 m³ capacity. Refuse may be sited in a refrigerated area to reduce nuisance from odour and flies, at a temperature of 2–5°C.

4.05 Storage area

Typical storage areas for conventional kitchens are given in 18.17 and in 18.18. Racks for storage of containers should approximate to the heights and widths of the containers to be stored allowing about 50 mm between packages for easy access. The top shelf should not be higher than 1950 mm, 18.19. Shelves and open bins must be kept at least 200 mm above the floor to allow a clear space for access and cleaning and to deter rodents. Shelves for frequently used or heavy items should be between 700 and 1500 mm high.

Containers may have to be returned to suppliers and space must be allowed for their storage and collection.

4.06 Preparation areas

Kitchen layout is determined by:

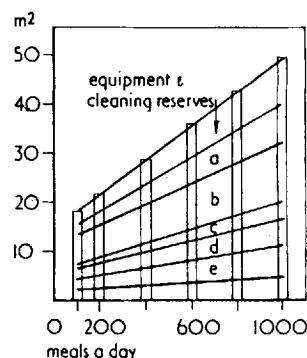
- The sizes of equipment and fittings
- Space for access and circulation.

Some typical dimensions are:

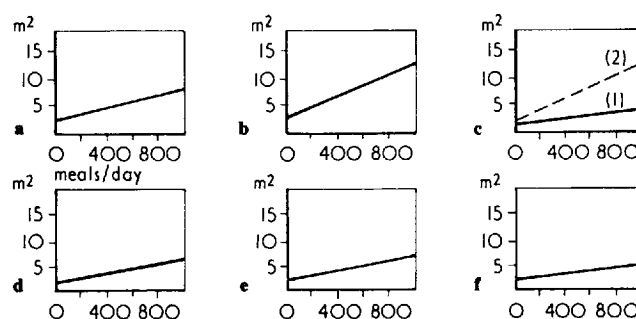
- Work top and sink top height: 900 mm (865 will do)
- Wall bench width: 600–750 mm
- Island bench or table width: 900–1050 mm
- Length of work area within convenient reach: 1200–1800 mm
- Length for two people working together: 2400–3000 mm.

There are usually four main areas of food preparation:

- Vegetables
- Meat and fish

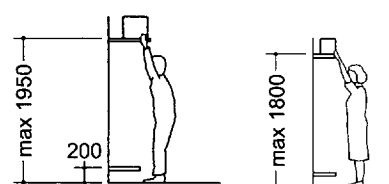


18.17 Total storage requirements in conventional kitchens, segments are covered in detail in 18.18

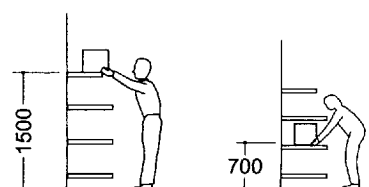


18.18 Storage space requirements. These figures are based on the number of meals per day in a modern conventional kitchen using a proportion of frozen foods. Where mainly pre-cooked frozen meals are used, a separate vegetable store may not be needed; more deep freeze space should be provided

- a Vegetable store for three deliveries per week
- b Dry goods store, three days' supply
- c Deep freeze, seven days' supply: (1) conventional use, (2) pre-cooked frozen meals
- d Cold room, daily delivery of perishable food
- e Goods entry area, including weighing and checking
- f refuse store where bins are used

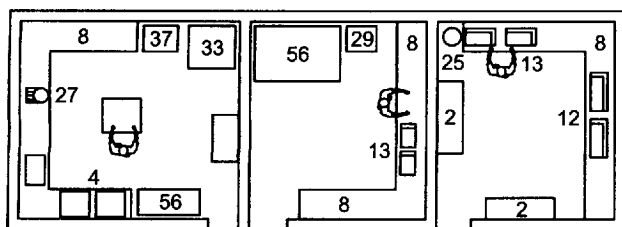
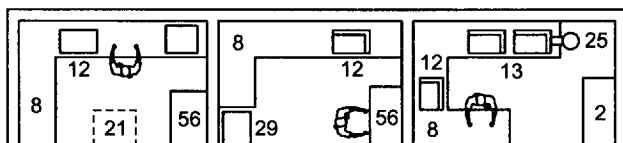
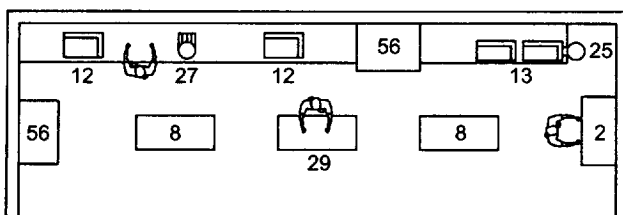


a Limits for maximum reach for men and women

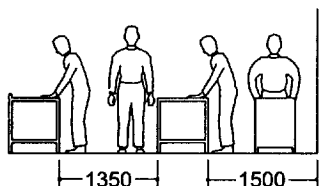
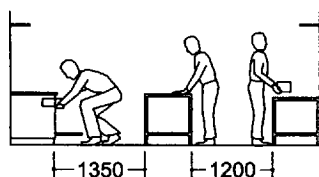


b Convenient reach for heavy or frequently used items

18.19 Heights for storage shelving

a *Separate rooms*b *Bays*c *Open plan kitchen*

18.20 Alternative preparation area arrangements (see 18.36 for key to numbers)



18.21 Minimum space between equipment for working and circulation

- Pastry
- General

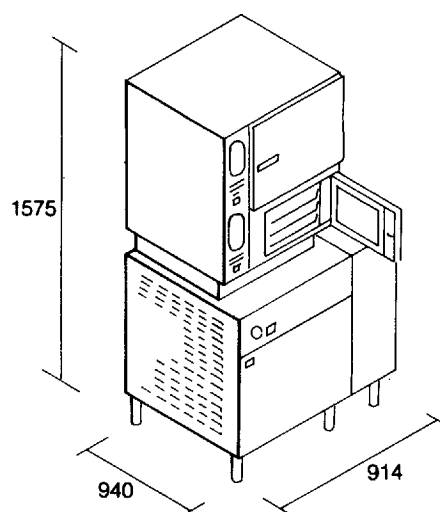
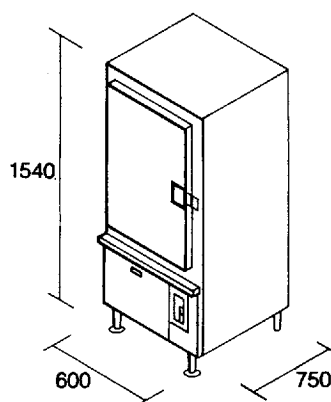
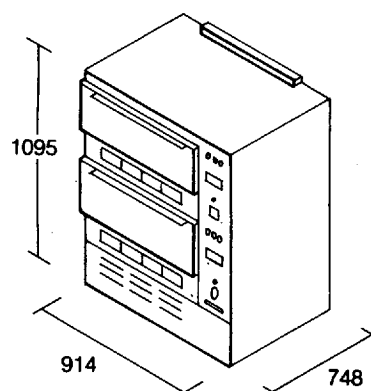
Preparation areas may be segregated by:

- Separate rooms adjoining the main kitchen
- Low walls, approx 1200 mm high between these areas and main kitchen
- The arrangement of benches and fittings. Alternative arrangements for preparation areas are shown in 18.20.

4.07 Cooking equipment

About 30 per cent of kitchen floor space is occupied by equipment, 10 per cent by worksurfaces and 60 per cent by circulation. Too little space will lead to obstruction and accidents. Too much will

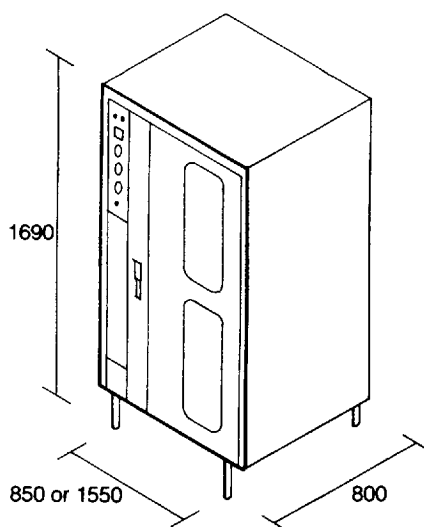
18.22 Kitchen equipment

a *Convection steamer with two compartments*b *Atmospheric steaming oven with steam generator in base*c *Tiered convection ovens, each 65 litres rated 8.8 kW*

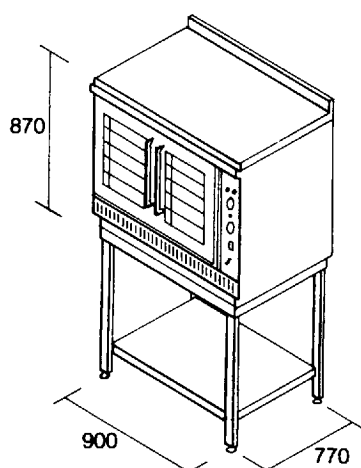
lead to extended lines of circulation causing wasted time, and increased cleaning, lighting and maintenance costs. Recommended dimensions are shown in 18.21.

Details of typical equipment are given in Tables IV and V. Some items are shown in 18.22. A typical kitchen layout is given in 18.23, with elevations of the equipment in 18.24.

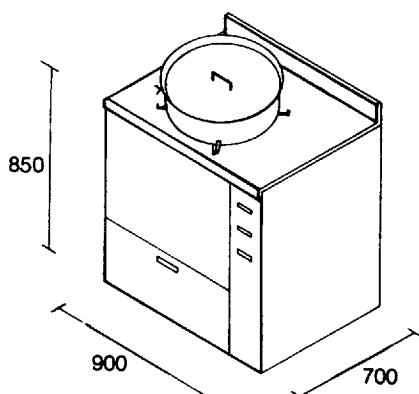
Placing equipment around the walls is common in smaller kitchens and leads to savings in engineering services. Island grouping will be necessary in larger kitchens: access for cleaning and maintenance is good, and the perimeter sites can be used for employees' workspaces. But island sites will need



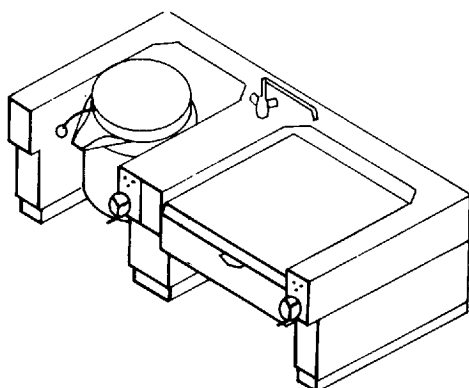
d Autoreverse convection oven



e Forced convection oven on stand, 145 litres, 9.2 kW

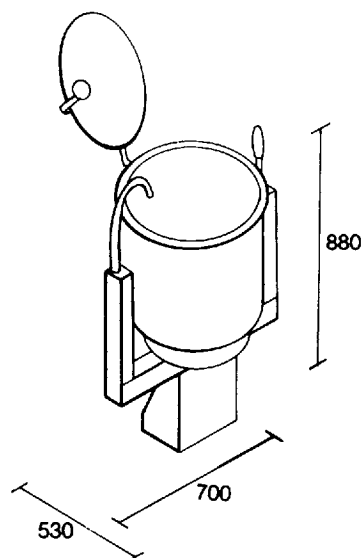


f Dual-purpose boiling pan, 90 litres. Direct fired or steam jacketed

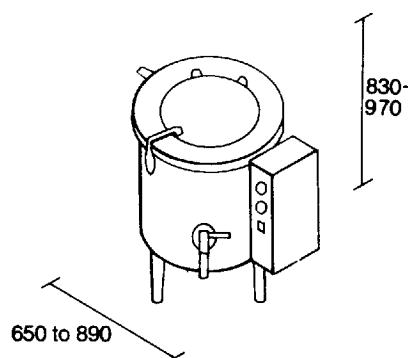


g Tilting kettle and braising pan console:

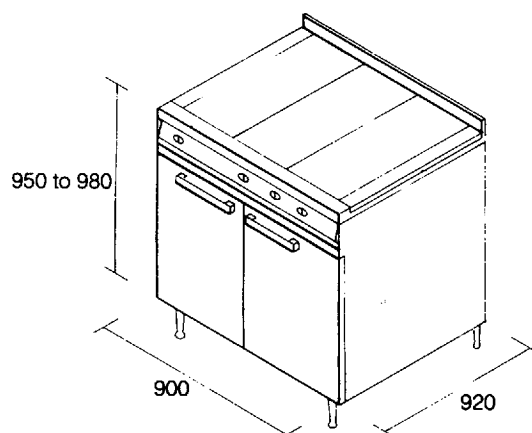
Unit width	Kettle	Bratt pan		
Capacity	Rating	Capacity	Rating	
1200 mm	70 litres	15 kW	68 litres	9 kW
1400 mm	200 litres	27 kW	89 litres	12 kW



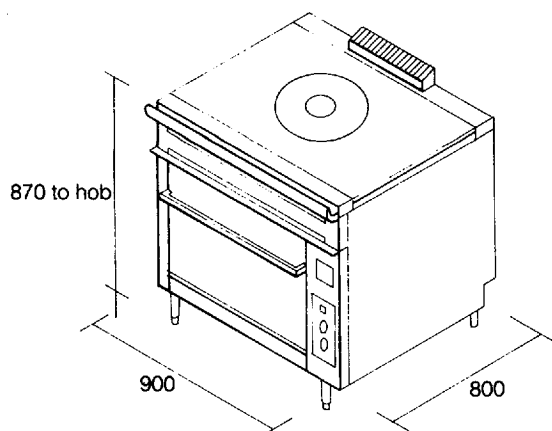
h Tilting kettle with swivel cold water feed, 40 litres capacity, electric or steam heated



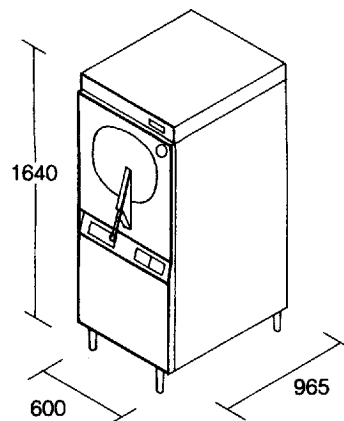
i Vacuum boiling pan with electric or steam heated jacket, 20, 90 or 135 litres



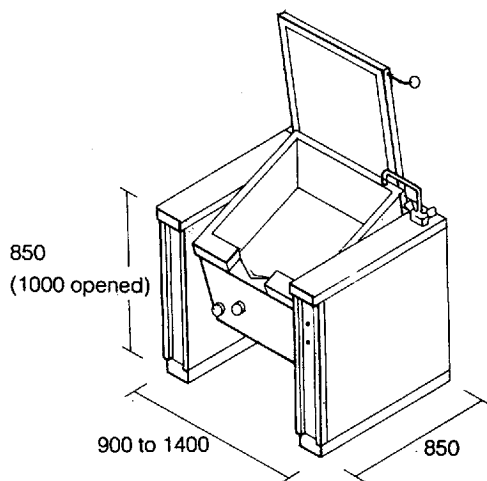
j Heavy-duty oven range, 200 litres, 18 kW (electric), hob with three solid hotplates or griddle plate



k Heavy-duty oven range, 150 litres, 16.5 kW, with drop-down door and solid hob top with tapered heat

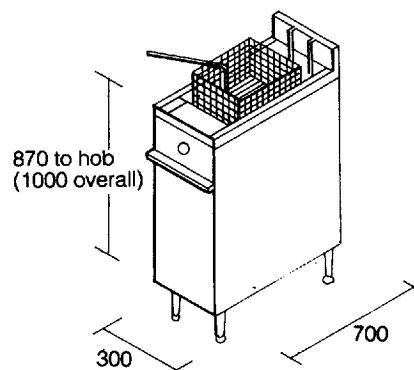


n High-pressure steamer on stand, 12 kW rating

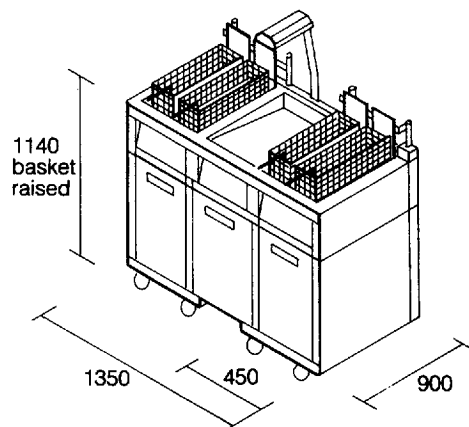


l Bratt or braising pan with pillar support:

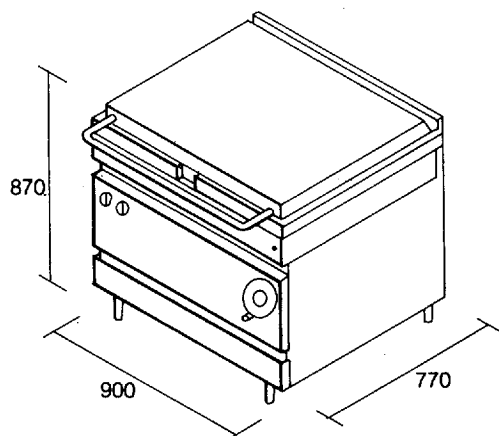
Capacity	Width	Rating
40 litres	900 mm	6.4 kW
80	1200	11.8
100	1400	14.8



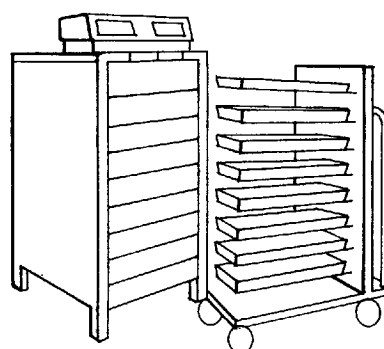
o Deep fryer with one basket 16 litres oil capacity, 9 kW. Output 22.7 kg chips per hour



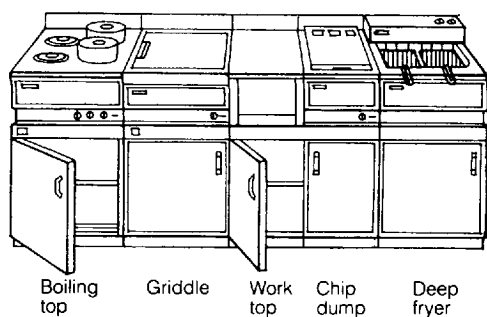
p Combination fast food fryer with dual deep fryers and central chip dump. Each fryer 21.5 kW. Automatic basket lifting, integral oil filtration



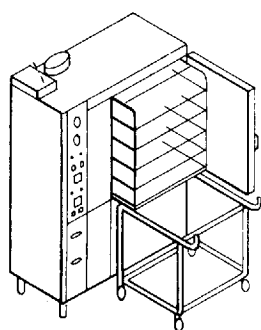
m Tilting Bratt pan with operating wheel and trunion



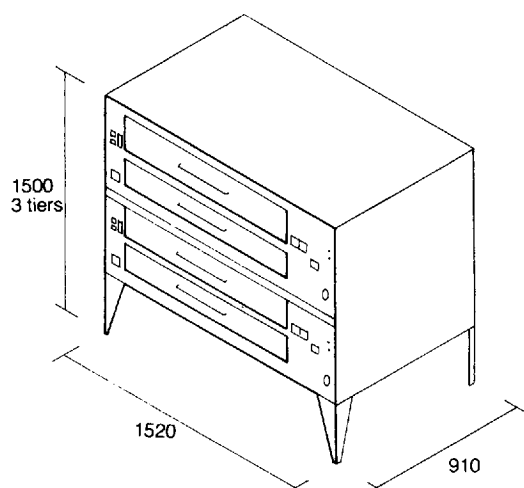
q Infrared (regethermic) oven system, 4.7 to 5.0 kW



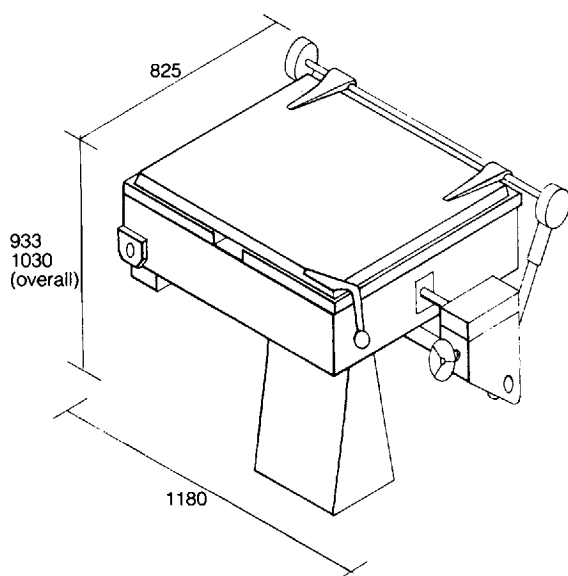
r Example of combined units with under-counter cupboards



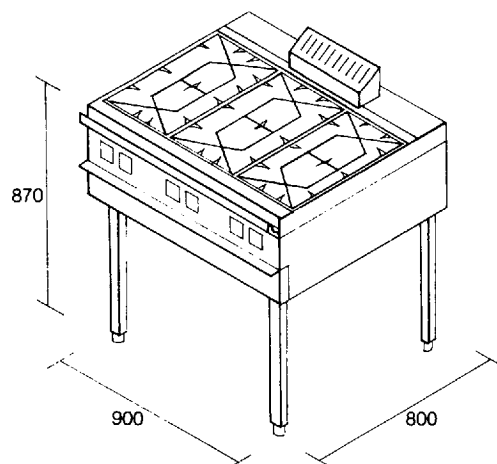
s Bulk loading system with mobile transporter



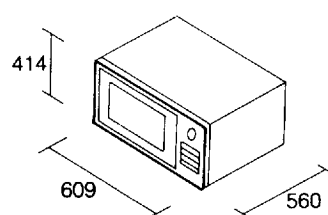
t Tiered pastry or pizza oven



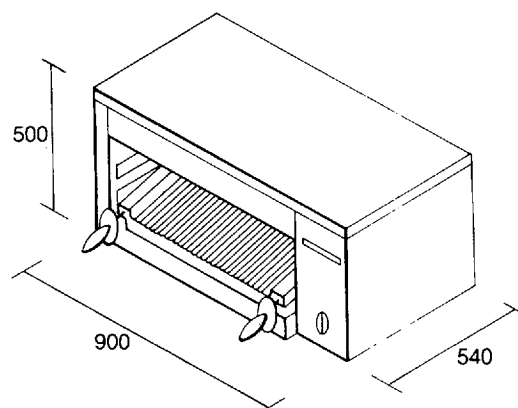
u Tilting bratt pan



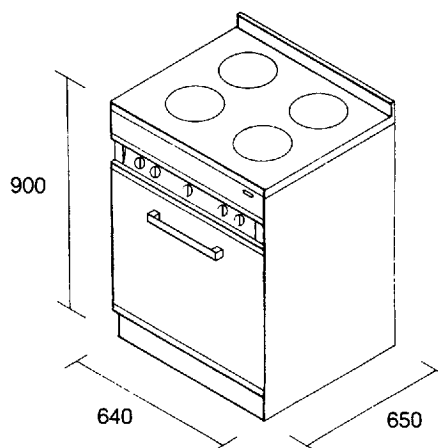
v Heavy duty boiling table with open gas burners



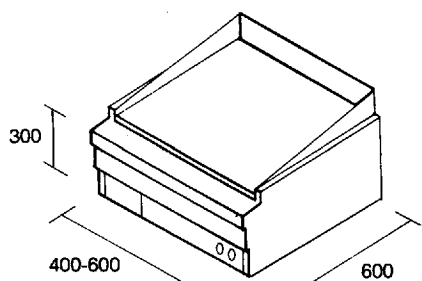
w Microwave oven, 2.6 kW supply, 1300 W output rings, 8 kW rating



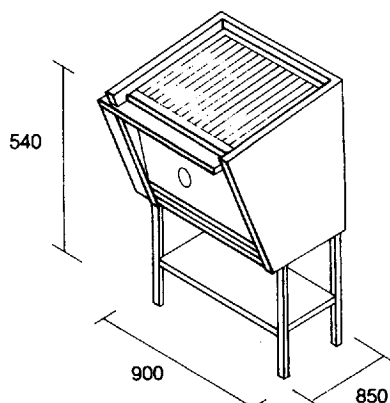
x Salamander grill, wall or stand mounted, 7.5 kW rating



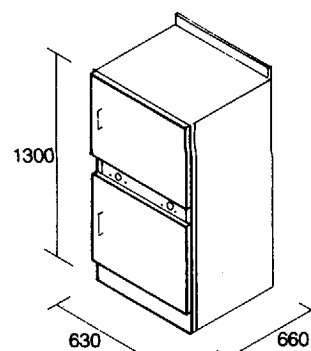
y Medium-duty oven range, 84 litres with four radiant rings, 8 kW rating



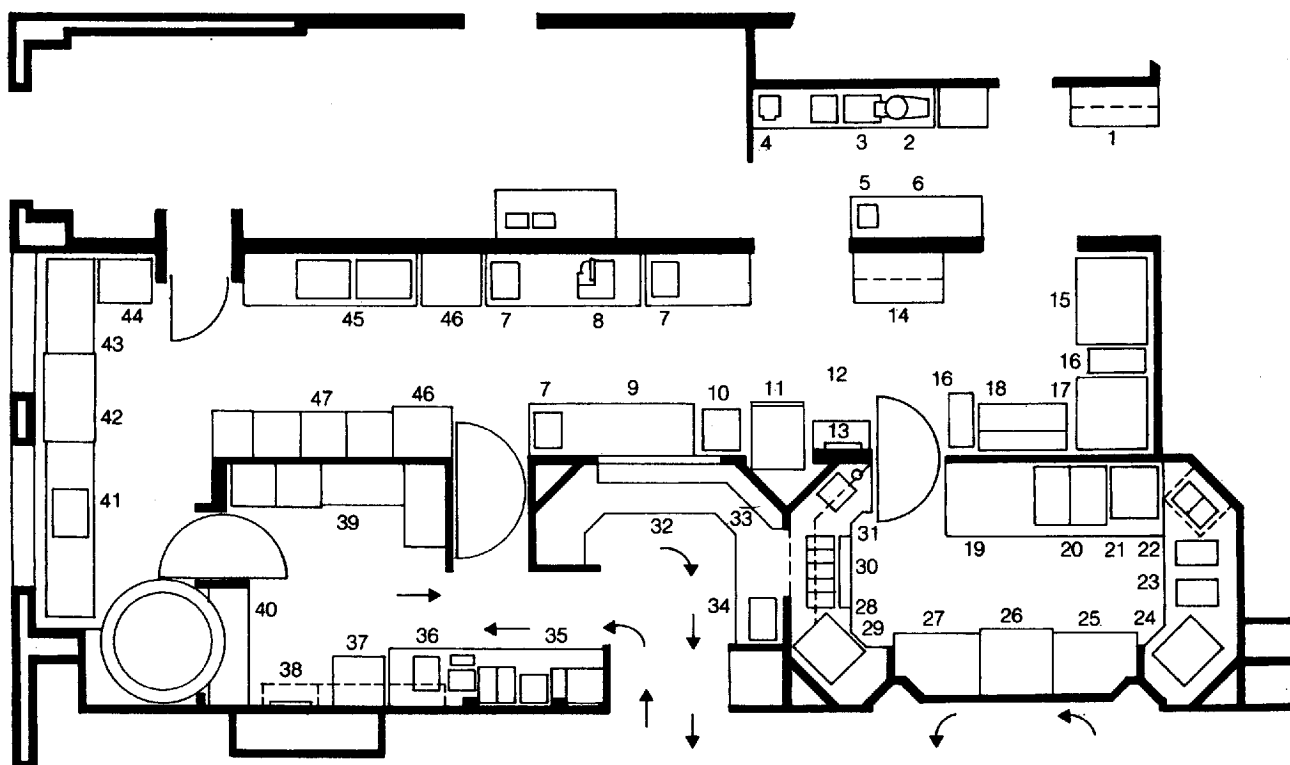
z Griddle, counter or stand mounted, 8 kW rating



aa Underfired grill, 37 kW



ab Two-tier general purpose oven each 80 litres capacity



Vegetable preparation area

- 1 Trolley
- 2 Potato peeler
- 3 Double sink
- 4 Cutter/chipper with knife rack
- 5 Vegetable mill, with blade rack
- 6 Mobile table

General preparation area

- 7 Workbench with sink and wall shelving
- 8 Meat slicer
- 9 Marble pastry slab with flour bins under bench
- 10 Food mixer
- 11 Refrigerator
- 12 Ultraviolet insect control (on wall)
- 13 Wash-hand basin

Main kitchen, primary cooking area

- 14 Mobile heated trolley
- 15 Mobile two-tier convection oven
- 16 Boiling unit
- 17 Two induction heaters
- 18 Mobile workbench with shelves over

Display kitchen – finishing area and servery

- 19 Tiled bench with access to time clocks and refrigerator valves
- 20 Two induction heaters over bench with chilled drawers
- 21 Boiling top
- 22 Grill/salamander mounted over tiled worktop with inset heated pans
- 23 Two fryers with chilled drawers under bench
- 24 Microwave convection oven on corner shelving
- 25 Tiled heated worktop over deep freeze cupboard
- 26 Gas broiler with shelving under
- 27 Tiled heated worktop
- 28 Tiled serving counter with shelf over
- 29 Microwave convection oven
- 30 Counter top with inset trays and cutting board
- 31 Inset sink and waste bin in corner recess

Pantry and beverage area

- 32 Fitted wall units
- 33 Two toasters
- 34 Large toaster over refrigerator
- 35 Beverage stand fitted with glass/cup racks and housing fruit juice dispenser, shake milk dispenser and two coffee machines
- 36 Water boiler stand with inset sink and drainer
- 37 Chest freezer
- 38 Wash-hand basin
- 39 Clean storage units

Dishwashing area

- 40 Carousel receiving unit with tray support shelf. Trolley bins under
- 41 Rack slide for soiled dishes with inset sink and basket shelves over
- 42 Conveyor dishwashing machine
- 43 Roller table for clean dishes
- 44 Mobile table
- 45 Double pot sink
- 46 Mobile pot racks
- 47 Mobile glass racks

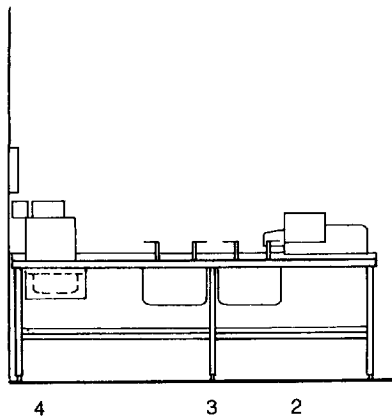
18.23 Kitchens of Post House Hotel, Sevenoaks

The plans of one of the latest Post House hotels illustrate the considerable advances made in food services equipment and planning in the 1980s. The facilities include separate main and display kitchens. Fortes, by far the largest hotel group in Great Britain, have also been a leading innovator in developing efficient systems of food production consistent with high quality. Development: Trust House Forte Ltd. Plans prepared by Stangard Ltd

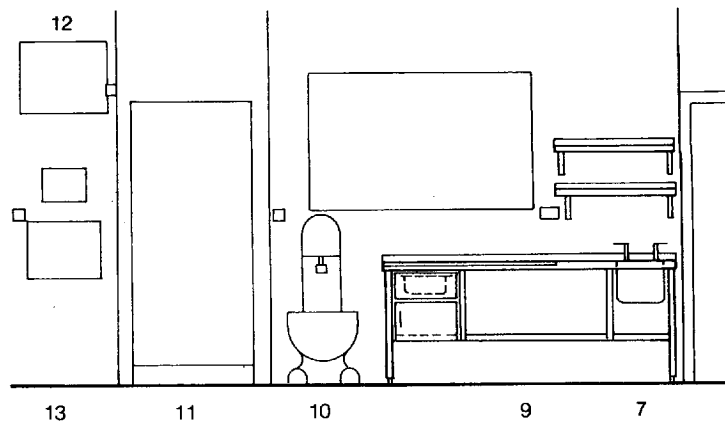
Table IV Kitchen equipment

Type	Main features	Typical size and rating		
Ovens	Transfer heat to food within an enclosure. May use hot air (circulated by natural or fan assisted convection), infrared or microwave emission	(s) – small units (m) – medium duty (h) – heavy duty		
General-purpose oven	Using hot air for baking, roasting or reheating. May be raised on stand or in tiers. Preloaded mobile racks used for speed and convenience. Working capacities: Trayed dishes 65–75 kg/m ³ (4–5 lb/ft ³) Poultry, meats 110–130 kg/m ³ (7–8 lb/ft ³)			
Oven range	Ovens combined with boiling hob top. Oven capacity based on shelf area. 0.015m ² (24 in. ²) per meal	(s) (m) (h)	80 l. 160 l. 200 l.	11 kW 14 kW 16 kW
Forced convection oven	Hot air circulated at high velocities up to 4.5 m/s (900 ft/min.) with directional flows to provide rapid heating, larger batch loadings, even temperatures. Normal cooking cycle: frozen food 25–35 min.	(s) (m) (h)	50 l. 110 l. 200 l. 300 l.	2.6 kW 6 kW 9.3 kW 13.3 kW
Pastry oven	Tiered shallow ovens to give uniform heating for baking, pastry, pizza, etc. Capacity based on area: 0.004 m ² (6 in. ²) per meal			
Roasting cabinet	Special cabinets for roasting meat, or mechanised spit roasting (poultry, joints, kebabs)			
Rotary or reel ovens	Specialised equipment for large-scale bakeries and continuous-cooking ovens			
Low-temperature ovens	For slow cooking of meat, etc. at 107°C (225°F) to reduce moisture loss. Specialist applications			
Microwave ovens	High-frequency (2450 MHz) alternating electromagnetic waves used to generate heat in dipolar molecules of food and water. Energy conversion factor high. Typical cooking cycle: 45–60 seconds (reducing with quantity)	(s) (m) (h)	20 l. 28 l. 28 l.	0.6 kW 1.3 kW 2 kW
Infra-red ovens	Interspaced rows of heating elements in quartz tubes emitting mainly radiant heat in waveband 1.5–5.0µm. Mainly used for reheating frozen food. Heating cycle 20–25 minutes			
Steam ovens	Free steam at or near atmospheric pressure: 3.5 kN/m ² (1/2 lb/in. ²). Used for large-scale catering	(m)	200 l.	9 kW
Pressure steamers	Pressure steam up to 103 kN/m ² (15 lb/in. ²) using jets for rapid heating of frozen food. May have option of free-vented steam	(m)		120 kW
Boiling and frying	May use loose pans and containers placed on or over external heat (gas burner, electric element, heated plate). Larger units incorporate heaters as part of design (with thermostatic control)			
Boiling tables	Usually provide four or six open burners or solid tops with tapered heat. Used as supplement or alternative to oven range	(s) (m)	2 ring solid	3.6 kW 11 kW
Halogen elements	Alternative to gas burners and electric radiant rings. Used in hobs to provide instantly adjustable heat output			
Induction heaters	Electromagnetic alternating currents of 25 kHz directed through ceramic hob. Used to induce eddying currents in steel pans producing indirect heating for boiling or frying	(s) (m) (h)	1 ring 2 ring 4 ring	3.6 kW 7 kW 14 kW
Boiling pans and kettles	Containers heated directly or indirectly (preferred). Emptied by tap or by tilting over drain. Output 45 litre pan: Root vegetables – 100–150 meals Soup – 150–200 meals	(m) (m) (h)	45 l. 90 l. 135 l.	7 kW 11.5 kW 14.5 kW
Bratt pans	Shallow tilting frying pans which are also used for stewing and braising. 150–350 mm (6–10 in.) deep. Mounted on trunnions for emptying	(m) (h)	0.28 m ² 0.44 m ²	6.4 kW 12 kW
Deep-fat fryers	Food immersed in heated oil. Frying temperatures typically 160–190°C (320–375°F). Fume extraction required. Cooking cycles: typically 6–7 minutes	(s) (m) (m) (h)	5 l. 7 l. 16 l. 20 l.	3 kW 5.8 kW 10 kW 20 kW
Pressure fat fryers	Fryer fitted with sealed lid. Operated at 63 kN/m ² (9 lb/in. ²), combining frying with pressure steaming of moisture. Output: 80–90 portions/hour			
Griddles	Shallow frying using surface contact with heated plate. Temperatures, 170–220°C (340–430°F)	(s) (m)	0.17 m ² 0.4 m ²	4 kW 7.5 kW
Grilling	Food exposed to elements emitting high intensity radiation in wave band 0.7–2.2 µm	(s) (m) (h)	0.1 m ² 0.25 m ² 0.27 m ²	3 kW 5.7 kW 7.5 kW
Salamanders, broilers	Top heating over food on grating or branding plates			
Grills, char-grills, char-broilers	Bottom heating using red hot tiles, plates, or charcoal. Fume extraction required. May be featured in display cooking			
Water boilers, beverage-making equipment	Includes boilers operated by steam pressure or expansion of water. May be installed in kitchen, in vending units, under service counter or as café sets. Capacity: Per litre 4–5 cups Per gallon 18–20 cups	(s) (m) (h)	28 l/h 48 l/h 68 l/h	2.8 kW 5.3 kW 7.5 kW
Holding units	Used to keep food hot or cold until served. Mainly incorporated into service counters			
Bains-marie	Heated well-fitted with loose containers (standardised sizes). May be dry or water filled. Thermostatically controlled at about 74°C (165°F)	(s) (m)	2 units 4/6 units	0.5 kW 2 kW
Chilled shelves, wells and plates	For cold storage and display of salads, dairy products and prepared sweets. Usually incorporates under-counter refrigerator. Temperature about 3.5°C (37–41°F)			
Hot cupboards	Heated cabinets to keep plates and food warm prior to service. May be under-counter units, pass-through cabinets or mobile. Temperature kept at 76–88°C (170–190°F). Capacity: Standard 1,200 mm (4ft) counter unit holds about 300 plates	(m) (m)	1.2 m wide 1.8 m wide	3 kW 4.5 kW

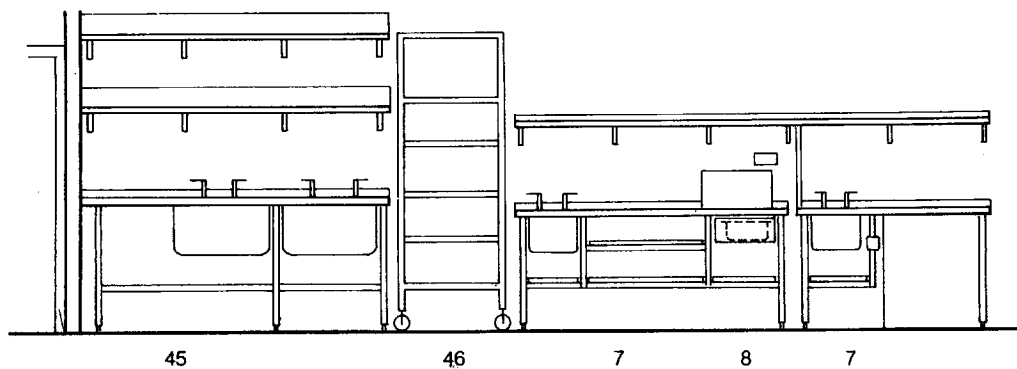
18-16 Eating and drinking



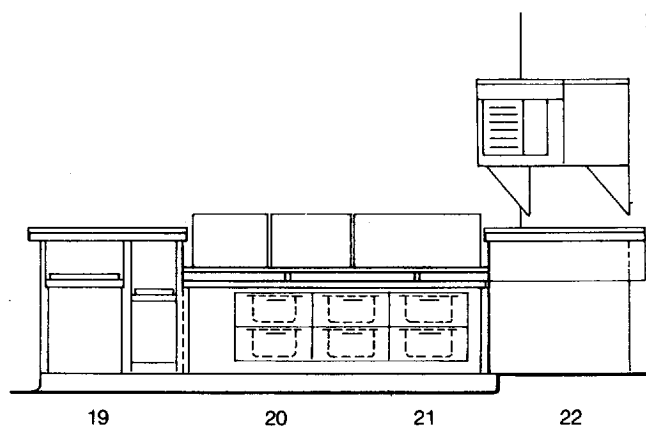
a Vegetable preparation area



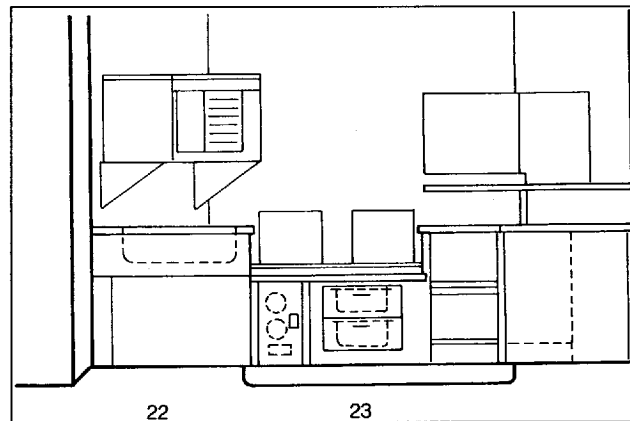
b General preparation area



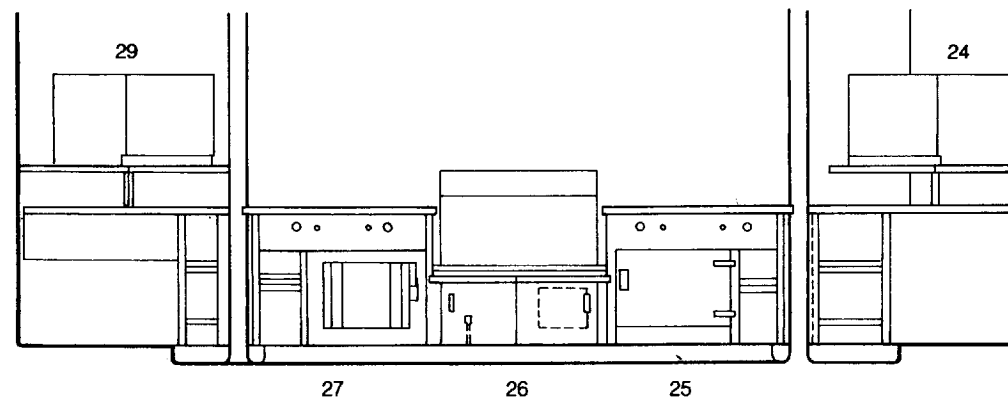
c Potwash and preparation area



d, e Display kitchen, finishing area and servery



f Display kitchen, finishing area



g Beverage counter

18.24 Elevations of installed kitchen equipment:

Table V Ovens and cooking equipment sizes and capacity

Oven type and capacity (m ³)	Internal* size (mm)	External* size (mm)	Loading (kW)
Oven ranges			
0.113	530 × 460 × 460	760 × 810 × 870	11–14
0.142	600 × 600 × 400	910 × 870 × 870	12–15
Forced-air convection ovens			
0.113		810 × 810 × 870	8
0.198		1020 × 910 × 1370	10–12
0.283		1120 × 1170 × 1580	13–15
Pastry ovens			
1 deck	760 × 610 × 230	960 × 1090 × 1380	14.4
2 deck	760 × 910 × 230	1270 × 1090 × 1680	14.4
Roasting cabinets			
0.48	610 × 660 × 1220	1170 × 910 × 1600	8.5
0.85	840 × 760 × 1320	1400 × 1020 × 1680	12
Atmospheric type steaming oven			
0.17	450 × 530	770 × 840 × 1520	6
Boiling tables			
(Consult individual manufacturers for number of plates etc.)		1220 × 760 × 860	12.4
		1680 × 760 × 860	21.2
		2130 × 760 × 860	30.2
Gas-fired boiling pans			
45 litres		910 × 990 × 760	7
90 litres		1040 × 1120 × 840	11
135 litres		1190 × 1240 × 860	14.2
180 litres		1190 × 1300 × 910	16.5
Tilting kettle			
40 litres		760 × 510 × 860	7.5
Deep fat fryers			
Single unit		910 × 810 × 880	15.8
Double unit		1830 × 810 × 880	31.5
Shallow tilting frypan		1180 × 820 × 930	12
Grillers			
Grill area			
410 × 380 × 230		610 × 510 × 510	4
560 × 380 × 230		760 × 510 × 510	5
760 × 380 × 230		840 × 560 × 510	7

* Width × depth × height

canopies and mechanical ventilation, as well as all other services, which will lead to increased costs. The minimum aisle width is 1050mm, but may need to be up to 1500mm to accommodate cooker door swings or if trolleys are used.

4.08 Dishwashing

Dishwashing is expensive in terms of space, equipment, labour and energy. It is possible to use disposables, but there is an image problem, and the cost of the disposables may be high. Also the waste generated may require a compactor.

Methods of collection of used dishes include: self-removal, trolleys or table collection. This must be decided at the initial planning stage. Trolleys will require aisles minimum 1050mm wide.

Manual dishwashing in a double sink can cope with a maximum of 50 meals per hour. Machines are of various sizes and can deal with 100 to 1000 meals per hour. Space is required for the loading and unloading of the racks that run through the machine, and for storing the crockery.

Typical sizes of tableware are given in Table VI. Allowances for dishwashing spaces are shown in Table VII. Dishwashing equipment is shown in 18.25.

4.09

An elaborate kitchen designed for a variety of types of cuisine is shown in 18.26, while a much simpler example is given in 18.27.

Table VI Range and sizes of tableware in general use

Type	Range	Size (rounded)
<i>Pots</i>	Tea	430, 570, 850, 1140 ml
	(related to cups and pint sizes)	
<i>Jugs</i>	Coffee, hot milk/water	280, 570, 850, 1140 ml
	Cream	30, 40, 70 ml
	Milk	140, 280, 430 ml
<i>Cups</i>	Tea	170, 200, 230 ml
	Coffee (demi-tasse)	110 ml
<i>Saucers</i>	Size related to cups but should be interchangeable	
<i>Plates</i>	Side	165, 180 mm
	Dessert	190, 205 mm
	Fish/dessert	215, 230 mm
	Meat	240, 255 mm
	Oval meat	240, 255 mm*
<i>Bowls</i>	Cereal/fruit	155, 165 mm
	Sugar	90 mm
	Soup	215, 230 mm

* Usually maximum size for a dishwashing machine

Table VII Allowances for dishwashing spaces (intermittent use)

Area/activity	Space (mm)
Collection area for unsorted table ware prior to sorting and scraping	600 length per 10 meals* Minimum 900 Maximum 2400
Stacking area for tableware sorted and stacked for manual washing	300 length per 10 meals† Minimum 900 Maximum 3600
Loading onto racks for machine washing	Depends on rack/basket size Minimum 1000
Draining and drying in racks or baskets after washing and sterilising	Manual process and brush type machines: Minimum 1200 Conveyor or spray type machines up to 3600
Unloading baskets and racks for clean crockery awaiting removal	100 length per 10 meals Minimum 600 Maximum 2400
Spray-type machines with mechanised conveyor systems	Space occupied by machine conveyor system
Rotary conveyor type (600–1000 meals/hour)	Width Length 1500 3900 to 4800
Flight-type escalator conveyor (over 1000 meals/hour)	750 to 1200 3900 to 7900

* Based on self-clearance. Smaller areas suitable where part stacking is provided

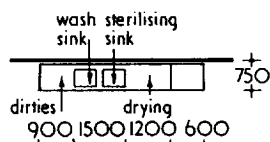
† Assumes some accumulation of dishes before washing up. The lengths relate to tabling 750 mm wide

5 SERVERIES

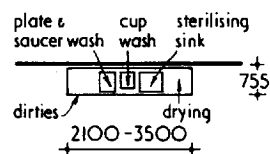
5.01

Some typical self-service counter arrangements are shown in 18.28. The average rate is 6–9 person per minute. One cashier can serve 9 customers per minute, but the rate depends on:

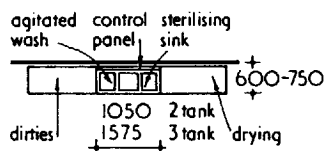
- Variety of menu: simpler menu gives faster throughput
- Whether beverage service is separate from the rest
- Whether there are bypass facilities, counter length depends on menu and rate of service:
 - school canteen:: between 9 and 11 metres would be suitable for a menu offering two or three choices of main dish and serving about 80 to 90 customers in 10 minutes
 - public cafeteria: the same length would serve 60 to 70 in 10 minutes.



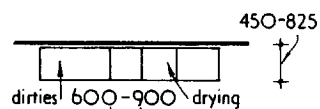
a Manual washing up with wash and sterilising sinks



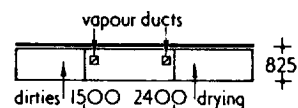
b Brush type dishwashing machine



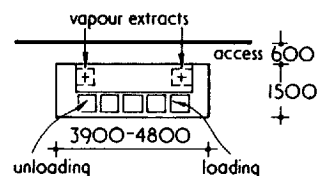
c Agitated water type dishwasher



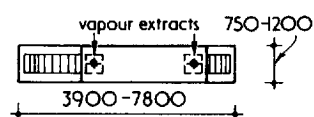
d Small spray type dishwasher



e Medium-size automatic conveyor dishwasher



f Rotary conveyor type dishwasher



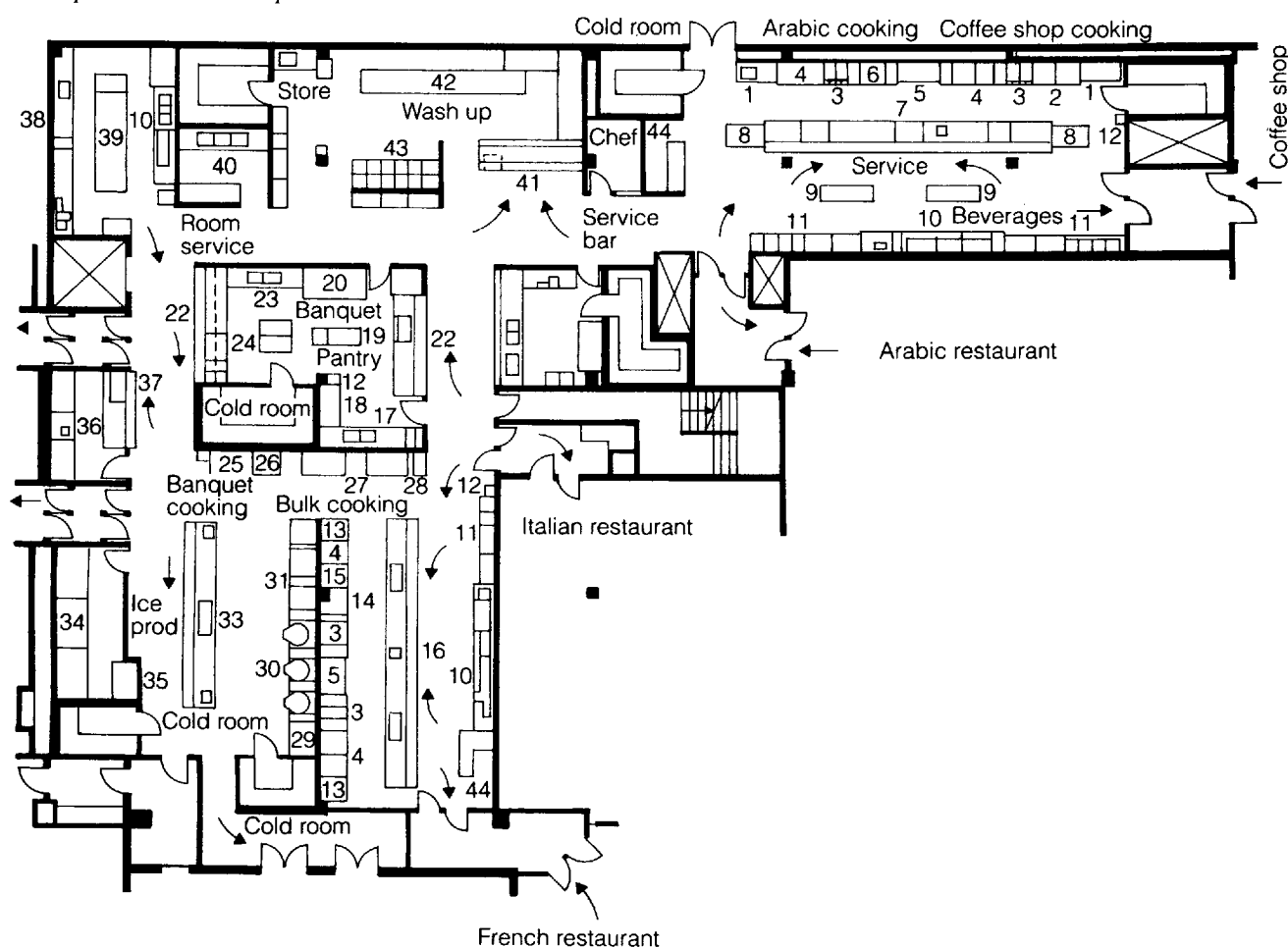
g Large 'flight' type dishwashing machine with continuous escalator type conveyor

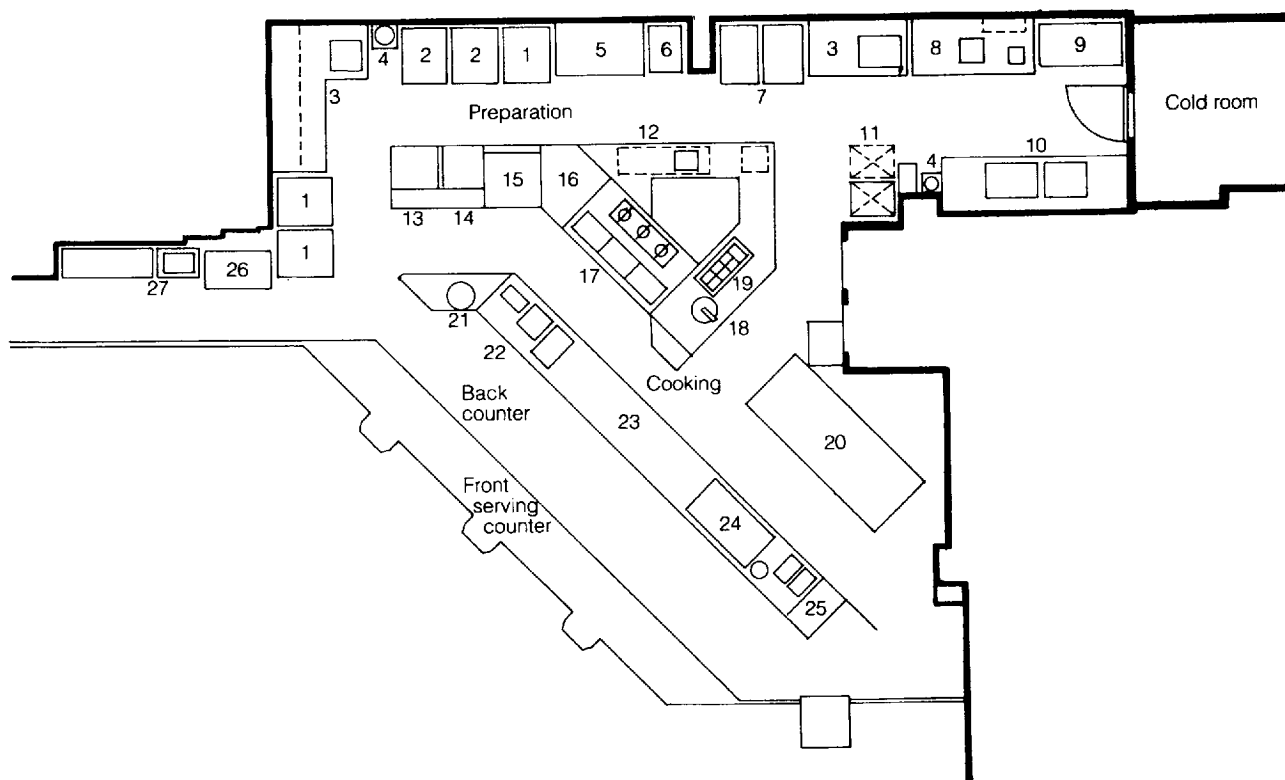
18.25 Alternative layouts for wash-up areas, with equipment dimensions:

18.26 Sheraton Muscat Hotel

This is a recently built 350-room hotel in the Middle East, and illustrates the careful planning of food service facilities by the Sheraton Group. It offers a choice of Italian, French and Arabic restaurants in addition to banqueting for 250, a night club, various bars and room service. Food preparation is separated into specialised areas with common storage and dishwashing services.

Development: Sheraton Corporation Food service consultants: David Humble Associates





Preparation area

- 1 Cabinet refrigerator
- 2 Workbench with sink and shelves
- 3 Wash-hand basin
- 4 Cabinet freezer
- 5 Mobile workbench
- 6 Mobile tray rack
- 7 Mobile proves
- 8 Workbench with sink
- 9 Workbench with cutter/slicer, can opener and cupboards
- 10 Five-tier mobile rack

11 Double sink

12 Trolley park

- 13 Pizza preparation bench with roller and tray racks

Central cooking area

- 14 Microwave convection oven
- 15 Steamer
- 16 Pasta cooker
- 17 Drainer
- 18 Heated bain-marie with infrared lamps over counter
- 19 Pizza-cutting machine

- 20 Chilled bain-marie with refrigerated cupboards under

21 Pizza oven

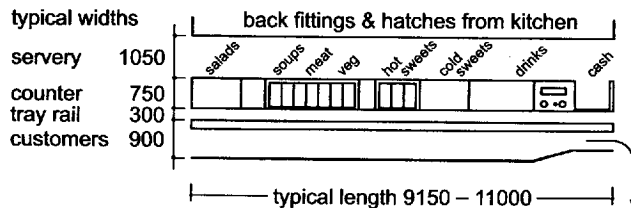
Back counter to servery

- 22 Post-mix, jet spray, ice well and drink dispenser cabinet
- 23 Heated pass-through chute
- 24 Beverage station with boiler, tea and coffee machines
- 25 Shake-machine
- 26 Ice maker
- 27 Cleaner's sink

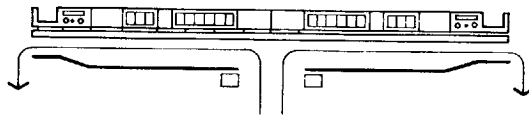
18.27 Seasons pizzeria, London

Key for 18.26

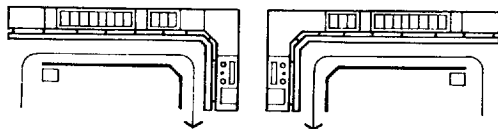
- 1 Sink with wall shelf
- 2 Griddles
- 3 Fryers with adjacent worktop
- 4 Hot top ranges (two) with overshelves
- 5 Refrigerator
- 6 Beverage and breakfast counter with automatic boiler, conveyor toaster, fruit juice and chocolate dispensers, espresso and coffee machines
- 7 Wash-hand basin
- 8 Radiant broiler
- 9 Cold food counter with overshelf and tray slide
- 10 Service racks and basket racks
- 11 Range-mounted broiler
- 12 Charcoal broiler
- 13 Hot and cold distribution counter with overshelf and tray slide
- 14 Pass-through refrigerators
- 15 Hot cupboards
- 16 Pasta cooker
- 17 Griddle
- 18 Hot food counter with overshelf and tray slide
- 19 Workbench with double sink and wall shelf. Conveyor toaster
- 20 Worktable with overshelf and trolley racks for Gastronorm containers
- 21 Worktable with refrigerator cupboard and slicing machine
- 22 Combined mixer
- 23 Ice cream conservator
- 24 Workbench with double sink and wall shelf
- 25 Worktables
- 26 Roasting oven
- 27 Pressure/pressureless steamer
- 28 Convection oven
- 29 Pasta machine
- 30 Worktable with weighing scales
- 31 Tilting kettles
- 32 Bratt pans
- 33 Hot food counter
- 34 Ice-making machines
- 35 Iceflaker
- 36 Cabinet refrigerators with adjacent sink and workbench
- 37 Beverage service counter
- 38 Sink and workbench with egg boiler and toaster
- 39 Trolley park
- 40 Pot wash area with triple sink and racking
- 41 Stripping shelves and rack slide with underbench waste containers
- 42 Flight dishwasher
- 43 Trolley park
- 44 Cashier desks



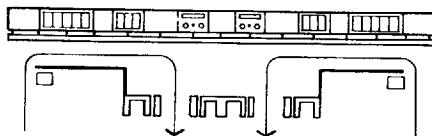
a Single-line counter, 60–90 customers per minute



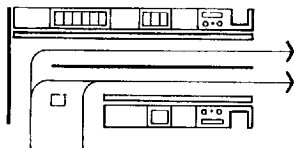
b Divergent flow



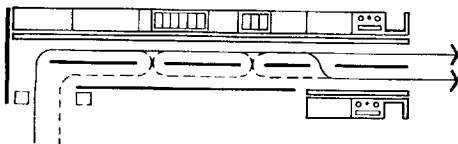
c Convergent flow



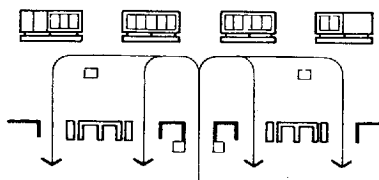
d Multiple outlets



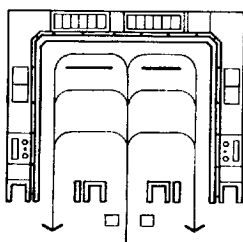
e Parallel flow



f Bypassing

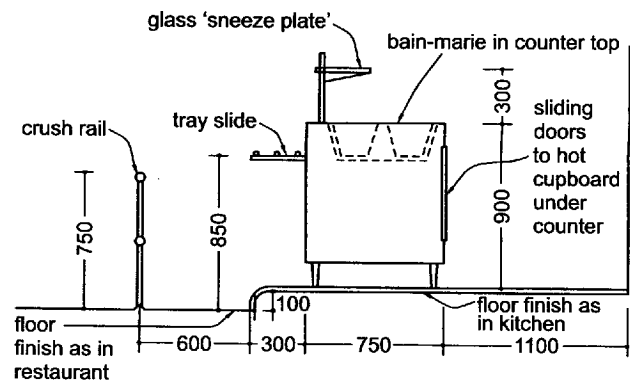


g Free flow with counters in line

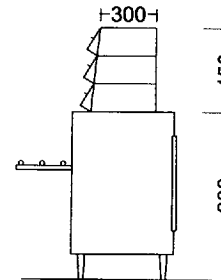


h Free flow with counters in perimeter

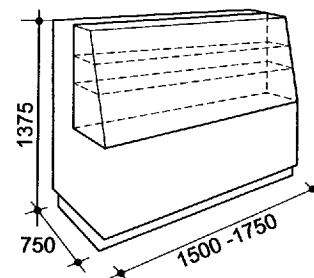
18.28 Alternative arrangements for self-service counters



a Section through counter for hot food



b Section through cold food counter



c Refrigerated showcase

18.29 Servery equipment:

5.02 Equipment requirements and sizes

Servery equipment requirements are given in Table VIII and shown in 18.29. British Standards for equipment are given in the Bibliography. There are no universal standards for dimensions of equipment but the European Catering Equipment Manufacturers Association favours the Swiss 'Gastro-norm' system of dimensions, widely adopted on the Continent, 18.30.

6 RESTAURANTS

6.01

Commercial restaurants are notoriously subject to fashion. They have a short life, not often over seven years. Money invested has to be recovered fast. The facilities provided for the customer, and the food available, may need to be frequently changed.

Full-service up-market restaurants are only 5 per cent of establishments. The mid-market range includes steak and seafood restaurants, grilles and rotisseries, and ethnic restaurants.

6.02 Ethnic restaurants

In Britain there are about 4000 Chinese restaurants and 2000 Indian/Pakistani. Design is often symbolic rather than authentic. Chinese cuisine is divided into: Canton, Peking, Szechuan and

Table VIII Equipment requirements for a self-service cafeteria

Equipment for servery		Meals served per day – based on main meal period							
		50	100	200	400	600	800	1000	
							1 (1–single line 2–double line)	2	
Trays									
Tray storage length	m	0.45	0.45	0.60	1.35	0.60	1.35	2 × 0.6	1.35 2 × 0.6
Bread, rolls, butter, etc.*									
Unheated counter with self-service display above: length	m	0.45	0.45	0.75	1.20	1.65	1.80	2 × 1.2	2.30 2 × 1.5
Cold meats, salads, etc.*									
Refrigerated counter	m	0.45	0.75	0.90	1.20	1.80	2.30	2 × 1.2	2.60 2 × 1.5
with dole plate and glass display above, refrigerator under of capacity:	m ³	0.06	0.06	0.08	0.08	0.11	0.11	2 × 0.08	0.14 2 × 0.11
Hot foods									
Hot cupboard with sectioned bain-marie and heated service shelf: length	m	0.9	1.5	2.4	3.6	4.9	6.1	2 × 3.6	7.3 2 × 4.3
Beverages – hot drinks†									
Counter length	m	0.9	1.1	1.2	1.4	1.5	1.8	2 × 1.2	2.1 2 × 1.5
Comprising water boiler capacity	litres/hr	55	115	170	225	340	455	2 × 225	570 2 × 285
Tea/coffee urns									
No. × capacity	litres	1 × 15	2 × 15	2 × 25	2 × 45	2 × 70	2 × 90	4 × 45	2 × 115 4 × 70
Storage racks under counter for cups/saucers:	capacity	50	100	150	200	250	350	2 × 200	450 2 × 250
Reserve cup and saucer storage behind counter:	capacity	–	–	50	200	350	450	2 × 200	550 2 × 250
Cold drinks, etc.†									
Counter length	m	0.6	0.9	1.2	1.8	2.1	2.4	2 × 1.8	2.7 2 × 2.1
Comprising refrigerator capacity	m ³	0.06	0.06	0.08	0.08	0.11	0.11	2 × 0.08	0.14 2 × 0.08
Cold shelf length	m	0.45	0.6	0.6	0.9	1.2	1.2	2 × 0.9	1.5 2 × 1.2
Ice cream storage*	litres	4.5	9.0	13.5	18.0	22.5	27.0	2 × 9.0	31.5 2 × 13.5
Squash dispenser		1	1	1	1	1	1	2	2
Iced water point		1	1	1	1	1	1	2	2
Cutlery†									
Counter length	m	0.30	0.30	0.45	0.60	0.60	0.90	2 × 0.6	0.90 2 × 0.6
Cutlery boxes fitted in top-capacity pieces		250	300	400	600	900	1000	2 × 500	1700 2 × 650
Reserve cutlery under			200	600	1400	2200	3000	2 × 1400	3800 2 × 1850
Cashier counter-cut away for cash desk length	m	1.2	1.2	1.2	1.2	1.2	1.2	2 × 1.2	1.2 2 × 1.2
Standard cash desks		1	1	1	1	1	1	2	2
Automatic change machine						1	1		1

* Depends on type of meals and customer preferences

† May be located away from service counter

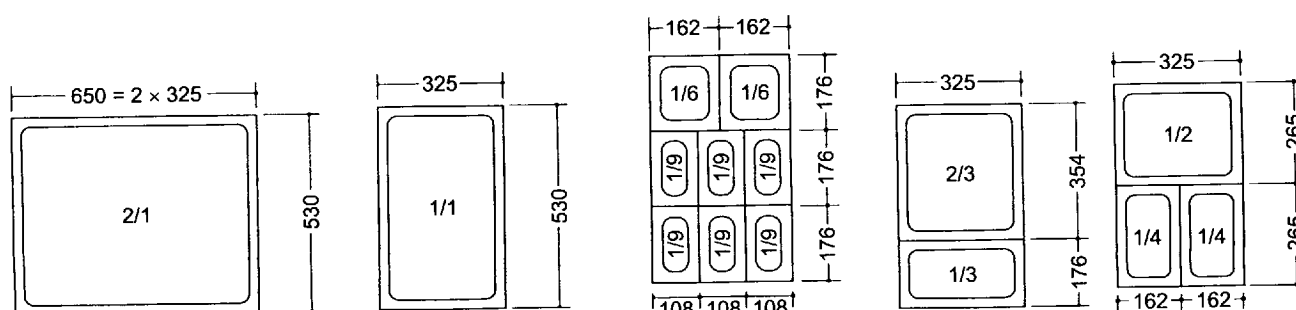
Based on equipment by Stotts of Oldham

Shanghai. The kitchens need to provide the extensive menus required, which can be up to 300 items. Indian food is strongly spiced and much of it can be cooked by quite simple means such as boiling. Japanese food is subtle: preparation and service are seen as an art form. Greek restaurants are often designed as peasant-style tavernas. Seafood and cheap meat is much used. Greek music and dancing may be featured. Italian food is very popular and pizza has moved into the fast-food area. Pasta is the other national dish and comes in many forms including lasagne

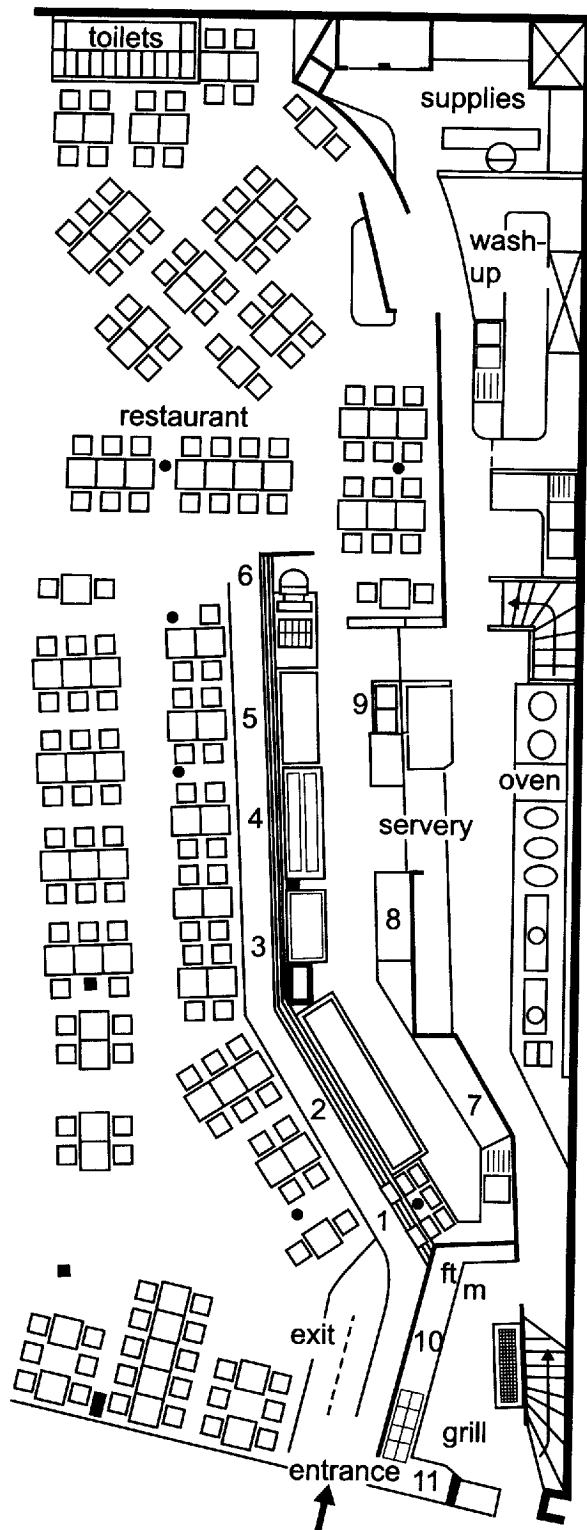
and ravioli. Spanish and Mexican restaurants are often also taverna-style. Mexican food is more spicy than Spanish. Scandinavian food relies on smoked food and cold meats.

6.03

A self service restaurant is shown in 18.31. Details of a self-service counter are given in 18.32. A drive-in restaurant is shown in 18.33.



18.30 Module sizes for Gastronorm containers



18.31 Self-service restaurant in Paris
Architect: Prunier

- 1 Trays
- 2 Cold buffet
- 3 Beverages
- 4 Hot meals
- 5 Cheese and desserts
- 6 Cashier
- 7 Refrigerator
- 8 Beverages cupboard
- 9 Ice
- 10 Hot cupboard
- 11 Street sales counter

7 CAFETERIAS

7.01

Cafeterias are self-service establishments, commonly run on a non-commercial basis as a service to staff and others such as students. They are characterised by:

- Scale of operation: usually fairly large, giving certain economies of scale
- Concentration of demand: a short service period demands a high rate of service. Above 600 meals a day, free-flow and multi-counter service is practical.
- Menus: balanced to meet nutritional standards. Degree of choice will determine counter layout and/or length.
- Operation: also used in high-demand commercial services (airports, stores, service stations)
- Space: counters add 0.2–0.3 m² to area per seat in the dining room.

7.02

Two examples of cafeterias are shown in 18.34 and 18.35. Both use the standard key 18.36.

8 TAKE-AWAYS

8.01

Fast food is the fastest growing sector accounting for about one third of the market for meals outside the home. These outlets usually concentrate on popular products such as pizza, hamburgers, chicken or baked potatoes. They rely on high-volume sales and tight control of costs and margins to provide competitive prices.

If high street locations are used trading may have to be over a 15-hour day, seven days a week. Investment costs are high: sophisticated equipment is required so that untrained staff can use it, and wear and tear is heavy. Most operators aim for a door time, entering to leaving, of 3.5 minutes. The maximum queueing time is 2.5 minutes, allowing for 1 minute from placing the order to service.

8.02

Food will be delivered to the establishment ready-portioned and frozen or chilled. The entire procedure is closely controlled: unsold hot food is kept for only a fixed period before being discarded. Employees will be categorised as till operators, backers and crew. There is a move towards health-conscious markets, such as making orange juice, salads and low-fat products available.

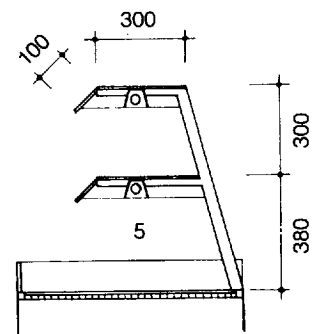
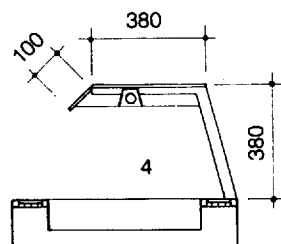
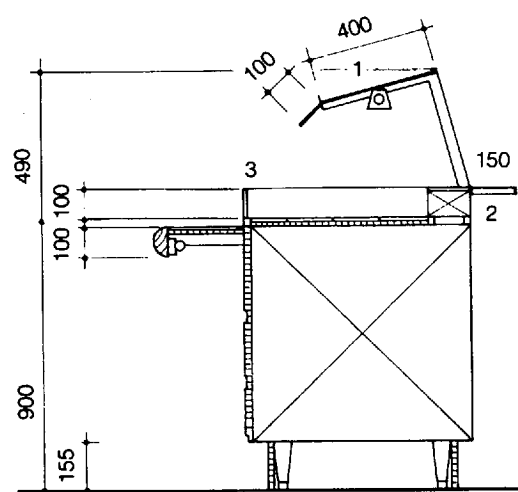
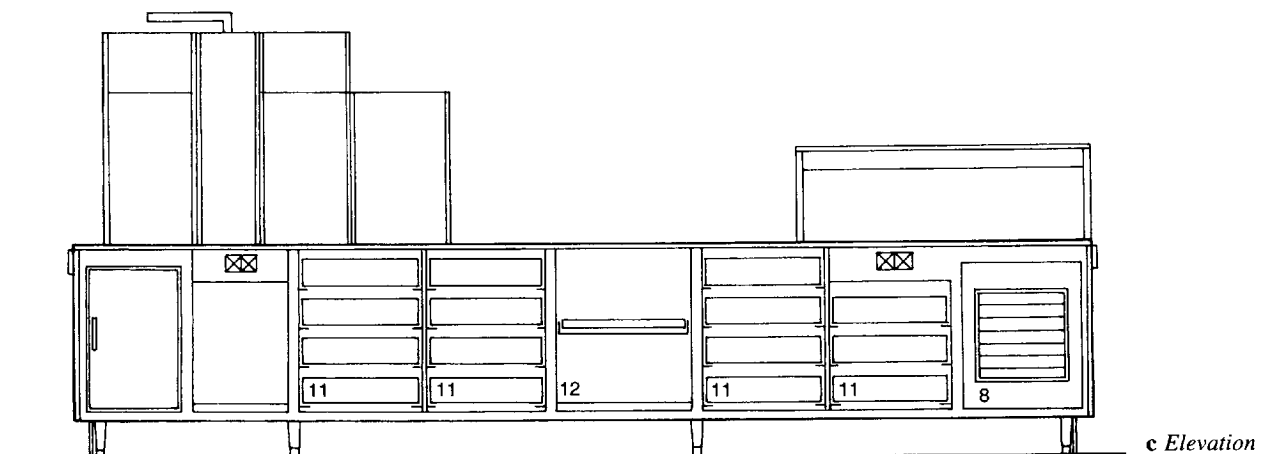
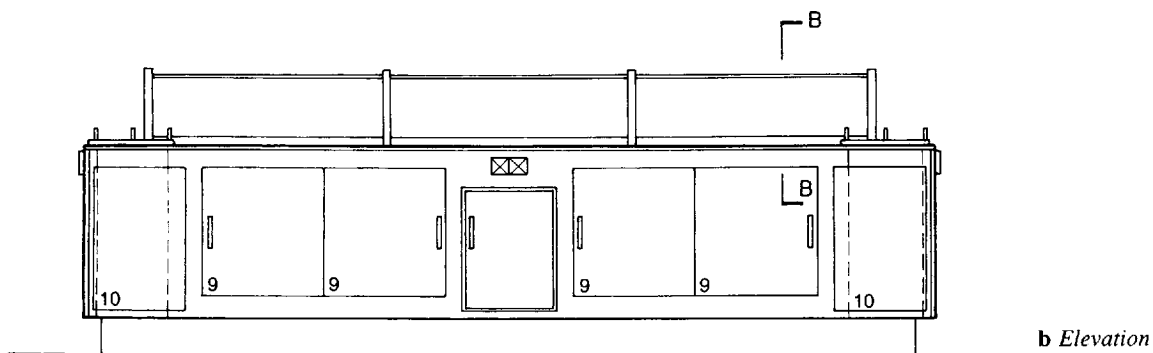
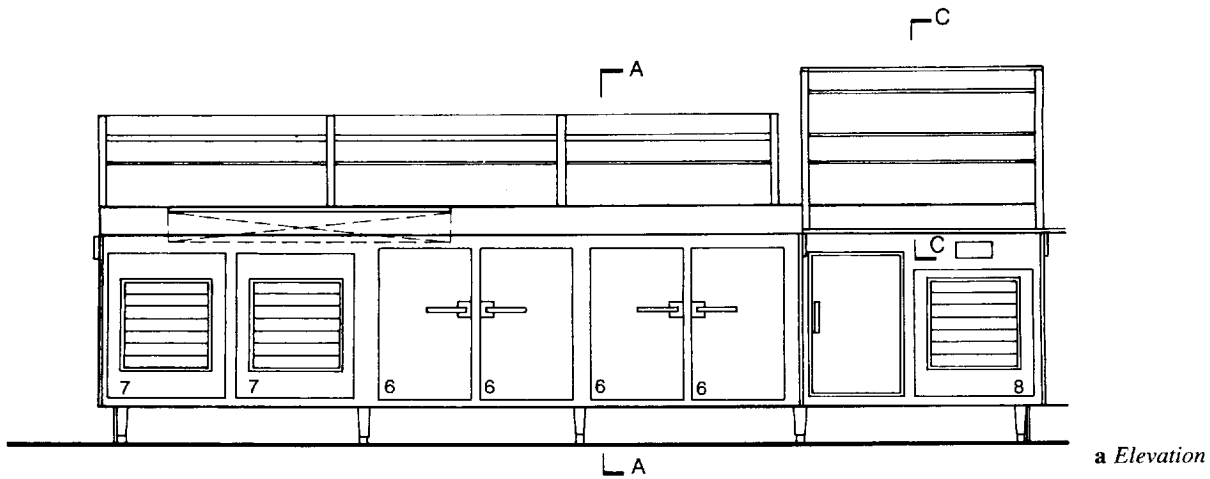
8.03

Many medium-price restaurants will supply meals to take away in addition to in-house facilities. However, there are large numbers of dedicated take-aways (called carry-outs in Scotland) occupying standard shop units, most of which is taken up by storage and preparation areas. A small public area will contain a counter and little else; although some will provide a few seats, either for people waiting or even for a very few to eat. Local authorities encourage take-aways to provide and service refuse facilities in their immediate vicinity to reduce the nuisance caused by the litter they tend to generate.

9 TRANSPORT CATERING

9.01

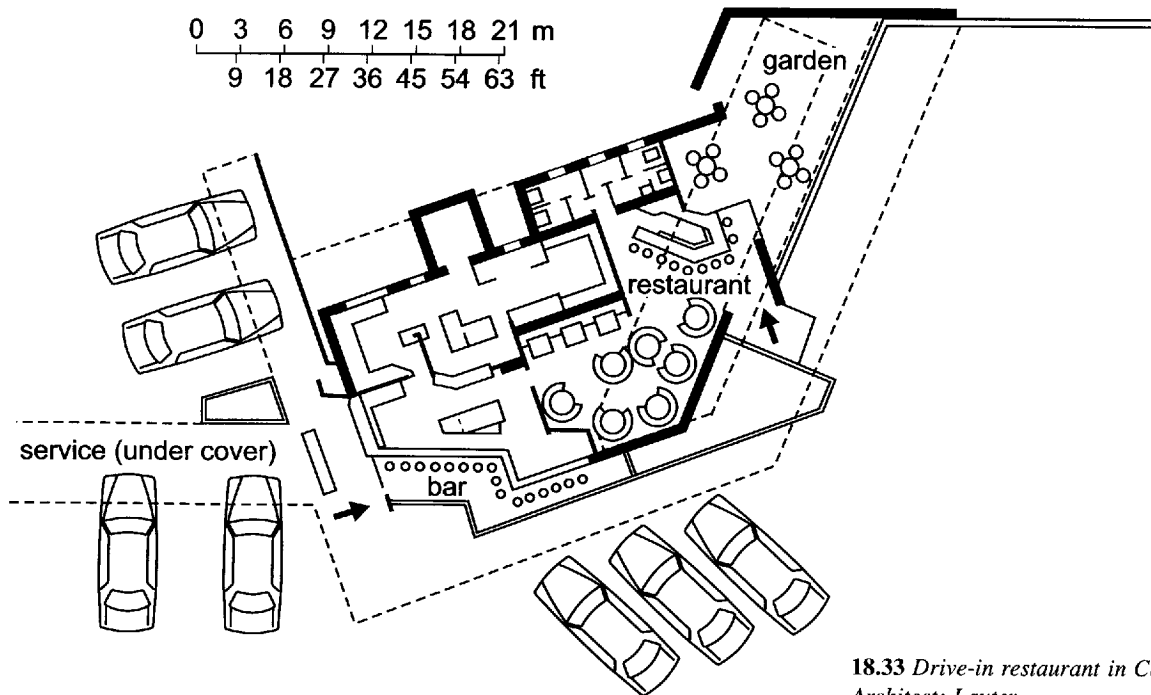
Airport, station, ferry and cruise liner catering has much in common with other commercial and canteen outlets. Airline in-flight catering is provided by specialist sub-contractors who prepackage everything for restocking planes, which must not take



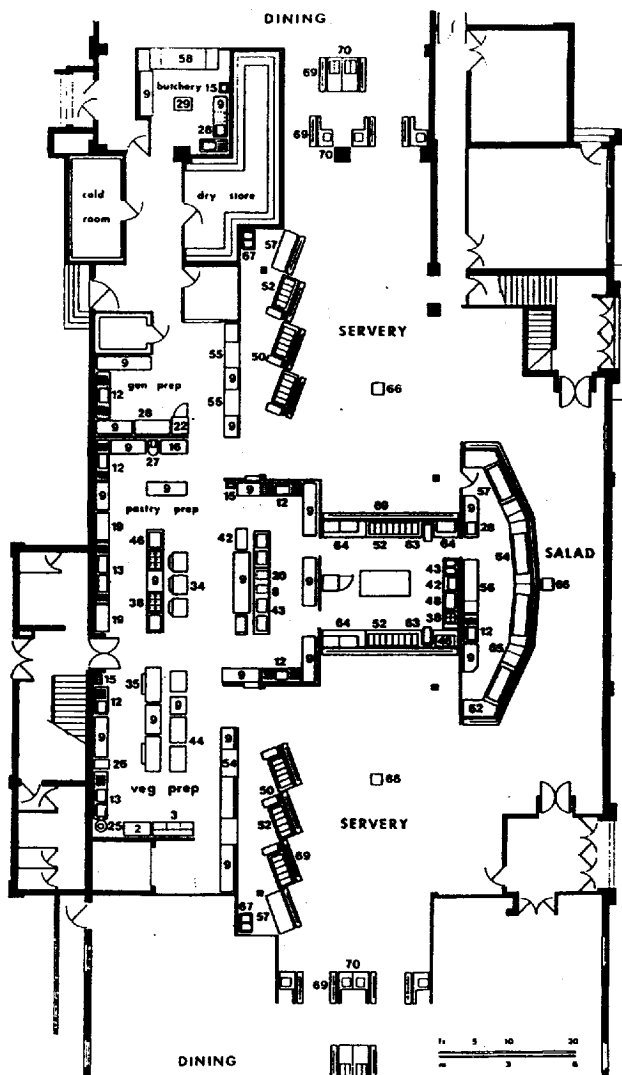
- 1 Sneeze guard
- 2 Fan cooler
- 3 Tiled tray slide with inset nylon runners
- 4 Refrigeration well
- 5 Two-tier shelves with fluorescent tube lighting
- 6 Refrigerated base
- 7 Refrigeration compressor

- 8 Electrical housing
- 9 Heated cupboard
- 10 Heated cupboard with plate lowerator
- 11 Open cupboard with cup basket
- 12 Open cupboard with shelves

18.32 Self-service counter:



18.33 Drive-in restaurant in California
Architect: Lauter



18.34 Staff catering facilities, Plessey, Liverpool. Designed to provide up to 4000 meals within a period of 2½ hours. Equipment by Oliver Toms Ltd, standard key, 18.36

more than 20 minutes. The requirements are tight: food should not have strong flavours, it must be consumable in a small space, it must not be damaged by changes in temperature and pressure. Containers must be attractive, unbreakable and stackable, light and cheap. Production is done in specialised conveyerised kitchens to the exact demands of the airlines.

10 PUBLIC HOUSES

10.01 General

The requirements of public houses are different from other food-service outlets in that alcohol sales are the dominant rather than a subsidiary activity. Licences to sell alcoholic liquor will only be granted if the applicant and the premises are suitable for the purpose. The licensing justices will consider such things as safety, means of escape, sanitary facilities and separation of bars from other areas. Any structural alterations must also be approved by the justices, who can require changes before a licence is renewed.

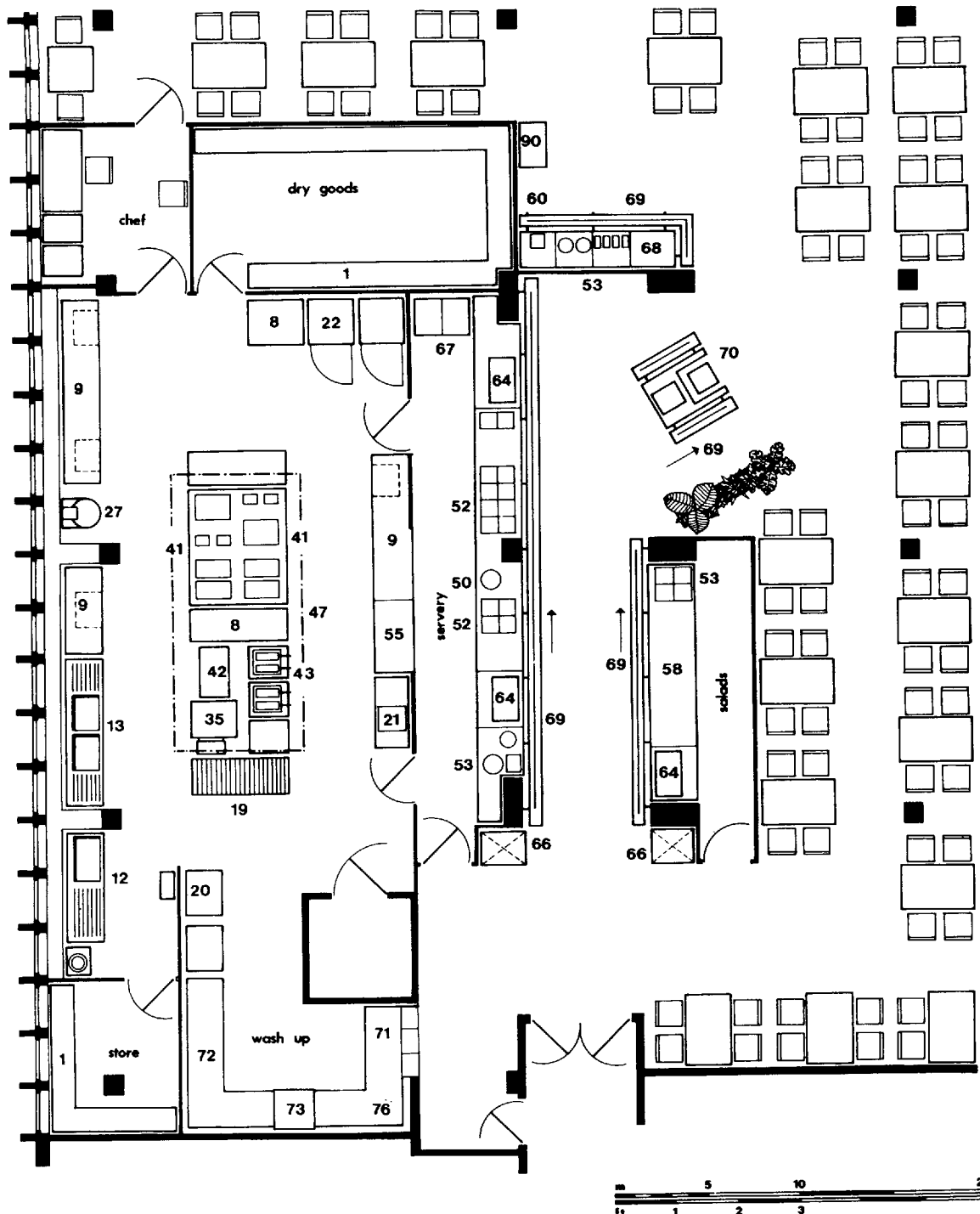
Most building work on licensed premises is in the alteration of existing buildings. Few new pubs are built. Public houses consist of two parts:

- Public areas: bars and lavatories, where the customers are allowed. Often, particularly in older properties, the appeal to the customers can lie in the age and eccentricity, or even the inconvenience, of the layout. Optimum seating may not be possible, or even desirable, and the clever designer will turn this to advantage.
- Private areas: for staff, consisting of serveries, cellars, kitchen and staff accommodation. Here, where the staff do their work, and where the liquor is stored, specific dimensions and good planning assume great importance, and closely affect the efficient running of the establishment.

The relationships of the main spaces are shown in 18.37. Some possible site layouts are shown in 18.38.

10.02 Drink delivery

Vehicles deliver drink in bulk by tanker, in barrels or kegs, and in bottles in crates. For vehicle sizes see Chapter 4. The vehicular access must be convenient for the cellars, owing to the quantity of heavy goods handled. Empty containers will be returned.



18.35 British Relay Ltd, Crawley

A self-service restaurant to serve 350 diners over a 1½-hour period. The island salad bar is designed to divide the flow and increase the speed of service. Standard key, 18.36

10.03 Drink storage

Cellars may be below ground, at ground level, or in rare cases at an upper level. They must be planned to store the following economically:

- Kegs
- Bottles, usually in cases stacked on one another
- Wine and spirits, usually stacked on shelves in a separate store
- Bulk storage tanks
- CO₂ canisters

The size of the standard metal keg or of the case containing two dozen half-pint bottles is fairly standard. Wooden barrels on tilting stillages are now extremely rare, 18.39 to 18.46.

Storage of empties is similar, except that it is easy to stack empty cases higher, so less space is required. For the purposes of design any beer other than bottles or cans, is referred to as 'draught'. Draught beer from the cellar is usually delivered under pressure. Beer travelling upwards one storey height is pumped electrically. Bottles travelling upwards one storey height are usually delivered by a case hoist, which is installed as a unit and

18.36 Standard key for kitchen and restaurant layouts

Storage areas

- 1 Shelving
- 2 Vegetable racks
- 3 Vegetable bins
- 4 Storage bins

Preparation areas

- 8 Worktable or bench
- 9 Workbench with cupboards/drawers
- 12 Single sink with drainer
- 13 Double sink unit
- 14 Mobile sink
- 15 Wash-hand basin (with dryer)
- 16 Marble-topped bench
- 19 Pot rack
- 20 Trolley
- 21 Mobile trays
- 22 Refrigerator
- 25 Potato peeler
- 26 Chipping machine
- 27 Mixing machine
- 28 Slicing machine/vegetable mill
- 29 Chopping block

Cooking area

- 34 Forced-air convection oven
- 35 Steaming oven/pressure steamer
- 36 Microwave oven
- 38 Boiling top with oven top
- 39 Boiling top with solid top
- 41 Oven range with boiling top
- 42 Griller or salamander
- 43 Deep fat fryer
- 46 Open-well bain-marie
- 47 Extraction hood over equipment

Serving area

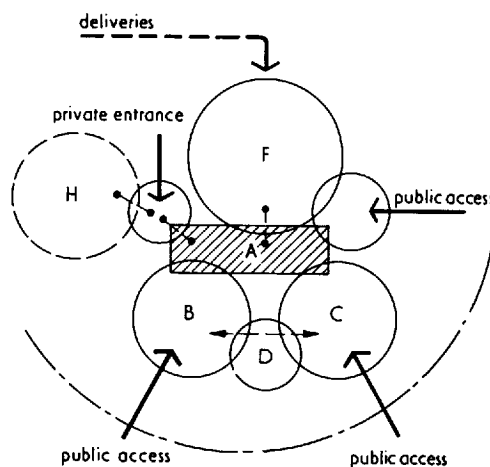
- 50 Plate lowerator or dispenser
- 52 Hot cupboard with bain-marie top
- 53 Bench type bain-marie unit
- 54 Pass-through unit – heated
- 55 Pass-through unit – cold
- 56 Refrigerator under-cupboard/drawer
- 57 Refrigerated cupboard with doleplate
- 58 Refrigerated display cabinet
- 59 Milk dispenser
- 62 Counter unit – unheated
- 63 Counter unit with infrared lamps above
- 64 Counter display cabinet
- 65 Compressor or boiler under counter
- 66 Tray stand
- 67 Ice cream conservator
- 68 Cutlery stand
- 69 Tray rail
- 70 Cashier's desk

Wash-up area

- 71 Receiving table for soiled dishes
- 72 Stacking table for clean dishes
- 73 Dishwashing machine – semi-automatic
- 76 Waste-disposal unit or scraping point

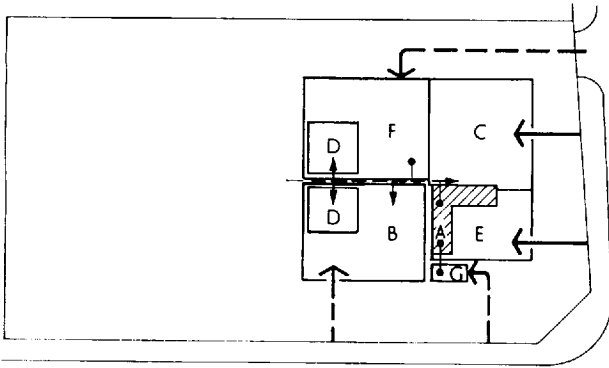
Dining areas

- 90 Beverage vending unit
- 91 Food vending unit
- 92 Waiter/waitress serving station

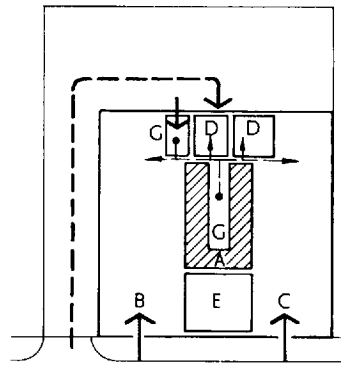


18.37 Space relationship diagram for a public house

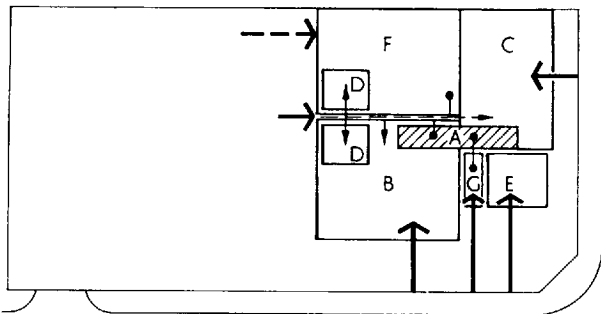
- A Servery
- B, C Drinking rooms
- D Lavatories
- E Off-sales
- F Storage (cellars)
- G Licensee's entrance
- H Licensee's accommodation



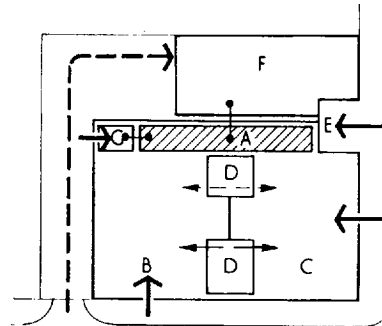
a Corner site with building clear of all boundaries



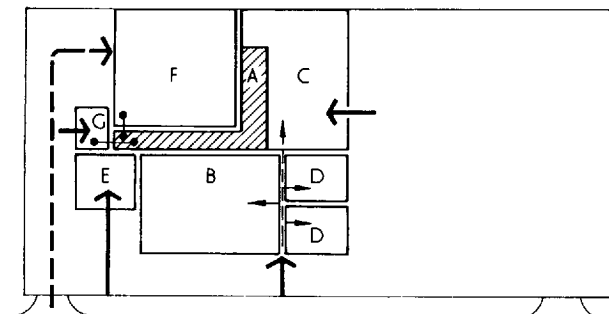
d Straight site with delivery access at rear, and storage at lower level



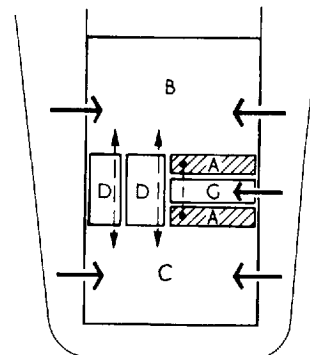
b Corner site with building set against back boundary



e Restricted corner site

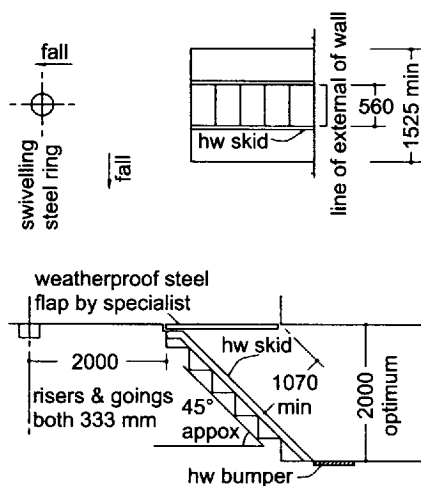


c Straight site with delivery access at side

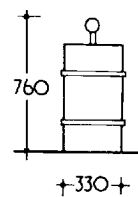


f Island site with storage at lower level

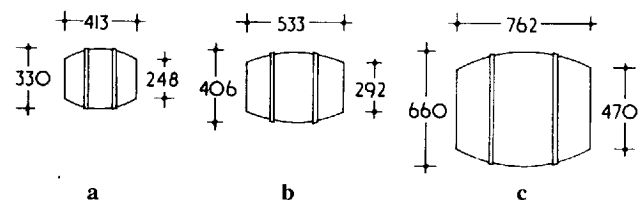
18.38 Planning public houses for different sites (key as for 18.37)



18.39 Cellar flap and barrel chute for use with below-ground storage. Note: wooden barrels are no longer used, but kegs are also rolled in



18.40 Keg with valve attachment

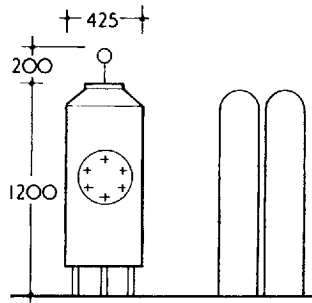


18.41 Metal barrels or kegs:

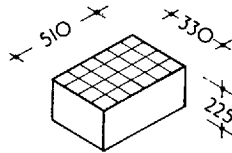
a Pin, 4.5 gall/20.5 litres

b Firkin, 9 gall/40.9 litres

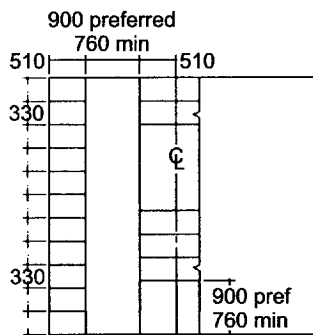
c Barrel, 36 gall/163.7 litres



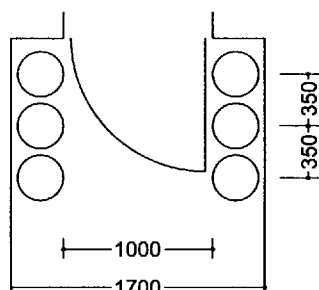
18.42 Bulk storage in typical CO₂ canisters. Larger canisters also exist



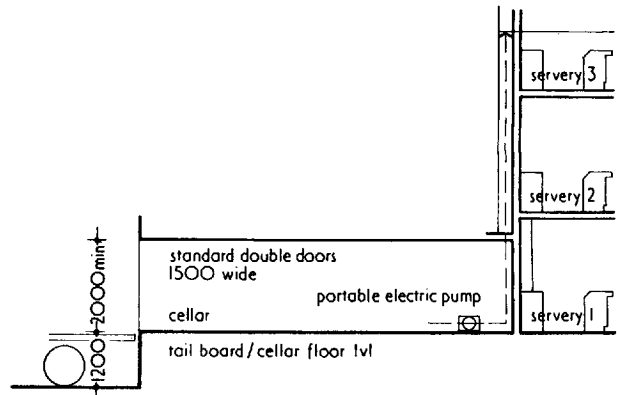
18.43 Case storage, each case contains 24 half-pint bottles. Non-standard cases are normally smaller



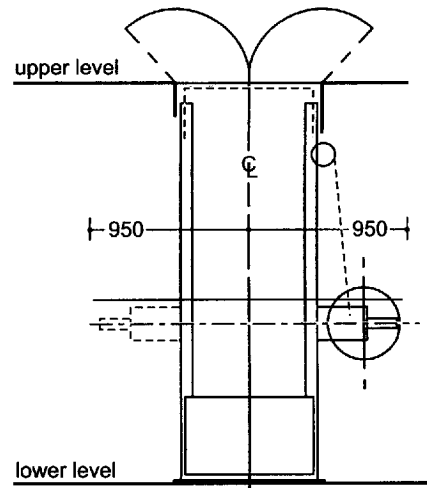
18.44 Alternative plans of case storage



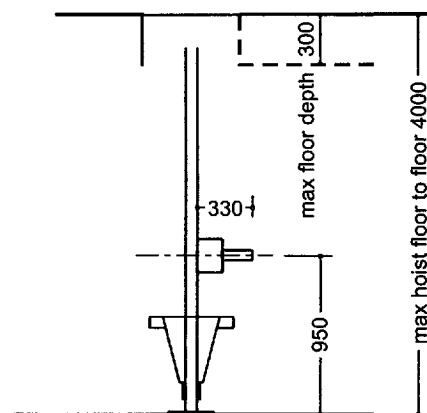
18.45 Keg storage



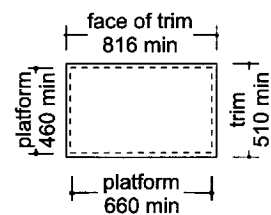
18.46 Beer supplied through several storeys from ground-level cellar. A standard electric cellar pump will raise beer up to 9 m



a Front elevation



b Side elevation



c Plan at upper level

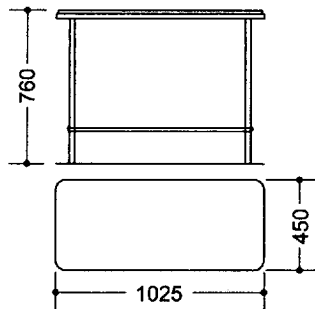
18.47 Small manual case hoist for two cases:

display fitting holding spirits, often in 'optics', wine and glasses. Adjustable shelves are useful. The lowest shelf must be high enough to accommodate bottles, siphons, the till, etc. Sizes of bottles and glasses are shown in 18.51.

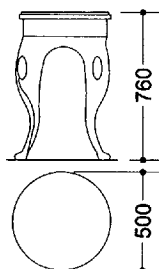
The sizes of special equipment such as coolers, glass washers, etc. should be determined from consultation with the client as to preferred manufacturers. The sizes of ducts for the beer pipes, which are usually lagged, should be confirmed with the client.

10.05 Cooling

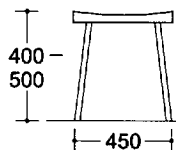
The temperature at which beer is kept and served is a critical factor. The two are not always the same. Recent fashion has tended towards colder dispensing, except for that of 'real ale'. This implies that two 'cellars' are needed: one naturally cool for the real ale, the other at ambient temperature for beers cooled in the pipeline or even at the bar. A 'remote cooler' is necessary for the latter processes; this should be installed where the heat generated from it does not unduly affect liquid stock. Requirements should be checked with the client and the supplier.



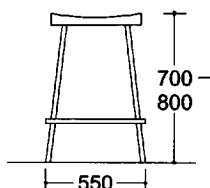
18.52 a Rectangular cast iron base pub table



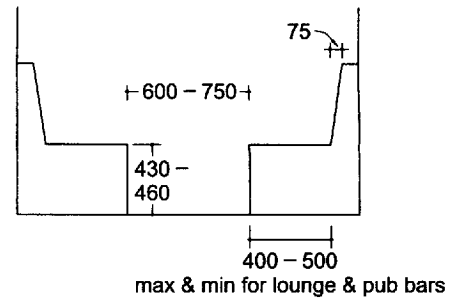
b Round 'Britannia' cast iron base table



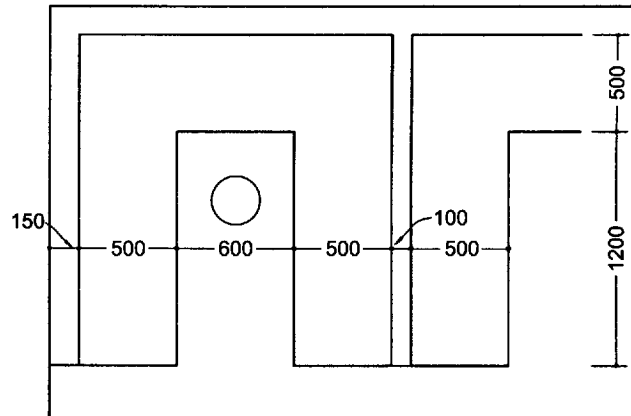
18.53 a Low stool for use at a table



b High stool for sitting at the bar

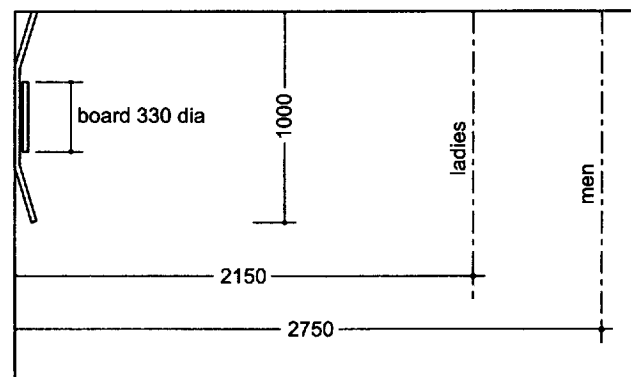


a Section through booth



b Plan of peninsular seating

18.54 Fixed seating of bench type:



18.55 Space required for darts

10.06 Bars

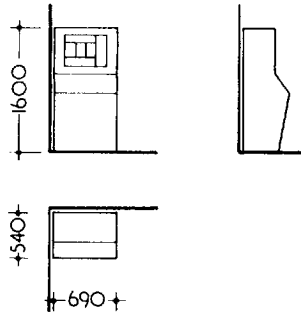
Sizes of cast iron tables are fairly standard, but other types are very variable, 18.52. Fixed seating can be from minimal to opulent, 18.53. Stools are shown in 18.54. Cill heights should be decided on with regard to fixed seating. Ceiling heights vary, and depend on the effect required.

Space may be needed for:

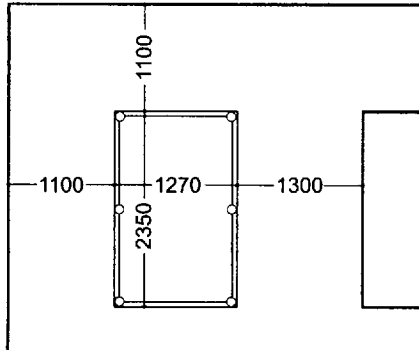
- Dartboard, 18.55
- Fruit machine, 18.56
- Pool table, 18.57

These are becoming very popular. A larger size may be needed if championship matches are likely to be played.

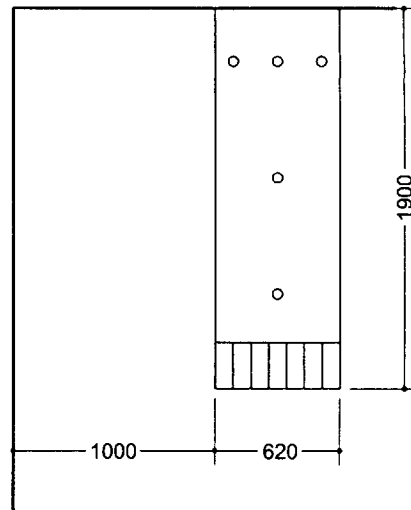
- Bar billiards, 18.58: this is becoming a rarity,
- Full-size billiards/snooker table, see Chapter 25
- Juke box – sizes vary considerably
- Piano or organ, 18.59



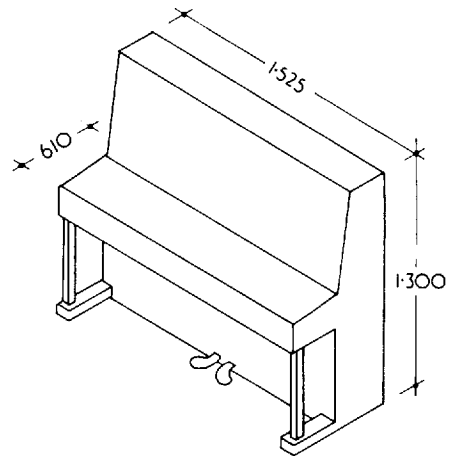
18.56 Large fruit machine, requires an electrical supply



18.57 Smallest size of pool table with cue space (for short cues) now common



18.58 Space required for bar billiards



18.59 Public house piano

11 BIBLIOGRAPHY

- S. Colgan, *Restaurant Design, Ninety-Five Spaces That Work*, Whitney Library of Design, New York, 1987
 B. Davis, *The Traditional English Pub*, Architectural Press, 1981
 F. Lawson, *Restaurants, Clubs and Bars*, Architectural Press, 1987
 F. Lawson, *Principles of Catering Design* (2nd ed), Architectural Press, 1978